

Chapter 5 - Can democracy survive climate change?

*“He is noble, wise, judicious, and best knows
The fits o’ the season. I dare not speak
Much further;
But cruel are the times, when we are traitors
And do not know ourselves, when we hold rumour
From what we fear, yet know not what we fear,
But float upon a wild and violent sea
Each way and move. I take my leave of you:*

What is so good about democracy that people die for it and countries go to war over it? Is democracy inextricably linked to capitalism and if so how do the anti-capitalist campaigners reconcile themselves with calls for more democracy? Do we really understand what democracy is and its limitations in the face of runaway climate change and ecological collapse? Are the very freedoms that are enshrined in democracy the very things that will destroy it?

These questions are made vital when many campaign groups claim that better democracy is essential in the fight against climate change. If they are wrong, or fail to specify what they mean by democracy, then their victories may just end up with more of the same and will delay the time at which climate change is ultimately tackled by providing opportunity for prevarication to take the place of painful action.

We need to consider democracy from its fundamental concepts. The ideals of democracy were first laid down in the Greek city state of Athens where direct democracy was the system of governance. In this system, every eligible male adult had a vote on the matters of importance; slaves and women didn’t so it was not perfect. Theatre and satire informed people prior to a vote on the strengths and weaknesses of the propositions under debate. Today we have theatre and satire, but today we are only able to have a say every four or five years in general elections. When we do cast a vote we are denied a say on any specific matter, instead we forced to weigh the positions that a prospective candidate takes across a series of issues which is far from satisfactory and is much inferior to the method of governance that the Greeks developed. To ensure their system worked, they had to have checks and balances in place that would seem improbable to our concept of democracy today. For example, appointment to the Boule, which managed things like the navy’s ships and army’s horses was decided by lottery, not election. The theory being that a random lottery was more democratic than an election which is determined by money and popularity.

What was extraordinary about this was not the direct democracy itself, because many indigenous communities that have existed sustainably for thousands of years have practised something very similar, though simpler, but that the Greeks successfully scaled it up to manage a city with a population of around 200,000 with a complex infrastructure and which required the ability to wage war on aggressors. Given the technological and human progress at the time, a city state was probably the limit for this type of governance. The Greek exper-

iment also provided a warning - it eventually collapsed into an aristocracy after surviving for two centuries, yet direct democracy is still the legacy it has past to the modern world.

Over time, as populations grew and nations evolved into bigger entities over larger geographical areas an alternate form of democracy was developed to cope with the scaling up of society and the complexities inherent within this. This required the election of representatives to form governments on behalf of the population and this has become the model for all democratic government. This concept of democracy was to be refined through struggles in both Europe and America with both enduring wars and revolutions as populations struggled to free themselves from the tyranny of either churches or aristocracies while developing the structure of the nation state. In the United States, the high point of these struggles was the Civil War which was also the world's first industrialised war. A final magnanimous victory was declared at Gettysburg with Lincoln's address to his troops, "*that government of the people, by the people, for the people, shall not perish from the earth.*" This is considered by many to be the finest definition that the world has of what democracy is supposed to be - but despite the bloodshed of the war, the democracy that was being fought for which was based on elected representatives would fall short of the Greek ideal and be permanently compromised by fundamental flaws.

These flaws were identified by Kenneth Arrow, who won a Noble Prize in 1972 for his work¹ on the matter. He demonstrated democracy can only be fair if the number of choices is limited to two, thus if a community prefers one over the other, then a collective decision is easily made. However, collective decision making quickly falls apart when there is are multiple decisions to be made. This is shown below for three voters (1,2 and 3) that are voting by selecting the order of preferences of three choices A, B and C, and we suppose they rank their selection in the following order:

Voter	Choice		
1	A	B	C
2	B	C	A
3	C	A	B

We can see from this that voters 1 and 3 prefer A to B, voters 1 and 2 prefer B to C. Thus if this community of three voters is behaving rationally, then we can conclude that as A is preferred to B and B is preferred to C then so A is preferred to C. However there is a conflict; the voting pattern shows that voters 2 and 3 prefer C to A - a majority. With this selection of preferences no voting system can represent the interests of the community. With only three choices and three voters the probability of such a conflict works out to be only 5%. However the more choices and voters that are involved, then the higher

¹A Difficulty in the Concept of Social Welfare, Kenneth J. Arrow The Journal of Political Economy, Vol. 58, No. 4. (Aug., 1950)
<http://gattton.uky.edu/Faculty/hoytw/751/articles/arrow.pdf>

the chance becomes of a conflict and it quickly reaches a certainty. As such, it means that the collective decision making systems of today can never represent people interests, irrespective of what type of voting systems is used.

In an electioneering environment, where there are many interests and many voters, a prospective political representative must manage this conflict by appealing to the largest set of common interests at once and ignoring any specific interests of individual minorities. The corollary of this is that if we want to maintain the type of democratic system we have today, either minorities must agreeing to forsake their demands and accept the dominant will of the majority, or the government must suppress minority interests, by force if necessary. It makes democracy illusionary, especially when life and death decisions come are involved.

As time progresses and societies becomes more complex through technological innovation, globalisation and the impact of environmental constraints, then both the number of choices increases and the number of people involved in decision making processes also increases. As well as this, the resulting conflicts become increasingly intractable. The simple model above becomes more and more of a crucial dilemma.

In the competitive environment that we operate in today were nations, corporations and individuals must all compete for economic survival and the media must support this for its own survival then the environmental issues that need serious debate and action will always be a minority interest for a few groups in relation to the overwhelming demand by most for survival within the existing system. Thus the politician that wants to get elected must appeal to issues such as job creation, economic growth, personal liberties, law and order, health care provision and personal opportunity which are commonly held concerns by the majority, yet virtually all of these are in direct opposition to implementing policies to address climate change and to protect the environment. It means that with the system of governance that we have today, based on the election of representatives, it is impossible for the key issue of the environment to be properly addressed when it has to compete against so many other common interests. Thus to preserve our democratic system, it requires that those who advocate climate change as the key issue must either agree to be silent and forgo any hope of progress and if they won't the government must silence them by force. It makes tackling climate change through the existing democratic processes of today impossible irrespective of how much effort is made to improve the process by Green Parties around the world. Thus, what exists today is a shadow of the ideals of direct democracy that the Greeks implemented as all nations must govern in the interests of preserving the strength of industrialisation and not the liberty of the people - what we are left with is a system of governance that we can call industrialised democracy. This can be summed up by paraphrasing Lincoln's address, "*we have government by the people, for the industrial might of the nationstate, and it shall never perish from the earth.*" This has become so embedded we have come to believe it to be the norm. It is so supported in the main stream media that it is rarely challenged. It has such legitimacy in people's mind that even environmentalists still hold on to the forlorn hope that

they can tackle climate change through the tools of industrial democracy. Not only does it not reflect the ideals of the Greeks, it totally ridicules Lincoln's vision.

Despite these inherent conflicts, the main stream media continue to instil in the populations they serve the notion that industrial democracy continues to be a good thing. This is often justified by the argument that the only alternatives are the dictatorships of fascism and communism or a dystopian anarchy, yet discussion on the alternative of a direct democracy is virtually silent.

If decisions are to be based on popular opinion, then the record supports the contention of the superiority of industrial democracy, at least up till now. Nations that are industrial democracies have historically been perceived as better places to live than those that are either dictatorships or agrarian as measured by the number of people who risk all to migrate from one to the other. But this is flawed from many perspectives. Many nations that are dysfunctional dictatorships have often become so as a result of meddling by the powerful industrialised democracies and struggling agrarian societies are struggling as a consequence of climate change and land grabs. Finally there is a time lag between the benefits of industrialisation and its associated costs. For example with climate change, a 30 year time lag exists between greenhouse gas emissions and warming; thus society can be enjoying the benefits of industrialisation for thirty years in ignorance of the costs to come. It is the same for many other aspects of industrialisation - the explosion of plastic manufacturing allowed many improvements in lifestyle and wealth, but the cost of disposing plastics are yet to be accounted for and their subsequent build up in the world's oceans and poisoning of the food chains is a problem that is developing to be as severe and intractable as the fall out from a nuclear war.

The other aspect of industrialised democracy that gives it the veneer of respectability is that it allows for better organisation than the industrial dictatorships of communism and fascism. As a result, industrialised democracies have won both economic and military competitions for dominance; again, at least up to this point in time. Industrialised democracy itself is a critical weapon in these battles; the intellectual freedoms it enshrines allows for more effective innovation and improved organisation which are key success factors in nation-state competitions, while simultaneously preventing significant dissent. As well as being good from an individuals perspective and from a nation state competitive advantage, industrialised democracy legitimises governments, irrespective of them operating illegally. Japan and Australia typify this perversity. Japan still continues to flout international agreements on whaling and the Australian people have elected a government that believes climate change is crap and which is unprepared to even attend talks on climate change, much less make binding agreements. Both of these are highly illegal and morally reprehensible, yet there little public condemnation of them from the senior levels of other governments and no hard hitting economic sanctions are imposed. By contrast, nations that are perceived to be in violation of international agreements and have governments which have little legitimacy with their people are subject to much more stringent economic penalties. The most notable recent example are the sanctions

against Iran's perceived nuclear weapons programme, which glaringly contrasts with the failure to even condemn Australia's position on climate change.

It is hard to fully appreciate how flawed industrial democracy is and it is easy to ignore the effects of its failings when you are surrounded by the trappings of its success. But those failures are spectacularly brutal and many millions around the world have paid the price with their lives. Nations from Iran to Guatemala to Chile have been destroyed through war, revolution and exploitation in the name of preserving industrialised democracy. But tragically it is often a mundane event on your doorstep that becomes the tipping point in demonstrating how incapable industrialised democracy is of representing human interests rather than the millions of dead elsewhere in the world. For me that rather mundane event, certainly in comparison to the millions that have died through industrial democracy, occurred when I was organising protests against the expansion of a local airport. The airport was Gloucestershire Airport. Rather uniquely this was owned jointly by the councils of the two adjoining cities, Gloucester and Cheltenham. The airport was a relative backwater in the aviation industry, the pollution it caused would never be on the scale associated with the big hub airports such as Heathrow and its political significance would not be something that would change the outcome of elections, however it was in my backyard and that to me made it worth fighting.

As I geared up for the fight, the Airport's management and their helpers on the council similarly geared up their business case and it was duly presented to the council for approval. With only the slightest bit of effort it was clear to see that the costs were under estimated and the gains over estimated. This is nothing too unusual, as many public spending projects are justified in the same way. However, what made this stand out from normal was how blatantly the tax payers of Gloucester and Cheltenham were going to be forced to stump up the cash for a project that would bring them no benefit at exactly the same time that spending cuts were going to be imposed on them due to the collapsing state of public finances. They were also going to be forced to pay for a high carbon piece of infrastructure at the same time that they were being told to cut their own emissions and be subjected to increasing energy costs that would break many in the attempt to achieve this. The noise and other environmental damage would also directly degrade the quality of their lives as well as placing many of them in an extended hazard zone as fully laden private jets, which have the highest risk of crashing, would be taking off and landing over their houses. To rub further salt in the wounds, the sole basis of the business plan was to increase private jet travel, much of which would be used by the richest in Gloucestershire to commute on a regular basis to their tax exiles abroad. The proposal was such an absurdly blatant example of the poorest in society being forced to pay for the very richest, it was hard to envisage anything more unjust.

Rather predictably the ensuing protests built up in intensity. Firstly the normal democratic methods of engagement were used, such writing to councillors and explaining the argument in the press. Equally predictably, they were all ignored by the Councils so convinced they had become with their own propaganda

that the airport would yield a return on the investment while simultaneously achieving the impossible of reducing CO2 emissions. So concerned had the council become about the continuing questioning of their judgement at the council meetings, that the every time I arrived with other members of the public whose lives stood to be ruined by the proposal, I was escorted in by police with the continual threat to be forcible eviction from meetings.

A key thrust of our argument against the proposal was greenhouse gas emissions would be disproportionately emitted by a tiny minority of the population. As a result of our efforts the airport's management had to produce a "green management" plan that incorporated an emissions ceiling. However, at the same time the business plan was being approved by the councils, simple arithmetic showed that with the increase of flights that it was predicated on, the carbon ceiling in the "green management" plan would be massively exceeded. It was blatant fraud and we reported it to the police - who ignored it.

Throughout the course of our protest, the councils continued to justify their decision with the argument that the development would increase the profitability of the airport and this could be used to reduce council taxes as the airport was council owned. So contentious had the argument become that the local press, which should do the job of holding councils to account and expose the weakness of the business plan, refused to cover the debate and the journalist that was supportive of our campaign was told by his editor "*not to rock the boat.*" So blinkered had all political parties become that both Conservatives, Labour and Lib-Dems all supported the development and instructed their councillors through a three line whip to vote in favour of the development despite over a thousand letters of complaint. Only one councillor fought against the development and he was expelled from the Lib-Dems for his troubles. The democratic process had been shut down with frightening ease.

In the final approval meeting, we arrived on mass again and with our usual police escort, to be told that the business plan would be approved along with the green management plan. In the increasingly rowdy meeting I asked that they confirm if planes would be grounded in the event that the carbon ceiling which the planning application was now based on was exceeded, to which I was told, "it was not that kind of ceiling" and good management would ensure that this would not happen! We were also told that the airport's management was now so concerned about their climate change obligations they had installed solar panels. These turned out to a single 5 inch solar panel to illuminate the light on the welcome sign. Immediately after the meeting we went to the airport and under cover of darkness we took the solar panels along with the lights, then reported to the council and the press that we had them and we looked forward to returning them when the airport confirmed planes would be grounded in accordance with the ceiling on the green management plan. It was political theatre of the best possible kind.

Rather unsurprisingly, the council did not see the funny side. Two weeks later I had an early morning raid on my house by the police and was arrested on theft and criminal damage and held for exactly 24 hours, the maximum possible. It was blatant political policing. The definition of theft is to intend to

permanently deprive, but as we made it clear we intended to give the lights back there was absolutely no illegal act committed. But this was an act of defiance, and this is something that cannot be tolerated by any system, especially when the moral foundations that it rests on are flawed. It did not matter that our act was on a trivial scale in the grand scheme of things, it was still an act of defiance necessitating a police response that was deliberately disproportionate and illegal to ensure that any further acts were deterred against. Ultimately, the basis of our argument is that in the face of runaway climate change building a new airport, especially one that caters specifically for private jets, is not possible but to concede to this argument forces many other activities to be stopped which would bring the system of industrialised democracy down.

With the monopoly of violence that the council enjoys, they got their way and the Airport was built with the tax payer providing funding through a loan. As anticipated, the airport today is unable to pay off the loan and local residents are now bailing it out. If our act achieved anything, it was to demonstrate how easily our system of industrial democracy can revert to the use of force to silence dissent, but how difficult it is for dissenters to use similar force or even the law in their defence. As said before, this protest is almost embarrassingly small in the grand scheme of things, but it does perfectly illustrate the difference between industrial democracy, where all decisions are made to support the forces of industrialisation, and the human democracy where all decisions are made for the benefit of society. What happens on a small local scale also happens on wider national scale. In the same way that Gloucestershire suppressed dissent, on a bigger scale the US has introduced the Patriot Act where almost any pressure group can be designated a domestic terrorist, and leading the list of potential terrorist groups are environmentalists. In the UK, the police and private security firms have infiltrated and suppressed environmental pressure groups almost at will and with no accountability.

A key principle that continues to attract people to the concept of industrialised democracy is the idea that one should be free to seek opportunity and benefit from the opportunity sought. This is its rallying cry and the individualism associated with this is something that is quite different from the early visions of democracy. Herein lies the problem. In the zero sum game of a global society facing resources shortages and rising greenhouse gas pollution, these aspirations and principles are invalidated. It is simply not possible for people, or groups of people, to enrich themselves without forcing others into poverty irrespective of how noble their cause is to make themselves rich. This is the Achilles heel of industrialised democracy, it can only survive by ignoring this truth as long as possible and it must suppress dissent on this as every single transaction within society becomes dependent on energy.

It does not matter what the transaction is, it can be anything from buying a hamburger to buying and running a private jet. The production lines for both which run from the mines and fields through the factories to the end consumer are all powered by fossil fuels. Not only are the production lines fuelled by fossil fuel, but they must be kept running as close to the maximum capacity

as possible to keep the costs per final product as low as possible. It means the total amount of fuel and energy used must be permanently maximised, which is totally contradictory to the drive to reduce energy consumption and move to renewables. It is simply not possible to move this energy intensive system to renewables. Despite all the hype, enthusiasm and investment in renewables the basis of the energy for all society's transactions remains fossil fuel. Renewables account for only 3.9% of the world's primary energy consumption² and lag so far behind coal there is no chance of catching up any time soon. The International Energy Agency says of coal, "*Since the start of the 21st century, coal production has been the fastest-growing global energy source. It is the second source of primary energy in the world after oil, and the first source of electricity generation. Coal consumption increased by nearly 60% from 4,600 million tonnes (mt) in 2000 to an estimated 7,200mt in 2010.*" The unavoidable fact that energy drives everything, also means that those people who are the richest and consume the most, also pollute the most. Thus, the very people who have achieved financial success and who are put on pedestals by society represent the antithesis of what needs to be done to tackle climate change.

Even a massive renaissance in nuclear power would have little impact on this energy equation or on our consumption of fossil fuel. The hundreds of nuclear power stations that would have to be built could not be finished before the critical triggers on climate change are pulled, especially once the delays caused by the heightened safety regimes that must be implemented after the various nuclear disasters are factored in. Uranium supply is already problematic and there is no guarantee that it could be expanded to support a large scale global switch to nuclear power. The fuel supply solutions of reprocessing and fast breeder reactors have all consistently gone over budget and failed to deliver anything near the output needed to be viable. These also introduce further proliferation problems in an increasingly unstable world. Even if the power stations could be built in time and the uranium sourced, the project will require an enormous energy hungry industrial manufacturing infrastructure to be built at the same time as nations are simultaneously facing energy shortages and failing to make progress towards the zero carbon footprint needed. Even if these problems could be overcome, nuclear will not power our shipping industry, or aviation industry nor will it provide the heat energy and materials for our industrial processes. All of these will require fossil fuel and all of these sectors have exponentially increasing expansion plans ensuring they will quickly consume any of fossil fuel savings that nuclear would make as they continue to maximise their production to minimise their unit costs. Without fundamental reassessment of our economic and political systems, the result will be the environmental risk profile on the planet will increase to critically dangerous levels from nuclear waste and additional reactors for no significant savings in CO2 emissions.

Similar arguments pertain to renewables, though these do not increase the environmental risk profile in the same way. The carbon savings from the \$1bil-

²BP Primary energy report
<http://www.bp.com/extendedsectiongenericarticle.do?categoryId=9041234&contentId=7075077>

lion Thames Estuary wind-farm which requires premiums on everyone's electricity bills are easily negated by the various expansion plans of aviation in the South East of England.

So our energy intensive industrialised economy is stuck with burning catastrophically high levels of fossil fuels at increasing levels for its very existence. The rationing and rewarding of access to these fuels for business and individuals is the basis for our economy and our monetary system. Money can most correctly be thought of as a token which can be exchanged for the consumption of energy. Money effectively allows energy to be consumed at a future time and place of the owner's choosing. The important word here is future. It implies that the benefits of the opportunities that someone exploits today can be accrued and also invested to secure further future opportunities through speculation. For most people their pension schemes do the speculation for them, often by investing in high carbon industries like aviation and oil production; others speculate successfully through the development and acquisition of businesses. In our market based, industrialised democratic society this is available to all and is fundamental to its operation. It is also fundamental to the aspiration that people have to a comfortable retirement and the maximisation of opportunity.

In all industrialised democracies this right to speculation has been extended to corporations and is enshrined in law through their "*fictional person*" status. It gives corporations protection by the laws that were initially designed to protect people. Under this legal protection they can acquire other companies, expand their operations and sue for damages caused to them. They are ambivalent to the damage they cause to others in their attempts to expand and grow as they cannot feel pain. In this context, they are the ultimate psychopaths; their *raison de etre* is the total preservation of self interest. What makes the subsequent battles they have with the people so one sided, is that they are able to use a legal system that was designed to protect people to continue their growth irrespective of the damage that they cause, yet they cannot be sent to jail. By contrast if a person was to inflict will-full environmental damage and cause deliberate loss to another they would be liable to imprisonment. The final absurd situation is that the limited liability status corporations have protects their directors and board members from imprisonment due to any environment damage caused under their watch³.

If one takes as an example the Formula 1 grand prix; there can be no more pointless exercise than packaging huge motor racing teams up on a weekly basis and sending them round the world so that a few lucky individuals can race around in circles at as high a speed as possible. The operation creates many hundreds of thousands of tonnes of CO2 emissions while encourages its one billion global audience to continue burning fossil fuel as normal despite the planet being in the early stages of runaway climate change. Despite the inherent crime of this, there is nothing in law that prohibits this reckless behaviour, in fact the legal system gives them protection to carry on as usual as if they

³Pre prepared police statement following fraud attest
<http://kevscimatecolumn.blogspot.co.uk/2011/04/police-statement.html>

were a person expressing their own free will. By stark contrast, if a person terrified about the consequences of climate change that this event supports and the immorality inherent with it tries to stop the charade by taking direct action such as blockading the entry road, having failed to stop it with all the usual calls to reason such as letters to the press and political representatives, they will be subject to the full weight of the law and face imprisonment.

Thus our system of governance and the mentality it reinforces is wholly incompatible with the crises of runaway climate change and planetary resource shortages. Two immediate impacts from these are being observed today. Firstly, resource shortages are already changing the basis of our continuous growth based economic system into something worse than a zero sum game; a contracting game. Secondly, the costs of pollution which up to now have been externalised from the polluters by burdening the poorest are reaching catastrophically unsustainable levels, especially amongst the poor and they are starting to revolt across the world. Climate change is already ripping apart the ecological fabric sustaining our civilisation by destroying food chains throughout the planet and moving billions from positions of survival into positions of poverty. Whole cities are being wiped out by flooding and storms on timescales far faster than predicted in the IPCC reports. Hurricane Sandy is just one in the latest of a series of increasingly intense storms to hit major industrialised centres. In all cases it is the poorest who suffer first and suffer the most, despite contributing the least to the crisis.

These events are conspiring to force a dilemma of unprecedented proportions to the global economic and financial systems which is ignored. All industrialised democracies raise taxes by people being able to consume to excess. Thus every holiday, car, restaurant dinner and everything in between that is purchased allows taxes to be raised through a combination of VAT, corporate taxes and employee taxes. If in an idealised and hypothetical world where everyone lived in a low energy, low carbon economy and consumed just what they needed to survive and not one bit more then no taxes would be raised. Accumulated government debts would not be serviced and the economy would crash. So our economic system relies on a significant portion of the population to continually be buying things that they do not need. In the face of climate change this is untenable and is doomed to crash. Climate change will force all surplus public and private expenditure to be directed towards building a low carbon energy infrastructure, relocating cities to cope with rising sea levels and rebuilding critical and dangerous infrastructure destroyed through storms and heat-waves. The unspoken crisis this will cause is the massive increase in public expenditure that society will demand will cause taxes to rise. However, the demand for rises in taxes will take place as private consumption drops due to the increased energy and food costs associated with climate change. This will cause unemployment to rise and simultaneously reduce tax receipts while imposing additional welfare burdens. Those in employment will be forced to pay higher taxes, thus reducing their discretionary spend and so less taxes will be raised forcing tax burdens to increase further. The cycle will repeat itself in a runaway spiral to bankruptcy as governments will come to quickly learn their tax revenues are unstable and

divergent functions of atmospheric CO₂. This positive feedback mechanism will drive economies towards a non linear financial crash, far before the full ecological collapse happens.

All governments around the world will be caught in the same bind and they face the same choices. They can raise taxes and divert all resources to the urgent job of climate change adaptation which will leave no money in circulation to maintain the normal excess consumption and the economy will collapse. Alternatively, they can ensure that consumption is stimulated by not investing in the critical infrastructure work needed and the economy will be quickly destroyed as climate change takes hold. The later is the approach that governments are taking. For example, the UK is cutting funding to the Department of Energy and Climate Change (DECC) and flood defences whilst simultaneously supporting further development of aviation. It is also an approach that evidently favours the most well off at the expense of the least well off, as it is the least well who will be the first victims of climate change and collapse.

Having chosen the approach to continue sustaining the economy as long as possible, then to avoid the inevitable economic collapse as atmospheric CO₂ rises, governments are forced to continue trying harder to stimulate the economy. This means that they must pursue policies leading to even higher CO₂ emissions, so the US expands tar sands operations, the UK shale gas and China maintains its demand for Australian coal. The economic benefit gained from each of these new energy stimuli is less than what went before and the pollution they emit is also higher. This is being driven by the continuously lower Energy Return on Energy Invested (EROEI) ratio that today's global energy sources provide and is epitomised by the low energy returns on tar sands and gas fracking projects. This metric has been the lifeblood of the global industrialised economy, but this is now going down at the same time as the climate change overheads are building up in society. The massive economic and energy demands that these cause such as recovering from climate change disasters whilst moving to a low carbon energy system paradoxically means that a higher EROEI is needed today than at any time since industrial democracy started.

These are the driving forces for the new economic conflicts that are plaguing our planet today. They are being played out in nation-state to nation-state conflicts such as the current war in Syria where struggling nations seek to use the Syrian battlefield to assert control over each other. They are also played out in the civil unrest which has spread from the Arab Spring, to the Occupy movement and to the mass anti Olympic protests in Brazil.

In the cities of Western Europe and the US, the Occupy movement was a focal point for these it directed arguments to the huge bonuses that bankers and other elites in society maintained while the general taxpayer was forced to bail out the collapsing financial system while suffering increased energy costs and losing the safety net of public services. The Arab Spring was similarly motivated. Those that were trapped in the lower income bands were not motivated by the desire to obtain democracy. They were motivated by the hunger and desperation that was brought about by a spike in food prices. Though we will never know the true motivation of Mohammed Bouazizi who sparked the Arab Spring by

setting himself on fire in Tunisia, it is not hard to come to the conclusion that once he reconciled himself with the fact that he had nothing, he realised he had nothing left to lose and the rest of the society was ready to follow into revolt.

In the Western capitals, the rallying call was the Occupy movement's declaration that, "*We are the 99%*." Behind the statement is the implicit assumption that most of the world's wealth has been accumulated by the top one percent of society and this should be distributed fairly to make a better society.

It is an entirely reasonable position to take, but embedded in this are two distinct but related questions. The first question is has this only become a problem now and is the increasing concentration of wealth in the upper 1% part of a trend inherent in our economic system? The second question is can the wealth held by the top 1% ever be distributed using the economic system that we have inherited from our predecessors? These are fundamental questions. If we can demonstrate that the concentration of wealth is part of an underlying trend then it implies that the wealth cannot be redistributed within our current system and so we answer the second question, because if any redistribution is done we will simply end up at the same point in the future. If this is the case, it tells us that shared human progress is a fallacy within our economic system and what human progress there is will increasingly belong to the elite and become more so with climate change.

The starting point to sourcing answers for these questions is census data. In the example that we shall work through we take the US Census data which records household income from 1967 to 2011⁴ and all figures are adjusted for inflation to 2011 values.

Table 1 extracts the 2011 data and is presented as the percentage of households earning above a given income, so for example it shows 5% of the US households earn more than \$186,000.

In Figure 1 we first plot the percentage levels against the income. This shows an exponential decrease in the number of people earning above a given amount. The curve will asymptotically approach the x -axis, but will never touch it. As the curve extends on towards increasingly large household incomes it shows a diminishing number of households earning above these levels. In theory it is possible for the curve to go an infinitely large income.

In the second graph we plot $\log P$ against $\log I$, in this case we are using natural logs, which we abbreviate to \ln . We see a straight line relationship.

For the data from 2011, the straight line relationship that relates $\ln P$ against $\ln I$ can be written as:

$$\ln P = -1.7042 \ln I + 17.851$$

We use log power laws to rewrite the equation as:

$$\ln P = \ln I^{-1.7042} + 17.851$$

⁴Income, Poverty, and Health Insurance Coverage in the United States: 2011
<http://www.census.gov/prod/2012pubs/p60-243.pdf>

percent above given income, P	$\text{Ln} (P)$	Income, I	$\text{Ln} (I)$
90%		12,000	
80%		20,262	
50%	-0.6931	50,054	10.82
20%	-1.6094	101,582	11.53
10%	-2.3026	143,611	11.87
5%	-2.9957	186,000	12.13

Table 1: Data from US Census on household incomes

And then raise both sides to the power of e and simplify, to give:

$$P = I^{-1.7042} e^{17.851}$$

Final rearranging and simplification gives:

$$P = 565441331 I^{-1.7042}$$

We can rearrange the equation, and using $P = 0.01$, we conclude that 1% of the US households earn more than \$527,911.

US Census data on household incomes is available back to 1968, all normalised to 2011 prices. We repeat the analysis year on year and plot the trend for α in figure 2. This shows an unbelievably consistent trend; the R^2 value of 0.9567 shows almost perfect correlation with time as α increases steadily from a low of -2.4107 in 1968 to -1.7042 today. It is one thing to see a trend, but to see so strong a trend is highly significant. The rise of α is completely unaffected by the great political events of the day such as the ending of the Cold War, the choice of president or any other factor. It is a trend that has its own unstoppable momentum transcending all political events yet the value of α determines the distribution of wealth in society and the very nature of society.

The effect of increasing α tells us that the income curve drops more slowly and as the graph goes off to the right its tail is thicker before eventually approaching the x -axis. In practical terms, it tells us that 0.16% of the households in 1967 earned above \$500k (in 2011 money terms) rising today to 1.1%. An increase of 680%. This would initially sound like a good thing. The advocates of the existing system would argue that this shows there is more chance that hard work can move you into the high income bracket and more people in society doing well means more taxes are being raised. But irrespective of the taxes paid, it represents a significant accumulation of wealth in the top 1%. At the same time as the tail is fattening the very rich are also getting very much richer. The Forbes rich list shows the number of billionaires increasing from 470 in 2000 to 1,426 in 2013 with their combined wealth rising from \$898 billion to \$5.4 trillion.

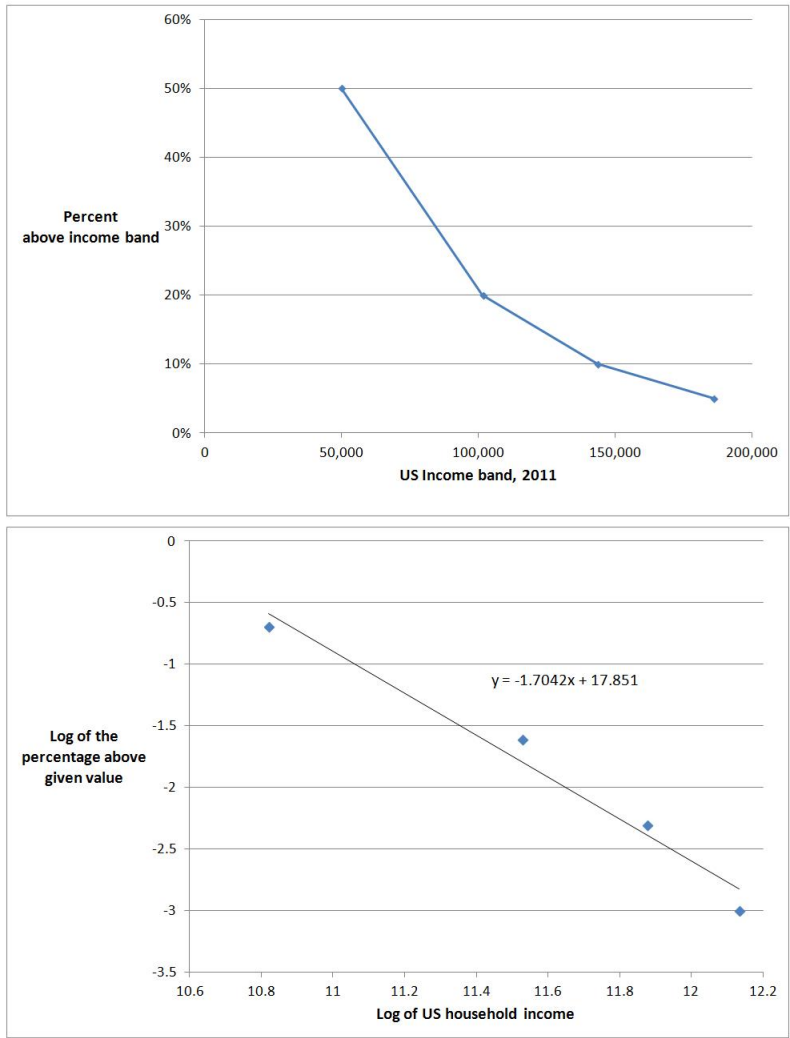


Figure 1: Relationship between percentage of people above a given income and the income

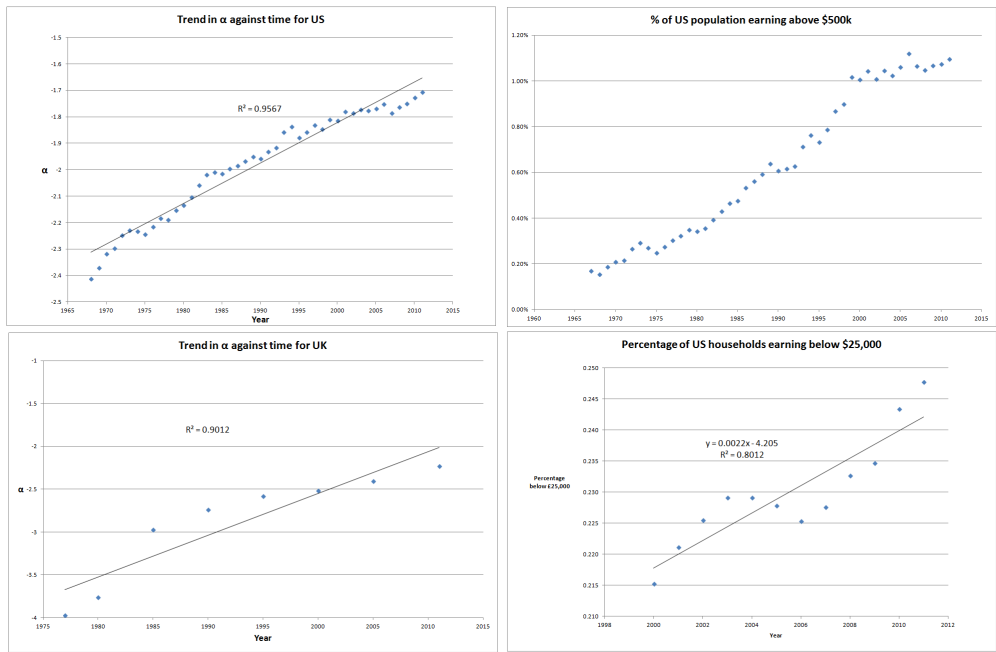


Figure 2: Analysis of changing incomes

The power law relationship is only useful for values above the median income. To analyse distribution of income at the lower levels, we simply extrapolate between the income class intervals given in the census data to find the percentage of people below a given income. In this case \$25,000 has been selected as representing an appropriate level at which a US household could reasonably be described as being in poverty. The data shows the percentage of people earning less than this threshold has increased since 2000 from 21.5% to a high of 24.8% in 2011, an increase of 3.3%.

So the figures show more people are finding themselves at the extreme ends of society and households are falling into poverty 3.5 times faster than they are rising into the high income club. Those at the bottom have two added problems. Their poverty is becoming more acute as the staple costs of fuel and food are rising as a consequence of climate change and resource depletion. In effect, the poverty line is moving upwards. Even if we move the bar for poverty upwards to \$30,000 we still find the number falling below this new figure is on a rising trend with 29.8% of the population below this level, up from 26.3% in 2000. The other more fundamental problem is that it is impossible for those on low incomes to earn less than zero. However, those at the other end of the income spectrum have no upper limit so they can earn more and more and accumulate continuously to price the poorest out of staple resources.

The graphs in figure 2 speak to these arguments. It is highly significant that the trend of people falling below the low income thresholds starting rising after 2000. This was when the price of oil ended its period of stability in the 1990s and started its climb from \$20/barrel to its peak of \$120 barrel in 2008. The zero sum game had set in. After this point, the rich could only continue to get richer by depriving others of wealth. The numbers being plunged into poverty increased while α continued its rise and the very wealthiest grew even wealthier.

The US graph and analysis is of course limited to US data only. However, in today's interconnected and globalised world the concentration of wealth in the upper elites of the developed world requires not only the poor of the country where the rich live to be impoverished, but the poor of other countries which supply food, mineral and oil resources also to be impoverished. The evidence is everywhere and brutal; 1 billion face chronic hunger while food production continues to be diverted to energy crops for biofuel and in oil exporting countries such as Nigeria poverty is endemic and increasing.

Conclusions? The Occupy movement is right, but perhaps not in the way that they argue. Their argument that the very richest are richer today than in the past is true. As importantly, the band of people earning above a given high income, e.g \$500k, is steadily increasing. The greater number of people in this band serves as an army of influencers to ensure that the system remains configured to protect the interests of the very wealth. A self perpetuating system can then develop that maintains the steadily increasing trend of α driven by industrial progress and technological innovation. This in turn drives globalisation and market liberalisation further supporting the increasing α . Political process becomes subservient to this and the role of voting becomes almost an

irrelevance.

If global wealth was gradually increasing, the increasing proportion of the population drifting to high incomes would not be a problem. That was largely the case till the year 2000. However, in a world facing limits to growth it is a considerable problem. More challenging for the Occupy movement and other social justice movements is the strength and consistency of the trend leads to the unavoidable conclusion that this is the natural way of things within our system of industrial democracy. Any attempt to redistribute wealth within our current economic system, which is what most are campaigning for through policies such as higher taxes for the very wealthy will fail and the distribution of wealth will return to the same levels of inequality in time. A far bigger change to the existing economic system is needed.

Discovery of this power relationship that forms the basis for income distribution is not new, it was first observed by Pareto in 1890, but what makes the situation today unique is the strength of the underlying trend. As far as Pareto was concerned, he believed that some people in the middle classes would fall from the middle classes into poverty through bad luck, alcoholism and tuberculosis. Meanwhile some people would rise from the middle classes to the upper reaches of society. Today, the incomes tails are more dynamic and growing at either end in a way that even Pareto could not have envisaged. Society is literally splitting itself apart. The middle class is becoming smaller. The haves have more and there are more of them. The have nots have less and there is more of them as well. The consistently rising value of α is an economic and social disaster. The trends at either end of the income distribution support the contention that as the economy starts to crash as a consequence of climate change and peak oil then society is configured to ensure that those at the bottom of society are to be plunged into poverty while those at the top will use the chaos to cement their hold on power. This was put in context at the 2013 Davos summit when Oxfam reported that the wealth of the 85 richest people in the world was equal to that of the poorest 3.5 billion. We should not be surprised, the trend to get to this point was evident from the 1960s and it was probably established before then.

This situation is analogous to the sinking of the Titanic. Those that got into the lifeboats were predominantly from the first class. Meanwhile those in steerage class were locked below and left to their fate. By contrast it was those in the steerage class who instantly knew how serious the situation was. From their vantage point below the water line they could see the water coming in and they did not need to be qualified naval architects to realise that ship was sinking. By contrast, those in first class who merely registered a judder carried on with the party unaware of the panic below. So it is with today's society. Those at the bottom can see the economic system that supports them is sinking through the effect that rising staple costs and unemployment have on their survival prospects, they are already up to their waists in water. By contrast those at the top feel little more than a judder as they re-adjust to a new economic paradigm by slightly reducing their spending on luxuries; some do not even have to do this. They are left with no personal concept of the severity of

the climate change or peak oil, yet the mechanisms of industrialised democracy give them the levers of control.

This separation of society into the haves and the have nots, where the haves have the power, permeates decision making and poisons the outcomes. The government delegates who attended the Bali Climate Change Conference in 2007 were all from the first class compartment of society. They shunned any contact with the environment that they were there to save by staying in the biggest, brashest hotels on the island and some even arriving by private jet. Hardly any wonder that one of the enduring photos of the Bali Conference was the UN Secretary General crying at the end in the realisation that no progress could be made on his watch.

In the sinking Titanic, those that survived used Machiavellian manipulation of the system to ensure their seats in the lifeboats, and so it is for our society today. The latest version of this is the use of market mechanisms to tackle climate change through carbon trading. In the unlikely circumstance of this being made to work free of fraud, it will simply price the bottom end of society out of the right to food and basic energy while allowing the top end of society to indulge in excess consumption. This is why it is the favoured option of the airline industry; people can continue indulging on carbon intensive holidays by further pricing others out of the right to basic energy. It allows the powerful to continue to grow while those at the margins of society are kept there and dis-empowered, further reducing their ability to fight back. Carbon trading is probably the most Machiavellian scheme yet and will serve to continue the trend of widening the gap between the haves and the have nots.

Given that working extremely hard gives you only a 1% chance of rising into the elites club, those at the bottom of society are left with only two choices and neither of them are good. The first is that they can try peaceful protest and appealing to reason but this is forlorn. The protesters will simply have the old adage proven to them, "*To he who has will be given, from he who has not will be taken.*" The second option is to revolt violently, but unless a violent revolt has a clear objective it will waste lives on either side and deliver the same type of system that it tried to usurp in the first place. This has been the fate of many recent violent revolutions such as Libya and Egypt where one set of bad dictatorships have been replaced with an equally bad set of dictatorships. This is the natural outcome of the industrialised democratic system that we have, and it is the system that we have always have always had. Collapse into violence is its inevitable result as the population moves through its three phases - (1) striving for success through hard work, when this fails (2) lobbying for social justice, when this fails (3) violent revolt.

One of the most powerful enabling mechanisms that forces the percentage of poor people to increase at a rate faster than the percentage of rich is the fraction reserve banking system which provides the money for our society. It is a concept that has at its heart continuous economic growth and energy consumption. It exists in a symbiotic relationship with the economy. It forces economic growth by increasing money supply and the economic growth it forces increases money supply. Without one, the other is doomed to collapse. It is the system that

the provides the mechanism for speculation that is inherent to our concept of industrial democracy.

The fraction reserve banking system is also known as the debt based finance system and in this system money enters the economy as debt. Its fundamental basis is that when a deposit is made into a bank, then depending on what fractional reserve ratio has been set by government, money can be conjured into existence by a bank in the form of a new loan. For example if a £1000 is deposited into a bank and the government has set a fractional reserve ratio of 9:1 the bank can lend £900. This then becomes a deposit in another bank. The next bank can use this deposit to lend £810 and so on. Thus a converging geometric sequence exists. With the numbers given in this example, the total amount of money lent will tend towards £10,000 given an infinitely long cycle of bank lending, with most of this created within the first the couple of cycles of lending. This represents the sum of the principles of all the loans so £9,000 has been created in the form of debt from the initial £1000.

Each bank in this chain of lending charges interest on the money lent out. To take the example further, if banks pays 2% interest on deposits and lend at 5%, it means that first bank must pay their depositor £20 (2% of £1000), but the total interest all the banks received from all the borrowers is £450 (5% of £9000). In total the banks have made £430 from the initial £1000 lent to the first bank. This must come from somewhere and in a debt based economy it can only come from other people being prepared to take out loans to this value, so more money must be conjured up and this can only come from further debts being taken out elsewhere in the economy, requiring a self perpetuating chain of money lending to prevent default.

The problem gets more serious if the fraction reserve rate is reduced. Taking the same numbers as above, but this time reducing the fractional reserve rate to 3%, then the money that is lent into existence from the initial £1,000 increases to £32,333. The profit the banks make on the interest now increases to £1,283. This is more than the initial principle. Somewhere loans need to be taken out greater than the initial £1,000, now requiring more debt to be taken out than the initial principle.

Now add another element to this set of numbers, the repayment period. Suppose in this simple example that all debts have to be paid off within one year, including the interest. To enable this to happen a loan of £1,283 must be taken out somewhere else in the economy which is greater than the initial £1000 that was started off with. The burden of interest is now greater than the initial capital. As the loan to pay the interest circulates through the banking system it too will create more money and interest greater than the £1,283 that was needed from the first set of transactions. Lowering the fractional reserve rate combined with the interest payments has changed the nature of the geometric series. Instead of the amount of money in circulation converging to a given total, the amount now diverges in an exponentially increasing curve.

This is good for banks but disastrous for society. As the interest burden builds up exponentially it can only be paid off if more money comes continuously into circulation by people and businesses taking new debt. This new debt must

be taken before the old debt is paid off. Any delay in issuing new debt will cause a catastrophic collapse in the system. Also, the banks will grow faster than almost anything else in society. The UK banking system was 60% of GDP in 1960, it now stands at 460%⁵. Today banks have grown to the point that they are too big to be allowed to fail, but neither can they shrink.

The trap is laid. The financial system will appear stable to everyone caught up in it while increasing amounts of energy can be injected into the economy to maintain growth. When this is the case people and businesses have the confidence to take out additional loans creating money to pay off the existing interest in the economy. However if available energy is set to fall, then the cost of every transaction in the economy rises so fewer people will have the confidence to put themselves in debt and the rate of new money going into the economy will shrink. If the amount of debt being taken out falls, then the money in circulation collapses and those that have loans to pay off will be unable to do so, further eroding confidence. The first to default will be those that are highly geared and those that have had to take out large loans just to survive; this applies to corporations and individuals alike.

Corporations are incentivised to increase gearing by maintaining high debt to equity ratios. In most developed countries, corporate debt interest payments are tax-deductible, so it is more tax efficient for firms to raise finance by additional borrowing. In the good times this increases the probability of shareholders receiving higher dividends. In the bad times, if the fixed overhead of the interest cannot be paid the company faces bankruptcy and the shareholders lose everything. To take the example of BAA (British Airports Authority) its operating profit in 2011 was £621million, yet the costs of financing its loans was £731 million, leading to an overall loss. It is a company that faces the dilemmas of many others, its interest burden is so high and unsustainable that the only way this can be paid is by expanding the company further requiring more debt, hence their frantic lobbying of government for a third and fourth runway at Heathrow. It must do this in the face of rising energy costs which reduce the margins for the airlines that operate from it and in defiance of the science of climate change which says that high carbon operations like this must be closed. It is also a situation that the government of the day must support as the development of a new runway and infrastructure is funded by debt and this increases money supply.

It is an absurd situation and one that can only result in collapse. It is also a situation that corporations must deny and do all in their power to cover up. Failure to do this would be to acknowledge that future expected earnings cannot be sustained which would collapse share value as investors race for the emergency exits. With the collapse in share value the collateral for additional loans vaporises. Further debt financing becomes impossible and the company implodes. It is to avoid this day of reckoning for as long as possible that companies such as BAA pay huge sums to public relations firms and employ scurrilous

⁵Gordon Kerr, Law of Opposites
http://www.adamsmith.org/sites/default/files/research/files/ASI_Law_of_opposites.pdf

activities. They have diverted their staff to protest for airport expansion⁶ at public hearings; have recruited Tony Blair's spin doctor, Tom Kelly, who was notorious for slandering Dr. David Kelly over the Iraq weapons dossier and employed private spies such as Tony Kendall from C2i to spy on the climate change activists, Plane Stupid.

At the other end of the debt spectrum are those millions of people who find themselves borrowing up to and beyond their limit simply to have a roof over their head and food on the table. This group includes the young and the poor who have virtually no chance of being able to buy their own home unless they mortgage themselves to many multiples of their income. They face spiralling interest payments as they are forced into the obscenity of having to rely on high interest pay-day type loans forcing them into financial Armageddon. In the unlikely event of economic growth resuming it will force interest rates to increase and they will be unable to make the payments on their existing loans, in the likely event of further economic contraction then money supply will contract as new debts issues dry up and they again will be unable to make their interest payments. Damned if you do, and damned if you don't.

This system rests on a knife edge. If banks are operating at a fraction reserve rate of 3%, this is all the drop in money supply needed to wipe out everyone's savings and trigger a banking crash. As economic growth and energy are fundamentally tied together, a 3% drop of energy supply is all that is needed. The one thing that we know is that the energy available to run our economy will fall by far more than this, either through peak oil or through addressing the climate change. We also know that increasing amounts of energy will have to be consumed simply to stand still due to the additional mitigation activity associated with climate change.

This is the situation that we face today - to keep growing unsustainably or to collapse. After a prolonged period of money growth after the Twin Towers attack driven by deliberately low fractional reserve rate almost all households, corporations and governments are in unsustainable amounts of debt. When in 2008 oil production could no longer keep pace with demand the system reached breaking point and loans could not be paid. The ensuing financial crisis started with the sub-prime mortgage market in the US, which was that section of society that was already tottering on the edge of financial survival. However vast though it appeared, the total size of the sub-prime market could only be relatively small in relation to the entirety of the US economy, as most of the wealth is held by the few at the top end of the income spectrum as already discussed. However, in a debt based financial system a small collapse is all that was needed to trigger off a much bigger one. Suddenly the much higher level of interconnectivity within the financial system that the risk models assumed was exposed as financial institutions collapsed one after the other, domino like.

It has yet to fully recover. Even with interest rates as a low as 0.5% borrowers still cannot be tempted to take out new loans. We now witness the farcical

⁶<http://www.planestupid.com/blogs/2007/09/19/baa-stansted-staff-paid-protest-expansion>

attempt by governments that in the immediate aftermath of the crash castigated banks for reckless lending now pleading with banks to start lending again while ignoring the fact that it was the structural instability caused by an accumulated interest burden from bank lending in conjunction with rising energy prices that caused the financial crash in the first place.

It is only a matter of time before a total crash occurs that will surpass the 2008 crisis. It is unavoidable and it will be virtually instantaneous when it comes. If most lessons from the 2008 crash are still being ignored, then the one that should not be is that when crashes happen, they happen extremely fast. Many politicians and banks claimed in the midst of the crisis they had no idea it was on cards. The UK Chancellor was on holiday in Italy and initially did not think the first reports serious enough that he need come home, yet within a few days the world's entire financial system came to within 24 hours of total meltdown as confidence ebbed away and governments were getting ready to put the army on the streets. Top financiers could offer nothing other than platitudes. It suddenly became clear that those who were in power were either too ignorant of the process or too affected with hubris caused by the illusion of wealth that they had created to be entrusted with it.

This fractional reserve system is what we inherited from our predecessors. Some claim it is evil and fraudulent. The reality is that it is neither. It is simply the system that we have. It is a function of industrial democracy and it has enabled economic growth by giving the tools to profiteer from speculation. As game theory has already demonstrated economic growth is essential in the competitive arena of the nation-state economic and military battles. Without the fractional reserve system and the economic growth it forced, industrial wars could not have been won and taxes could not be raised to support them.

One option talked about by many opponents of the fractional reserve system is to move to gold. However, the same situation would arise. Goldsmiths would take gold as deposits just as they did hundreds of years ago. They would issue loans to borrowers based on the gold that has been deposited with them using paper promises. They would repeat the processes of the past were they conclude that they can lend paper promises to higher values than the gold that they have in reserve on the assumption that not all the gold will be withdrawn by the savers at the same time. They would charge for doing this and profiteer. The first stepping stone for a quick return to the structurally unstable fraction reserve banking would be quickly laid.

As well structurally doomed to collapse, the fractional reserve system is also the most inappropriate system for distributing resources during ecologically forced contraction. Again returning to the 2011 US census data we see how iniquitous this is. We calculate first the income bands for each decile of the population to obtain table 2. We make an exception on the last decile which we split in half and nominally take the highest income as being \$5million. This is a conservative estimate and well below the likely earnings of the super rich, but it this will suffice for the illustration that we are making. We then multiply the midpoint of each band by the percentage of people in that band to obtain a weighted average. Summing these values and taking each weighted average as a

Band	Household Income	Midpoint	Midpoint x Percentage	Percentage of total
0-10%	$0 < I < 12,000$	6,000	600	0.3%
10-20%	$12,000 < I < 20,262$	16,131	1613	0.9%
20-30%	$20,262 < I < 30,192$	25,227	2522	1.4%
30-40%	$30,192 < I < 40,122$	35,157	3515	1.9%
40-50%	$40,122 < I < 50,054$	45,088	4508	2.4%
50-60%	$50,054 < I < 67,230$	58,642	5864	3.2%
60-70%	$67,230 < I < 84,406$	75,818	7581	4.1%
70-80%	$84,406 < I < 101,582$	92,994	9299	5.0%
80-90%	$101,582 < I < 143,611$	122,596	12259	6.6%
90-95%	$143,611 < I < 186,000$	164,805	8240	4.4%
95-100%	$186,000 < I < 5,000,000$	2,593,000	129,650	69.8%
Total			110,655	

Table 2: Distribution of total wealth

percentage of the total gives us the proportion of total wealth that each decile controls.

We see the top 10% of the population control 79.2% of the county's wealth, yet the bottom 60% of the population control only 10.1% of the wealth. As money is an approximation to the amount of energy that someone consumes, we can be reasonably safe in the conclusion that the top 10% of society are responsible for approximately 80% of the greenhouse gas emissions, while the bottom 60% of society are responsible for only 10%. Even allowing for error within this crude calculation the distribution of emissions will be of this magnitude and other than income there is little else that is a useful predictor of CO2 emissions per sector of society.

It is the extreme wealth that the top 10% controls that allows them to squander planetary resources on unneeded and energy intensive second homes, private jets, air travel and luxury holidays and to pollute accordingly. None of the things they use can operate without liberal quantities of fossil fuels. In contrast, those at the bottom are simply clinging on to life. The consumption at the bottom is by necessity little more than is needed for basic survival and poverty limits the greenhouse gas emissions that can be created. This iniquitous distribution of greenhouse gas emissions holds for all economies, as well as the global economy as a whole.

To try and reduce greenhouse gas emissions by burdening the entire population with the increased energy bills needed to cover the costs of introducing low carbon technology while not restraining consumption at the top end of society is immoral. Any saving that people at the bottom struggle to contribute towards will be instantly negated by the excess consumption of a tiny number of people at the top of the income tree who will be at liberty to effectively divert the fuel saved to the purchase of luxury goods.

At the extreme end of this spectrum is the sale of A380 Super Jumbo jets

to bored Middle Eastern billionaires, whose construction is subsidised by the European Taxpayers. The greenhouse gas emissions from the owner of one of these planes will negate the carbon savings of hundreds of thousands of people.

Despite the glaring reality of a failing system there is virtually no discussion in the mainstream media of the structural flaws that are besetting society. Even news outlets such as the Independent in the UK which have been foremost in reporting on the dangers of climate change still have editorials supporting the construction of large scale infrastructure projects to stimulate the economy and return to unsustainable economic growth. To argue otherwise would upset their advertisers which predominantly are from high carbon industries and to whom they are beholden.

So without any public discussion and little understanding, we have allowed an economic system to develop that is doomed to fail through the build up of interest, that will imprison the majority of the population in poverty and is inherently unsuited to fairly distributing critical energy resources to the population. In fact the opposite can easily be argued; the purpose of the system as it currently stands is to ensure those who cannot contribute have no access, or at best minimum access, to critical resources irrespective of this being their fault or not. This is the end result of the industrial democratic process that has governed our society and allowed every person free access to speculation in the pursuit of self interest. What is happening is the antithesis of Adam Smith's contention in his Wealth of Nations which was that if everyone was free to pursue self interest, society as a whole would benefit. We have tolerated the absurdities of this system for so long because we needed it to compete internationally, but continuous competition drains an athlete and in the same way it drains nations.

It is this fate that we must avoid.

In the face of climate change, we cannot rely on the fraction reserve banking system to be the means of resource distribution nor can we allow the associated system of the industrial democracy to be the system of governance. We must have a system which constrains speculation to the minimum and prevents a small elite from squandering the sacrifices of the masses. New technologies such as wind and solar may allow for a lower carbon future, but to believe that this is all we need to do to stop the catastrophic build up of greenhouse gases is dangerous naivety. The only system that will enable this is a rationing system where every man and woman is given a set carbon budget and they have to work within this.

A UK parliamentary group headed by Shaun Chamerlin and David Fleming developed the framework of electronic Tradable Energy Quotas (TEQ), a concept that was developed from the carbon rationing argument initially proposed by Mayer Hillman in his book, How We Can Save the Planet. The basis of their proposal was that energy quotas would be issued based on the carbon emissions from the energy supplied. 40% of these would be issued to households and 60% to industry. Industries would buy their allocations through auctions. Any energy transaction would require the surrender of carbon rations and unused energy quotas could be traded. For example, the purchase of petrol would require ration certificates to be exchanged with the petrol station, the petrol

station in turn would transfer the ration certificates to the oil refiner, and the oil refiner would transfer these to the oil producers who would then return these back to the issuing body. So as money goes one way through the supply chain, then the energy quotas go the other way. It is a system that does provide the basis of a fair distribution system in a way that is demonstrably not possible with the existing economic systems. It is a system that could reverse the trend of rising inequity discussed above and it would incentivise those that are frugal and penalise those that are wasteful, which is the opposite of the current system.

It is an idea that would achieve the objective of reducing the UK's carbon emission and it was also described as being "*ahead of its time*"⁷ by Ed Miliband who was the Energy Secretary when the proposal was first published. This is a somewhat strange way of dismissing it given the emerging disaster of climate change is so bad one can only conclude it is an idea behind its time. Chris Hulme, who took over as the Energy and Climate Change secretary after the next election followed in the footsteps of his predecessors and dismissed the proposal as politically unacceptable and argued that a carbon tax was the way ahead. If the thought of TEQs is politically unacceptable, then Australia's experience of carbon taxes shows this to be even less politically acceptable with it being blamed on job losses and eventually bringing down the Labour government. The inability of the TEQ proposal to gain ground merely goes to prove that anyone can set up a parliamentary group and develop what ever ideas they want with absolutely no chance of it ever succeeding if it challenges the basis of industrialised democracy.

If TEQs are not explicitly introduced, then they will be done implicitly through the welfare state as the economy will be forced to bail out the bottom half of society to prevent insurrection. This is what is happening today and is unavoidable in the existing economic system. It is also a poor substitute for the TEQ alternative; those at the bottom of society are stigmatised and placed at the mercy of those at the top. It is not a debate limited to the UK, today draconian welfare cuts are being implemented across Europe making life untenable for many and it is being reflected in a boom in suicides. Just as King Canute could not stop the tide, then society cannot stop the march towards a rationing economy. The choice is stark, it is rationing or it is collapse. There is little middle ground.

TEQs have two problems that its proponents have not addressed. Without saying so, these are probably the two reasons why the proposal has not been implemented and why people like Chris Hulme considered it to be politically unacceptable. The first problem is that it becomes an alternative to the existing currency and will undermine it. As the existing currency system depends on increasing energy supply into the economy to maintain itself and the purpose of TEQs is to rapidly drive energy consumption down there is the real prospect that its wide scale implementation would crash the existing finance system especially when it is so fragile. Ironically the TEQ proposal relies on the existing finance system to allow trading of unused energy quotas. However, the failure

⁷ http://www.geos.ed.ac.uk/homes/s0671956/PCT_workshop_report.pdf

of the existing financial system is inevitable and so the prospect of its failure is not reason enough to dismiss TEQs, but considerable thought needs to be put in place to work out how the existing financial system should be configured to minimise the impact of collapse. This thinking was absent from the proposals submitted. Options that can be considered include increasing the fractional reserve rate and reducing interest rates so the money supply cannot grow exponentially. Though this will constrain liquidity and lead to a partial collapse, the poorest will no longer be the hardest hit as they will be able to trade their unused energy quotas. Those that will be hit will be the richest.

The second problem is that if it is successful in constraining energy consumption to that needed to tackle climate change and peak oil, it means that there can be no excess consumption in the economy so no taxes will be raised. No taxes means no way of competing economically and militarily on the world stage. Though in an ideal world sourcing all our energy and food within our borders obviates the need for us to wage war externally, it does not stop other people threatening this country either militarily or through mass migrations from climate change ravished countries. In this latter scenario, these new waves of migrants would be seeking access to our rationing system and the population would demand protection from this. In a world that is both globalised and collapsing it is not possible to pull up the drawbridge and seek isolation from the rest of the world, so we are forced to return to the game theory problem of competition versus co-operation and it makes the argument a flawed one that says we should implement TEQs to set an example to the rest of the world, which was used by some. It is inconceivable that the population would vote for this at a time of increased international insecurity.

To implement such a system, far reaching security guarantees are a prerequisite. These need to include guarantees not to pursue resource based wars such as the Iraq war and agreements on nuclear command, control and disarmament. The countries that we share our security with can then share a common rationing system. This must be done multinationally and most importantly it must be done jointly between competing blocks of nations such as the NATO block, Russia and China. Ideas also need to be explored about including the oil supplying nations. Many of these have the benefit of being located in extremely hot countries where solar power is abundant and the TEQ system would incentivise developments of their renewable energy industries while forcing their oil production to be curtailed. Freed from the tyranny of military competition they should be able to balance their energy budgets using their abundant renewable energy resources.

Recent UK parliamentary debates on the Trident replacement illustrate how important it is to make these far reaching linkages and how these linkages are impacting us today. Conservative MPs recently argued that the instability caused by the melting Arctic Ice cap makes the Trident replacement all the more necessary. It is a strange proposition to anyone who is concerned about securing the future of the planet. It is akin to saying that we will stand by and watch planet's ecological collapse while ensuring we retain the ability to destroy it if this does not come about naturally. However, it is a populist idea that is easy to sell to a

terrified population. The problem is that once the decision is made to proceed with Trident all serious attempts at tackling climate change become impossible as the nation must commit to maintaining the existing economic system. This is the case irrespective of the cost being 1% or 50% of GDP. Once taxes have to be raised for competition based overheads such as nuclear weapons - that is it - the fractional reserve system needs to be maintained along with the fundamental problems that go with it of requiring continuous economic growth in a constrained world.

Thus without tackling Trident and nuclear disarmament, we will never be able to implement a rationing based economy and without a rationing based economy we will never achieve the social justice that the Occupy movement and other social justice campaigns are fighting for. It also means that there is no space for an industrialised democracy. The flip side of this argument is that if we do not introduce a rationing system and maintain the existing system which locks us into expanding energy consumption, the competition that it causes makes nuclear weapons essential along with the risk of destruction that this causes. The only thing we can be certain about is that this scenario leads to the abyss.

The one thing that we can be certain about is that TEQs will prevent the richest from being able to continue polluting, or at least make it considerably more expensive for them to continue doing so. They will be constrained in a way that they have never been before. This is the antithesis of industrial democracy, but this system is now dead in the face of ecological limits and that is a brutal fact that we have to face. The elite group of excess consumers that TEQs must first target are also the group that has control over the media and are most able to control political decision making. Few political parties will want to support this as most rely heavily on backing from big donors and institutions and are all wedded to the concept of industrial democracy. While opponents of carbon rationing and energy quotas will argue that it is undemocratic, it is more undemocratic to allow the sacrifices on the majority to be squandered by the selfishness of the minority. It forces us to differentiate between industrial democracy and human democracy.

We must also face the equally brutal fact that the quicker we kill the right to excess consumption off the better. Wars are already being fought around the world over the basics of survival such as access to land, food, water and energy, yet the right to excess consumption is causing further demands on these resources. As wars ferment, groups are formed under what ever banner is needed to wage the resulting resource wars. The most infamous is Al Qaeda. It is the poverty and hopelessness that many face on a day to day basis that is its true recruiting sergeant. Religion is not the issue, it is merely a tool for maximising terror. Muslim extremists can for example use the persecution of women and sharia law as ways of terrorising other communities that they have to share resources with or terrorise those within their own community they have to keep under control. In so doing they are copying the means of control that have been used for thousands of years which is the maximisation of terror and it dates as far back as the Pharaohs and Chinese leaders who would having their aids

buried with them at the times of their death. Al Qaeda's terror attack on the Twin Towers which cost a few hundred thousand dollars sucked the US into the economic disaster of the Afghanistan and Iraq wars by maximising terror. Without winning the battles, Al Qaeda type groups can win wars by holding the opposition to long term stalemates and bleeding their economies dry, just in the same way as the Vietcong previously did to the US.

The war against Al Qaeda is not a War on Terror as George Bush and Tony Blair declared it. As many authors have pointed out, war on a concept is impossible - instead it is a war that the poorest and politically marginalised have declared on the richest and it is one that uses as fuel the desperation industrial democracy forces upon them. What differentiates today's a-symmetric war that Al Qaeda and its affiliates are waging now compared with that of the Vietcong is that they are able to use the tools that our globalised and industrialised society must provide to its citizens such as the internet, financial networks and easy accessibility to high technology against its enemies. It makes them a far more potent foe. The most dangerous available high technology objective of any disgruntled group are weapons of mass destruction. They do not even need to obtain them to be a threat, they only need to make a convincing case that they might have them. It makes the electronic surveillance and loss of privacy an inevitability. These are prices we pay for an industrialised democracy that has at its heart expansionist policies in a constrained world. Its survival is inconceivable when it is based on exploitation while simultaneously providing the tools for attack from those it oppresses.

Moving to a rationing based economy which extends the right to fair access to resources to all is the only way that the tensions towards conflict and environmental destruction can be defused. Anything else perpetuates the existing system which has the seeds of its own destruction implanted within it and requires the ability to maintain industrial warfare while ensuring unwinnable industrial wars are maintained.

We cannot escape the rationing economy. We must either embrace it with the risks that it will cause to the existing fractional reserve currency system, or a de-facto rationing system will impose itself on us through a massive and unsustainable extension of the welfare state and charity handouts which will be needed to prevent social unrest and will always be under threat from those in work. Meanwhile the increasing number of people plunged into poverty and dependent on these will always will be subject to permanent humiliation.