

Chapter 4 - What happens when nuclear weapons meet climate change?

*"I am in blood Stepp'd in so far that, should I wade no more,
Returning were as tedious as go o'er:
Strange things I have in head, that will to hand;
Which must be acted ere they may be scann'd"*

It is politically correct to support the abolition of nuclear weapons. Yesterday's political leaders such as Mikhail Gorbachev who had his fingers on the button or Robert McNamara who maintained the ability of John F Kennedy to keep his fingers on the button have both done so along with many others. Today's political leaders largely do the same whilst simultaneously placing contracts for new nuclear weapons systems.

Despite the contradictory position that many leaders find themselves in, the thing they have all managed to agree on irrespective of which side they sit is that these weapons pose such unacceptable risks that they cannot be used. To do so against a nuclear armed adversary would be suicidal and against a non nuclear armed adversary morally impossible, but with increasingly irrational leaders emerging across the world the past success of avoiding nuclear war cannot be used as assurance that nuclear war will continue to be avoided in the future, especially with the advent of new technologies and the increasing numbers of nations who have access to nuclear weapons.

It is hard to comprehend the scale of the crisis and the combined madness this represents and in the face of climate change it a madness that is increasing in intensity with each passing year. Today it is twenty five years since the Cold War ended yet approximately 18,000¹ nuclear warheads still remain in the world's arsenals, the majority of which are held by the USA and Russia. Though this is significantly down from the overkill levels at the 1986 peak of the Cold War when 70,000² were in existence, it is still enough to ensure that the planet will be destroyed many times over in the event of even a partial exchange. Thousands of these missiles are on hair trigger alert and ready to be fired into each others cities at a moments notice. As well as the strategic weapons sitting on the top of intercontinental missiles thousands of "battlefield" nuclear weapons remain in military arsenals with so little audit control there is not even agreement on how many exist and despite their name they still are easily large enough easily to destroy a city.

This hangover from the Cold War raises a set of fundamental questions that many campaign groups are wrestling with such as why is meaningful progress on disarmament at a standstill? Why is it that nuclear weapon systems are proliferating to increasingly unstable regimes? Why is that spending on nuclear

¹Bulletin of Atomic Scientists, Global nuclear weapons inventories, 1945–2010
<http://bos.sagepub.com/content/66/4/77.full.pdf>

²This number does not include about 7,000 nuclear warheads that are believed to be scheduled for dismantlement. R.S. Norris and H.M. Kristensen, "Global nuclear weapons inventories, 1945–2010", Bulletin of the Atomic Scientists, vol. 66, no. 4, 2010

weapons systems is going up, not down³ despite the ending of the Cold War? However, the vitally important question that is not being addressed in any significant way by either governments or campaign groups is how the political and security landscape that these weapons operate in will change as a consequence of global warming which will inherently increase instability. This critical aspect of the debate drives the first set of unanswered questions because climate change brings three unique problems to nuclear armed nations, these are:

1. As climate change worsens will this make nuclear disarmament more difficult?
2. As economies collapse from climate change will nuclear weapon states be able maintain their weapons systems safe from attack and accident?
3. On the assumption that they are not used, once economies have collapsed through climate change how can the weapons be managed in a way that prevents them becoming an eternal liability for the survivors struggling to make ends meet in a new, hostile and dystopian environment?

The unstoppable momentum of climate change makes these fundamental questions which should be key discussion points in both the NPT and climate change negotiations. However, they are notable only by their absence. As well as crucial international forums avoiding these contentious issues so do the press and parliament in this country (the UK) and every other that holds nuclear weapons. They are also questions that I did not fully consider until I accidentally blundered into the debate.

Every year, near my house the Fairford Air Tattoo is held. The proud boast of its advertising is that it is the world's biggest military air-show. Hundreds of bombers and fighters from around the world arrive for a weekend of fossil fuel burning mayhem to celebrate the killing ability of the global military industrial complex. It is also an event that is sponsored by BAE Systems who are also the prime contractor for Trident. BAE Systems do not sponsor this for fun. They do so because it is essential to selling their weapons systems and legitimising to the public why their taxes need to continue to be poured into the defence industry.

Thus the weekend of the Air Tattoo sees the world's best weapons systems being sold to the world's worst dictators. It sees thousands of tickets sold under the guise of family entertainment and supporting the charitable cause of injured veterans, yet only a token payment of less than 2% of the ticket sales goes to this. It is glorified in the local and national press and on radio and television. Every potential arms sale signed during the weekend is splashed across the media headlines with estimates of jobs created and vindications to the quality of British engineering.

The celebration of fossil fuel burning that this show ultimately represents along with its attempt to enable this country to build arms for others is done

³Nuclear weapons spending: a theft of public resources
http://www.wagingpeace.org/articles/pdfs/2011_10_03_ican_spending.pdf

despite government protestations of virtue about the urgent need to cut CO₂ emissions. Amongst the crocodile tears shed by government and press when justifying the hiking of energy bills to support low carbon energy there is never a single question in the press on the morality of holding a high carbon event such as this.

In 2008 following the IPCC report of the previous year which spelt out our doom from climate change, I calculated the carbon emissions of the show by looking at the fuel consumption of the planes attending and displaying. This demonstrated in a single weekend the Air Tattoo would negate potentially a years worth of carbon savings from all the renewable investment in Gloucestershire (the county in which the event was held). When I sent it round the local and national press not one paper, radio or TV station was prepared to discuss the report. When I queried the lack of response with BBC Radio Gloucestershire I was told they considered the event to be a family weekend and their reporting on it is as such, therefore they would not be covering the environmental damage it causes. The corporate advertising had done its job spectacularly well again as it was beyond the wit of the BBC journalists to understand that events such as this are there precisely to legitimise the high carbon military industrial complex to the public and to hoodwink them into ignoring the warnings of climate change. This inability to properly question the ethics of the event is no doubt linked to the £¼ million marketing budget that the Air Tattoo has every year for the express purpose of wining and dining journalists on the best claret and caviare. It is also a budget far beyond the means of the environmental movement.

In a fit of frustration I went out with a fat paint brush and painted large, black “CO₂” signs across the advertising banners that sprung up uninvited around my neighbourhood. To make sure the knife was properly stuck in, I sent an email⁴ to the Air Tattoo’s management offering the challenge, “*We will paint out as many of your signs as we can before the weekend to raise awareness of the environmental damage you will be causing. You try and stop us.*” I then sent photos of the defaced signs to the BBC hoping that this would spark some kind of debate. Instead, the BBC told me they would not cover this as it would encourage vandalism. In 2010 still frustrated with the main stream media’s glorification of this event and my inability to penetrate it, I spoofed the Air Tattoo’s web site by downloading their home page and replacing the main content with a letter purporting to come from the management of the Air Tattoo claiming that due to climate change they had come to regrettable conclusion that as responsible managers they would cancel the show. Just to add spice, the letter also referred to the US Centre for Naval Assessment report⁵ which highlighted climate change as being the biggest cause of future threat, finally it finished off with an offer to provide a refund on tickets if Air Tattoo visitors found the prospect of the event’s contribution to climate change too unsettling.

⁴Email to organisers of the Fairford Airshow
<http://kevsclimatcolumn.blogspot.co.uk/2008/07/email-to-organisers-of-fairford-airshow.html>

⁵<http://www.cna.org/reports/climate>

I then bought a web site with the same name but a different extension and posted it up and waited for the reaction.

The reaction did not take long in coming and when it did all hell broke loose!

After only four days, the web site mysteriously disappeared at 10 o'clock at night. I immediately contacted the internet service provider who told me that he had been told to take the web site down or the IP address for his server would be disabled taking down all the other web sites he hosted. For a £50 contract, this was more hassle than he could be bothered with so rather than support the principles of free speech, he acquiesced with the demand. The following morning I was served with a letter from the Air Tattoo's lawyers threatening legal action for breach of copyright and trade descriptions act for which they wanted my offer of compensation. This I found amusing and in my response to them I questioned why the Air Tattoo did not have the sense of humour that the military are proud to have. Two weeks the police raided my house at 4:00am where I was absurdly arrested for fraud on the tenuous basis that I was trying to cause financial loss by false representation. At this point, like the Air Tattoo, I also lost my sense of humour given that fraud comes with a sentence of up to 10 years in prison. The Air Tattoo then contacted my college and told them I was bringing the college into disrepute, irrespective that I had never used the college's name in the protests.

I then was summonsed to a disciplinary meeting where I was told that the college had been informed that no students would be employed in the Air Tattoo unless I guaranteed to stay silent on the Air Tattoo's environmental impact. A further condition of my continued employment was to give a guarantee to avoid doing anything that could be perceived to be illegal. Given that virtually anything can be perceived to be illegal, especially if it is protesting against the environmental destruction inherent to high carbon industries, this demand flies in the face of innocence until proven guilty that our justice system is built up. It was a further extension of the de facto gagging order that was already being imposed on me by the police's arrest for fraud. In the increasingly heated meeting, I pointed out as calmly as I could that this was a fairly evident violation of Article 10 of the European Human Rights Act to ensure free speech - the college's personal director rather bravely retorted this did not apply thus nicely opening up the college for a court case. However as this would become potentially the third court action, in addition to fraud and copyright defences I was being to feel a little punch drunk so I acquiesced. Later that summer the college was also investigated by the US copyright authorities because some unidentified person had allegedly downloaded an unidentified file from the internet. Coincidence? Possibly and I would like to think it was, but to the best of my knowledge no other college had been similarly investigated nor has our college been investigated since. I remained on police bail for 18 months while my solicitors and barristers scratched their heads in amazement at the absurdity of the arrest and the length of time that I remained on bail. Eventually without apology the charges were dropped and the dust settled.

It was an over reaction that surprised even me. Sitting in a police cell is never a great experience nor is having your job threatened, but it did make me question

the whole concept of the debates on climate change, for here was a nation and society that prothlesizes its democratic credentials yet was defending itself from action on climate change by employing exactly the intimidatory practises of a totalitarian police state which we like to think our military is there to protect us from.

It occurred to me during my extended time on police bail and while preparing a defence⁶ that the driving motivation behind the predicament I found myself in was that it is impossible to make the cut backs in CO2 emissions necessary to tackle climate change whilst maintaining the industrial base that the military depends on. Blackening the name of the Air Tattoo by questioning its carbon emissions also blackens the name of the military industrial complex it represents. This does not go down well with its main sponsor, BAE Systems who must not let debates of this type impinge on the decision by government to proceed with the Trident replacement which is critical to their bottom line. Likewise governments that are concerned about national security in an increasingly uncertain world do not want to cut carbon emissions by cutting defence and compromising on international competitiveness, even though there is no way around this conundrum. So the show must go on and brick throwing at the prime shop windows of the military industrial complex and all these represent must be stopped immediately. Any such decent must be crushed much more robustly than that associated with the usual climate change campaign targets such as coal fired power stations and new runways at airports. Ultimately, the thing that differentiated this protest from other environmental protests is that it fundamentally challenged the rational of the nation state which is to preserve the ability to wage war and maintain international competitive advantage against a background of escalating climate change which other campaigns do not do. Thus the UK can live without a third runway at Heathrow airport and still be the UK, but without its military it cannot be the same country and its ability to use its influence on the international stage to maintain the status quo from which it benefits is lost. However, this is the ultimate essence of the response to climate change - to render national borders meaningless and where courage must be found to change from the status quo of preserving international competitiveness to international cooperation.

I believe that by linking climate change with the military industrial complex and by inference nuclear weapons which supports national identity was what the spoof web site ultimately highlighted. By contrast maintaining the debate simply on the immorality of deploying nuclear weapons whilst not fundamentally challenging the political system that these uphold can be tolerated and CND amongst others have been arguing this case for years against those that support the continued deployment of nuclear weapons. Keeping the debate in this territory keeps it in the comfort zone for all sides and there is effectively a tacit agreement not to discuss the three problems outlined above. As such, the debate is tolerated by those in power because they know they can always win

⁶See for example pre prepared police statement
<http://kevsclimatcolumn.blogspot.co.uk/2011/04/police-statement.html>

through the hold they have on the mass media and because this can be used to persuade the majority of the country to back nuclear arms in times of danger. It has been so successful that all three main political parties in the UK support nuclear arms in some form, with either a direct Trident replacement or some cheaper cruise missile based variation. It means the UK electorate has no more choice than a North Korean citizen about whenever or not the nation should remain nuclear armed. Not linking nuclear weapons with fundamental political change is also tolerated by the majority of supporters of groups such as CND and similar organisations because it does not require a substantial change of living standards or expectations if they were to win. Thus they stick with the argument that by getting rid of nuclear weapons the status quo of high energy life styles can be maintained and business as usual cannot only continue but improve as the money saved is used to fund other public services such as old age pensions and health care.

It is also an approach that has consistently failed for all sides for the last sixty years since nuclear weapons first came into service. For the pro-nuclear weapons supporters neither human rights abuses or wars have been averted by their deployment and the world has failed to find a solution to its biggest security threat which is climate change. For the anti-nuclear weapons campaigners despite sixty years of campaigning against nuclear weapons since the 1950s the next generation of missiles and submarines are entering service with operational lives that will ensure nuclear weapons systems remain with us in the future for as long as they have remained in the past, forcing campaigners to commit to another sixty years of struggle.

So against this background we can now turn to the three questions that have been posed.

Question 1 Will climate change make nuclear disarmament more difficult?

It would be nice to think that in the face of the common threat that climate change is the world would come together and fight with common cause with sanity prevailing and all human efforts becoming focused on developing mutual survival strategies. Despite the nirvana of this proposition, there are some signs of hope. Possibly one of the most iconic of recent years has been Greenpeace's Arctic 30 protest against oil drilling. It was more than just a protest against oil exploration - its multinational crew drawn from nations who are economic and military rivals, amongst others, was a statement saying that protection of the planet was a bigger motivator for the concerned and enlightened than the protection of national self interest. But the bigger question behind the headlines is do actions like this represent a small but vociferous minority who remain in the domain of the environmental intelligentsia but are unable to change the majority view as climate change and all that it encompasses intensifies competition? If this is the case and if international competition intensifies will the prospect of nuclear disarmament become even more remote than it has been at any time since the end of the Cold War and will the curse of nuclear weapons become

more entrenched with each rising CO2 measurement?

The basic maths behind the prisoners dilemma warns us that players are forced into competition in response to resource scarcity. The effects of this is already evident in the glossy brochures that arms manufacturers prepare which are keen to point out how increasingly global uncertainty can be solved with the further purchases of their equipment and major trade events such as the Singapore air-show now focusing increasingly on military sales⁷. So while military budgets for conventional arms have declined following the end of the Cold War and the Iraq wars, arms sales in the Far East and Middle East are increasing and more than making up the difference. Along with increasing arms sales comes increasingly nationalism. Japan, China and India are all becoming more so and these are just three examples of a growing trend. It is the antithesis of the strive for the common good that the Greenpeace warriors displayed and it dwarfs their efforts.

The spill over to nationalism and global insecurity drives the decision to proceed with nuclear weapons. In the UK every main stream party is behaving exactly as game theory predicts by supporting the maintenance of a nuclear deterrent. The only difference between them is in the packaging. The Conservatives are arguing for a “like-for-like” Trident replacement and have already made considerable upfront investment through the Initial Gate⁸ phase. The Lib-Dems are arguing for a lower cost replacement of nuclear tipped cruise missiles on attack submarines. Labour has yet to confirm a change of strategy from their previous period in office which was to support a Trident replacement. In many ways the most worrying of all is the potential influence of UKIP (United Kingdom Independence Party) which as a nationalist party wholeheartedly supports the Trident replacement while simultaneously playing to peoples worst fears on economic collapse and immigration. The structure of the UK parliamentary system is such that an extremist party such as UKIP or others waiting in the wings could hold a dangerous balance of power. This could initially be limited to having influence on the finger on the button, but in the event of economic break down caused by climate change, it is conceivable that an extremist political party of this nature could either hold power or have such influence that an existing party such as the Conservatives would have to morph into a similar political stance to maintain their hold on power. In either way, a dysfunctional economy leads to the increased prospect of dysfunctional leaders being in charge of the ultimate deterrence and climate change guarantees a dysfunctional economy. Ironically, the fear of having a stable nuclear armed country becoming controlled by fanatics is the justification that drives the the UK and USA to preserve their nuclear weapons and was the motivator that prevented total disarmament of nuclear weapons at the end of the Cold War when President Gorbachev proposed their elimination. At that time, neither the USA nor the UK could be assured that some other dictator would not emerge, which is what many would argue has happened with Putin cementing his control on Russia.

⁷<http://news.bbc.co.uk/1/hi/business/8486831.stm>

⁸The United Kingdom's future nuclear deterrent

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/27399/submarine_initial_gate.pdf

No doubt Russia sees the same position from their vantage point and all nations maintain an unstoppable drive towards pursuing nuclear weapons which is accentuated by climate change.

The challenge in stopping momentum towards maintaining nuclear weapons became apparent to me in the general election of 2009 when I stood for the Green Party in the Cotswolds. The Cotswolds is possibly one of the most pleasant parts of England. It is characterised by beautiful villages, rolling hills, lush woodlands and some of the best pubs that can be found selling the finest ales. It is also one of the most affluent areas outside of London and territory for royalty and second homes of the rich. The canvassing experience was largely a pleasant one with most people willing to share their time and thoughts, but what was of such brutal surprise was the frequency of racist outpourings on the doorsteps where prospective voters were determined to vote for the far right to keep immigrants out, despite this constituency being one of the most homogeneously white areas in the country. Even the whiff of change was enough to cement a large and easily disaffected minority towards game theory's stable saddle point of increased competition. In the end, I spectacularly lost scoring only 1.7% of the vote, massively behind UKIP's 4.2% and the sitting conservative 53% share of the vote, both of whom campaigned on the platform of raising the barriers to immigration, increasing nationalism and replacing Trident. Albeit a small sample of one constituency, the experience demonstrated to me the impossibility of achieving nuclear disarmament through the ballot box within the current system. My experience was shared around the rest of the country where the Green vote collapse contrasted with the rise of the UKIP vote. It caused much soul searching within the Green party with workshops being held on how the Green Party could learn from the UKIP success as if the swing was due to poor campaigning - the reality is that the swing is reflecting the desperation that people are finding themselves in and the dynamics of the prisoners dilemma. For much of the electorate the prospect of voting for a party that promises action on climate change and nuclear disarmament will never be as appealing as one that promises to erect barriers and to continue with the ability to wage maximum warfare to maintain a status quo which maintains unfair advantage irrespective of how untenable this is.

This rise of nationalism which UKIP is but one example of is a rapidly growing global phenomena as populations respond to escalating interstate competition for diminishing resources by choosing competition rather than co-operation. Countries in the vanguard of economic collapse such as Spain and Greece where 50% of the young are unemployed are witnessing the biggest rises in the far right with credible reports from both countries of police support for fascist groups. More dangerously, lurches to nationalism are also happening in all nuclear armed countries making the prospect of either unilateral or multilateral nuclear disarmament more unlikely. This surge of nationalism backed by nuclear weapons in response to growing global insecurity has brought further progress on Nuclear Non Proliferation Treaty (NPT) to an abrupt halt. The last talks ended with all

sides accusing each other⁹ and nuclear weapons states, old and new, continuing to develop their arsenals. Progress towards the goal of a global zero agreement on nuclear weapons looks increasingly unlikely in the current circumstances and the evidence suggests that the trajectory of climate change is making this a diminishing prospect under the existing political systems. The related question is will lurches to nationalism and the preservation of nuclear weapons that inevitably come with this make the use of nuclear weapons more likely? A prudent risk management strategy is always to assume for the worst case and actively reduce risks to a position of as low as reasonably possible. The spread of nuclear weapons to unstable regions of the world and the inability of the existing nuclear powers to comply with NPT obligations makes it difficult to conclude that any significant progress is being made towards this objective.

The corollary of this is that if it is accepted that climate change will make progress towards nuclear disarmament more difficult then it makes achieving meaningful progress now more important. If the opportunities presented today are lost, they will not return in the future.

Question 2 - As economies collapse from climate change will nuclear weapon states be able to afford to maintain their weapons systems safe from attack and accident?

Collapse is an emotive word, and deliberately chosen, but nations can respond to climate change in one of two ways with neither offering a way of avoiding collapse. They can ignore it by sticking to a business as usual strategy, hoping they can muddle through despite the science being overwhelmingly clear that ecological collapse is inevitable, bringing with it economic collapse. Alternatively, they can address it and move to a zero carbon economy which will cause such economic dislocation that nations will as good as collapse, only this time it is done deliberately in the hope that some sort of controlled soft landing replaces the nose dive of a crash landing that would otherwise happen. The reality is that nations have already opted for the former and continue to do so thus sowing the seeds of the hardest possible economic crash landing. The question this leads to is how can the enormous costs of maintaining an effective nuclear weapons force be funded in the face of this impending climate change driven collapse and what are its implications.

There are three fundamental facts that determine the answer to this.

The first is that the global economy is addicted to economic growth to maintain the debt based system of finance and this will be discussed in the following chapters. Typical global economic growth averages out at around 3% per year and at this rate the economy doubles every 24 years. As economies grow they need more energy and with simple maths it can easily be demonstrated that in each 24 year doubling period the same amount of energy will be used as ever

⁹NPT: toothless in the face of real world dangers, Rebecca Johnson, 4 May 2013
<http://www.opendemocracy.net/5050/rebecca-johnson/npt-toothless-in-face-of-real-world-dangers>

used up to the start of this doubling period. To put this in perspective, our global economic system requires us to use the same amount of energy in the next 24 years as we have ever used since the stone age. We will also produce the same amount of greenhouse gases. This is a prospect that is totally untenable and the inability to maintain this level of energy consumption will lead to certain economic collapse.

The second fact is that as climate change increases its hold on the economy more public and private funds must be directed towards mitigation and the implications of this are little discussed by mainstream economists. In extremis, cities will need to be relocated as rising sea levels consume them, massive flood defences will need to be built and food that was once abundant must now be produced at increasing cost and effort. The list of climate change adaptations will go on with each addition further straining public and private finance. Every single thing that is added to the list it is not a matter of if, but a matter of when they come to fruition. The accelerating speed of climate change means we can expect to start incurring the costs of all these in earnest on a time frame measured in tens of years and well within the operating lifetime of the next generation of nuclear weapon systems. This will have to be managed as the economy simultaneously transforms to a zero carbon economy which in itself requires enormous levels of upfront finance and energy to build the appropriate infrastructure. Simultaneously funding both climate change mitigation measures and climate change transformation measures will become an increasingly unsustainable burden on the economy which will reduce the discretionary spend essential for raising taxes. Tax receipts will thus fall at precisely the time when they are needed the most, forcing the tax burden higher. A virtuous circle will form where the collapse in discretionary spending will starve critical infrastructure and services of the funding needed causing further austerity and lower tax receipts. Once the realisation becomes apparent that governments are inherently unable to guarantee future tax streams in the face of climate change it will be impossible for them to raise money through bond auctions. It makes the consumerist economy upon which the global system of governance is based uniquely unstable and primed to fail prematurely and rapidly.

The third fact is that the energy and mineral resources the global economy depends upon are increasingly scarce and becoming more so at the time when they are needed the most. This is forcing up the cost of extraction and defence of these sources of wealth. Oil is but one example. As all the easily accessible oil has been extracted, the global economy has come to depend on increasingly marginal energy sources such as tar sands, deep sea drilling or oil secured by war. This is moving the energy equation of the global economy in the wrong direction. In the early years of industrialisation up to the 1970s economic growth was maintained by new sources of energy that were progressively cheaper per kilowatt of power used. This progression can easily be seen. The initial use of coal in the 19th century was expensive and difficult without the modern technology and mature logistic networks that now encircle the globe. As such Britain's premier battleship of the 1870s, HMS Warrior, had to rely on sail power partly because of the unreliability of coal supplies and their expense. Eventually coal

delivery improved through a combination of new technology and improved logistics allowing the Royal Navy to dispense with sails altogether and the industrial revolution to pick up speed. Around the 1900s oil started superseding coal for transportation and powering the military. Its easy availability in Persia and the US meant that each kilowatt of usable power was delivered cheaper than from coal allowing the next phase of industrialisation and militarisation. This trend of reducing energy costs continued through technology driven cost reductions that were either equal to or better than the cost increases driven by having to exploit increasingly difficult oil reservoirs. However by the 1990s the cost of oil extraction was rising rapidly and outstripping the improvements that technology could deliver. This was typified with the move towards high temperature and pressure sub-sea well-heads needed to extract oil from the most marginal fields in the deep water sections of the North Sea. The cost per well-head was now many times that of an equivalent well only 20 years previously and the margin between energy invested and energy returned had narrowed to such an extent that many fields were no longer viable unless the price of oil rose¹⁰. It has narrowed further with the Canadian Tar Sands where almost as much energy is used in extraction and processing as is delivered.

Economies are driven by the differential between energy invested and energy returned and the result of this narrowing gap is that less energy is available to fuel economic growth; added to this is the drag of mitigating climate change and transforming to climate change.

Even the nuclear industry's margin between energy invested and energy returned has gone the same way as the fossil fuel industry. In the early days of the nuclear age power stations were built with limited safety measures and waste disposal was yet to become an economic burden. Today, a plethora of nuclear accidents and near misses has forced the costs of safety management to levels that make nuclear power non viable unless with enormously subsidies. Additionally, the cost of waste management is becoming an increasing headache that no government has yet managed to resolve and the crude early disposal techniques such as dumping at sea¹¹ are not acceptable and acknowledged to be a liability for the future.

As energy becomes more expensive to extract then society is also becoming more energy dependent - food is now sourced from all around the world, and personal and business transportation networks are now global. This makes it increasingly important that the security of energy supply is maintained despite its increasing scarcity. It drives both public spending down and defence spending up making preservation of the current economic model impossible. In the UK, the defence secretary has acknowledge this with his call that defence funding be maintained by cutting deeper into the already strained budgets of health,

¹⁰e.g. I was the Cooper Camerons project manager on the Shell ETAP project in 1998, providing the subsea wellheads and trees. Oil prices at the time were about \$25/barrel and the field was barely economical at this price level.

¹¹Tampa Bay Times, USS Calhoun County sailors dumped thousands of tons of radioactive waste into ocean, 20th Dec 2013

<http://www.tampabay.com/news/military/veterans/the-atomic-sailors/2157927>

education and welfare¹². The very budgets that he is calling for cutting are the very things that are most critical in the economic collapse that climate change is causing and are the things that will determine if our society manages a smooth decent or a chaotic collapse.

There is no comfort in declining defence budgets in the West reducing this demand on resources and in many ways this actually makes the situation worse. The trend in warfare is such that nations becomes increasingly dependent on high technology weapons systems that can deliver explosive force with precision but this can only be sustained by an energy intensive military industrial complex. In turn, this must be supported with regular ongoing contracts for military hardware as well as having a large civil market across which costs can be amortised, thus defence spending is effectively subsidised by supporting the industries which allow dual use of equipment. This comes in many forms; the civil aviation industry is subsidised and provides important markets for companies such as Rolls Royce¹³ and Airbus to amortise R&D costs across; civil logistics networks can be used by the military and even the technology of computer games play an important role in the new generation of the drone warfare weapon systems. The result is that the ability to maintain a high technology precision bombing war machine can be maintained only if a large high technology civilian market is also kept in place such that the way we make our wealth becomes the way that we make our wars. This extends equally to nuclear weapon systems. In the UK the initial gate document¹⁴ that justifies the preliminary spend for Trident and placement of long lead items such as steel for the hulls clearly and unashamedly acknowledges the need to keep the military industrial complex healthy. It stated the primary objective of the decision to proceed with preliminary work on the Trident replacement programme is that *“We must retain the capability to design, build and support nuclear submarines and meet the commitment for a successor to the Vanguard Class submarines.”* In other words we must continue to build a Trident replacement so we can continue building Trident replacements in the future, despite the country being virtually bankrupt today and heading to certain bankruptcy in the future. This is exactly the same position that Russia found itself in after the collapse of communism, when despite being bankrupt and requiring the US to fund its nuclear weapons clean up it still continued with its Akula class nuclear submarine building programme¹⁵. For all competing industrial nations, the military industrial complex becomes a living organism which must be fed at any cost and any failure to do so means it dies and cannot be resuscitated. With this logic the planet will never

¹²Philip Hammond: cut welfare not troops, Telegraph 2nd March 2013
<http://www.telegraph.co.uk/news/uknews/defence/9903911/Philip-Hammond-cut-welfare-not-troops.html>

¹³Rolls Royce accounts show 30% of sales are military. This is also a strategic industry company, determined by the government support it receives.

¹⁴The United Kingdom's Future Nuclear Deterrent: The Submarine Initial Gate Parliamentary Report

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/27399/submarine_initial_gate.pdf

¹⁵Project 971 Shuka-B Akula class, Federation of American Scientists

<http://www.fas.org/man/dod-101/sys/ship/row/rus/971.htm>

be free of nuclear weapon systems and nations will continue building up expensive, dangerous and environmentally destructive arms industries to the very last days of civilisation. As a further disconnect from reality and demonstration of the absence of joined up thinking that the preservation of the military organisation forces, the initial gate document states that the Trident replacement will “*deliver our minimum credible nuclear deterrent out until the 2060s.*” This is beyond 2050, when the planet is not expected to be habitable through global heating and by which time the economic systems will have passed the point of total collapse.

As we move towards an ecologically driven collapse, the costs of maintaining nuclear weapons systems will increase both relatively and absolutely. This will be driven by the defence of these increasing as other nations try to counter their threat with expensive technological arms races that are the essence of the military, and these will costs will fall due at a time of decreasing public funds. Despite the claims of government that Trident will be a “like-for-like” replacement, it will not. The new generation of Trident submarines must cope with the new generation of Russian Akula class submarines which reports suggest are as quiet as the best of the UK and US Navies. If the new Tridents were to enter service with the same level of electronics and defensive weaponry as the existing generation, they would be hunted down and destroyed before they could fire in the event of war. A like for like replacement would mean spending billions on an obsolete system, so even more billions must be spent on the latest technology and protective surface fleet which must also be capable of hunting down Russian ballistic submarines.

Against this background, the UK is about to place itself in the worst possible scenario of all nuclear weapons states. Its Trident programme distils down to concentrating all the nuclear eggs in a single basket as the plan of purchasing four submarines guarantees only one submarine on patrol at any one time as determined by the timetabling of refit, repair and crew rotations. In effect it means a £100bn of investment is locked into a single submarine on patrol. As austerity cuts deeper, maintaining the level of protection it needs will be increasingly difficult and the UK’s single nuclear deterrent submarine will set sail into the unknown with little idea if the latest silent Akula class submarine is sitting on its tail or not. If a conflict does occur, the UK’s entire operational nuclear deterrence and the decades of investment attached to it can easily be wiped out in a single torpedo strike. This is a totally flawed and dangerous strategy. No other nuclear weapons nation has its deterrence dependent on a single weapon system as the UK does. It is beyond credulity that such a system is being developed today in world made unstable by climate change and technology races. It also makes the UK’s pretensions of being a credible nuclear armed nation a nonsense, and a nonsense that will cost £100 billion to maintain.

The result of this combination of a dangerous military strategy and economic hardship is the entirely plausible scenario that in a world moving towards the edge of ecological collapse a Trident submarine could easily be forced into a premature launch decision. For example, a Trident submarine commander in doubt about the effectiveness of the weakened antisubmarine warfare capabilities

that he needs to guarantee his security may believe correctly or incorrectly that a Russian Akula class submarine is on his tail. If his submarine is the only one on patrol, he knows that he is the custodian of the entire UK nuclear deterrence as all other submarines will be destroyed within seconds while in port. His failure to fire when the country is under threat or under attack would render the concept of deterrence a failure and he and his crew have been drilled to fire without question if the order comes through. If for any reason his communication with headquarters has broken down, due to any one of a long list of possible causes that may emerge in the event of economic melt down such as a high altitude nuclear burst designed to disable electronic systems with its electromagnetic pulse or a more mundane wide spread power failure or equipment failure, he would have to decide with his executive officer if he should fire. His dilemma is to fire and kill one hundred million people and precipitate a war that will end the world or don't fire and have the country's entire nuclear deterrent destroyed in seconds. He will know that if he fires one missile, he must fire them all because one missile being fired will betray the location of his submarine and his submarine is designed to allow continuous rapid fire of all missiles with twenty seconds between each one. He does not have the option to predetermine not to fire in a situation of ambiguity because that would render the concept of deterrence a failure. He may look at the sealed letter of last resort that every submarine captain has from the prime minister to be opened in the event of his death or perceived as such by the Trident captain. But, it is unlikely that this will offer any categorical guidance not to fire, because the concept of deterrence requires the willingness to fire. The captain would not need to remain waiting indefinitely for a command from government because Trident is designed as a second strike weapon system. This means it must be able to fire at an aggressor following their attack on the UK even if their initial attack has destroyed the entire country, so the commander of the submarine must have launch authority. Thus the UK or any other nation operating submarine launched ballistic missiles must accept the folly of putting so much destructive power in the hands of so few people. The US Navy's Congressional Liaison Office admitted that with the cooperation of only three other officers a Trident skipper could launch an unauthorized attack - an attack equal to 6,500 Hiroshimas. Given the confined environment and morbid atmosphere for each seventyday-long submarine patrol it is not hard to conjure up numerous scenarios where reality can become distorted¹⁶.

The technology race that characterises the strategic environment that attack and ballistic submarines operate within will drive exponentially increasing defence budgets as it is relatively feasible for a new aspect of stealth or sensor technology to be deployed by one side that totally negates the entire investment of the other. A UK submariner has already claimed that on one occasion a Trident submarine was unable to be put to sea because the track of a Russian attack submarine was lost in the Atlantic; thus for the next generation of Tridents to be

¹⁶Robert Aldridge
<http://karenhousecw.org/documents/NextStopSt.Louis.pdf>

a truly effective deterrent a massive increase in anti submarine warfare capability will be needed at a time that such cost increases would become increasingly impossible. These step changes in technology are so unpredictable that establishing any budget with meaningful accuracy is impossible. Thus Greenpeace's £100bn estimate for the Trident programme could be a significant understatement in the event of a technological step change by any potential aggressor.

Against the background of inevitable economic collapse caused by climate change which will happen well within the planned operational life of the nuclear submarines being commissioned today it is inconceivable to imagine that the costs of safely maintaining a nuclear weapon system from either accident or attack can be met such that a credible deterrent can be maintained. The corollary of this is that the very spending cuts that will be forced on the defence budget will make the likelihood of a premature launch more likely by making the concept of nuclear deterrence less viable. All this will happen while the nation's decent into economic collapse is simultaneously accelerated by the cost of maintaining a nuclear weapons system.

Question 3 - On the assumption that nuclear weapons are not used, will they become an eternal liability for the survivors struggling to make ends meet in the new hostile and dystopian environment that climate change will bring?

It is easy to dismiss this question as rhetorical - of course nuclear weapons will be an eternal liability for the survivors struggling to make ends meet in the new hostile environment that we are creating for them, but it is worth while thinking through how this can come about. Whilst future gazing is always a dangerous game and history is littered with failed attempts to predict the future there are certain guesses that can be safely made based on extremely strong trends that currently exist. We know for example that atmospheric CO₂ is increasing at an increasing rate, that radiation levels are increasing as a result of the Fukushima accident and that major economies remain perilously close to collapse after the 2008 banking crisis and that on current projections global population will reach an unsustainable 10 billion by mid century. We also have a library of climate change research predicting serious temperature rises. So it is prudent to see what broad scenarios could play out in the future for the management of nuclear weapons systems post collapse.

The first scenario to consider is the strategy the world's most powerful governments are collectively, but silently, working towards. This is the possession of nuclear weapons prevents large scale war through their deterrence effect and the status quo of industrialisation is preserved by their presence. In this scenario the nuclear weapons industry will be maintained through a large scale industrial base which will pump more CO₂ into the atmosphere and maintaining this will be impossible within a genuine democracy so authoritarian rule will become the norm. Once the generation of weapons systems currently being developed and entering service such as the Russian Borei and Trident ballistic submarines reach

the mid point of their lives in the 2040s the design and construction of the next generation of even quieter and more deadly submarines will begin in a world that is collapsing economically. The cost burden that the replacement weapons now impose on their respective nations will be higher than at any time since the advent of the nuclear weapons age as the economies will be much diminished and the technical costs will be even greater. At the same time that these are being developed major cities along with submarines bases and other critical infrastructure will be flooding. Large scale civil unrest would be breaking out and nations such as the UK would be implementing plans to return ecological and economic migrants back to their own countries and by inference to their death in an attempt to maintain some semblance of order at home. The end point of this scenario and hence current government policy is that the nation's last survivors would be the crews and maintenance staff of the nuclear submarines. This is no nightmare dream, it is simply an extrapolation of existing government policies around the world that assume nuclear weapons should always be replaced and climate change should be ignored because other nations are planning on doing the same. It is as predicted by the prisoners dilemma.

A different, more chilling and equally plausible second scenario has society breaking down schizophrenically at all levels as the climate change disaster plays out and the break down that happens to society happens within the submarines that are on patrol around the world. A key selection criteria of an officer in command of nuclear weapons is mental stability, but in a world going mad can the mental stability of these officers be assured in the same way as it can in a world that is stable and safe? It is hard not to conclude that the world is collapsing into collective schizophrenia as a result of climate change and this is affirmed almost every time the news is watched. A viewer can have the latest horror story of climate change explaining that business as usual cannot continue followed by an update of the Formula 1 championships which is given equal credence in its attempt to portray the idea of business as usual continuing, or reports of rising energy costs and the endemic poverty this causes being followed by adverts to fly around the world. These powerful and continuous images of extreme of wealth and opulence set against destruction and poverty have become the norm and they pervade all aspects of society. In education we teach school children, especially primary school children, the importance of sustainability and many schools have their own vegetable patches to support this yet organisations such as the Atomic Weapons Establishment are invited to run "Chain reaction" competitions¹⁷ specifically for primary school children to encourage them to consider careers in the nuclear weapons industry. In the UK education system, inspectors that validate sustainability and equality is incorporated into teaching at schools and colleges also judge success by the number of jobs students end up in irrespective of the environmental damage the job causes. Educational establishments still see no conflict between teaching about climate change and running school trips to the other side of the world. The result is surge of

¹⁷July 2012 - Local Schools compete in AWE's Chain Reaction Challenge
http://www.awe.co.uk/shownews_0222af0.html

mental illness, depression, suicide and schizophrenia amongst the youth with psychiatric hospitals reporting surges in admissions from young people. But a society is made up of people and those ending up in hospital are the tip of the iceberg and if the iceberg is large enough society can break down through a self replicating fractal pattern affecting individuals, families, communities and the nation shaped by the invisible driver of having to maintain business as usual against a clearly evident collapsing environment. In many ways, though on smaller scale, this is what happened with the rise of Hitler in the 1930s where individuals, families, communities and ultimately the nation were all swept up in a wave of destructive madness that was national socialism.

So against this spreading chain of madness what chance can there be for mental stability on a nuclear submarine? It is too hard to imagine the stress in the best of times that must accompany the commanding officer and his executives on a tour of duty. It is even harder to imagine how that stress can be maintained if at the start of the tour the commanding officer sees the society he is leaving is in terminal decline, if he realises that his own children have little chance of survival and he has to spend his time consoling his family on departure, if he is surrounded by a crew with the same worries and if he can no longer make sense of public policy and attitudes towards the crises that is obvious to him. In these circumstances what is there to stop a suicidal launch that only mad men can instigate? Once the concept of climate collapse is embedded within the chain of command it makes the concept of deterrence to ensure peace and preservation of society meaningless and the tip over into suicidal actions become more likely. This is not beyond credibility, several airline pilots who are normally the epitome of mental stability have committed suicide by deliberately crashing their planes and taking everyone with them, likewise the attacks on the Twin Towers have set off a wave of suicide driven warfare. Speculation has it that in 1968 a Russian Golf class submarine sank while the crew attempted to launch a rogue ballistic missile at Midway. With a world on the tipping point and governance breaking down, it would not take much for such desperate or disillusioned madman to set a spark that triggers a series of retaliatory responses that would make escalation into full blown war impossible to avoid. Every nation with nuclear weapon systems has to run the risk of mad men seizing charge of nuclear weapons systems.

The final scenario is that as society breaks down it becomes so dysfunctional and anarchic that no nation is able to maintain the order needed to operate nuclear weapon systems, especially the submarines. The officers and crew commanding these give up and down tools and return to their families to eke out a living as best they can, leaving everything lying around. This is largely what happened when the Soviet Union collapsed and highly enriched bomb grade uranium was left lying around in unlocked warehouses with the only safety precaution being to keep the material sufficiently separated to avoid a spontaneous nuclear reaction starting¹⁸. In this case the United States was

¹⁸The Dead Hand: The Untold Story of the Cold War Arms Race and its Dangerous Legacy
David E. Hoffman

able to mobilise and step into assist in securing abandoned material and to clean up the weapons sites as best as possible. However with the universal collapse that climate change will cause no benefactor will be on the horizon able to step in. The result will be nuclear weapons, nuclear power plants, processing and disposal facilities scattered around the world with each one having enough material to poison an entire continent. Without an intact industrial base supported by large scale fossil fuel availability it will be impossible to instigate any meaningful decommissioning. Even with this, it is difficult. Polaris submarines still sit in dockyards in the UK from the 1970s with little agreement on what to do with the nuclear contamination that they have on board. The situation is even worse in Russia.

The three questions posed are questions that any responsible society deciding on nuclear weapons should be asking of its politicians. Likewise any responsible politician deciding his country's nuclear and security strategy should also be asking the same. But discussion on these issues is notable only by silence, because they represent a fundamental emerging conflict that nobody wants to face. To pursue nuclear weapons systems assumes that the status quo which they are designed to preserve must last indefinitely which it cannot, and to discuss climate change in context of nuclear weapons policy assumes that the status quo cannot continue in anyway so undermining the entire concept of nuclear weapons. Thus staying silent on these questions is the easiest option.

This was illustrated in a series of email requests that I instigated from the end of 2011 to 2012 along with several other anti-nuclear weapons campaigners with the Department of Energy and Climate Change (DECC) when we asked that they commit to producing a carbon budget for the Trident Submarine replacement programme in line with the government's Low Carbon Transition Plan which committed to producing a carbon budget for all major decisions. As there can be no decision more important than the replacement of Trident, then we reasoned a carbon budget should be produced. DECC refused to even consider the idea. We argued in our correspondence that this should be done in line with the Durban Platform¹⁹ to which all signatories, including the UK, had committed to "*increase the level of ambition on climate change.*" As part of our request we argued that the budget should include the full carbon cost. This would cover the embedded carbon in the manufacturing process, in operating and maintaining Trident, in defending Trident with an anti-submarine warfare programme, in decommissioning Trident and finally the carbon associated with the taxation that must be raised to fund the project. They refused. Instead we were told the government would no longer be committing to the low carbon transition plan and instead they gave the bland assurance, "*The Government believes that the operation of Trident and the combating of climate change are consistent with each other*"²⁰ - an assurance with no substantiation at all, especially when it was clear in the correspondence that they had not even considered

¹⁹http://unfccc.int/files/meetings/durban_nov_2011/decisions/application/pdf/cop17_durbanplatform.pdf

²⁰DECC Statement on Trident and climate change being consistent
<http://kevsclimatecolumn.blogspot.co.uk/search?q=trident>

the issue. To believe as they did that Trident could be built while the government meets its climate change commitments of making an 80% reduction of greenhouse gases is simply another piece of the wishful thinking that any nation must indulge in if it wishes to pursue a nuclear weapons programme.

It raises a serious issue. If a nation that believes itself to be a mature and responsible democracy such as the UK cannot raise these issues in either the main stream media or in parliament and stamps out protest and replaces rational argument with erroneous wishful thinking what chance is there that the dictatorships which have always been playing catch up with their own nuclear arsenals will have similar debates? None. In the absence of these important discussions the governments on all sides can continue to build illegal weapons of mass destruction unfettered by rational argument while pursuing the nationalistic agendas that are to be expected as climate change drives economic hardship and intensifies competition for resources. This vacuum allows the United Nations P-5 security council members to effectively collaborate together to update their own nuclear weapons systems and secure their collective influence on global affairs. In so doing they collectively violate Article VI of the Nuclear Non Proliferation treaty which states *"Each of the Parties to the Treaty undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control."* The other dark side to this silence is that the P-5 represent the industrial might of the planet. That industrial might can only be maintained through environmental destruction, violation of the human rights and breaching the principles of natural justice. The misfortunes of Iran and Iraq exemplify this.

Iran's problems started with the British Navy. As the industrial revolution built up momentum one of its most prodigious outputs was a growing fleet of battleships which culminated in the super Dreadnought fleets at the beginning of the First World War. These colossal ships were the most powerful killing machines the planet had ever seen and they needed oil in large and reliable quantities. Iran was cursed to be that source. In 1907 Britain signed the Anglo-Russian Entente bringing to an end The Great Game that they had fought for control of Persia and India. As part of this agreement, Persia was calved up with the North falling under Russian control and the South East falling under British control. Britain used this from 1913 to 1951 to secure Iranian oil production by setting up the front company APOL (Anglo Persian Oil Limited), which was eventually to become BP. This contract so disadvantaged Persia, that the oil was effectively seized with Persia receiving only a token payment of 16% of net profits with no right to audit the books. Despite the wealth that oil should have brought, the Persians lived in poverty. In 1951 a new democratically elected government of what had now become Iran took the oil into national ownership to the distaste of the UK government. Britain responded with a Naval blockade of the Abadan sea port and oil refinery and by enforcing sanctions. The subsequent collapse in oil exports and revenues led Iran to bankruptcy. At the same time, Britain simultaneously lost its case against Iranian attempts to nationalise

APOC in the International Court of Justice at The Hague. Initial American reluctance to support Britain was overturned by British arguments that their support for the Korean War should be reciprocated with American support for Britain's interests in Iran, so working together the CIA and Britain's MI6 fomented a coup under the justification that the new government had communist tendencies. The coup succeeded with the help of thugs paid for by the CIA and MI6. The result was the pro-Western Shah being imposed on the people of Iran; it was a blatant instance of force and power usurping the rule of law. The new Shah held power with extremes of brutality and military support from the west. His unpopular and illegal rule ultimately forced the population to coalesce around the most viable opposition which was the radical religious groups. It was the fuel for the 1979 Iranian revolution that brought back from exile the Ayatollah Khomeini who was subsequently elected into power. Amongst the many acts the new government carried out was cancelling the nuclear programme the Shah of Iran started with US and Western help on the grounds that nuclear weapons were un-Islamic²¹. What should have been recognised as a brave step towards world peace and nuclear disarmament was totally ignored in the face of the 441 day US Embassy occupation in Tehran and wide spread suppression and human rights abuses. Saddam Hussain's Iraq was now seen as a bulwark against the perceived dangers of growing Islamic extremism emanating from Iran. With the full blessing of the USA, Iraq launched a surprise attack on Iran in 1980.

In support of this, an Aladdin's cave of military hardware was opened up for Iraq. Funding was provided through the little reported Iraq-gate scandal where the US branches of the Italian bank BNL provided illegal loans²². Hundreds of Western companies²³ provided the material for Iraq's nuclear and chemical weapons programmes ranging from items as mundane as door seals to the precursors for nerve gas production. The CIA provided satellite targeting intelligence for chemical weapons attacks. The French sold their latest fighter jets, trained Iraqi pilots and even flew sorties over Iran on behalf of Iraq²⁴. As a result Iran was held to stalemate and up to one and half million Iranians were killed, many through chemical weapons. If the existential threat to Iran was not enough, it was increased further through Iraq's underground nuclear weapons programme which was started in response to Israel's destruction of the Osirak experimental nuclear reactor. In the midst of this came the very public Matrix Churchill and super gun scandals where UK companies with government complicity aided the Iraqi nuclear weapons programme. As a consequence of the Matrix Churchill contracts, Iraq ended up with some of the highest quality weapons components in the world. Violations of the nuclear non proliferation treaty and the Geneva Convention ban on chemical weapons were simply ig-

²¹Summary of Iranian nuclear weapons development

<http://www.nti.org/country-profiles/iran/>

²²BNL - IRAQGATE SCANDAL

<http://www.textfiles.com/conspiracy/bnlgate.txt>

²³Made in the USA, Part III: The Dishonor Roll

<http://www.laweekly.com/2003-05-01/news/made-in-the-usa-part-iii-the-dishonor-roll/>

²⁴Web of Deceit, Saddam Hussein - The Trial You'll Never See

<http://www.informationclearinghouse.info/article17053.htm>

nored by the West in the bid to contain the perceived Iranian beast that their policies had in the first place given birth to and to ensure that cheap oil kept flowing to power the military industrial complex. The great democracies of the world had become blind to morality and reason.

Iran learnt that if you do not have weapons of mass destruction, you are prone to attack from those that do. It was a lesson that Iraq was also to soon learn.

In the absence of moral leadership from the P-5 and where climate change means they must fight harder and dirtier to maintain their position, the new nuclear powers (Israel, India, Pakistan, Iran & North Korea) are forced to follow in their footsteps leading the world to the brink of uncontrolled nuclear weapons proliferation. Each one has been supported in some way or another by the initial P-5 nations making a mockery of the NPT commitments to prevent the spread of nuclear weapons. Thus America and France at various stages supported Israel's nuclear programme which in itself has destabilised the Middle East. Russia has supported Iran with the Bushehr reactor. China supported Pakistan by providing warhead designs. India continues to be able buy and nuclear technology and weapons from Russia, the UK and the USA. The first wave of proliferation was followed by a second when the AQ Kahn network in Pakistan supplied nuclear technology to North Korea, Iran and Libya. The subsequent arrest of AQ Kahn has not stopped Pakistan from the profiteering in the lucrative trade of nuclear weapons; instead it changed its offering to the market now is selling itself as a nuclear guarantor²⁵ with Saudi Arabia²⁶ being the first customer and making the Pakistani nation the ultimate modern day mercenary.

It is hard to imagine a worst nightmare than NPT agreements falling apart as the world moves towards runaway climate change, but that it is were we are. The events of the past are driving us to into a vortex of violence making the agreements needed on climate change increasingly impossible within the current political systems.

²⁵<http://www.brookings.edu/research/opinions/2008/01/28-saudi-arabia-riedel>

²⁶Saudi nuclear weapons 'on order' from Pakistan
<http://www.bbc.co.uk/news/world-middle-east-24823846>