

2023-04-03 Graham and John discuss the option of nuclear energy and how it fits into Australia

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Well, hi everyone and welcome to Club Grubbery and we're recording this Wednesday the 3rd of April and the year's flying by and this, this is going to be a really great show tonight because we're going to talk about something a little different, but very, very topical with our three guests tonight who we'll introduce shortly.

Uh, but before we do that, uh, John, some news items from your end. Great to see you back on, mate. Great to be here, Hildy. Yeah, look, uh, John Ruddock in the upper house of the New South Wales Parliament, who, uh, is with the Libertarian Party, who incidentally are a massive supporter of, uh, Of, uh, clean energy and nuclear, uh, the police minister Yasmin Katli has written to, uh, John in relation to the police being returned to duty after this ridiculous 181 D mandate.

Garbage. Anyway, she says in the last sentence, the New South Wales Industrial Relations Commission has consistently held that removal for failing to comply with the COVID 19 direction issued by the former commissioner of police is lawful and reasonable. While I appreciate Mr. Paul's position, referring to Justin Paul, I am advised that Mr.

Paul has no further legal recourse in relation to this matter. Thank you for writing about this matter. Yours. Sincerely, Yasmin Catley. Well, Yasmin Catley, you are now on our list of, uh, people to target because you're a disgrace. You're a grub. You're an absolute idiot. I did some background research into this woman, Hoodie.

She's a librarian. She's a librarian. Now, I'm not having a crack at librarians, but fair dinkum. What would a librarian know about bloody running a police force? This is a joke. You know where else this idiot worked? Greg Combay's office. How ironic here we are talking about, uh, uh, nuclear energy tonight.

She works for Greg Combay and Albanese. Unbelievable. Unbelievable. Um, yeah, look, you, you can't make that stuff up, John. And we're not going to let up on that. We've just got to keep going. These people have got to get their jobs back. And, uh, there's no doubt about that. Regardless of what people think about vaccines, the mandates.

that have done this to people that they can't even work anymore because they've got a section 118d which means that they've been fired and terminated on the basis of gross misconduct. Now who's going to hire an ex copper who's got gross misconduct on their file? I mean, it's just disgraceful. The very least they should do is remove that.

Uh, but anyhow, more about that a bit later on. Uh, also we have, um, Nick Patterson in court. He went to court today. He's five days in court in Melbourne. He's fighting the legitimacy of the lockdowns. Um, and I'll tell you what, he's really doing a great job there, John. Five days in the court, uh, Brett Sutton has been subpoenaed.

And the health minister at the time of being subpoenaed in Victoria to provide information and evidence on how they came to the conclusions they did. And, uh, they have not come forward with, with proper evidence. All those, all I've done is come forward with hearsay. So, um, anybody in Melbourne, get along to the court in William street.

I think it's two 51 William street and support Nick Patterson. You can go to our website, to our, um, pages and all the information is there along with Nick telling everybody what's going on. So let's get on with our program. Um, we are in Australia in the midst of, we are in the midst of a crisis in so many areas.

Um, it would appear that, um, the currently elected government is just completely inept and unable to, to manage the country. There's no doubt about that. Now let's discuss a couple of the issues there already. Um, we already know that Albanese and, uh, the czar of, uh, of, of. Carbon zero, um, Bowen, Chris Bowen have flown to one event in two separate Air Force jets.

Um, now this, this is all about saving the, uh, the environment. I'm sure it is how much. How much rubbish can they associate with that? I mean, it's just bizarre, absolutely ridiculous. Energy in Australia is in crisis John, there's no doubt about that. Um, the Albanese government came in, elected that they were going to reduce power bills by 250.

Nah, we need, the grid is failing all over the place. All we need is a cow to pass wind in Western Australia and the grid in South Australia goes down. I mean, it's just ridiculous. Our infrastructure is shot to pieces. We're covering our beautiful farmland and our scenic tourist areas with wind turbines that don't work.

Solar farms are going through the roof. Grazing land is being decimated by solar farms. And all this to fulfill an agenda that is just, anybody can see is unachievable. It's not achievable. Electric cars, what can possibly go wrong? I mean, there's already massive failures of electric vehicles around the world.

In America at the moment, they can't handle the cold weather. They're having all kinds of trouble charging these things up and they're blocking highways. I mean, we, we've really got to rethink this and everybody with an ounce of sense, John, and we would hope that our government was like that, would say, you know what, We've got uranium by the thousands and millions of tons in Australia.

We've got the ability to store the spent uranium safely in the ground in vast desert areas in this country. We can build a stable nuclear power system that will be cheap to run, efficient, that would end all of our problems and help get this country back on its feet again. But no, the czar of, uh, of, um, of zero carbon, uh, Chris Bowen says, it's going to take too long.

It's not going to work. It's too expensive. We've got to, we've got to use renewable energies. So to discuss all this tonight, we have an unbelievable panel, uh, on with us tonight. Firstly, the top of the screen next to me is a wonderful, uh, young man who is, uh, Will Shackle and Will is the founder of the nuclearforaustralia.

com organization. He's just 17 years of age. And uh, I mean, he's got a grin on his face from ear to ear. And we're smiling because, you know, for someone like him to have the courage and the wherewithal and the tenacity to do this is amazing. Sitting underneath him is the, is Adi Patterson, who's the former CEO of ANSTO.

Great to have you on, Adi. And ANSTO is the Australian Nuclear Science and Technology Organization, and, and, uh, they were in charge of running, uh, Lucas Heights. So, great to have you on, Ansty. Good to be here. Great to have you on. And, uh, sitting next to him in the, uh. A very interesting t shirt. I like the t shirt.

Um, I do like that t shirt is, uh, Paul Vallejo. Now, Paul is an ex NASA engineer who's been a resident in Australia for 12 years. And you all are going to talk to us about the feasibility of nuclear power. So, I might start with you, Adi, um, because you are, you are the chair of the Nuclear for Australia, uh, Foundation, I guess.

Tell us, tell us what this government needs to do for a start before we can even get out of the mess that we're in. Well, thank you for the opportunity to join in tonight. Um, I think the most important thing in the Australian setting. is to remove the bans and restrictions, um, that exist at the federal and state level, uh, so that we can actually progress a discussion about the opportunity for safe, low carbon nuclear power, um, which is happening in 40 countries around the world already that have nuclear power, and about another 40 countries Um, a lot of countries have started nuclear power programs that they can establish the footprint to, to make electricity, um, always on low carbon, uh, price effective, uh, electricity, um, is essential to, to modern nations.

And we are no longer in a situation where with the dilute resources that we have in our grid. All of which are DC when they get into the grid and you have to. Uh, turn them into 50 hertz type of electricity. And that's a messy job that they're making of that. And ultimately it means that the cost of the electricity goes up.

And we face that risk, so. I've been passionate about, uh, nuclear power since I was about seven and a half years old and read a book called Science Can Be Fun, with a red and yellow cover. I've got, got that in this room somewhere. Um, and it was a reminder to me right from that age, uh, that nuclear power, they called it atomic power in that book, because before we found it wasn't just the atom, it was the nucleus.

Um, and, uh, and it's remarkable that right through my life, countries have been adopting this power, using it, adding value to people's lives. And we still have bans in this country. It is unbelievable. And when you consider in the light of the, uh, of the Orcas submarine deal, uh, we've been thumbing our noses at nuclear power for so long, we've now committed to a deal to buy submarines that will be obsolete by the time they get here, that will be nuclear power.

And the deal is costing the Australian taxpayer 32 million per day. It's already been paid for the next 32 years. So, um, the argument that nuclear power for electricity is going to be, uh, too, too cost restrictive and data and all the other arguments and the fact that the government's prepared to have nuclear powered submarines sailing in and out of our waters, uh, under our own flag, all this flies in the face of, of, uh, everything we should be pushing now.

So, um, Will, tell us a little bit about how you got involved in this. How long you've been involved in it and what inspired you? So look, I started Nuclear for Australia, which is a, you know, the largest grassroots movement for nuclear power in Australia's history. I started that at the start of last year.

And the reason I started is because, you know, I think the first thing to make really clear is that if you're a young person in Australia, it's really unlikely that you're going to hear about nuclear power in school. And that goes down to the fact that nuclear power is banned. There was just such low nuclear literacy in the country.

So it was just by accident that I learned about it. I was doing some school assignments. And as you do, you get a bit curious, uh, and I actually in grade 10, it took me until then to realize that nuclear power was banned in Australia, which just made absolutely no sense to me because When I would look around the world and see, uh, the benefits that nuclear energy was providing to countries, you know, like France, uh, you know, all of these different countries, it just made no sense to me that Australia wouldn't be considering it even as an option, uh, considering all the issues we're experiencing at the moment in Australia, whether it is, you know, You know, energy reliability, increasing power bills, even, you know, reaching our climate targets, all of those different issues that we're experiencing, and we're not able to even consider it.

And then I think the other thing that really confused me was, You know, Australia is really uniquely positioned to benefit from nuclear power. We've got the largest uranium reserves in the world. We're about to have, you know, as he just pointed out, floating small reactors around our coastline for our energy security, for our national security, sorry, but we're not able to consider the role of nuclear energy, nuclear science, uh, for our National security, and that just made no sense, even the fact that, you know, Australia has got a research reactor and has got a world renowned nuclear science capability, yet we're not allowed to apply that nuclear science, uh, and we're not apparently able to trust ourselves to manage a nuclear power industry to produce fuel.

Uh, power to provide low carbon ozone electrons, uh, to people. So, all of that just made no sense to me as a young person and I decided to take it into my own hands to a certain degree. I started posting some stuff on social media and then we were able to build a lot of traction to get to the point now where Uh, we are the leading movement for nuclear power in Australia, and I'm really glad to now be working alongside people like Ady, uh, and so many other experts as we push for Australia to have an open mind to nuclear power.

Wow, that is so impressive, uh, Will. You know, John, we need to inject some of his DNA into Into Australian youth. I mean, this is fantastic. This is how we save this country. This is how we turn this country around. I'm just

so impressed. Um, and it sounds like you and Adi probably share a similar beginnings, uh, in your research and the things that you've done.

Uh, Paul, uh, Valeo, what is, what is a NASA engineer doing involved in this? Ah, well, my first major at uni was nuclear engineering. My degree combined nuclear engineering and aerospace engineering. And I used the nuclear engineering degree a bit at NASA. There were some considerations about actually doing a nuclear propulsion rocket.

And I was evaluating some of the safety issues and I've followed the technology ever since and now as we've gotten to the point where we have this ridiculous, uh, narrative debate about, uh, green energy, which. Leaves aside all the brown costs involved in the transmission lines, cobalt mining, lithium mining, you know, and calling it renewable where I've never seen a solar panel once it's used spring up another solar panel out of the ground.

All these propagandistic terms are being used. To make our energy grid unreliable and very expensive. And, you know, someone who cares about Australia and cares about people all through the world. This is this. This is a disaster. So one of the things I wanted to say is, uh, I always like to start my day off with gratitude, and I'm grateful for all of you here doing what you can to make a difference.

We've got to see what we can do to turn this around. Well, thanks for coming on, Johnny. Yeah. Well, Paul, look, I'll start with you. Um, you, you've just indicated, uh, that this renewables thing's a fraud, really. Uh, what's driving the back of house of that? You know, where, who is it? The World Economic Forum?

Who's responsible for all this madness and wokeness going on with renewables? Yeah, it's it's a really interesting question. One of the things I like to try to be careful with is what we can know and what we can't. And so, you know, while we can know that, uh, you know, vast sums of money putting being put into unreliable power is is not a recipe for a stable economy.

We can't read minds. So I wish I could. And if any one of you has that power, that'd be great. But what's actually, you know, it does seem like Whatever the agenda is, it's not for the benefit of the Australian consumer, not for the benefit of the Australian industry, uh, and, and not something that an adult in the room would do in order to create a reliable power grid, for which really our own lives depend on.

So I wish I could tell you, uh, I knew who the wizard behind the curtain is, but all I can tell you is, They don't have our best interests at heart.

Speaks volumes, doesn't it? I mean, here, here we've got, uh, the Prime Minister, we've got the, uh, minister for the environmental climate change or whatever he is, Bowen. Uh, they're running around in, in Jets, two jets. Uh, it, it just speaks volumes about where they are in in democracy. Uh, you know, we've got people like this, Yasmin Catley, the Minister for Police.

She's a staffer or previous staffer in Albanese's office. I mean, the people that should be staffers in Albanese's office are people like Will. This is where the future is. Um, well, what would you do if you had the opportunity to, uh, to go and sit in there for a day with Albanese and Bowen? What would you say to them?

Um, well, I would encourage them to listen to the experts when it comes to nuclear power and not to just surround themselves with people, uh, You know, who don't have Australia's best interests at heart. I think it's, it's, I, I think it's quite concerning, um, that Australia does have this really tunnel vision approach to our energy transition where we're not able to consider all clean energy options and we're just hell bent on just pursuing it.

You know, single technologies like solar panels and wind turbines, and I think that's really harmful. I, I think I'll be the first to admit that, you know, I wouldn't go there and meet both of them and then start drawing the plans in front of them, but where I think all the nuclear reactors should be built, because I don't have that level of expertise or authority, 80 would probably be a bit of a much better position to do something like that than I ever would.

Um, but I think the main thing is just to encourage them to. You know, maybe even pick up the phone, uh, and call, uh, Emmanuel Macron during the time I'd be in their office or something like that, and to ask for his advice on how they've been able to use nuclear power. Even, you know, they, they, you could use that opportunity.

I might encourage them to call, uh, the leaders of the United Arab Emirates, uh, and the boss of ENEC, which is their nuclear energy corporation, and encourage them to look at the case study of the Baraka nuclear power plant, which I think it probably surprised a lot of people that the UAE is currently actually now generating 25 percent of their power from nuclear.

And even though they've got, you know, vast access to renewables, obviously, they're near the equator. So if they wanted, they could probably have as many solar panels as they wanted to produce power. And in addition to that, they have vast access as well, obviously, to fossil fuels, but they've still identified the need for nuclear.

And they've been able to launch For world class nuclear reactors using the best knowledge from around the world and have been able to do that, uh, in a manner which is not only being really economically successful, but was done in a really short period of time. So I think my it wouldn't be. You know, if I had that opportunity, it wouldn't be, uh, me imposing the little knowledge I have on them, it would be me encouraging them to look at the evidence around the world and to speak to the experts like Adi, uh, and like Paul as well, uh, to get their views on nuclear power in the best interests of advancing the country.

Well, John, they're, uh, they're not, uh, well known for talking to experts, are they? Um, they only talk to those who, who want to tell them what they want to hear. But Adi, given that, given your background, uh, in nuclear, uh, energy, um, you know, we, we, we're very fortunate in Australia. Not only do we have the uranium and we have vast, uh, open spaces in which we could store it, we're also not in a particularly dangerous area as far as naturally occurring earthquakes are concerned.

If you were, if you were to sit down now and draw a sketch of Australia, where, where would you say these power stations and how many would we need? Yeah, well, just before I get to that, um, a lot of people don't know that before I was a nuclear guy, I used to, um, uh, run an energy research institute in South Africa.

And, um, I was able to license lithium battery technology to the Japanese and develop the wind map for the eastern part of South Africa, look at pumped hydro and various other things. So I'm literally a broad based energy geek, but I've focused in the last 15 to 20 years on nuclear, first of all, because of my early youthful passion.

But I think it's really important to recognize that part of this debate is getting the mix right. very much. And moving towards something that can be sustainable. And from my point of view, the best thing that we should do is to look at the most compact grid that we can achieve that gets the most electrons to the most people with the shortest, most well designed 50 Hz grid that we can get.

That means that you want to probably have a small number of the 1400 thou, you know, one gigawatt to to, to 1.4 gigawatt reactors. Uh, will was just talking about the 1.4 gigawatt ones in, in the Emirates. Uh, these are really, um, big, but modern and safe reactors. And they can anchor the key places that you need to keep big cities with critical infrastructure running, uh, particularly if we still want to make things like aluminium.

Uh, aluminium smelting is a big user of electricity. We've already lost one aluminium smelter. We'll probably lose the other four fairly soon. Uh, and that'll be just tragic for us. So, you need some big always on power, and the big plants can do that. Whether it's the, uh, the Westinghouse plant, or whether it's the South Korean plant.

Those are very robust plants, they've got a good track record, they've been built around the world. But just talk about the big ones for a second. Everybody says, you know, it takes too long, too expensive. And we've got a real life example of a reactor that did take too long and was too expensive, which was the new reactor in Finland, which is, is one of the French designed reactors.

It was late, and it was too expensive, but they don't finish the sentence and say what happened when they switched it on. Well, when they switched that reactor in Finland, the price of electricity went down by two thirds. And this is what people don't understand. It's critical to understand that it is the quality of electrons, and the way that those high quality electrons stabilize the whole grid, And they bring everything else into synchronization because they also provide that 50 hertz beat that we need to get the electricity of high quality into the places that we need it.

And so one of the things I love about the big reactors is the debate that it's too expensive to take too long. Can't, that argument, that argument can no longer be used. And I think, This podcast, hopefully going out to your audience every time they, they, uh, cost too much, takes too long. They think Finland, react to two thirds of the price to the real consumer, the person who's pocket.

Um, is an is impacted by the electricity price. I think that's really important. The second thing that I do is in in those areas where our population density goes down, South Australia is a really good example. By the way, South Australia this morning at five o'clock had a carbon footprint pretty much the same as the rest of Australia.

Because the five o'clock in the morning, the sun hasn't come up, and they'd had a wind drought all night and the battery was empty. And so they were essentially, um, gas plus imports of coal from Victoria to run the whole of South Australia. So South Australia looked just like the rest of us at 90 percent carbon based electricity.

And that's the other thing that I think is really important for people to understand. The actual plan to get to a 85 percent electricity grid. based on dilute resources, defies all of the laws of physics and the principles of engineering. The Australian Energy Market Operator Plan does not even stack up on spreadsheet engineering.

You cannot get there. And so the risk that we face is if we don't get a nice mix of these bigger reactors and these small modular reactors, And then for what I call the diesel grid, which goes all the way from from Brisbane, right across the north, where you've got diesel taken out to regional rule, you can use these new micro reactors, which would directly replace the diesel generators that you find in Bergtown and other other towns.

I guess I've been to Bergtown spent time with the community finding out what their energy needs were. And so I think it's very simple. There are three layers to this cake. The big reactors, small reactors and the micro reactors. appropriately distributed for the best quality electricity for most of our people, and it will be the lowest cost electricity in the hands of the consumer.

We know that from Finland. So it's actually in a way, it's not even a debate. It's an information transfer session to the other humans in the room. And we should not be, you know, shouting slogans, take too long or whatever. We should be saying what can we do for our nation, for its people, for our economy, and for our impact in our region.

And that is a mix of nuclear power at all the places that would add value to the lives of Australians and create the economy that would add value to the Pacific and the world. John, you know, the whole idea of, of cheap, uh, sustainable and reliable power. Uh, would reinvigorate industry, it would reinvigorate jobs, construction, there's so many benefits from, from this whole debate.

Um, but you know, one of the other big things that people are going to throw at us is the safety of it. Paul, uh, obviously doing the engineering work you've done. Um, what do you know about, what can you tell us about how safe nuclear power is? Yeah, it's, uh, I mean, the history of it is, uh, there's a very good level of safety.

Uh, a lot of the problems people think about, Chernobyl, Three Mile Island, those were 1950s designs. Um, you know, if we compare, uh, the, the design time of, of, of those nuclear https: otter. ai To wind and solar. Well, there's nothing to compare to because there was no wind and solar in the 1950s. So people are looking at very old technology.

One of the key things people also have to realize is, is back then during for those reactors, you needed active cooling, you needed the active electrical pumping of water in order to keep the fuel rods cool. Otherwise, you could have a meltdown, which would lead to an escape of, of, uh, radioactive waste.

Modern designs can be designed to be passive safety, so that if, even if the operators is complete, you know, power failure, the operators walk away, uh, all the new fissile material goes into a dump tank and loses quite. And, and, and nothing, nothing bad happens. Uh, so, you know, modern designs can design away these, the, the, those issues, and you can have a passive safety system, which cannot have a critical meltdown.

So that's one of the things. And people also, you know, they, they, The amount of waste you get from nuclear is so small, uh, you know, it's a soda can, uh, for, uh, for a one lifetime's worth of energy. The amount of wind turbine blades, solar panels, you need, uh, And those chemical toxins, they're going to be toxic for a very long time.

You know, the, the, the nuclear waste, if you put it in the middle of a, of a, of a used solar panel field in, in, in a few hundred years, it will be the least toxic thing in that field. Um, you know, so it's really not, you know, Um, I think there's a lot of false fear about nuclear and, uh, and that really does need to change.

We need stable baseload power in order to run our modern economy or else we're going to party like it's 1699 and no one's going to be happy about it. Unbelievable. Where would you like to see it all go, Will? I mean, how much of Australia's power do you think should be generated by nuclear? I'm probably not in a position to suggest that, um, but I think that nuclear should definitely have a role in our grid.

And, you know, talking to the experts, I think it's really clear that they see that nuclear has to have a role in our grid. Um, I personally am not opposed to renewables when they are. You know, not causing an unnecessary burden on land and all of those different issues. Um, but I, I think that it's going to, I think what's going to be inevitable is that it will be very, very difficult to reach, uh, our current targets and to reach a 100%.

Uh, renewable plan under our current approach, and that inevitably you'll need some nuclear in the mix to be able to fully decarbonize the grid. I think. Recently, probably people have seen the story of Dick Smith in the fact check with the ABC, where he claimed that no country has been able to decarbonize their energy, uh, just with solar, with just with renewables, which is the case.

No country has been able to do it. Australia would be the first. Uh, and when you look at the countries, which actually have been able to make some progress in decarbonized decarbonizing, sorry. Uh, they've all had to either rely on nuclear. Or they've used a lot of hydro, which probably won't, uh, be able to work for Australia.

So I think that, you know, I probably can't give an exact number, but I think in some way or another, we will need some nuclear, and at least we need the option of nuclear, which is why I'm pushing for the bans to be lifted. Fantastic. Adi, you could probably answer that question. Yeah. I mean, basically, if you look at the economics and you look at the detailed, uh, simulations and models that people have done, You can't really get beyond 40 percent wind plus solar because the capacity of wind, capacity factor of wind is 40%.

So if the wind's not blowing, you've got nought. And if the wind's really blowing, you shouldn't build more than 40 percent because then you're overbuilding wind. So the best economics is between 15 percent and 40 percent intermittent renewables. And there's some utility in terms of rooftop and site, as we know, but that's it.

Um, there's some benefits so you can get a mix, but it saturates out at 40 percent basically. And so you need at least 60 percent uh, uh, nuclear. And, and then I, I think the other thing that you want to do is, is you want to build fleets, um, at the same time as you build your waste solution. Uh, I mean, some of you, uh, will remember the Synrock technology that was invented by Ted Ringwood.

Um, back in the day that everybody's been talking about. Well, you'll be pleased to hear that Synrock technology is ready to go. It's been fully developed under the time that I was in Anstow. The world's first Synrock plant is sitting there waiting for the waste to accumulate from some of the nuclear medicine production.

And that, um, nuclear medicine waste will be put into the synthetic rock in a can about this big. Uh, and in order to put it underground, you'll use directional drilling. So you'll use the technology we use for oil drilling. You can directionally drill the hole, you can put the can at the bottom, and no one will ever get it out.

And in any event, it's in synrock, and you couldn't extract the waste, so you can't do anything naughty with it either. So, I think convincing people that the nuclear waste cycle can be closed is pretty close. The Finnish people have done that. Um, and with our own waste, we've closed the, uh, the waste cycle, and people don't need to worry about even our nuclear medicine waste.

Thanks for watching! Because the Synrock technology has been taken from the lab, uh, to the first full scale global, uh, plant. With Australian engineers in Australia, which tells you the story that we have got the engineering capability to develop a world class nuclear technology in 5 to 7 years. And so I think the only thing that is holding, um, us back is the bans and self doubt, uh, but with the, with the, the narrative of building the first one and getting things done.

We'll overcome the self doubt and then we'll become properises. We'll beat everybody at the game and we'll do it in a way that we keep our sense of humor. Oh, yeah. I also think we have a lot more time to figure this out than people say. I mean, I may be the only person among this panel. I'm not sure who's a global boiling denier.

Maybe I am, maybe I'm not, uh, but, uh, the idea that we are rushing headlong into, uh, you know, a climate change catastrophe, I think is not based on, on, on good facts. Um, you know, one of the things that I'm quite passionate about is the difference between science and science narrative. And it seems like we basically, you know, science narrative is you take a subset of cherry picked, uh, data, uh, you know, facts and figures.

And you basically bend the science around a pre existing narrative, and that's what the whole climate change, uh, hysteria seems to be about. Now, I can't say for sure that changing, uh, the, the carbon dioxide in the atmosphere from 0.02 to 0.04 isn't going to cause an effect. But the idea that we can stabilize the climate, Um, when even inside of human history, there's been vast changes in in the climate, uh, you know, back in 1000 AD, uh, uh, there was barley farming in Greenland.

And, you know, then, you know, just in the last few decades, some of those, you know, uh, old farms melted out of the ice and like, oh, wow, they used to farm barley here. And, and that's not evidence of a current catastrophe. Yes. Okay. You know, the, the ice has recently melted, but clearly a thousand years ago, it was, you know, there was plenty of farmland there in order to farm barley.

So, you know, it, it, it seems like, um, there's hysteria there. And the idea that that would drive us to an unreliable power source, uh, the, the quote renewables that are not renewable, um, you know, it does not seem like rational policy to me. Yeah, well, look, what he mentioned earlier about, uh, the ability to, to manufacture, um, it just seems to be a no brainer, doesn't it?

That, uh, creating cheap energy that's safe and reliable, uh, is the key to invigorating your manufacturing industry. I mean, Paul, I mean, look at the aviation industry in Australia. I mean, you're probably not overly familiar with it, but I mean, I don't think we've manufactured a plane here since the Victor air tour in the 1960s.

Um, I mean, clearly we we've got the ability to do stuff as Australians. We're, we're, we've got some of the best minds. We've got some of the, uh, We've got some of the best, uh, sites. We've got some of the best resources. But, uh, the governments don't want to, uh, invest in, in people like you. They don't speak to you people because you're experts.

I mean, they speak to these nuffers that, that don't have a clue about anything. Uh, a lot of the industry is de industrialized. You know, like in Germany, Germany is the industrializing over and a lot of cases expensive energy, you know, they've invested a lot into the quote renewables and now the price of energy has gone up a lot of the industry is fleeing in the United States.

There's also a great deal that is not no longer getting built in the United States. The rust belt is still. And, you know, it's, I agree with you. It's, it's, uh, you know, we have the smarts, we have the capability, um, you know, but, but we don't, we don't have long term thinking in order to, to keep the industry, the critical industry, like for instance, even antibiotics.

From what I understand, all the antibiotics we use are from India and China. Uh, you know, there's, there's a lot of critical materials that we don't produce here at all, which leaves us vulnerable to foreign supplies also in, in energy. That's one of the great things about nuclear is that, you know, we have, as, as Will has pointed out, uh, the, the, the largest reserves of uranium.

In the world, we don't produce the rare earth magnets that come to the windmill blades. We don't produce the solar panels. It is another measure of reliance we have on, on foreign powers that may not have our best interests at heart. Well, haven't we seen that? Well, and didn't the COVID, uh, fraud, uh, expose that?

I mean, I don't think there was anyone in Australia, uh, during that entire so called pandemic. Uh, when, when they couldn't even get a mask to put on somebody's face that they, that they were, we weren't even manufacturing something as simple as a mask. And I thought people had woken up then. I thought people would say, geez, we're, we're, we're buggered.

You know, here we are in a country where in the so called, uh, pandemic, everyone's going to die and we can't even make a mask. Uh, but. Here we are. I mean, we're, we're, we're still, we're still now talking about, uh, you know, being able to progress energy, uh, in, in this sort of climate. I mean, we've, we've got all this, uh, nonsense now with all these politicians wanting to get in.

I, I heard this morning on Ben Fordham, uh, on 2GB that, There's a forest in Germany where there's hundreds, a hundred thousand acres of pristine forest called the Fairy Forest or something. And even the Greens are now protesting about the, this forest being cut down because they're cutting it down to put these windmills up.

I'm thousands of years of transmission lines. Uh, 80. I think you, uh, probably, uh, would you be able to speak to just how bad the transmission line problem is? Is that something that you followed? Yeah. Look at the group is is the most so the Eastern group in Australia. Um, when I arrived in Australia, I was looking to try to understand the electricity system and I think the simple description of the Eastern Grid in Australia when I arrived, is at that point it was the most complex machine in the Southern Hemisphere already, okay?

So the Eastern Grid is not a toy with some poles and wires and the odd transformer and a sense of humor. It is already an awesomely complicated machine. Now, the way that you can keep a really complicated machine as simple as possible is to simplify two things. You go for the highest average energy density that you can get.

In other words, you go for, you know, really high kV transmission wires. You run them the shortest distance you can before you get to your distribution grids. You drop them into distribution grids. And you get it, uh, into the local networks and the local networks deliver it to the customers. So we've got three layers in this grid.

Now what we're doing is we're taking the energy density of the grid and we're reducing it to get the grid to go and find very dilute sources of power, which is all DC. So coming out of wind turbines or coming out of solar panels, it's direct current. You then put it through a digital device, um, called an inverter that makes the 50 hertz signal.

Now that 50 hertz signal is normally made by a spinning machine that spins at 1500 rpm. It's a massive machine and it makes a beautiful sine wave. When you get a digital machine to make that sine wave, it's digital. Digital means it puts a little wave on the sine wave, um, that makes it like a sawtooth.

So instead of being a smooth wave, if you take that sawtooth electricity and you try to do injection molding, precision injection molding, instead of using the 50 Hertz signal to control the machine, the messy sawtooth means that you don't have precise timing. We have lost businesses in Australia that are now back on the West Coast of the United States because we've got messy 50 Hertz inverter based electricity.

Now every single wind farm, every single solar farm has got a big box at the fence, which is one of those digital inverters, really, really big one. Then you add batteries, my old game that I used to play with, uh, lithium batteries and sell patents to the Japanese. We were, we were using them to make button batteries for phones and batteries for computers.

I would never imagined at the time that we would store lots and lots of electrons in the battery, take it out, put it back through digital converters as if it's a primary source Of electricity. It's like every day you you get a ladder and you fill up a tank on your roof with water. Um, just in case, uh, when the sun goes down, you haven't got any water in the tank.

That's what we're doing with the battery. All right. So, batteries are extremely inefficient stores of electrons because you're putting these tiny little electrons, which, you know, is, is, is, is about 2, 000 times smaller. This is not accurate, by the way, so don't test my science. I think it's 1, 760 times smaller, uh, than, than, uh, than the proton.

We're taking those tiny little electrons and sticking them next to all of these atoms. It's just terrible energy density. So everything we're doing is moving away from the simplest grid to a low energy density, dilute grid full of transformers on poles. So pretty much in my suburb, uh, in Southern Shire, within the next two years, they will have to put a 300 kilogram Um, transformer and battery onto the pole to support all of the panels on the roof as the quality of power coming in goes down.

Those batteries already in Australia are spontaneous, are spontaneously erupting into flames because they haven't got the designs right. So when you, when you've got a 300 kilogram battery bursting into flames at the end of your street, Then maybe we'll change both his minds on the future. So, you know, I am really, really worried about the most complicated machine, uh, in the Southern hemisphere.

And we're going to make it twice as long, half the energy density. And, uh, absolutely ruin the 50 Hertz signal while we do that. It's it's three forms. Of self destruction, which are difficult. I hope I'm sort of explaining it to you, but it's, it, you know, it's, it's really not something that you would do in a rational way.

And these lithium batteries may catch fire. They're not easy to put out, are they? The lithium NMC batteries are very, very dangerous. And my advice to anybody who's keeping, um, uh, a bicycle battery pack, that's a lithium NMC battery in their house, that they take it out and they put it in the garage now.

Because the fumes from that battery, when the lithium is released in the atmosphere, will enter your lungs, it will travel to your heart, it will replace the potassium in your heart, and it will stop your heart, because the lithium replaces the potassium and it stops your heart. So that, and if you've got young children, do it even before I finish talking.

Because it is so dangerous. We are killing people and have killed people in Australia in their own homes by not telling them about lithium batteries. My advice as well is if you've got a whole lot of tools that should be in your shed, that are in your house, you should also think about charging them outside and when they charge, you know, taking off the charger and not having them charging inside.

These batteries are really, really dangerous. Now the ones we have in our computers. Morris Luckte is safer for, and they are very, very stable, so there's no reason to panic about that. But the high energy density ones that are in a lot of the bicycles, and certainly the ones in the cars, Um, or not to be trusted in a household environment.

What could possibly go wrong, John? I've got a 23 kilowatt off grid system on lithium batteries at the moment and now I'm going to run over and put a fire extinguisher in there, I think. Yeah, it better be a good one because it's quite difficult to put out those fires, yeah. I can imagine. I'd say you better put a pack a whacker over there, Hoody.

might be in trouble. I might be, yeah, absolutely. Paul, you're busting to say something. Well, I was also going to ask about the transmission lines, the degree to which I think a lot of the renewable power is supposed to be sort of based out of Dubbo. And then the, the snowy hydro too, is going to be sort of the pumped, the pumped hydro thing to even it out.

And so you have, you know, we have thousands of miles of transmission lines that we have

Put this kind of nutty plan into place. Unless I have this wrong. I'd love to hear if we'll already know. I mean, is that really the plan is to rip through thousands of kilometers of Australian Bush in order to put this plan in place? Is that right? Yeah, look, I think I'll have a go at that. Um, I was recently in Dubbo, um, at a conference of the Reef Foundation, which is the local community actually organizing around some of these issues.

Okay. Um, and, and it's a, it's a, it's a wonderful environment, you know, they, they built something that is a really useful grid, which is a water grid, which moves water all over that region, and was the basis of the agricultural heartland that is around Dubbo, and, and which is a hidden gem, and meeting that community, and seeing the entrepreneurship that has created the context, that awesome community, Uh, which is a wonderful thing.

And I was chatting to the people from the foundation again today. So the really important thing to understand about, um, what will happen with these, these, uh, these, these dilute, uh, grids is they will, um, try to get power from the Snowy Hydro 2 scheme. Snowy Hydro 1 is essentially also a pumped hydro scheme.

It's not, not really a primary dam, but the Snowy Hydro scheme is a complicated one because. It's not in an ideal place, and it's really been designed to react to the problem we've created for ourselves. Um, and it's essentially a big battery. But it's a big battery with a 30 kilometer cord from the, from the dam to the bottom of the battery, which is, which is a pipe, which is running the water down the hill.

The angle at which they're running down the water down the hill, is about the lowest angle that you can run water down and actually make decent electricity. It's a 30 kilometer tunnel, so about 14 and a half degrees I think. So it's like, it's like, uh, running it off your veranda as opposed to running it from your roof, if I could make that distinction.

Um, and so it's a really expensive way to move water up and down a hill. Um, and, and it's not going to be a very efficient battery because, if the evaporation and the general losses and other things that are happening mean at any time that it loses some of that volume, the battery loses its utility. So snowy Hydro two is part of a defense strategy for the underestimation of what renewables will do, uh, due to us, um, as they've started to understand that they, they want these big batteries 'cause they know that the chemical based batteries are not gonna do the trick.

Um, and my view is that Snowy Hydro 2 is a really good example of something that really is expensive and takes too long and probably doesn't have the utility that you want. Um, because it's, it's not a rational plan. We really don't have the grades in my view, uh, in Australia and the height differences in Queensland where they do have some, some nice hydropower.

And the little bits that we've got scattered around were put there many years ago because they were obvious. Everything after that's not obvious. So Snowy Hydro 2 is essentially a battery. Um, and it's, it's, it's going to take a long time and it's not going to be a great battery. However, if we've just got intermittent renewables, it might protect some stuff, uh, in that, in that basin.

But again, it's, it's, it's something that we are only doing because we're already on a journey. Um, you know, it was like the Irish guy that I've met, um, many, many years ago and we were lost. And I, I, I said to him, how do we get from here to Kilkenny, and he said, oh, sir, this is not a very good place to start.

Um, and, and that's the problem. We're in the wrong place. Um, and we're starting to do things that, that will use up a lot of resources. And we like, you know, Patterson stuck trying to get to Kilkenny. Uh, we're on the wrong road and I'm here. I was just going to say, Paul, I can confirm to you that that, uh, issue with the transmission lines is, is very active.

Uh, I live in Tumut, which is at the foothills of Snowy 2. 0 and I'm on the council. So, I'm aware of the issues. Transgrid, uh, trying to get these, uh, transmission lines. Uh, put in and the community is up in arms about this. The farmers are going nuts and it's not just, it's not just here locally, but it's all over the place.

They are fuming about this because of the, uh, the, the devastation that it's going to cause. Uh, you know, it's, it's a cancer on the region because it looks ugly. Uh, it's an aviation nightmare. We've got bushfires all over this, uh, part of the world. So, uh, You know, you start to have visibility issues and, and, and want to fight fires with aviation assets like helicopters.

These wires are a danger. Uh, you, you just can't go bombing these, uh, bushfires. They've got to maintain all this vegetation under these bushfires. They can't even do that now. So, I mean, it's, it is a complete, uh, mess. I mean, they haven't thought this out. This snowy 2. 0 was just a, uh, a whim of the government at the time, and it's a disgrace what they've done.

Paul, I want to ask you, uh, Paul, or maybe Adi, I don't know, uh, either one of you. Is there such a thing as clean coal and does it still have a role to play in our generation needs? Um, I think, I think the original idea of clean coal, uh, came from a coal where you would handle the fly ash, which was the dirty bad, the stuff back in the, in the old days.

And you would close the coal cycle, not by worrying about the carbon dioxide, but by dealing with the fly ash, not just sticking it into slimes dams and so on. And that's where all the fly ash going into concrete paths and all that sort of stuff happened. And that was a good thing. Because you really took, uh, you know, quite a messy waste, um, and dealt with it.

Now, you can actually, uh, try to find ways with, um, you know, burning the, the coal at higher temperature, uh, to get some top end out of it and to, to make it overall, uh, cleaner. Um, and, and so there are sort of clean coal technologies that are there, but I think that the challenge of clean coal is that you've got to have the coal that at the beginning can be cleanable coal.

So brown coal and. In Victoria, it is never going to be clean coal, no matter what you do with it, it's always, it's always going to be really difficult because you're basically taking a, a, a poorly consolidated coal with high water content and you, you're having to do a lot to it before you can get there.

What I do like about coal, however, is it's going to be very difficult to decarbonize some aspects of steelmaking, for example. And so. When you're not talking about thermal coal, but what we call metallurgical coal, which Australia has got massive resources, we could become the clean metallurgical coal supplier to the world for steel making.

Because I think to move to hydrogen for steel making is a problem because, um, steel has got carbon in it. And part of what you do with the coal when you make steel is to get the carbon content to the steel, right? So

nobody's really cracked the, the sort of clean steel making. Um, and so my sense is that we should definitely be going for the cleanest possible coal that we can get.

Um, but probably the quickest way, uh, to decarbonize, you know, I'm, I'm, I'm a, what I call a rational, I'm, I'm, I'm fascinated by the long range history of weather and so on, and we can have long discussions about, you know, whether carbon dioxide is good or bad. The bottom line is that, you know, um, we are not heading towards the highest.

Carbon dioxide. We've got that in the atmosphere. We just coming out of just about having too little, um, to keep C4 photosynthesis going efficiently on the planet. That's the stuff that is in sugar cane. We have two types of photosynthesis, uh, C3 and C4. Uh, C4 needs more carbon dioxide to kind of switch on.

Um, and what happens when we get more carbon dioxide in the atmosphere is we get a little bit less C3, which is your garden plants. And you get a little bit more of the grasses and the pampas and the sugar cane type of stuff. And so the first thing that will happen when we get more carbon dioxide is we're going to change the mix of plants from C3 plants to C4 plants and we'll use up a lot of that carbon dioxide.

So there are really good reasons to understand that the carbon cycle is not something to panic about. It's something to strategize about and to understand. By the way, there's a third form of photosynthesis that they found out recently, which happens in the blue spectrum. And two of the three types of photosynthesis were actually discovered scientifically and worked on in New Zealand and Australia, which is marvelous.

I mean, we are world leaders. In discovering our plants do photosynthesis. Um, and so I think we've got this beautiful thing called photosynthesis, which takes carbon dioxide out of the atmosphere and puts oxygen back in and we breathe in the oxygen and breathe out the carbon dioxide. So we literally every time we breathe out providing blood food, which is why when you talk to your plants, they actually grow better because you're feeding them their food by breathing out carbon dioxide over them.

So it's actually true talking to your plants doesn't prove that. Well it must work on the weeds because I curse the weeds and they grow bigger than anything else. That's a good example. That's a good example. But um, you know, let's face it. We, we are the lucky country, uh, as far as resources is concerned.

We're just very unlucky with, uh, with, uh, intelligent politicians and, and bureaucrats. That's, that's our biggest problem. We've got world class bauxite, world class iron ore, world class coal, world class uranium. That's We've got so many minerals and resources. It's unbelievable. If we made power cheaper and we, we should be manufacturing our own steel.

Let's be honest. We should be, um, if we get this mix, right, we can really bring this country back to its feet again. And, and yet we have sycophants hanging around, um, white green politicians. And it just, it just, it looks as far away from happening as it can ever be. I guess we've got to bring this one to a close and I want to go to you, will, because you set this up.

You set up a nuclear for Australia. Um, tell us about some of the people that you've got involved in it. Are you getting any traction? Uh, who are the high profilers that are supporting you and, and are you getting any good results from, from people in Canberra? Uh, in terms of people in Canberra, I would say not yet, but I hope, I hope, uh, for them to actually respond to what's happening because it's obvious that a majority of Australians do support nuclear power and we're currently working on really, um, bringing together that support under Nuclear for Australia.

In terms of the people we're working with, obviously, 80 is the chair of nuclear for Australia. Uh, we've also just established an expert working group, which has got some of the nation's leading nuclear experts in it. We've got Jasmine Diab, uh, who is a nuclear security expert. We've got Tony Irwin, uh, who was involved in the commissioning of, I think nine or eight nuclear reactors in the UK came back.

To work in Australia on the opal reactor. So he's got a lot of knowledge. We've got a few more, which we haven't announced yet, who are also involved in what we're doing, because we think it's really important that there is a platform and a movement, which is able to reach Australians with the facts that are needed to help inform the nuclear debate, because currently, it's all down to the debates all around the politicians and all the politics.

And clearly, they're not doing a very good job, So at the moment, we're just trying to reset that and refocus things, uh, with the first priority being, uh, for politicians to realize that the nuclear power bans are simply untenable, uh, and just so out of touch, uh, with not only people in Australia, but also so many countries around the world.

Um, in fact, Australia was recently called out at the world first, uh, Nuclear Energy Summit was, which was held in Belgium, where the Belgian Prime Minister actually took it upon himself to point out. Australia's absence there. Uh, so I think it's, it's really clear. Even the last thing I would just say is, uh, when I was at COP 28, the climate conference, the French president himself actually called on Australia to lift the bans on nuclear power.

So I think the nuclear power bans is so just so indefensible. It's not funny. Um, there, It makes no sense why the government would continue defending them. So I'll be doing everything at least in my power to make sure they're lifted. Well done you. I mean, the country may well be in your debt, young will, um, fantastic.

You're an absolute inspiration to even old. Absolutely. Um, I guess, look, we've got to bring this to a close. Promote your website. And anything else you want to promote, and then we'll bring it to a close. Uh, so in terms of our website, newclearforaustralia.com, if people support our efforts to lift the bans on nuclear power, they can sign our petition at newclearforaustralia.com.

[com slash petition](http://newclearforaustralia.com), or find the link on any of New Clear for Australia's social media accounts, which are on every single social media. Channel you can possibly think of that's now got over 22, 000 signatures as of maybe yesterday. Uh, so fantastic momentum behind that and we'd appreciate all of the support we can get.

Wow. And we'll give it to you. And we, we would love to have you back on whenever you need to come back on and tell us some more information. I've learned so much tonight. You know, it's just been incredible. I've learned so much stuff that I had no idea about. And I mean, that's what the journey's been like for me the last three or four years anyway.

But, uh, Johnny, any final comments? Yeah, look, I wouldn't mind just finishing up with Paul, and if anyone else wants to offer an opinion, I'm happy for you to jump in as well, but look, I think the nuclear industry has been in a vacuum, experts like you have been in a vacuum, you're not able to be heard. I mean, you're almost like the ivermectin of the COVID industry, I mean, you're wrongly labeled.

Um, Paul, as someone with three science degrees. That's worked for NASA. I mean, I mean, from the aerospace point of view, working for NASA is just phenomenal, really. I mean, that that's the pinnacle of every young kid's dream to, to end up there. What did you make of mandates and the mRNA COVID jabs? Big, big question.

Important question. And it's really changed my view on a lot of things. Um, one of the things that, uh, that really clued me into what was going on was, uh, when they tested early treatment late and at the wrong dose. So, uh, one of the Um, the when you had an off patent treatment like hydroxychloroquine, uh, normal dosage was 200 milligrams twice a day.

And the hypothesis was it should be done, uh, early because as an antiviral, you have to give it early and they tested it late and it dosages of 200 milligrams. Six times, uh, 2, 800 milligrams on day one and 800 milligrams on day two through seven. So they basically gave toxic doses at the wrong time and then they said, Oh, it doesn't work and it has side effects.

When I saw that happen, not just on one test, uh, the, I think it was the together trial and then the, uh, the recovery trial and then the solidarity trial. I knew something was seriously wrong with how the governments

were trying to respond to the COVID crisis, and then they allowed remdesivir at 3,000 a vial to pass through testing, showing no benefit to hospitalization or death.

So, um, The bottom line is, uh, something is clearly wrong with the science around health. Uh, then saying that the, um, saying they changed the definition of vaccine. Uh, they, uh, said that it was safe and effective. My partner's brother, my partner, Stephanie's brother, Daniel, got myocarditis after his first shot of a mandated, uh, vaccine, which actually, like I said, they changed the definition of vaccine.

Um, We've got some problems when it comes to science. Uh, when, um, when you have to change definitions, uh, when you mandate, uh, medical procedures, when you test off patent treatments at the wrong time and the wrong dose, uh, and then you don't have accountability after that, um, there's work to be done. That says it all.

That says it all. And look, you know, all we want is for people to be re-platformed, not de-platformed. Conspiracy theories thrive when governments keep secret. So we bring out the truth. We want everyone to come to a truth based on right principles. And you can't have science without debate. And that goes for energy.

It goes for health. It goes for everything, climate, the whole thing. And what we're seeing now is there are certain agendas that are hell bent on banning any kind of debate. And, um, that's got to stop. That's got to stop. We do have. Look, we have things in the cupboard that we can use. I've been saying this a lot lately.

We should be going to see what we've got that we can use now to the most effect while we develop these other solutions. And, uh, it's just nuts. So I just want to thank you all for coming on. I'm going to pray this one out if that's okay. Dear Lord, father in heaven. We just thank you that we're able to speak to intelligent, uh, people with their, with their eyes open, who are looking for solutions.

And this has been a program about solutions, wonderful solutions. We have. Great opportunity in this country, Lord. You've given us all the resources that we need. All we need now is common sense, which seems to be lacking. If only we had as much common sense as we have uranium, this place would be so much better.

So we thank you for your constant vigil over us. We pray in Jesus name. Amen. All right, uh, gentlemen, Will Shackle, you're a, you're an absolute hero, mate. You really are. And I can't, and you're humble and you're honest. You've got buckets of integrity, a whole lot more than the people who need to be listening to you in Canberra, I dare say.

And we, we take a hat off to you. AD Patterson, it's been a real joy listening to your experience and having you share that with us. You've certainly cleared up a lot of things for me and, and Paul, um, Paul Valeo, I mean, um, it's just, it's just all tied together so beautifully and we're so glad that you're part of this country and we hope that all three of you are utilized to your full potential to get this country back on its feet.

Thanks for having me on and we'll see. very much, appreciate it. Thank you guys and Johnny Larder, you've often been heard to say. You just couldn't make this stuff up. You couldn't make this stuff up, that's for sure. Stay out of the trees everyone. Good news, we're interviewing Tony Abbott on Friday morning which will be screened on Friday night.

It's been a long time coming, we're looking forward to it. And we're going to get his views on a few things and maybe ask him a few tough questions as well which is what we should all be doing. And so we look forward to that. Thank you for following Club Grubbery, uh, support this, this, um, this Nuclear for Australia organization, because it really solves a lot of problems.

And I can't believe that we have to be pushing Canberra to listen to you guys, because why are we, why are we not surprised? So thank you so much for watching Club Grubbery and we'll be back our next interview probably Friday night. Uh, you'll see, uh, Tony Abbott. So thanks for watching us and bye for now.