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UK attachments to nuclear power – a military romance

Professor Andy Stirling and **Dr Phil Johnston** in discussion with **Dr Dave Webb**, Chair of CND.

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The close technological interrelationship between the nuclear weapons and nuclear power industries has been known for some time and it is widely understood that the first UK first nuclear power stations were built primarily to provide fissile material for nuclear weapons. However, many people might think that this was in the past and that the two industries are no longer linked – but it now appears that the government is using the Hinkley Point C nuclear power station to subsidize Trident, Britain's nuclear weapons system. A recent parliamentary investigation into the Hinkley project revealed that, without billions of pounds earmarked for building this new power station in Somerset, Trident would be “insupportable”. So, this is a big and controversial issue.

Andy and Phil have argued that Hinkley C will “maintain a large-scale national base of nuclear specific skills essential for maintaining Britain's military nuclear capability” – clearly showing the links between those two industries.

Q: Andy, could you say a bit more about your project and what is new about your findings?

A.S.: Yes, the general links with between nuclear power and nuclear weapons have been known for a very long time – right back to the very beginning, and organizations like CND have done a fantastic job over the years in exposing all kinds of linkages. However, these exposures have been mostly focussed on the fissile materials coming from some British reactors. Now however, with a somewhat downsized nuclear arsenal, that is not

such a pressing issue any more and the discussions and debates on nuclear weapons and nuclear power have, tended to become separated. So, a lot of organizations that used to work on both issues no longer do.

What Phil and I have been really taken aback by is that the link now is not about fissile material - it's about the industrial base, it's about skills, University Departments, about research capacities and special kinds of metals and engineering companies. It is also not so much about the nuclear weapons but about the nuclear propelled submarines. If you want to be able to build, in your own country, a nuclear powered submarine – one of the most complex things ever developed – then you need an industrial base to do that, and that has not been costed in. So, consumers will be paying for very expensive electricity and the money trickles down into that industrial base to keep the industry alive, otherwise, it's not feasible.

Q; So, Phil, we've been told time and again, that we need nuclear power in order to cope with climate change - is that not the case?

P.J.: There are a lot of well-informed people that put this argument and it may be the case that nuclear is lower carbon than coal and gas to run. But the crucial thing is, we need to look at how much it costs and how fast it can be deployed. The cost reductions in renewables and the rapid construction programmes that have occurred over the past 20 years have shown that they can be utilised much faster and they are a far cheaper way of reducing emissions. Given the urgency of

climate change, it is increasingly clear that you need to finance renewables if you want to act fast on climate change - to put money into nuclear is to divert precious resources from quick, cheap solutions to long time commitments to build complex and expensive systems. In the U.K. we were told that new nuclear power stations built before 2025 would significantly reduce emissions - but it simply hasn't happened. It's the same in France, Finland and the USA, where renewable systems have been built more rapidly and cheaply than the 'Nuclear Renaissance'.

Q: Andy, could you say a bit more about the evidence that you found for the links between the military and new civil nuclear power systems?

A.S.: What really amazes us is how much evidence there is - if you look - and how little the media and NGOs are looking. On the defence side, there's all kinds of grey literature, evidence of select committees, comments by professional organizations, academic organizations, industry, Rolls-Royce (the key company building the submarine reactors) for the submarines built by BAE Systems, are absolutely open about this link - in order to build nuclear submarines, you need this industrial base. So, there's reams of evidence in the defence literature - if you look for it.

But on the civil energy side, it is striking that there is absolutely nothing. We think that is one of the biggest issues. However, our presence at energy select committees and bodies like the National Audit Office (NAO), has meant that slowly, evidence has begun to be conceded - very grudgingly. We have now had the NAO and the Public Accounts Committee (PAC) challenge the government on the lack of an energy case - the government hasn't yet come back.

Off the record, we have had exchanges where it's quite clear that these bodies know there's quite a lot going on and we can see that the NAO has put the case together quite well in the footnotes. They are just not able to state it - which could be seen as quite sinister. Under questioning at the PAC and on evidence that we submitted, Stephen Lovegrove, the Permanent Secretary for the Ministry of Defence openly acknowledged the link, saying that if they weren't attending to it, they wouldn't be doing their jobs. What is remarkable is how clearly it has been acknowledged but how little public debate there has been - given the massive financial implications.

Our website at the University of Sussex, Science Policy Research Unit pulls together all the evidence and reaches out into all the technical details and we welcome questions and comments.

Q: Thanks Andy. Phil, why should any of this really be of any concern to UK citizens?

P.J.: Well, because of the transparency issues it is difficult to obtain exact figures but, in terms of a cross subsidy from civil energy bills to the military, we are talking about tens of

billions of pounds - which is a lot of money! This is a lot of money that's being invested in the nuclear sector not just in terms of an energy policy, but also to sustain military related capabilities. At a time when the UK could be really benefiting from a renewables revolution. The UK is in the fantastic position of having the best renewables resource in Europe, and a huge number of jobs could be generated in the renewable sector at a time like this. But the diversion to nuclear infrastructures - both civil and military - is really going to slow down the potential for the UK to accelerate towards a renewables future. You don't need to be pro- or anti-nuclear to have a stake in this issue, what it all comes down to is a matter of UK democracy. We have a situation where money is being diverted from civil to military nuclear infrastructures, and it is not being discussed. And in a functioning democracy, it should be discussed. So really, the main issue is about rigour and democratic accountability within the UK system.

Q: Andy, you've both alluded to a cover up on this civil subsidy to the military. Isn't this all just a conspiracy theory?

A.S.: Well, we've been working on this for around four years and being accused of being conspiracy theorists is one of the two ways in which we tend to be dismissed. Most of the time, we actually get ignored, which is the experience of a lot of academics in the field, and also of a lot of specialist journalists whose livelihoods depend on clientship with people like the Department of Energy as well as all the energy system.

However, no one has ever refuted any part of our argument in substance but they do sometimes dismiss it saying, "well, everyone knows that" - it's kind of a contradictory alternative way of dismissing it! But the dynamics we are pointing to certainly do involve covert processes. So what's effectively happening is a large part of the indirect costs of maintaining the British so-called deterrent, is kept off the Ministry of Defence budget, actually kept off government spending generally, because it's being channelled from electricity consumers and therefore also kept out of public scrutiny. As a result, no one knows exactly what these costs are - and that is a covert process. But I don't think it's actually being engineered that way. I'm not sure the British government is capable of such a phenomenal conspiracy over so many years, I think it's just structural pressures have led to it, and the depth of the commitment in Whitehall to the nuclear weapons status of Britain on the international stage means that they just don't see an alternative. So, it's a covert process. It's not a conspiracy, it's structural pressures, but the cost to the consumer and, as Phil said, to British democracy is pretty much the same.

Q: That's very interesting. But Phil, isn't it a bit simplistic to suggest that the military links are actually driving the civil nuclear power programme?

P.J.: Well, that is another reaction that we've had. As Andy was just saying, we often get one of two reactions. One is

that it's a conspiracy theory, or, well, it's obvious. We have always very clearly stated that this is one among a variety of factors and that we are aware that there's a lot of complexity and diversity and uncertainty with regards to the drivers behind civil nuclear. But the point that we've been making is that, while a number of these different drivers have been looked into, what hasn't really been looked at and what has really been concealed and neglected is the military related driver. As Andy mentioned previously, it's not discussed in energy policy, nor in energy research either. So, that's the point we've been making, it's not the only factor, but it is one that's been neglected in current discussions.

Q: Back to you then, Andy. Why is it do you think that this discussion is not happening more widely – in Parliament, in academia, in various think tanks and so on associated with nuclear systems? Why isn't this conversation taking place?

A.S.: That's a very good question! It is slowly getting more so. It's slowly becoming more attended to. And we've been told now by too many people who were initially saying quite sceptical things to us like "if this were true, it would be all over the place" and specialists in the field are now saying, "okay, I'm sorry, actually, I was wrong to be as critical and dismissive earlier because it clearly is a big issue". So it is slowly happening, and we continue to get more response on an individual basis than we do at an organisational level. I alluded to the kind of pressures on journalists in terms of the clientship. Journalists who are otherwise very good at doing their job – do they want to risk their sources of information in the establishment by coming out with things that are seriously inconvenient? Phil and I have a taste of how very seriously inconvenient this storyline is for the establishment –for obvious reasons.

Why is it so little discussed? I think we live in quite an eccentric political culture in the UK, the status of the country in this post-Imperial situation seems to be really important. All political persuasions are influenced by it. Phil and I have gone back through energy policy since the Blair government and, it's too detailed to go into now but, the number of times that really extraordinary moves have been made to cover this up and to justify nuclear but with no kind of real attention to it and the acquiescence of public officials, public agencies and even NGOs. Leading NGOs who would be expected to be critical, have told us "you're right – but this isn't a good thing to raise. We aren't going to win an issue with the Great British public by talking about this". We've had senior public officials say to us, "as a professional, I have to remain silent on what you've done. But as a citizen, I'm extremely glad you're doing it." That is a verbatim quote from one senior official who we promised not to quote. So, this kind of dynamic is very deeply entrenched in Whitehall. So that's why, as Phil said earlier, it really isn't about being pro- or anti-nuclear power or nuclear weapons. It is a serious pathology in the British political system, extending out from Parliament into the media into the think tanks as well - but they are not able to discuss this openly because it's far from

clear. You don't necessarily conclude we should stop nuclear weapons or nuclear power from this – you could say "yes, let's go for it!" But we just aren't talking about it - and that is what is so unhealthy.

Q: Phil, is this just unique to the UK or is it happening elsewhere in the world?

P.J.: Well, we can definitely see a pattern. Countries that have very ambitious new nuclear build programmes tend to be nuclear weapon states or aspiring nuclear weapon states. This is something we've documented in one of our working papers, there's a lot of evidence (see:)

One interesting time was in 2017 – after we'd published our initial paper on this. Some key reports by Ernest Moniz, the former U.S. Energy Secretary, stated clearly that if the civil nuclear industry in the USA declined, this would be disruptive for the US Naval nuclear power and nuclear weapons systems. It made it extremely clear that the supply chains were interdependent. That the military needs civil nuclear couldn't be clearer.

We also have statements from France, Brazil, Russia and from China. It is all documented in in our paper, but I think that what our focus on the UK draws out is the democratic issue. The UK sees itself as being committed to policy rigour, accountability and democracy and as a bastion to these kinds of traditions. However, this issue is not being discussed here and the fact that it's not being scrutinized in the usual parliamentary procedures indicates that there are serious democratic failings at play. But absolutely, it is a global pattern and that's becoming clearer as time goes on.

Q: Thanks. Perhaps it might be worth saying something briefly about the nuclear Non-Proliferation Treaty (NPT), which was due to be reviewed again this year at the UN in New York, but the Coronavirus prevented that although it may go ahead at the beginning of next year. One of the three pillars of the NPT is to encourage the free exchange of technology for nuclear power. Do you think that's a failing of the treaty?

A.S.: Well, I think it's absolutely core to the problem. It's been well known in general, right, going back looking at all kinds of industries, how it's typically the case that regulatory regimes whether they be health and safety or environment, or indeed proliferation, like this cases, are best understood not as a way of actually holding business to account but protecting the largest firms against smaller ones that will come in. Regulation is part of an industrial regime, and that's not a nuclear thing, it's a general feature of regulatory capitalism and it's true in this area. What's remarkable is the number of organisations that have since the 50s had this hardwired – the dual promotional and supposedly regulatory function on nuclear. It's really amazing how they are sustained – the Nuclear Energy Agency, Euratom, the IAEA (to name an organization under the International Federation regime) and it's really clear that the formula for nuclear

proliferation is to actually prep very intensely - there is no technology backed by a UN agency so strongly as nuclear power is, and yet it's obsolete. It is obsolete in the sense that now it's beyond debate that it is manifestly more expensive than other low carbon alternatives and yet it has this international agency pursuing it, supposedly to protect us from the weapons that intrinsically depend on it.

So, we really have a Kafkaesque situation here and we have to deal with these international regimes – the NPT is definitely part of the problem. And the IAEA is also a part of the problem, rather than part of the solution. And a lot of the disarmament organizations, especially in the USA (although it's not true of CND), sense that, in order to take on nuclear weapons, you have to somehow say “look, don't get me wrong, I'm not against nuclear power” and almost go through a ritual of acknowledging nuclear power, which is a quite a shallow analysis, I think of how to get rid of nuclear weapons. Because the opportunity now is that they are simply going obsolete, just like other types of weapons went obsolete in the past. And unless we directly address this issue, we're going to be missing a chance.

Chair Dave Webb: Thank you very much Andy and Phil – a very stimulating conversation!

Q&A from audience

Linda Rogers: Is the argument we need to be putting then that the submarines are redundant now, because they are no longer able to move around without detection, etc?

A.S.: Yes. We talked about the obsolescence of nuclear power because it's so much more expensive than other low carbon technologies. Similarly, oceans made transparent by signal processing from satellites and by drone technologies, allowing submarines to be detected now poses serious questions about the obsolescence of the UK nuclear weapons system. Although this may not be CND's, nor my, major commitment to a scepticism of nuclear weapons, nonetheless, we are at a really important political moment which helps the arguments that have been made on other grounds.

I wouldn't say the key of our argument is to say get rid of submarines because they're not working but it does point to the fact that they are only staying in place because of the entrenched thinking going on in countries like the UK, who are not listening to the evidence – either from the energy side or from the military side. The past shows us how military technologies are often retained well past their sell-by date - even for military proponents. They eventually outlive their so-called usefulness - and that's the case now for nuclear submarines.

Rae Street: What do we do about the trade unions? For example, UNITE has recently declared its support for Sizewell C and, of course, we know that the TUC has a policy in support of Sizewell C.

P.J.: This is a really interesting question because trade unions are one of the major sticking points when it comes to the continuation of nuclear power. In our research, what really came out was that unions in the Barrow shipyards and their “Keep our Future Afloat” campaign are a very strong political coalition that has put pressure on sustaining nuclear submarines, nuclear weapons and civil nuclear, of course, for jobs and often forming very interesting alliances for trade unionists.

What is interesting, and revealing, is that when the industrial strategy was proposed, one of the first deals that was agreed was the nuclear sector deal with the Nuclear Industry Council, where the head of Prospect, the trade union for engineers, scientists, managers and civil servants, had a place at the table with politicians, at a time when unions had been excluded, in many ways, from UK political life for 10 years. Once again, nuclear seems to be the exception.

What we need to do about the unions is to start having the conversation. My trade union friends tell me that the real challenge is to actually get these issues on the table – because they can be quite fiercely resisted. CND has done a lot of work on this regarding how many jobs there actually are in relation to nuclear weapons and the building of submarines. On the civil nuclear side, way back in 2014 the Office for National Statistics was pointing out that there are more direct jobs in renewables and that's going to increase as renewables increase – and nuclear markets and export opportunities are shrinking. But renewable markets are booming and the UK, with some of the best resources – as mentioned previously – has a fantastic opportunity here. The potential for jobs from renewables is vast and if we continue with the nuclear front, the UK workforce is going to miss out on the opportunity to fully benefit because the unions have spent so much time trying to protect a relatively small number of jobs in the nuclear sector.

So it's about getting that conversation going and it's an uphill battle but it has to happen for the good of energy policy but for the good of the UK trade union movement as well.

David Lowry: In the early 1960s when the MoD wanted plutonium from the newly opened Hinkley A, they issued a press release and ministers in Parliament defended the deliberate public proliferation on economic benefit grounds. Today, the military civil crossover and reinforcement of civil and military nuclear programmes has been deliberately obscured and UK energy ministers may not even realize the complexity of these machinations. I suspect that the lever pullers are in the Cabinet Office.

Any comments or thoughts on that?

A.S.: And some special advisors are now playing a really strong role as well. Thanks for that comment David, I don't think anyone has done more work over the years to really uncover these kinds of things — it is really thankless and gruelling work, year after year. You don't make friends in high places when you do this kind of work. So, David — thanks for all you've been doing on this, which Phil and I have hugely benefited from it.

Yes, you are absolutely right. You really can't explain this international nuclear complex now. I don't think it is even understood as linkages — it is one thing.

If archaeologists were to excavate our civilization in 1000 years' time, they would not be able to distinguish between the nuclear infrastructures of the different major nuclear powers which are ostensibly there to fight each other — but they're each now threatened by their own domestic politics more than they are by each other.

Nuclear is there to perpetrate mass industrial violence against each other but actually, they are all worried about how they can they get orders abroad if the nuclear plug is being pulled. You see these weird situations, such as a British nuclear power station being built not just by a Chinese company but by the Chinese nuclear weapons company. This is one (civil and weapons) infrastructure and the destinies of each side of it are tied quite closely together.

Linda Walker: We've got to get all this great work you've done out into the campaigning world to change the minds of those climate campaigners who were saying they would rather not have nuclear power, but it has to be part of the mix, how can we best publicise this link?

P.J.: I sympathise — because I have really struggled to understand that climate change argument, especially as time has gone on, and especially as we've heard people talking about the IPCC report and 2030. Yet, some people still make the argument that nuclear, which takes a long time to build and is very expensive, is somehow a solution. The evidence is clear that energy efficiency and renewables are a much faster solution.

How can we get that argument out? Well, everyone can help, whatever groups you're in, have discussions on this issue. As Andy was saying, there does seem to be a

disconnect in some ways between questions of energy and peace — it's getting that conversation going and talking about nuclear in a different way. Talking about nuclear from the military perspective and not always beginning the conversation as if it is about climate change (which is the framework of nuclear proponents). That's how to help and we are happy to participate in any events you might want to hold and we are open to suggestions as well because we have also been thinking about how we could get this out.

A.S.: Just to build on that — I do not want to play to this conspiracy theory gallery but it's not innocent either. There is a striking difference between the way climate is campaigned on in non-nuclear weapon states like Germany and in nuclear weapon states. It is not a conspiracy, it's a political culture in the nuclear weapon states that tends to be affected by this commitment to nuclear in that way. But it's not innocent that some protagonists in the climate debate are so strongly backing nuclear power. Just look at the countries that have made the greatest progress — a group of us at SPRU have a paper coming out shortly which statistically analyses the rate of progress made against climate disrupting emissions over 123 countries to see whether nuclear or renewables contribute more. The statistics are clear — it's remarkable that this hasn't been done before, but it's never been the case that nuclear can be principally justified by a climate argument. So, just have the courage of the convictions. This is a really bogus argument. Many honourable people make it, it's not that people are being cynical, but it is backed by very powerful interests who are putting it out there all the time to try and keep it going — and the press are pretty supine on questioning it. So challenge it — because it's ridiculous now to claim that nuclear power is justified by climate change when it's so expensive and blocking resources to other options.

Keith Scott: Did South Africa abolish nuclear power when it got rid of nuclear weapons?

A.S.: No, it didn't. It's got Coburg nuclear power station and it's looking to follow on, although there's a lot of noise on these things — especially when Russian deals are involved. Anyway, nuclear power is alive and well in South Africa.

It's another one of the patterns that Phil pointed to — it's states like Iran, South Africa, Brazil who are aspiring to regional status with explicit ideas about nuclear propelled submarines, where you start hearing this fantasy world about new nuclear power stations.

Emma Howell: Does this link therefore mean that it is inevitable that Sizewell C is approved as well?

P.J.: No, is the simple answer. Things are getting very desperate for the UK so called 'nuclear renaissance'. The challenge for the UK Government is that there's very few organizations that want to invest in nuclear anymore other than EDF and China. We know from the news recently that nuclear is getting increasingly expensive and financing these

plants is proving more and more difficult. So, there is nothing inevitable about it, these things can always be challenged.

I know there is a lot of work going on about Sizewell by activists, who are very well read and on top of their game, challenging some of the claims that are being made. There's everything to play for. A telling thing I think about the UK programme is that there are so many different elements to it and that attests to this desperation to try and get just something built whatever it is. So, whether it's mini reactors or Hinkley C or Sizewell C, there's lots of different reactor designs, lots of high risk, but there's a desperation to try and secure that investment to sustain this supply chain. But just because the military is a reason to try to do that, does not mean it cannot be challenged. There are a lot of risks and Sizewell C does not inevitably have to go ahead – it can be challenged. So, the simple answer “no” and that was the long answer.

Rebecca Warren: Why are the Trident submarines nuclear-propelled? There is not a direct link between the way the submarines are propelled and the nuclear weapons they carry.

A.S.: There's not an engineering necessity but there's a nuclear engineering culture and this fascination with this concentration of power both in the weapons and the reactors does play a role in conditioning, the mindset that conceives of that kind of weapons platform.

It's another element of the obsolescence we touched on earlier. There are new kinds of air independent propulsion for submarines that are making nuclear propulsion more questionable now, challenging the old argument of being very silent and being able to go to sea for a long time with large amounts of energy. There are other forms of propulsion that are allowing for instance, Swedish submarines to be leased to the US and, in exercises, sink US aircraft carriers without being detected at all. That is really worrying for the military, and the nuclear Navy, but these are for attack submarines and they are not so good for ballistic missile platforms. In the UK, it's not just a new generation of Trident submarines that are being planned but also attack submarines. Britain has only got nuclear propelled submarines and for reasons that are openly discussed in the defence literature – because of the need to keep the industrial base. If you want to build four ballistic missile submarines with a lifetime of 30 years or so, then you need that industry to keep going until the next generation is needed. If you're going to do that then you need every single submarine to be these gold-plated nuclear-propelled submarines. That is the logic – it's this political economy of keeping the industry open that has also contaminated the energy policy as well. And it's very unclear why you would need nuclear propelled attack submarines when you could get a whole bunch of the Swedish style Stirling engine submarines instead.

Kemal Cufoglu: I would like to ask the panellists about their opinion on nuclear fusion and if they consider it as a safer, cleaner option than nuclear fission. Obviously, this technology is still in development, but I would like to find out if panellists and CND have a separate policy/view on this issue. Similarly, I do not know if nuclear fusion has the potential of leading to stronger nuclear weapons and maybe panellists could share their knowledge on this matter, too.

A.S.: It's a good question and it's something I and colleagues have thought about for a long time. The situation is not fundamentally different from fission, except fusion has not yet made any impact whatsoever on energy production. Since the mid-50s the rolling horizon for the commercialization of fusion power has been around 30 years, as it is now. We are experiencing a new hype now and these hypes cannot be explained by the success of the technology. History has shown that this has been minimal - o.k., they are making progress, but they have not achieved what they said they would achieve over more than half a century.

What can explain the hype is the pressures of the funding round cycles and the pressures we are talking about. This is because you need nuclear expertise and skills for nuclear weapons, you need a similar kind of expertise, in terms of the physics, for fusion. There is no time to go deeply into it but although some of the problems are less acute – like the production of actinides, long-lived radionuclides from irradiated nuclear fuel – because it's a different nuclear reaction – nevertheless, the fusion reaction produces a high energy neutron flux which enables the production of material for nuclear weapons – if that's what you want. It also creates a lot of intermediate level waste by the irradiation of materials. So, there are still problems of nuclear waste and of nuclear proliferation and you also sustain an industry whose only rationale in the end is nuclear weapons and we have alternatives in renewables that are already available. It is not a question of cost, because there is no cost for fusion because it's not feasible.

Chair Dave Webb adds: Another important driving factor that I can see is that the scientists and engineers involved desperately want to solve the very difficult physics and engineering problems. It's a huge challenge that has occupied and tested many very clever people for many years and they want to solve it. It's like the creation of the first atomic bomb in the desert of New Mexico – so many enthusiastic nuclear scientists and engineers hired to solve extremely complex and difficult problems. They became so involved in the problem solving that they forgot what the end product might do and what possible repercussions it might have. It's our society's culture that does not encourage scientists to consider why they are doing what they are doing – that should be left to the military or to the politicians.

Diana and Nick Francis: Is there likely to be a reaction

to Chinese investment in Hinkley C?

P.J.: Yes, we are seeing that reaction now. They are a minority investor in that project, but the concern appears to be that if Bradwell B is scrapped then they will retaliate by withdrawing their investment in other plants. It seems that, despite the economic problems and all the problems with nuclear, the only way that disturbs certain political parties is the threat of China. We have even seen Conservative politicians saying that we need to be cautious. But we are also seeing proposals that the government take a golden share to protect the investment and we have already heard talk of the state funding any gap in the finances if that occurred. So, if China did pull out, we are likely to see even more eccentric financial moves on the part of the British government to try and protect that investment. Ultimately, that would be at the behest of the British taxpayer – so we need to keep a close eye on that.

Linda Pentz Gunter: Could you talk about why countries like Saudi Arabia would want nuclear power given its climate – sunny and windy? Isn't it a pathway to nuclear weapons? It is allowed by Article Four of the NPT, giving the inalienable right to countries who disavow nuclear weapons to develop nuclear power – a reason, as you say, why the NPT is a problem. Any further comments on that?

A.S.: Linda put it really well and it is worth reflecting on, because it is amazing that the mainstream media and serious debate doesn't ridicule what's happening in countries like UAE, Saudi Arabia or Iran, which are endowed with multiple alternatives for energy production. Obviously, oil is completely unacceptable for climate reasons, but nuclear power does not make sense except for its link with nuclear weapons. This is so clear that we have to reflect on the kind of society we live in and without doing that, we won't solve this problem. We need to realize how political debate on energy policy has been deeply corrupted by the need not to acknowledge this connection. It is a big issue and I am worried about the securitization angle that challenges Bradwell because of the Chinese connection and that the nuclear weapons infrastructure is also involved. We have to be careful what we wish for – if we use that as an argument against nuclear power then we are stoking this sort of fear-driven military politics at the same time. So, it can work, but it can also be dangerous.

Kenneth: I now live in France and I'm astonished to find the anti-nuclear movements here, focused almost exclusively on nuclear power generation; and the force de frappe, that's France's nuclear weapons, is never mentioned. How can this be? Any thoughts on the campaigning situation in France?

P.J.: It's a very good question and it is a shame that it's the case because if anything it is a lot more out in the open in France in terms of the civil-military link. One of the statements we came across was in *le Monde* which basically said that if France makes a decision to reduce its nuclear power capacity, which has been proposed, then there's the

risk that France will also lose its military nuclear power. So, the links are very clear, and it is a shame that it hasn't been developed more – I don't know why but it is certainly more out in the open than it is in the UK and should be challenged.

A.S.: Just to add that, despite many differences, the basic pattern for France is very similar to that of the UK. A colonial power trying to maintain a position on the world stage by possessing a few nuclear weapons to threaten deterrent or terror on other countries. It is the same basic dynamic – it's a national identity issue. When Nicolas Hulot, the former French Energy Minister, announced that he intended to scale French nuclear power back massively, there was a scandal which wasn't fully illuminated, but was discussed in the French media, that a report came out of the nuclear establishment saying, if you do that, the *force de frappe* will be threatened. That's what *le Monde* and other papers reported. So, a very similar dynamic in France, with a real reluctance to concede the nuclear links and the national identity hinging on the issue as it does in the UK.

Chair Dave Webb: I think in the past in France there have been two separate movements, one against nuclear power and one against nuclear weapons, and they haven't really connected. I'm not really sure why – but that's not the case now. The *Mouvement de la paix* are the major peace movement in France, and the French equivalent of CND. They are very active, and we work with them when we can, and they are now also campaigning against nuclear power because they recognize the dangers it represents and the connections with nuclear weapons industry. So, I think it's changing, and it is becoming much clearer there that this connection needs to be challenged.

Q: Finally, to finish off, have you any suggestions for us as individuals or as CND members and activists in our local groups, how can we be most effective in campaigning on this?

A.S.: Well, just keep on doing what you're doing – keep being CND – be proud of that tradition that goes back longer than anyone, making these links when so many other organizations have dropped the ball – keep on doing the same thing. Now is a moment in the history of these technologies when the chances of making progress are greater than for over a decade. So, thank you for everything you've done. Please carry on doing it because I think there's a genuine prospect of changing not only the UK but the world dynamic around this technology.

P.J.: Yes, along similar lines, it comes back to an earlier point about just getting that message out there about the military connection. I've spent an unfortunate amount of time on Twitter and you can get intimidated by some of the material that's put out by very pro-nuclear people. They are sending photos of the French nuclear scale up in the 1970s as evidence of what we should do now, saying that we don't care about climate change and all these things. They must

be resisted, don't listen to them. On climate grounds, nuclear is not a solution. Be clear on that and talk about nuclear in the context of what it was and what it in many ways continues to be – which is a military technology. Let's talk about it in those terms and be brave and not be put off by the often unpleasant things you can encounter on Twitter and so on.

Chair Dave Webb: Thank you, Andy and Phil, for the work that you've done, and for the work that you'll continue to do. We do need people like you to dig out the things that we can then use and follow up on with questions. Because these things need to be seriously questioned, seriously challenged, and it will be up to us citizens to do that.

Thanks very much – it's been fantastic.

