

Energy Security

For
Whom?
For
What?

February 2012

THE
CORNER
HOUSE

Energy Security For What? For Whom?

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The Corner House aims to support democratic and community movements for environmental and social justice, paying constant attention to questions of social, economic and political power and practical strategy.

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Introduction

Energy is never far from the headlines these days. Conflicts of all kinds – political, economic, social, military – seem to be proliferating over oil, coal, gas, nuclear and biomass. While some interests struggle to keep cheap fossil fuels circulating worldwide, a growing number of communities are resisting their extraction and use. While an increasingly urbanised populace experiences fuel poverty and many people in rural areas have no access whatsoever to electricity, large commercial enterprises enjoy subsidised supplies. As increasingly globalised manufacturing and transport systems spew out ever more carbon dioxide, environmentalists warn that the current era of profligate use of coal, oil and gas is a historical anomaly that has to come to an end as soon as possible, and that neither nuclear energy, agrofuels or renewables (even supposing they could be delivered in an environmentally sustainable and safe manner) will ever constitute effective substitutes for them. For progressive activists, all this raises an unavoidable yet unresolved question: how to keep fossil fuels and uranium in the ground and agrofuels off the land in a way that does not inflict suffering on millions? What analytic and political tools are available to formulate democratic policies regarding “energy” that reflect these realities?

Mainstream policy responses to such issues are largely framed in terms of “energy security”. The focus is on “securing” new and continued supplies of oil, coal and gas, building nuclear plants and even translating renewables into a massive export system; energy efficiency is accorded a lower priority, but transition away from fossil fuels is nowhere to be seen at all. Climate change objectives, though once at the forefront of policy responses, are increasingly relegated as concerns about “keeping the lights on” predominate.

Yet, instead of making energy supplies more secure, such policies are triggering a cascade of new insecurities for millions of people – whether as a result of the everyday violence that frequently accompanies the development of frontier oil and gas reserves, or because the pursuit of “energy security” through market-based policies denies many people access to the energy produced. Indeed, the more that the term “energy security” is invoked, the less clear it is just what is being “secured”.

Like many other political buzzwords, “energy security” has become a plastic phrase used by a range of different interest groups to signify many often contradictory goals. For many individuals, energy security may simply mean being able to afford heating in the depths of a cold winter or having access to a means of cooking – a “logic of subsistence”.¹ For political parties in government, it may mean ensuring that a nation’s most important corporations have reliable contracts with guaranteed fuel suppliers until the next election. For exporting

countries, it may mean making certain that their customers maintain their demand for their oil or gas via long-term contracts.

The multiple meanings of “energy security” have become an obstacle to clear thinking and good policymaking. They are also an open invitation for deception and demagoguery, making it easy for politicians and their advisers to use fear to push regressive, militaristic social and environmental programmes:

“Energy security is a concept notorious for its vague and slippery nature, no less so because it is bound to mean different things at different times to different actors within the international energy system.”²

This multi-faceted nature makes it difficult, if not impossible, to come up with a definition that is accepted by all,³ which is hardly surprising given that no single term can capture realities on the ground involving different histories and materialities.⁴

Both the word “energy” and the word “security” have in fact become so detached from their vernacular meaning that they are themselves problems. “Energy”, usually treated today as an abstract concept from physics, makes no distinction among energies derived from wood, muscles, coal, oil, gas, nuclear materials, falling water or moving air. It ignores the diversity of things that different groups want energy for – cooking food for your family? extracting more surplus from workers? – and the different types of political struggle connected with each. It hides the different ways in which energies are bought and sold, and the differing politics of class, race, gender and nation that characterise each energy source.⁵ Measuring “energy” and “energy sources” cannot by itself help decide which types, amounts or uses of energy are more important for humanity’s future. It may even get in the way.

“Security” is just as problematic. “What kind of “security”? For whom? Which kinds of security are connected with which energy sources? What kinds of strategies are required for each kind of security? How do they conflict or overlap? The word abstracts from all these questions. By concealing differences and conflicts that have to be acknowledged and brought out into the open, it hinders effective, democratic policymaking related to agriculture, electricity, trade, aid, transport, manufacturing, housing, banking, national development and the role of the military in society.

This report explores the pitfalls of “energy security” as rhetoric and as policy. Instead of illuminating possible ways forward, the phrase (and the policies that are framed by it) obscures increasing inequality, diverts attention from the need to slow global warming and nurtures underlying conflicts. In sum, it gets in the way of effective discussion about, and organisation for, a democratic, fossil-free future. A critical examination is needed to find ways to talk about poverty, climate and other issues connected with “energy” that are more coherent and

analytically fruitful as well as better attuned to progressive goals. Putting the collective security and survival of *all* above the individual short-term gain of a *few*, and acknowledging the deep political, economic, social – and even psychological – entrenchment of today’s locked-in dependence on coal, oil and gas, it would be wise to start now to make transitions in how we produce and transport food and goods – how we live and organise our livelihoods, societies and economies around the world.

The four sections of this report:

- explore the abstract and historical energy concept reflected in physics, which ignores the different types of political struggle connected with each energy source;
- describe the wave of new energy enclosures justified by “energy security” that are creating new scarcities and insecurities as people are dispossessed of energy, food, water, land and other necessities of life;
- outline how the neoliberal market-driven approach to energy and climate policy strengthens energy exclusions, while the financialisation of energy and climate creates energy shortages and delays effective climate action; and
- summarise the violence that accompanies the everyday “normal” operation of fossil-fuelled industrialism that is entrenched within the “securitisation of everything”.

“In tracing the connections . . . between pipelines and pumping stations, refineries and shipping routes, road systems and automobile cultures, dollar flows and economic knowledge, weapons experts and militarism, one discovers how a peculiar set of relations was engineered among oil, violence, finance, expertise and democracy.”

Timothy Mitchell
“*Carbon democracy*”
2009.⁶

The trouble with “Energy”

“Energy is not a single, easily definable entity, but rather an abstract collective concept.”

Vaclav Smil, *Energy*, 2006¹

Many people who hear the term “energy security” are often rightly suspicious of the word “security”. It seems to mean so many things. What kind of security is being talked about? Whose security? Over what time scale? Does “energy security” mean being self-sufficient in fossil fuels? Having secure contracts to buy them? Being able to project military force to defend oil-trading routes? Protecting vulnerable centralised energy systems against guerrilla attacks? Or does it mean having enough heat in the winter? Or reducing demand? Or developing renewable energy? Or decommodifying electricity so that it becomes accessible to all? As geographer Mazen Labban notes:

“‘energy security’ can be endowed with any meaning, depending on the political expediency of the moment.”²

But there is another, even deeper problem with “energy security”: that complicated word “energy”. This concept needs exploring even before tackling “security”.

The breadth of “Energy”

Like “security,” “energy” covers a lot of ground and partakes of many different debates. Energy sources, for one thing, are bewilderingly diverse, physically, socially and politically. Biomass can be gathered and burned wherever there are trees or crops. Oil, with a much higher energy density per unit weight, has to be extracted in particular locations using special expertise and massive investment, refined, then transported vast distances to where its products are burned in specialised machines ranging from power plants to home boilers to the engines of military aircraft. Hydroelectric dams do not involve combustion at all; nuclear power, packing a fearsome energy density per unit weight of fuel more than three and a half million times greater than that of coal, requires, as a result, high-tech containment and unrelenting surveillance. Human and animal muscles, together with sunlight and photosynthesis, still provide much of the energy used in growing food. The role of each such source, moreover, has varied over time and will continue to do so.

If the sources of energy are diverse, so are the ways individual people use energy. Cooking, heating, hauling, building, lighting, cooling are just a few examples. Indeed, for most people, energy’s only purpose is to fulfil such diverse needs, not to be acquired for its own sake. As energy expert Amory Lovins has long pointed out, people do not want energy or kilowatt hours; they want “hot showers, cold beer, lit rooms”.³

Yet despite the similarity of many of the homelier things that individuals want energy for, the amount used varies hugely from society to society. In 2008, the US used on average 7,503 kilogrammes of oil-equivalent

per person per year, Britain 3,395, China 1,598, Uruguay 1,254, Viet Nam 698 and Bangladesh only 192.⁴ Energy use – even for the same range of activities – also shifts in strange ways from era to era. In 1900, Danes used only around one-fifth of the energy per capita for cooking and heating than they had used in 1500, yet by 1975 were back up to about the level of 1500; the reason was an initial shift from wood and peat to coal-burning cast-iron stoves, followed in the 20th century by an increased reliance on electricity provided by inefficient centralised power stations.⁵

This highlights a further kind of diversity from which the word “energy” abstracts: the diversity of social and technological regimes in which different kinds of energy are embedded. Coal is not just coal. It attained its modern meaning as a crucial component of the regime of production and imperialism that Britain pioneered between 1775 and 1925 – a pulsating system of furnaces, steam, steel, machines, railways, factory production, heightened worker productivity, urbanisation, enclosure of commons, naval engagements and much more.⁶ Oil, similarly, can be regarded as a symbol of the US-dominated era of accumulation that followed: automobilisation, suburbanisation, the Green Revolution with its petroleum- and natural gas-fed agriculture, new high-tech military equipment, new styles of disciplining workers, and so forth.⁷ Electricity, by the same token, is not just a flow of electrons. Thanks to the political, social and technological organising of Thomas Edison and others, a system distributing electricity generated in huge plants in central locations into individual homes was laboriously built up in the 19th century.⁸ The contemporary consequences are vividly expressed by writer and thinker Wolfgang Sachs:

“Take the example of an electric mixer. Whirring and slightly vibrating, it mixes ingredients in next to no time. A wonderful tool! So it seems. But a quick look at cord and wall-socket reveals that what we have before us is rather the domestic terminal of a national, indeed worldwide system: the electricity arrives via a network of cables and overhead utility lines fed by power stations that depend on water pressures, pipelines or tanker consignments, which in turn require dams, offshore platforms or derricks in distant deserts. The whole chain guarantees an adequate and prompt delivery only if every one of its parts is overseen by armies of engineers, planners and financial experts, who themselves can fall back on administrations, universities, indeed entire industries (and sometimes even the military).”⁹

Solving the environmental problems created by such vast systems is never a question of merely hooking up a greener energy source. For example, reducing US dependence on fossil fuels by partially repowering the country with solar and wind power would necessitate rewiring the landscape with at least 65,000 kilometres of new high-capacity power lines from the deserts and coasts at a cost of over \$100 billion.¹⁰ Reducing fossil fuel use in US transport, similarly, would require contending with the country’s entire “geography of everyday life centred on single-family homeownership, automobility, and the nuclear family”.¹¹

Clearly, like “security”, “energy” is a term that leaves out a disturbing amount of critical detail. That fosters confusion – confusion that can easily be exploited for political purposes. Politicians are prone to threatening that the “lights will go out” unless new oilfields are developed,

dams built or miners' unions defeated, playing on the popular belief that any energy price rise or shortage must be a simple matter of insufficient supply. In the 1970s and 1980s, US leaders talked up an oil "crisis" triggered by "a cartel of foreign sheikdoms" to push programmes of increased and diversified energy production at home and abroad in the name of "energy security", despite the fact that the accident- and guerrilla-vulnerable centralised energy infrastructure that they supported (most of which was not dependent on oil but on coal) posed (and continues to pose) a much greater threat of supply failure.¹²

The abstract character of the concept of energy fosters other confusions as well. Consider the regular forecasts made about energy consumption. For 150 years, the easy quantifiability of energy has tempted experts into making predictions of energy use that almost always turn out to be wildly wrong because they do not take into account the diverse and shifting uses of energy, the specificity and materiality of particular sources, the unpredictability of innovation and of political and economic change, and so forth. Emboldened by the power of computers and the eminently measurable nature of various variables (ranging from "share of air-conditioned areas in service establishments" to "average bus ridership" to "demolition rate of dwellings in New Zealand and South Africa" to national GDP), experts assemble mathematical models of energy use that purport to be able to look ahead 5, 10, 20 or even 100 years. The results have been dismal. In 1970 most energy experts in the US expected electricity-generating capacity to reach around 2,100 gigawatts by the year 2000. The true figure turned out to be less than 40 per cent of that.¹³ The next decade's efforts to predict world energy use in 2000 by such prestigious institutions as the OECD,

Abstract Energy

"Energy" makes no distinction between different sources of energies: those derived from burning wood and biomass, coal, oil and gas; human and animal muscle power; splitting nuclear materials; water falling under gravity; air moving; and the most abundant of all energy types, radiation from the sun.

Some of these are interchangeable: electricity can be generated from burning coal, water behind a dam falling or wind turning the blades of a turbine. Others are not: nothing so far can replace kerosene, the purest product refined from crude oil that airplanes burn.

Transportation relies heavily on crude oil refined into gasoline/petrol, diesel and jet fuel (although trains mostly run on a secondary source of energy, electricity.) Agrofuels can technically substitute for oil, but

can never be available in comparable quantities.

Some energy sources can be (relatively) easily extracted and moved great distances across land and sea. Liquid crude oil shipped in supertankers to refineries is the prime example. The physical properties of other energy sources pose more challenges. Pumping gas through fixed pipelines under pressure requires more energy than moving the equivalent mass of crude oil. Super cooling the gas to a liquid requires still more.

Coal mining requires less physical or technical infrastructure and processing than oil or gas. Its extraction is less centralised and relies on fixed networks of railways and canals to be transported. Coal yields less energy per unit volume compared to oil and gas, and has historically been less

economic to transport long distances.

Wind power is abundant but erratic, a challenge to societies structured around flipping a switch for instant electricity flows.

A tiny fraction of the solar radiation reaching the earth every day could energise a civilization consuming 100 times more energy than that consumed in Europe, North America and China today. But while solar panels on roofs could potentially provide sufficient electricity to cover many households' consumption, harnessing enough of the sun's rays to power constantly growing industrialised economies would require massive solar collectors and electric grid infrastructures, as well as substantial quantities of minerals and metals.

IIASA, the World Energy Council and the Hudson Institute were typically 30-50 per cent or more too high.¹⁴ Short-term extrapolations and projections for particular countries such as China fare little better. Despite engendering what energy specialist Vaclav Smil calls “false feelings of insight,” such “counterproductive” forecasts continue to dominate energy and climate change planning around the world.¹⁵

To sum up, “energy” may at first appear to be an innocent concept. Bearing the imprimatur of science and mathematics and holding few of the emotional (menacing or reassuring) connotations of “security”, it may seem to be a harmless, matter-of-fact, timeless term of analysis denoting a “natural,” background constant or continuum. But its haziness means that it is equally likely to promote confusions that lend themselves to counterproductive policymaking and campaigning, and that can be seized upon to promote other objectives.

How “Energy” organises politics

But it is more than the vagueness of the concept of “energy” that renders it less than an ideal tool for analysing what is at stake in social conflicts revolving around so many divergent issues ranging from urban fuel poverty in Europe to the economics of shale gas, from the trade in oil derivatives to ill-health among those who cook with wood and other biomass in enclosed spaces. The abstractness that the term “energy” has acquired, like that of “security”, is an expression of a hidden, often antidemocratic, political bias that makes the word’s appearance of neutrality all the more dangerous.

Like minerals and water, energy is commonly seen as a Malthusian resource. In this sense, it is viewed as a substance external to human societies, an input on which they are constantly exerting pressure, a (finite) good for which there will be an ever-increasing need as human populations and aspirations for development increase. On this conception, energy, ineluctably and continually encroached upon by a voracious humanity, is something of which new supplies have unceasingly to be sought. Energy scarcity, or rather the threat of it – or more precisely the perception or feeling of such a threat – is omnipresent. If this is what energy is, there can never be enough of it.

This perspective is connected with a view of history as a tale of the progressive unleashing of energy, or of humanity’s unending struggle to break through barriers in the quest for more of it. One historian writes, in a common turn of phrase, of the industrial revolution as an “*escape from the constraints of an organic economy*” into a mineral-based era based on fossil energy.¹⁶ Increased energy use signifies liberation, a breaking free from the “limitations” of land, soil, time and space.

Accordingly, all societies, past and present, tend to be commensurated and then “rated” according to the amounts of energy they use. “Organic” societies of the past (and the millions today who cook with crop residues, wood or dung) are seen as backward, while contemporary societies are ranked according to per capita kilowatt usage of modern fuels, together with other markers of “development”. Even distinguished energy experts tend to give short shrift to the possibility of a deliberate reduction in overall energy use. Vaclav Smil, for instance, assumes that

Location, location, location

Coal, oil and gas are found under the ground in various terrains and countries around the world, but often not in the same place where they are burnt.

Oil deposits are concentrated in the Persian Gulf region, which accounts for some 60 per cent of all proven reserves. But 30 countries around the world are substantial oil producers, including the United States, Russia, Mexico and Brazil.

In fact, for most of the “Petroleum Era”, crude oil production was concentrated in North America and Europe. It is only since 1950 that the “Middle East” has become synonymous with oil as demand in Europe was actively increased.

Reservoirs of natural gas, formed primarily of methane, are often associated with crude oil deposits about 2-3 kilometres below the earth’s crust. Over half the world’s proven gas reserves are in Russia, Iran and Qatar.

The geographical disparities between hydrocarbon deposits and their burning mean that almost every industrialised country requires large volumes of imports to sustain its economy. China, India and the United States import over half their oil, Japan, France, Germany and Italy almost all (exceptions have been Russia, Canada and the United Kingdom).

Coal is still the predominant fuel for electricity generation. Its extraction has been transformed

in recent years by mechanisation. The largest recoverable reserves are in the United States, Russia, China and India, with significant deposits in Australia and South Africa.

Once mined, coal may require cleaning and sorting, but is ready to use. Crude oil, in contrast, has to be heated so that it separates out into different hydrocarbons, which can be refined further.

The extraction and burning of each energy source has different consequences. Burning coal emits more carbon dioxide and other pollutants than burning gas. Spent nuclear fuel must be stored safely for generations if it is not to cause fatal radiation – an unresolvable problem.

the transition away from coal, oil and gas to avert catastrophic climate change must find a way to meet the world’s current annual use of 400 exajoules of energy as a minimum,¹⁷ as do well-known scenarios for reducing carbon dioxide (CO₂) emissions.¹⁸

Inevitably, fairness or justice themselves become measured partly by how evenly energy is distributed between countries and within societies, despite the fact that energy-use figures correlate poorly with both standard measures and subjective evaluations of well-being. Conflict over energy is analysed applying a similar approach. As an addictive “thing,” energy is seen to possess a scarcity that causes violence as people and countries fight each other for it, while the violence that (sometimes deliberately) creates its scarcity tends to drop from view.¹⁹ Unless the supply of energy can be increased indefinitely, it is assumed, or divided up (fairly or unfairly) and husbanded more efficiently according to accounting principles, strife will result.²⁰ Energy politics becomes a matter of reconciling supply and demand. Many geopolitical struggles are simplistically portrayed as grabs not only for oil but also for an abstract “energy”, while at the same time, the unstoppable trajectory of energy use is seen as inevitably leading to an environmentally-damaging appropriation of nature (for example, of oil deposits or plant growth).

Before “Energy”

The political influences over the concept of energy are no accident, but have had a particular historical development. The abstract concept of “energy” that we use today – call it **Energy** with a capital “E” – was not always there, with all its elusiveness and biases. Creating it took a lot of hard work. Just as commons were not always conceptualised as

resources, water not always seen as H₂O, and forests not always viewed as stands of timber or quantities of industrial pulpwood, a charcoal fire or a bullock drawing a plough through a field were not always regarded as an instance of characterless, quantifiable “energy consumption”. Nor, in many societies, are they necessarily seen this way today. Understanding today’s notion of upper-case Energy as a relatively new development requires trying to recapture what was there before, and what will always remain as one foundation of energy politics: namely, the vernacular, varied, lower-case subsistence “energies” of commons regimes.

Lower-case “energies” are multiple, incommensurable. Each is associated with a particular survival purpose. Indeed, it is part of their logic that in ordinary speech they seldom go by any single name – least of all “energy”. Heat from burning biomass is used for cooking, washing, keeping warm, preparing land for seed. Light from the sun drives the growth of crops. Mechanical energy from animal muscle (or diesel engines) is used to get around the country. The amount of each “energy” used is fitted to the task at hand. What would be the point of using twice as much wood as you needed to bake a loaf of bread? In times of hardship, moreover, it is expected that specific “energies” will be shared around so that even the poor have a crack at them. On remote mountain roads in the global South (and the North), it is a given, not a choice, that drivers of pickup trucks will give lifts to whomever they encounter on foot, even if there is hardly any room.

Outside the ambit of fossil fuels, what we now call energy had a different relationship to **time** – and still has today. The accumulation of plant growth required for food for muscle power depends on the annual rhythm of the seasons, and the growth of wood over several years if not decades of sunlight. Work has to be done mostly during the hours of

Commons life

Commons regimes are regions of life in all societies that are neither private nor public. They may vest in their members the power to determine access to almost anything: land, forests, water, fish, radio wavelengths, seeds, streets.

Commons regimes are perhaps better defined through social characteristics than physical domains: local or group power, distinctions between members and non-members, rough parity among members, a concern with common survival and security rather than individual accumulation.

The rules, regulations and practices of the commons ensure checks and balances on members’ activities and

shared responsibilities, but are also adaptable to change.

Commons regimes do not arise simply out of shared values, or common property or specific institutions – although all three play a part in shaping governance. Critically, they depend on an everyday struggle to limit the power of any one group or individual to exert control over others.

Commons are ubiquitous in industrialised and urbanised societies as well as in rural or historical societies. Contemporary commons include inshore marine commons, irrigation systems and forests as well as many city spaces.

In Denmark, wind power took off in the 1980s and 1990s as local

residents set up wind turbine cooperatives. Planning permission for one turbine only on each farmer’s land was conditional upon cooperative shares being owned by local members only, thereby excluding those unconnected with the area, while the number of shares that each member could hold was limited. The ownership model led to high public acceptance of wind power, faster deployment and tremendous good will.

The structure was disrupted only in the late 1990s when the national government abolished restrictions on planning permission and ownership. Outside financial investors muscled their way in to build more and larger turbines, resulting in local opposition, bitter conflicts and long delays or cancellations.²¹

daylight. Before the age of coal and oil, plant (and marine life) energy stored and concentrated over millions of years deep underground played little part in either livelihood or commerce.

Outside the fossil-fuelled world, energy has always also been tied to a multitude of disparate but particular **activities** that have no omnibus category or abstract quantity linking them all. There was seldom any reason, for example, to treat heat and mechanical energy as equivalent or exchangeable, physically or economically. As economic historian Joel Mokyr notes:

“the equivalence of the two forms was not suspected by people in the eighteenth century; the notion that a horse pulling a treadmill and a coal fire heating a lime kiln were in some sense doing the same thing would have appeared absurd to them.”²²

Agriculture was driven by sunlight and muscles, long-range trade by wind and water currents. Cooking and heating depended on wood and sometimes coal, which, together with charcoal and falling water, helped power industry. People did not think of themselves as “energy constrained” in the contemporary sense: an energy unbounded by seasons and the land still lay in the future. Capital “E” Energy as we know it today was in fact nowhere to be found.

What we now recognise as Energy was also embedded in particular **places** in a fairly non-flexible geographical pattern. In European countries, grain-milling was scattered across the countryside, depending on where rivers could provide sufficient mechanical energy. As late as 1838, water still powered one-quarter of Britain’s cotton factories (and even the coal-powered upstarts were nevertheless called “mills” in a mark of their watery heritage). The size of towns depended on how much firewood was available within range of horse-powered transport. Global trade relied on understanding geographically specific wind patterns that had to be worked with, not against. Energy was not mobile, liquid, transferable in large quantities over long distances. The age of Btus, kilojoules and oil-equivalents lay in an unimagined future.²³

As a result, there was no **politics** of energy of the kind that has become familiar in the fossil-fuel era. Controlling muscles meant controlling people and animals. Amassing power over production meant, above all, amassing human bodies – through slavery, for example. Exploitation of firewood and charcoal depended on access to land. How energy was used was subject to different kinds of monitoring: for example, the practices of millers scattered along rivers were vulnerable, to a certain extent, to surveillance by the local peasants whose business they sought. One person could control only limited quantities of energy, both in absolute terms and relative to others.

How a new age of production begat Upper-Case “Energy”

Fossil-fuelled industrial capitalism changed all that. In effect, it created the abstract concept of Energy we use today. For one thing, fossil fuels allowed emerging industrial elites to abstract from **time**. With the

tapping of millions of years of “fossilized sunshine”,²⁴ seasonal rhythms could be disregarded. The products of photosynthesis from past eras could be transported, in effect, to a single point in the present, commensurating biological activity of different ages and allowing energy to be accumulated and deployed in unprecedented quantities. Today, 400 years’ worth of plant growth are burned every year in the form of coal, oil and gas.²⁵ The use of energy also became disconnected from the diurnal cycle: fossil fuels’ transportability and energy density allowed the construction of machines that could be run around the clock (indeed, they had to be to repay investment in them and defeat competitors), together with the enhanced lighting systems that human beings needed to operate them.

Fossil fuels also allowed energy to be disembedded from the particular socio-ecological **activities** from which it had been inextricable in the past. Coal-fired steam engines, followed by internal combustion engines, helped make heat and mechanical energy equivalent on a practical, mass scale. Electricity took the process one step further, visibly transforming the energy embedded in fossil fuels or uranium atoms into heat into mechanical energy into electromagnetic energy, which could be distributed widely only to be translated back into heat or mechanical energy. Under the reign of the machines of a mineral-based economy, it became possible to compare the efficiency of different fuels along a single scale. Owners of industrial boilers did not necessarily have to tie themselves to a single, highly contextually-bound Energy source, while homeowners could switch from wood to coal to fuel oil to gas. For workplace managers whose labour productivity depended on electricity, different power plant fuel sources – biomass, coal, oil, gas (all of which were themselves standardised into different grades), nuclear, solar and wind – became “equivalent”. An abstract Energy could be assessed merely according to price. Just as abstract labour became embodied in the mobile, partially expendable flesh of the first generations of industrial workers, so too abstract Energy took shape through the mechanisation of the fossil fuel era. Through this process, the energy density of coal and oil became an implicit standard of measurement.²⁶ Today, agrofuels are assessed according to their ability to replace oil in transport. The giant Desertec solar array proposed for the North African desert is designed around renewables, but its “super grid” infrastructure of high voltage, direct current transmission lines throughout the Mediterranean region bears a striking resemblance to the model of centralised fossil fuel power stations. Electric cars are intended to substitute for gasoline- and diesel-powered vehicles. Upper-case Energy is an “abstraction which became true in practice.”²⁷

In addition, fossil fuels helped commensurate **places**, transforming them into equivalent spaces for accumulating capital. Bringing up coal and oil from underground partially freed production from the land. By 1700 in England, coal had already replaced wood in making beer, bricks, glass, soap and lime, replacing around one million hectares of woodland. By 1800, so much coal was in use that one-third of England’s land area would have been needed to grow wood to replace it.²⁸ Today, coal, oil and gas supply the equivalent of phytomass from well over 1.25 billion hectares – even though the total land area taken up today by the global extraction, processing and transportation of fossil fuels, as well as the generation and transmission of thermal electricity, amounts to “only” 3 million hectares worldwide, 400 times less.²⁹

Physics as politics

As a concept from physics, energy may seem to stand apart from human history and politics. Indifferent to class, race and gender. The equation $E = mc^2$ makes no distinction between energies derived from wood, muscles, natural gas, falling water or sunlight.

Yet however indispensable and ubiquitous the scientific concept of energy has become, it has, like all other ideas, a historical origin. It was possibly first used in its modern scientific sense only in 1807 (as a replacement for the concept proposed by German mathematician Leibniz of *vis viva*, or “living force”), while “kinetic energy” was described in its modern sense only in 1829. Thermodynamics, which is largely about transforming different forms of energy into each other and into “work”, became a central scientific discipline only after 1848. Is it a coincidence that the period when the scientific concept of energy gained respectability

was also the beginning of fossil-fuelled industrialisation?³⁰

To point to this connection is not to doubt the truths of physics, merely to understand better their place in the human scheme of things. However far they may venture today into string theory and quantum mechanics, the questions that energy physics sets and solves have traditionally been more intimately constitutive of the quantitative world of capital accumulation than of the realm of qualitative reasoning about progressive social change. Energy scholar George Caffentzis goes so far as to say that physics’:

“essential function is to provide models for capitalist work.”³¹

Unsurprisingly, the illuminations of physics, as well as its omissions, are typically of more far-reaching use to fossil fuel developers than to their opponents. Dwelling on physics and its quantified abstractions is not the same thing as making choices about energy transitions, although the one may contribute

to the other. For example, calculations demonstrating that new devices proposed to generate energy by exploiting temperature gradients between the cold depths of the ocean and the warmer waters of the shallows will be unable to meet the “needs” of a fossil-based economy, no matter how well-grounded, cannot answer the prior question of whether those “demands” should continue to be met in the first place.

More than 2,300 years ago, Aristotle used the word *energia* (*ergon* was Greek for “work” or “deed”, *en* the word for “at”) as a metaphor for something moving or active. The connections between the rise of abstract labour and that of abstract energy in the 18th and 19th centuries faintly recapitulate Aristotelean associations between human and other activity, between work and force. But both the concept of energy and its political uses have changed.

The capacity of fossil fuels to delink energy use from specific locations (for example, rural watercourses) made it possible to concentrate workers and production in large factories, while business’ new-found ability to increase energy flow at will (assuming it could pay for it) made possible greater extraction of surplus, both through physically magnifying workers’ output and through routinising conditions in which they could be pushed to or beyond their physical limits.

As people were pushed off the land and energy-dense coal transported by boat, barge and railway to urban industry, cities became larger and less dependent on the land around them for energy and labour. One result was still more innovation and mechanisation and yet higher extraction rates.

Railways and fossil-powered shipping (including, eventually, oil-powered navies), meanwhile, annihilated distance, as did subsequent electricity grids.³² The land itself was partly transformed into a manufactory of cheap food for labourers, its productivity in part underwritten by the same processes that were transferring fire from the open fields into the combustion chamber.³³ Eventually, the refined products of crude oil were put to work not only to plough crops, but also to fertilise, harvest, transport, process, cool and store them (*see* Box: “Fossil food”, p.20).

All of this, finally, was intertwined with a new **politics** partly defined by the new abstractions of capital “E” Energy. Hugely amplified levels of productivity hastened and expanded the generalisation and de-skilling of wage labour. In England, the steam engine led to a 100-fold increase in labour productivity in textiles, for example, making it no surprise that investment in mineral-based energy jumped from 11 per cent in the 1790s to 50 per cent in 1850. The internal reorganisation of the labour process – assisted by the increasingly abstract Energy that fossil fuels heralded – shifted the focus of emerging elites from specific groups of “workers” (including those that did not depend on a wage but lived partly off the land) to a more abstract paid-for “work,” and sharpened the divide between skilled and unskilled labour.³⁴ To put it another way, the commodification of the capacity for work – and the progressive “insecuritisation” of ordinary people’s lives – was accomplished largely through fossil-powered industry (*see* Box: “Upper-Case ‘Energy’ vs. the Right to Live”, p.18). As geographer Matthew Huber puts it, the “historical emergence of the social relation of wage labor” is “part and parcel of the ‘energy shift’ in the productive forces from biological to inanimate (fossil) sources of energy”.³⁵

In industrialised countries, in addition, mass production and the spread of wage labour engendered mass consumption – which also ultimately became dependent on the provision of cheap Energy – in the form of, for example, private cars (particularly in the United States) and electrified family homes full of consumer goods.³⁶ Fossil capitalism’s invention of a plastic Energy that could be enlisted without customary types of regard for time, place or context helped mould the belief in infinite economic growth.³⁷ As Energy became a fully-fledged resource defined by numbers, it also became a topic of forecasts and an object of security worries, rather than seen as a “contingent and historically situated socioecological relationship that is prone to contestation”.³⁸ Abstract Energy became as much of an obsession for business and the state as abstract labour. In time, it became equally a concern of the suburbanised, individualised, automobilised homeowners of the US and some countries in Europe, the geography of whose daily lives and whose ideology of freedom and autonomy revolved around the unfettered use of fossil fuels, reinforcing obsessions with oil or gas, the machines they help drive³⁹ and the “hostile foreigners” impeding access to them (*see* Box: “Automobility”, p.78). It became almost as easy to want Energy as to want warmth, comfort, cooked food, clothes, entertainment and so forth – and for such wants to morph into needs. At the same time, however, the new politics of Energy associated with the fossil fuel era has been dominated by battles among businesses over how much money can be made throughout a fossil-powered system.⁴⁰

The trouble with “Energy”

In sum, encouraging a rational debate about “energy security” necessitates understanding what is meant not only by the phrase, but also by its composite parts. The term “energy,” despite its apparent simplicity, presents particular challenges. During the past two centuries, the vernacular, varied, lower-case “energies” of commons regimes have been joined by a new, abstract, upper-case Energy evolved in industrialised societies. Exploring the difference between “energies” and Energy is crucial to understanding the international politics of “energy security”.

Upper-Case “Energy” vs. the right to live

Commons regimes tend to enshrine both a common right to human survival and respect for nonhuman agents. In 19th century England, John Clare, the “poet of the commons”, saw the human suffering that resulted from enclosure of fields, woods and streams as indivisible from the degradation of the nonhuman world as it was partly converted into resources and its nurture abandoned.

In the Andes today, movements for *buen vivir* and against water and land privatisation and mineral extraction are closely tied to agitation in support of the “rights of nature”.

Historically, the development of the concept of Energy with a capital “E” – deriving as it does from the developments of the fossil fuel era – constitutes a threat to this “right to live” of both humans and nonhumans.

As geographer Matthew Huber notes:

“with the development of large scale fossilized industry, provisioning the right to live did not suit the needs of the emerging industrial capitalist class”⁴¹

as steam engines were “clamoring for freedom and machines were crying out for human hands”. In England, the Poor Law reforms of 1834 did away with the right to live and established a national waged labour market, complete with a reserve army of unemployed whose existence helped limit worker power over wages and conditions.

Fossil fuels also helped make possible national and then global prices for the necessities of life, rendering local, survival-ensuring “fair prices” a thing of the past. Profits from the massively increased

production of the fossil fuel era needed massively extended trade in order to be realised, as well as for all the raw materials involved.

The long distances involved necessitated competition to reduce turnover time between investment and payoff. Transport time had to be quickened (and thus fossilised) too.⁴² Fossil-intensive transportation networks were locked in, becoming the basis for yet further expansions.

While little price convergence had occurred prior to 1800,⁴³ prices steadily became less responsive to local circumstances as global commodity markets began to emerge. Railways ensured that the price spread between wheat sold in the United States’ grain-producing heartland of Iowa and that in New York dropped from 69 per cent to 19 per cent between 1870 and 1914.⁴⁴ Transatlantic voyages dropped from five weeks in the 1840s to 12 days by 1913; today, oil-powered containerships continue to shave transit times.⁴⁵ By 2007 international trade flows were 30 times greater than in 1950, although output was only 8 times greater.

As the right to survival of individual humans has been undermined by the fossil-fuelled expansion of commodity relations, so, too, has respect for nonhuman nature. The record of fossil fuel extraction – from the contamination of the Ecuadorean Amazon and the Niger Delta to the removal of mountaintops in the coal fields of Appalachia to the Torrey Canyon and Exxon Valdez oil tanker wrecks to the gigantic BP oil spill in the Gulf of Mexico – has consistently been one of disregard for water, air, land and living things.

This disregard has once again undermined the bases of survival for innumerable human communities. “Securing” supplies of fossil fuels in the name of Energy has

tended everywhere to threaten the diverse forms of livelihoods associated with the commons.

Nowadays, upper-case Energy itself has taken on the aura of a survival good. In the words of UN Secretary General Ban Ki Moon:

“universal energy access . . . is a foundation for all the Millennium Development Goals,”

particularly for more than 1.3 billion people worldwide who have no electricity.⁴⁶

And new struggles for the commons are being waged around modern energy forms, as well as around oil itself. For example, under the banner of the right of all to survive regardless of their income or social status, movements to decommodify electricity are springing up in the deprived urban areas of South Africa, insisting that it should be accessible to all, and making links with movements against privatisation of basic pharmaceutical drugs and other goods.

But in an age in which movements that link the right to live of humans and nonhumans constitute what Slovenian thinker Slavoj Žižek calls the “cutting edge of progressive politics”, it is crucial to remember the destructive role played by the emergence of abstract Energy in struggles against enclosure and privatisation. Among those who lack access to modern energy, ironically, are many who have been displaced to make way for hydroelectric dams, coal mines and power plants, many of whom are excluded from access to other subsistence necessities as well. If security has anything to do with survival, any discussion of “energy security” needs to confront the implications.⁴⁷

Abstract, monolithic, seemingly limitless Energy is something that only became possible with fossil-fuelled productivism and the machines, networks and institutions that came with it. This Energy, like lower-case “energies”, can deliver the basic necessities of life, at least to some, lending a certain plausibility to politicians’ claims that their worries about “energy security” centre on keeping the lights on and homes warm. But its underlying logic is different. Upper-case Energy is a transformation and commensuration of specific energies into a general capacity to maximise the ability of human bodies to make stuff. As the First Law of Thermodynamics (developed at the same time as industrial capitalism) recognises, any form of energy can be transformed into others and used to do work (but cannot be created or destroyed). Just as the invention of an absolute Time independent of daylight variations and traditional holidays helped discipline early industrial workers into the regular rhythm of a long working day, so too the subsequent development of an abstract Energy was key to intensifying their productivity further and harnessing them to the pace of the machine. For this upper-case Energy, survival is incidental except insofar as it supports the production imperative. Whereas specific “energies” know their limits, of Energy there can never be too much. Other things being equal, the more there is, the more can be produced, and the more money business can make, without limit.

Lower-case “energies” and Big-E Energy are not only different: they are also, in many senses, enemies to each other. In order that fragmented “energies” do not become an obstacle to the mobilisation of economic value, they have to be folded into abstract Energy under the care of dedicated disciplines and institutions (bureaucrats, engineers, statisticians, laboratories, economics departments, inventors, investors, armies). Obsessed with quantitative growth for growth’s sake, Energy tends to treat the right of all to a warm home (or a cool one in hotter climes), cooked food, electric light as a nuisance. It heralds a world that is not only unequal, but also unable to respect the common right to subsistence.

Nowhere is this clearer than in the case of agrofuels, whose “interchangeability” with oil under the rubric of a unitary Energy makes routine the replacement of subsistence agriculture with industrial cropping aimed at fuelling cars and airplanes. It is also plain in India’s development plans, which call for US\$100 billion to be spent on a burgeoning number of large Energy projects – coal, oil, hydropower and renewables – that will serve above all to boost the profits of industrialists but leave less than 2 per cent for the household use of the 700 million who lack modern services. And it can be seen in South Africa’s policy of providing some of the cheapest electricity in the world to smelting companies while many township residents are forced to pirate electricity illegally because the price is out of their reach. Well over a century into the era of electrification, more than a billion people, about one-quarter of the world’s population, have no access to electricity or other non-biotic forms of energy (and many will never have under fossil-fuelled capitalism).

If fossil-fuelled capitalism has defined what we mean by energy, then merely to use the word uncritically is to make a commitment to certain assumptions about scarcity, foreclose certain alternatives and cover up some of the most important issues that need to be discussed. Paradoxically, having a serious discussion about “energy security” requires

taking a therapeutic step back from the modern concept of Energy itself.

For example, the seemingly innocent query “How can we have energy security in a post-fossil world?” is not so much a question as an ultimatum. The question implies that however we organise our societies in future, it will have to be on the model that fossil capitalism built, with its threats to the right to survive of both humans and nonhumans (and the associated threats to “security” itself, on a commons understanding). A more fruitful question would be: “Is the world that is defined (in part) by the modern concept of Energy the world that we want?” It is just such questions that policymakers and social movements must ask when initiating any discussion of energy security.

Fossil food

Today’s global food system exemplifies multiple uses of fossil fuel “energy”. The high-yielding wheat, rice and corn crops of the Green Revolution promoted around the world from the 1950s onwards rely on oil-derived pesticides, nitrogen fertilisers generated from natural gas, and phosphate and potash fertilisers mined, manufactured and transported by oil. Irrigation pumps use electricity. Farm machinery sowing seeds, spraying pesticides and harvesting crops burns petrol and diesel.

While harvested wheat contains nearly four times as much energy as was used to produce it (together with rice and corn accounting for two-thirds of the world’s agricultural output), tomatoes grown in a heated greenhouse can consume up to 50 times more energy than they contain.⁴⁸

Fossil fuel energy is used to store, process and transport food, particularly as cereals and other staples, fresh fruit and vegetables are produced in one part of the world and sold in another.

Supermarkets rely on roads to transport food from farms, ports and processing plants to central distribution depots, and then to individual stores. Out-of-town supermarkets not served by public transport increase individual car journeys to buy food.

The concept of “food miles” – the distance food travels between farm and fork – has raised awareness of the waste inherent in a globalised industrial agricultural system. As important is how food travels its distances. One estimate suggests that a three-kilometre journey in a Sports Utility Vehicle (SUV) to buy bananas can use more fuel per banana than was spent shipping it thousands of miles from a tropical country.⁴⁹

The packaging necessitated by long-distance and processed foods consumes a significant amount of fossil fuels, as does refrigeration. Cooking and washing up needs heat.

While more and different foods are now available to those who can pay for them, paradoxically more food is now wasted. The UN’s Food and Agriculture Organisation (FAO) suggests that one-third of the world’s food is not consumed. In poorer countries, especially in rural areas, most food losses occur during harvest and storage, whereas in industrialised countries, they occur at the other end of the food supply chain during retail, preparation, cooking and consumption.⁵⁰ An estimated half the available food supply in industrialised countries is wasted every day. Individuals buy more than they need in case they cannot drive back to the supermarket, or are tempted by discounted offers.

In the globalised agroindustrial food system, food processing (canning, freezing and drying), packaging, storage, transportation and preparation account for most of the “energy” input into most of the food consumed in industrialised countries,⁵¹ far exceeding the “energy” used to produce it in the first place. Approximately 9 kilocalories of fossil fuel energy are required to grow, process, package, transport and prepare every 1 kilocalorie of food energy contained in a can of sweetcorn.⁵² A 2002 US study estimated that 3 kilocalories of fossil energy are used on average to produce 1 kilocalorie of food energy; meat from grain-fed animals takes much more, and when processing and transport are included, the figure jumps still higher.⁵³

In November 2011, FAO estimated that:

“The food sector, including input manufacturing, production, processing, transportation, marketing and consumption, accounts for approximately 30 per cent of global energy consumption, and produces over 20 per cent of global greenhouse gas emissions.”⁵⁴

All told, the average energy flow to agriculture has increased by a factor of 50 in the past 60 years. Many people are effectively eating fossil fuels.⁵⁵

The world that “Energy” begat

“The current discourse around energy security . . . signals the ultimate fulfilment of the enclosure movement.”

Robert P. Marzec

Radical History Review, 2011 ¹

For time-pressed, slogan-bound, “must-be-ready-with-a-response” policy analysts and politicians, the invitation to reconsider such a seemingly settled concept as “energy” may look like an irksome invitation to navel-gaze. What does it matter if many societies – perhaps even the bulk of humanity – do not view a charcoal fire and a bullock drawing a plough through a field as twin instances of “energy consumption”? Far more important is the plight of the 2.7 billion people who rely on traditional biomass for cooking at the expense of forests and health; the 1.3 billion people who do not have access to electricity and thus the means to be “productive citizens”;² the increasing competition for energy resources as the middle classes in China, India and Brazil weigh into the global mêlée for consumer goods; the need to assuage worried (Northern) consumers that the lights will not go out; and, above all, the threat that resource scarcities pose to continued economic growth. Who cares how or why fossil-fuelled capitalism is tied up with the evolution of a novel conception of energy? What matters is whether this gas pipeline should be built, that nuclear plant commissioned, or that LNG terminal financed. The pressing task is how to make the distasteful tradeoffs dictated by the *realpolitik* of securing energy for the future – human rights versus access to gas, maintaining jobs versus permitting pollution, leaving future generations with irresolvable problems of nuclear waste versus cutting carbon dioxide emissions.

Such apparent pragmatism is understandable – but, in the end, unpragmatic. In today’s world, “energy” is about far more than pipelines and power stations, transmission lines and oil contracts: it is a system of economic and political relationships that weaves and reweaves the connections between corporations, governments, investors, human rights activists, environmentalists, the military, scientists, the media, trade unions and consumers alike into constantly shifting networks of power that serve to reproduce “the world that Energy begat”. No decision related to upper-case or abstract Energy (*see* pp.12ff) can escape the influences that such networks of power exert: Energy with a capital “E” not only frames the decision; it structures the solution, trapping the critical and the uncritical alike. To respond only to the daily froth of upper-case Energy talk – which power station? where? fuelled by gas or coal? – is to remain hostage to a dynamic that simply reinforces and reproduces the problems that Energy represents.

Such “pragmatism” has helped shape an “energy security” agenda that mischaracterises the many energy scarcities – and insecurities – experienced by poorer people; promotes a response that has little to do with ensuring that everyone has the energy to meet their basic needs and everything to do with creating new sources of accumulation; and that disrespects the limits posed by climate change and resource depletion

to endless economic growth. The result is a wave of new enclosures that, in addition to creating new scarcities (not only of energy but also of food, water, land and other necessities of life) are making a transition away from fossil fuels far harder to achieve.

Enclosure: more than fencing off

Because history's best-known examples of enclosure involved the fencing in of common pasture in England during the 16th century, enclosure is often reduced to a synonym for "expropriation".

But enclosure involves more than land and fences, and implies more than simply privatisation or takeover by the state.

Enclosure inaugurates what radical thinker Ivan Illich has called "a new ecological order".³ It transforms the environment from a source of livelihood that is outside the market or state control into an "economic

resource" for national or global production, and redefines how that environment is managed by whom and for whose benefit.

People, too, are enclosed as they are fitted into a new society where they must sell their labour, learn clock-time and accustom themselves to a life of production and consumption.

Enclosure reorganises society to meet the overriding demands of the market, dictating that production and exchange conform to rules that reflect the exigencies of supply and demand, of competition and maximisation of output, of accumulation and economic efficiency.

Enclosure redefines community. It shifts the reference points by which people are valued and ushers in a new political order. It recharacterises not only the fora in which decisions are made but also *whose* voice counts in those fora.

Enclosure is thus a change in the networks of power that govern how society is organised. It reduces the control of local people over community affairs. And it unsettles or destroys those forms of social organisation aimed at ensuring that survival is "the supreme rule of common behaviour, not the isolated right of the individual."⁴

The politics of scarcity and abundance

"Things could be otherwise. That is what the contingency of scarcity is all about."

Fred Luks
The Limits to Scarcity, 2011⁵

Fears of scarcity (demand outstripping supply) and promises of abundance (supply outstripping demand) form the twin pillars of neo-classical economics and frame mainstream discussions of energy security: *scarcity* because it is taken as read that energy needs, wants and desires are unlimited but the means to meet them are limited; *abundance* because whatever scarcities arise it is assumed that markets, technological innovation and substitution processes will resolve them.⁶ That framework, though often unspoken, has important implications for how the multiple challenges of "energy security" are both analysed and addressed. It also plays a central role in determining what current energy security policies aim to secure and for whom.

Manufacturing demand

When scarcity is "naturalised" – by making it something that is part of the human condition – awkward questions as to how demand for

specific sources of energy has been (and still is) deliberately created are conveniently pushed aside. What needs to be explained (scarcity) becomes the explanation (scarcity). Growing demand is simply assumed to be, and understood as, a force that cannot, indeed must not, be tempered, a function both of rising numbers of people and of their innate desires, wants and needs.

Yet demand for oil-based “energy” and its products results from policies deliberately aimed at creating demand for oil that have been pursued for over a century, at the expense of non-oil based forms of livelihood or production.⁷ In the case of agriculture, for instance, farmers North and South were pressed into abandoning organic forms of farming, which rely on rotations and other techniques to maintain fertility, and adopting oil- and gas-based chemical agriculture through subsidies, land amalgamation schemes, taxation, and, in many cases, violence. In South Korea, for instance, officials uprooted varieties of rice that farmers had developed to meet their own needs over centuries and pushed peasants into planting chemical-intensive modern varieties, whilst elsewhere farmers who refused to “modernise” were frequently dispossessed of their land.⁸

Today, similar efforts are made to create demand for electricity and other market-based forms of energy through policies that curtail people from gathering fuelwood for free, on the spurious grounds that fuelwood collectors are, in the words of the World Health Organisation, “stripping our forests, heating our planet”⁹ (see Box: “Fuelwood Collectors”, p.24). In the transport sector, demand for cars has been carefully nurtured through suburbanisation, highway construction programmes, advertising (with cars being made an object of desire) and policies that have favoured the car over mass transport systems.¹⁰ Infamously, tram systems in a number of US cities were deliberately run down or replaced after they were bought by a consortium of manufacturers including Firestone Tire and Rubber Company, Phillips Petroleum Co., Mack Truck and General Motors.¹¹ The consequent manufactured scarcity of public transport means that cars are a necessity, not a luxury, for many US urban dwellers.

Anonymising consumption

The framing of energy demand in terms of faceless unmet needs that spring from an inexorable but anonymous expansion of desires also obscures *who* is responsible for demanding energy and *who* is not. A constant refrain in the discourse of “energy security”, for example, is that rising numbers of people in the South are the “cause” of growing energy scarcity.¹² China and India are usually top of the list of countries singled out; more than half the growth in global energy demand in the next 25 years is predicted to come from these countries.¹³

Impending future energy scarcity is framed not as a dynamic created by the political and economic infrastructure that underpins the endless creation of consumer “desires” and their transformation into “needs”, but as a problem born out of the inherent future aspirations of developing countries. Within 20 years, it is suggested, the world’s energy needs will be more than 50 per cent higher than today, with developing countries accounting for 74 per cent – China and India alone for 45 per cent –

of the growth in demand.¹⁴ But whilst growth in demand may be higher in the global South, actual consumption of energy in those countries will still trail far behind that in the North.¹⁵ China might be importing and consuming more energy than ever before, but energy consumption per head of population in the US and Canada is still roughly twice as high as in Europe or Japan, more than ten times as high as in China, nearly

Fuelwood collectors

The use of woodfuel is often mentioned in discussions of the UN's Millennium Development goals. Women and children have less time for income generation or education because they have to collect wood. Its burning in enclosed spaces contributes to respiratory ailments. Because woodfuel cannot power machinery, communities have limited opportunities to develop. Harvesting fuelwood is said to cause ecological damage. These discussions, however, tend:

“to pay little attention to arguments and evidence that much of this impact is less clear cut or severe than is often postulated.”¹⁶

In many countries, particularly in rural areas, wood is the preferred form of domestic energy for cooking and heating, despite being energy inefficient, because it does not require complex or expensive equipment. It can be burnt in an open fire, and obtained at no greater cost than the labour of collecting and preparing it. Most of its supply and use is outside the monetary economy.

Although national and regional aggregate figures of fuelwood supply and demand are arbitrary because fuelwood collection and burning is so location specific, they suggest that consumption in Asia, which accounts for nearly half the world's woodfuel consumption, is declining, but growing in Africa, where per capita use is higher on average, and rising slowly in South America, where fuelwood is less important as an energy source anyway.

Although deforestation is often attributed to fuelwood gathering, most fuelwood comes from woody plants in places other than forests – scrub, bush fallow, farms, common lands – that easily regenerate. It is also drawn from deadwood, pruning and lopping without felling trees. The fuelwood that does come from felled trees is largely as a result of land being cleared for agriculture. Overall, forest damage from woodfuel gathering is not as widespread as frequently assumed or asserted.

Farmers tend not to plant trees for fuel but to provide protection, fruit, fodder, construction timbers or products for sale. For fuel, they rely on existing woody material, agricultural waste products or by-products of trees grown for other purposes.

Most country studies suggest that there is sufficient abundance of wood and related biomass to provide more than adequately for woodfuel needs.

Nonetheless, in Africa, land privatisation is disrupting multiple forms of rights to fuelwood and other biomass products. People's survival depends on their capacity to access labour, land, money and other common resources to replace them.

One International Labour Organisation study on fuelwood shortages found that the top priority of most women interviewed was obtaining food and money rather than woodfuel and its cooking inefficiencies.

Many rural households in Africa have not adopted improved stoves, even in countries where

they have been taken up in towns, such as Ethiopia and Kenya, because of the cost of buying them (even though they save time and are more fuel efficient).

One survey in India found that women considered reduced respiratory illness from stove emissions compared with those from woodfuel and other biomass to be less of a priority than tackling water supply and sanitation problems.

In some places, many landless and poorer people gather wood to sell. In India, fuelwood “headloading” is the largest source of employment in the “energy” sector. Such trading bridges seasonal gaps in income or acts as a safety net in times of hardship, being a livelihood of last resort.

Women often handle small-scale fuelwood selling, but when it increases in scale and becomes more directed toward urban markets, trading often gets taken over by men who have better access to transport.

There are few indications that non-biomass fuels will become accessible to the majority of people in rural areas across Africa or India any time soon, suggesting that wood is likely to remain the main domestic fuel for the foreseeable future. The Center for International Forestry Research concludes:

“forest policy needs to act in concert with energy policy . . . to facilitate access to woodfuel supplies for those who still rely on them, either for their own use or as a source of income.”¹⁷

20 times as high as in India, and about 50 times as high as in the poorest countries of sub-Saharan Africa.¹⁸

Even these figures do not reveal who or what uses energy within a country and for what purposes. In China, for instance, heavy industries consume more than 70 per cent of the country's total energy use,¹⁹ while in South Africa, more than 70 per cent of the country's energy is consumed by industrial, mining, agricultural and commercial interests – and just 16 per cent by the country's residents.²⁰ Moreover, much of the growth in demand for energy in China has not been to supply goods for Chinese customers but to manufacture consumer products for export to Europe and North America,²¹ the direct result of energy-intensive US and European manufacturing being “off-shored” to China (and to India and other Asian countries).²² In effect, higher imports of oil into China are driven as much by US and European consumption as by growing affluence in the country itself. The Chinese government has questioned whether all the carbon dioxide molecules emanating from smokestacks in China are really “Chinese”, or should in part be attributed to the Western countries consuming the goods that China produces.²³

The politics of exclusion

Mainstream interpretations of “scarcity” also tend to render invisible the way poorer sections of societies are denied access to energy, not because the means to meet their needs are limited but because doing so is unprofitable, offers few opportunities for corrupt enrichment or empire-building, or is bureaucratically cumbersome to administer. Nepal is a case in point. With 6,000 or so rivers cascading down the Himalayas, the hydroelectric potential of the country is one the richest in the world.²⁴ But hydroelectric development has, until recently, consisted of building large dams only, leading to short periods of excess capacity followed by several years of brownouts as shortages ensued from the increased demand for electrical goods stimulated by electricity producers – until the next mega project was constructed. The “choice” of large dams over other hydroelectric technologies, however, results not from a rational assessment of what would best ensure access to energy for all, but from the entrenched power within government circles of what Dipak Gyawali, a former Minister for Water Resources in the country, and Ajaya Dixit of the Nepal Water Conservation Foundation term “hydrocracies” – government departments and international financial institutions whose economic, bureaucratic and political interests are intimately bound up with the large dam industry or whose technocratic approach to development leans towards “larger, expertise-dependent technologies, such as one large power project implemented by their in-house expertise”.²⁵ The problem is compounded by the bureaucratic “needs” of international development agencies, such as the World Bank, which find it more “cost-effective to make one large sovereign loan to a single large dam than to many smaller projects”.²⁶ In contrast, when popular opposition to one of the largest dams proposed for Nepal, Arun III, coupled with the restoration of multi-party democracy in 1990, led to the energy sector being opened up to small producers, numerous villages introduced their own mini-hydro schemes, some run collectively, some privately. The outcome was to produce almost one-third more electricity at close to half the cost and half the time of the proposed Arun III project.

Other reforms, such as the introduction of a “right to energy”, led to a major redistribution in access to the grid: local electricity user groups, often run collectively, have flourished, with the electricity company required by law to connect them once they have been formally established. The demand is not necessarily for more electricity but for its equitable distribution: if the grid exists, its electricity should not belong “only to urban and connected Nepal [but] to the entire country”.²⁷ In effect, Nepal’s energy scarcity, rather than reflecting a lack of means to meet needs, has been socially constructed from a politics of exclusion – exclusion not only from access to the energy that is available, but also from decision-making power over how it should be produced.

No limits to growth

“... the biggest point about debates on climate change and energy supply is that they bring back the question of limits. This is why climate change and energy security are such geopolitically significant issues. For if there are limits to emissions, there may also be limits to growth. But if there are indeed limits to growth, the political underpinnings of our world fall apart. Intense distributional conflicts must then re-emerge – indeed, they are already emerging – within and among countries.”

Martin Wolf
Financial Times, 2007²⁸

The treatment of “abundance” within the framework of energy security is as problematic as that of “scarcity”. The concept of Abundance dominant in industrialised societies today (like Energy, it is an “upper-case” phenomenon, interpreted as supply outpacing demand) recognises no practical limits to economic growth. On the contrary, such growth is considered both necessary and inevitable: not only does it provide the means through which to satisfy the (assumed) unlimited demand for energy, but also, critically, the (assumed) innovation through which all scarcities can be overcome.

But climate scientists have stressed that the amount of carbon still remaining in fossil deposits underground is enormous compared to the amount that can be quickly absorbed by the above-ground carbon-cycling system of atmosphere, oceans, vegetation, soil, fresh water and surface geology. As an illustration, the earth’s living vegetation (today containing perhaps 600-1,000 billion tons of carbon) is *incapable* of absorbing the 4,000-plus billion tons of extra carbon now lying beneath the planet’s surface in fossil stores built up over millions of years.²⁹ Because carbon brought to the surface cannot be got safely back underground in the form of coal, oil or gas over human time-scales, it is imperative that fossil fuel extraction ends as soon as possible to avert runaway climate change.

The framework of upper-case Abundance (more properly read as a framework for continuing accumulation) cannot easily countenance stopping the flow of fossil fuels out of the ground. Instead, technical fixes

are proposed to “overcome” the scarcity imposed by the earth’s inability to absorb all the carbon dioxide. The most important of these fixes is carbon markets (*see* pp.56ff), but others include the employment of unproven technologies such as carbon capture and storage. Instead of “energy security” policies being directed towards the urgent task of organising for structural, long-term change capable of keeping the remaining fossil fuels in the ground, the road is declared open for their further extraction, including the development of more destructive “unconventional” sources as shale gas, shale oil and tar sands. Within the European Union, for example, it is envisaged that, regardless of energy conservation and efficiency measures, coal, oil and gas will continue to provide member states with most of their energy for many decades to come.³⁰

The same (over) optimistic faith in the ultimate ability of markets, technological innovation, energy substitution and economic growth to

Carbon capture, storage and sequestration

The theory behind carbon capture and storage/sequestration (CCS), sometimes called geosequestration, is that carbon dioxide (CO₂) emitted by coal-fired power plants would be captured, liquefied and transferred underground to a new “waste frontier” in geological formations and abandoned coal mines.

The experimental “fix” has not yet been tried out. The first commercial carbon capture and storage plant would not come on stream before 2030 at the earliest and would require decades of research and tens of billions of dollars before the vast infrastructure needed could be deployed.

Sequestering even a mere 10 per cent of today’s global CO₂ emissions would require forcing underground every year a volume of compressed gas equal to, or larger than, the volume of crude oil extracted globally by a petroleum industry whose infrastructures and capacities have been put in place over the past 100 years.

Sulphur dioxide cannot yet be captured fully in developed countries, but capturing carbon dioxide presents technical challenges of a higher order of magnitude:

“It is . . . like taking the enormous infrastructure currently devoted to the extracting, moving, and burning of coal and building it all over again, but in reverse.”³¹

To be effective, the technology would have to inject 50 cubic kilometres of corrosive liquid carbon dioxide into underground “toxic waste dumps” every day until the coal is gone and then gamble the earth’s climate on the numerous unknowns connected with being able to keep it in place for thousands of years.

Along the way, over 25 per cent more coal would have to be burned just to produce the energy needed to liquefy the carbon dioxide, scrub out the sulphur dioxide and mercury and, as needed, transport the product around the landscape.

CCS confuses the process through which fossil fuels were formed underground over millions of years with an untried experiment involving injecting millions of tonnes of a dangerous fluid into leaky reservoirs in the earth’s crust – it gets its basic science wrong.

To have any faith at all in carbon sequestration, “a tremendous system of international governmental oversight to ensure

compliance” would have to be set up.³² Cheating would be incredibly hard to detect absent near-constant oversight.

Just as agrofuels help sustain oil dependence, so CCS sustains coal dependence, making global warming worse while driving up the ultimate, unavoidable cost of switching away from fossil fuels.

Its abandonment cannot come a moment too soon for environmental justice movements battling the expansion of fossil-fuelled industries near their communities or the transport of coal or oil through them; or those suffering from coal mining or the dumping of the toxic wastes already associated with the industry.

While energy companies strategise about how to manage the expected resistance to the new liquid carbon dioxide dumps, groups bearing the immediate environmental brunt of coal-dependent infrastructure are already clear about the futility of CCS. As the US group, Coal River Mountain Watch, says:

“We cannot afford to waste precious time and resources on this dead-end technology”.³³

overcome all scarcities is reflected in the supposition that renewable energies will be able to power a continuously-expanding global economy. But to put in place the necessary generating plant powered by solar collectors, wind turbines and tidal systems would require large areas of land and large quantities of aluminium, chromium, copper, zinc, manganese, nickel, lead and a host of additional metals, most of which are already being used for other purposes; their increased supply is “problematic if not impossible”.³⁴

Water, too, is likely to prove a major constraint. Already, the energy system is the largest consumer of water in the industrialised world (in the US half of all water withdrawals are for energy, to cool power stations, for example). The development of alternative fuels, including non-renewable “alternatives” such as electricity derived from nuclear power, and shale oil and gas, is likely to increase water use still further.³⁵ A 2006 Report from the US Department of Energy calculates that to meet US energy needs by the year 2030, total US water consumption might have to increase by 10 to 15 per cent – and that such extra supply may not be available.³⁶ Unsurprisingly, US Secretary of State Hillary Clinton announced in March 2010 that global freshwater scarcity was now a national security concern for US foreign policy makers.³⁷ This is not even to mention one of the biggest threats of a runaway “renewables”-based economy, which is to ordinary people’s access to land, as it faces further enclosure for giant wind farms or solar parks. The problems do not end there. Whilst significant and wholly welcome gains have been made in improving energy efficiencies, these gains are soon overtaken by continued economic expansion (*see* Box: “Energy Efficiency”).

Sustaining the unsustainable

Instead of providing a bridge to a society organised around using less energy and phasing out fossil fuels, energy efficiency pursued within the framework of continued economic growth simply becomes a means of what political sociologists Ian Walsh and Ingolfur Bluhdorn have termed “sustaining the unsustainable”, moving Western consumer democracies “beyond the politics of sustainability and into a realm where the management of the inability and unwillingness to become sustainable has taken the center ground.”³⁸ “Energy security” plays a key facilitating role in this. The belief that consumer capitalism and ecological sustainability are compatible and interdependent has become hegemonic; technological innovation, market instruments and managerial perfection are asserted to be *the* most appropriate strategies to achieve sustainability, even though empirical experience suggests the opposite. The belief, however, is obsessional:

“This insistence on the capability of these strategies; the denial that the capitalist principles of infinite economic growth and wealth accumulation are ecologically, socially, politically and culturally unsustainable and destructive; the pathological refusal to acknowledge that western ‘needs’ in terms of animal protein, air travel, or electric energy, to name but three, simply cannot be satisfied in ecologically and otherwise sustainable ways is itself a syndrome that deserves closer sociological attention.”³⁹

Energy efficiency

Energy efficiency plays a significant role in the European Commission's energy security plans.⁴⁰ But while higher energy efficiencies of processes and appliances could reduce the amount of energy used by an individual, household or business (at least initially), they would not necessarily result in reduced consumption overall, especially if the price stayed the same or fell. In fact, energy efficiencies could lead to *increased* energy consumption.⁴¹

This paradox was first noted by British economist Stanley Jevons, who observed that increased energy efficiency in coal-fired steam engines resulted in more coal being used to power more steam engines in more applications. In 1865, he concluded that greater efficiency in extracting and burning coal reduced coal prices, thereby leading to greater overall coal consumption. He said:

"It is wholly a confusion of ideas to suppose that the economical use of fuel is equivalent to a diminished consumption. The very contrary is the truth."⁴²

During the 1970s, another British economist, Len Brookes, argued likewise that devising ways to produce goods with less oil – an obvious response to the sudden leap in oil prices – would merely accommodate the new prices, causing oil consumption to be higher than it would have been if efforts had not been made to increase efficiencies.

Several examples illustrate this paradox. In 2005, for instance, the average US passenger car consumed about 40 per cent less fuel per kilometre than it had done in 1960. But more widespread ownership of

automobiles (an average of two people per vehicle in 2005 compared to nearly three in 1970) and higher average distances driven, particularly as out-of-town shopping malls and suburban housing proliferated while public transport declined, resulted in average per capita automobile fuel consumption being 30 per cent higher in 2005 than in 1960.

Despite increased energy efficiencies of refrigerators, light bulbs and buildings, US electricity consumption in 2008 was double that of 1975 while overall energy consumption was up by 38 per cent, even though manufacturing had been outsourced to Asia over this period.

During the 20th century, the efficiency of British public street lighting rose some 20-fold, but the intensity of the illumination increased about 25 times, more than eliminating the efficiency gains.⁴³

Between 1980 and 2000, China halved the energy intensity of its economy, but more than doubled its per capita energy consumption.

Refrigeration has enabled fresh fruit and vegetables to be transported ever greater distances and kept in shops and homes for longer, but has also contributed to more food being thrown away.

These examples suggest that under an economic logic of "permanent" growth, reining in energy use simply provides more energy to drive the whole system on. Efforts to mitigate the excesses may only worsen them. More efficient energy transformations lower the per unit cost of captured energy, which then stimulates increased consumption of the resources. Sociologist Bruce Podobnik who

has studied energy transitions of the past concludes:

"True reductions in energy consumption require political and social transformations; they are not caused by energy technologies alone."⁴⁴

In several countries, overall energy efficiency could certainly be improved through technical innovation and better management. It is difficult, however, to do much about the inherent energy losses from centralised, large-project, generating and transmission systems that send "energy" over long distances.

The UK, for instance, which is heavily reliant on centralised energy networks, loses nearly 10 per cent of its electricity in transmission and distribution.⁴⁵ Transmitting electricity generated in the Sahara desert or from hydroelectric dams in the heart of Africa and sending it to Europe is hardly energy efficient.

If energy savings were integrated into a transition away from fossil fuels and from a "growth for growth's sake" economy, however, they could play a major role in securing energy, in the lower case sense of the word.

Energy losses could be reduced if "energy" was generated closer to where it is ultimately used, not only reducing losses in transmission and transportation, but also reducing the amount of energy required to build the substantial infrastructure networks in the first place.

Yet it is precisely this debate – about what and whose needs, wishes and demands *can not* be satisfied – that the implicit framing of energy security in terms of “unlimited wants”, “limited means” and capital-A Abundance prevents. Indeed, by naturalising unlimited wants, it denies the reality of the continued existence of numerous communities, user groups, co-operatives and other forms of social organisation whose lives are governed not by the principles of neo-classical economics but by the rules of the commons (*see* Box, “Commons life”, p.13). Within such groupings, the experience of scarcity is very different. This is not because forms of scarcity do not exist: periodic dearth is a recurring phenomenon, for instance, when a crop fails (though the risks of wholesale scarcity can be guarded against by planting multiple varieties⁴⁶) or when a generator breaks down. But the needs that commons regimes satisfy are not infinitely expanding and the means by which they are satisfied are framed by a politics (which has to be constantly sustained through social

“When scarcity is presumed as a fact of nature and not a remarkable social achievement, it is posited as the natural cause of violence and war.”

Matthew Huber
“Enforcing Scarcity”, 2011. ⁴⁷

practice) in which no one individual or group has the ability to survive at another’s expense. The survival of all is a key principle around which social relations are organised. Needs reflect less the requirements of an “economy” for “effective demand” than the evolving give-and-take of the specific commons regime itself, whose physical characteristics remain in everyone’s view. Without the race between growth and the scarcity that accumulation creates, there can thus be a sense of “enoughness”.⁴⁸ It is no surprise that among, for example, many Andean indigenous communities in Bolivia, there is an underlying sense that the default condition of life is (lower-case) “abundance” or enoughness and that when “scarcity” appears, it is likely to be the result of intrusion by profiteers.⁴⁹

New enclosures

Whilst numerous communities continue to explore ways of living that embody the notion of “enoughness”, whether they are villages in the Andes, Transition Towns in Europe,⁵⁰ or groups in South Africa, Nigeria, Ecuador, Indonesia and Norway fighting to keep fossil fuels in the ground, mainstream policymakers, on the other hand, tend to remain locked in the zero-sum game of capital-S Scarcity and capital-A Abundance. They portray nations as increasingly pitted against each other to compete for what energy is available, a contest in which one nation’s gain is interpreted as another’s loss.

Fears that scarcity will result from other consumer countries grabbing limited energy resources are exacerbated by fears of another scarcity: that which may result from a lack of “reliable suppliers”. The spectre of Russia shutting down its pipelines that supply gas to other countries, for example, has dominated many energy discussions in Europe since 2006 when Gazprom, Russia’s state-owned gas company, stopped supplies to the Ukraine for a few days, which in turn temporarily interrupted gas transit through to Central and Western Europe. The short-term dispute over prices and debt was quickly resolved, but had long-term impacts: most noticeable has been the rise within Europe of “energy security” talk in which Cold War language and attitudes are revived. Fears are also expressed that supplies of oil and gas from

“unstable” or “politically volatile” countries in the Middle East, characterised (or caricatured) as a zone dominated by “theocrats and autocrats”,⁵¹ are vulnerable (without exploring how the “fragility” of such states is linked to the development of oil). Attention is also drawn to the actions of oil-rich countries deemed unfriendly towards the West, such as Venezuela and Iran.

For the mainstream “energy security” discourse, the upshot is clear: grab and lock-in energy resources before competitors do and then keep them out of their hands, all the while easing the scarcity created by “political unreliability” by diversifying energy types, country sources and supply routes. Whilst the European Commission sees all this being achieved through the exercise of “soft” power – partnership agreements with foreign governments, the extension of free trade agreements and adherence to the Energy Charter⁵² – others take a more aggressive view of what is needed to ensure that the European Union has access to the energy it needs.

Václav Bartuška, the ambassador at large for energy security for the Czech Republic, is blunt:

“The debate should start with a simple fact: more than 95 per cent of the world’s known oil and gas resources are now controlled by the governments of nation states. Most of these states have no special reasons to like Europe and will do us no favours. We like to see ourselves as a model for others, a benign giant loved by all. But much of the planet (and definitely many oil and gas producers) see us simply as rich and weak: ideal for blackmail . . .

“Unlike the United States, which has often been prepared to use force even far away from its shores, most Europeans prefer ‘soft power’. But words neither fill tankers nor protect pipelines. Unlike China, which is prepared to sign energy deals with any kind of government, we claim to shun dictators. In reality, we are only postponing difficult choices. When it comes to energy, Europe is the great procrastinator . . .

“Today, Europe – once the sword-master of the world – is a military dwarf. To be taken seriously in any forthcoming battle over resources, Europe needs to increase its military muscle and change its attitude towards conflict.”⁵³

Bartuška’s benign but false depiction of Europe and his militarism are heirs to a long history of imperial adventurism that continues to frame many mainstream responses to energy scarcity. The “soft power” solutions are no less imperialist or violent in their ambitions or impacts. In the name of “energy security”, land, rivers, estuaries and forests in the South are being directly “grabbed” by multinational corporations and investors from Europe and elsewhere in a scramble to acquire, produce and trade energy – and to obtain “sinks” in which to dump carbon emissions (*see pp.34ff, 56ff*).

The result is a new wave of enclosures that not only exacerbate current scarcities and insecurities but also create new ones.

“(The) supply-and-demand driven model of oil market behaviour . . . obscures the role of power relations and speculative profiteering in that market.”

*Anna Zalik, “Oil ‘futures’”, 2010.*⁵⁴

Energy enclosures

Western companies have a long history as the prime developers of oil and gas in Africa. The company with the largest number of exploration licences today is reportedly UK-based Tullow Oil.⁵⁵ Despite fears being stoked over the West losing oil concessions to the Chinese, Western oil investments in Africa outstrip Chinese ventures by a factor of ten to one.⁵⁶ European and US companies have also moved in to extract deep-sea oil off the coast of Ghana and from the tar sands in the Republic of Congo, at great cost to local people and the environment.⁵⁷ Other planned oil and gas ventures in the continent include a new 4,000-kilometre-long Trans-Saharan pipeline to take gas from Nigeria's Delta region through Niger to Algeria's export terminals. The project is estimated to cost around \$12 billion and claims it will supply up to 30 billion cubic metres of natural gas per year to Europe. Quite apart from the expense and the considerable technical difficulties involved in constructing such a pipeline, a number of guerrilla groups have already threatened to ensure it never functions.⁵⁸

The Caspian region is another focus of new oil and gas acquisitions. BP's Baku-Tbilisi-Ceyhan oil pipeline was pushed through by US President Clinton purportedly to ensure that Europe had access to a source of oil outside the Gulf or Iran,⁵⁹ an accompanying gas pipeline from

Pipes, prices and politics

Many discussions about gas (but rarely oil or coal) supplied from Russia to Europe are now framed in terms of Europe's (over) dependence on it. Various proposals are put forward to reduce such dependence by diversifying country sources, energy types and supply routes.

Over the past decade, however, there has not been a rise of overall energy dependence on Russia in real terms within Europe – if anything, hydrocarbon imports from Russia have gone down.⁶⁰

But with EU enlargement, what has increased is the number of EU countries burning gas from Russia: Estonia, Latvia and Lithuania are "fully dependent", while Bulgaria and Slovakia are "highly dependent".

In addition, what has changed is the terms and conditions under which Russia supplies gas to the countries of the former Soviet Union, shifting towards (higher) market prices

instead of subsidised rates. Incidentally, when West Germany was importing gas from the Soviet Union from the 1970s onwards, there was little talk of supplies being cut off.

EU countries have responded differently to these changes. Some have sought closer commercial and diplomatic ties through the renewal of long-term bilateral contracts to supply oil and gas and welcome participation in developing new pipelines. Others have been more wary.

Two projects have fanned the flames of controversy:

- Germany's 2005 bilateral agreement with Russia to build the Nord Stream gas pipeline under the Baltic Sea, which does not go through any transit country (such as Ukraine or Belarus), bypasses Poland and came on-line in 2011; and
- Hungary's and Italy's deals with Russian gas company Gazprom to build the South Stream pipeline, a competitor in practical terms to the EU-

supported Nabucco pipeline, aimed at diversifying sources and routes of gas supplies into Europe away from Russia.

These bilateral strategies to secure energy have exacerbated tensions within the EU. Poland has called on member states to show solidarity with each other in the energy field, language that found its way into the 2009 Lisbon Treaty (see p.64). Poland also proposed a cooperation mechanism between countries dubbed an "energy NATO".

This is despite Russian supplies of oil and gas being relatively insignificant in Poland's energy mix. Poland is the EU's largest extractor of coal from which it generates more than 95 per cent of its electricity. Its shale gas deposits, potentially among the largest in Europe, are already attracting the attention of international oil and gas companies.

Baku to Erzurum in Turkey diversifies Europe's gas reliance on Russia. The European Commission, with the support of some member states, is now seeking to build the ambitious and expensive Nabucco project that proposes to deliver gas from Turkmenistan and Azerbaijan (if built, potentially even from Iraq and Iran) via a 3,000 kilometre pipeline stretching from a hub in Turkey, bypassing Russia, through Bulgaria, Romania and Hungary into Austria.⁶¹ The Commission is working to build cooperative relationships with all the producer and transit countries in order to help six European firms tackle the logistical and financial challenges involved⁶² – the pipeline would pass through 240,000 different plots of land across five jurisdictions.⁶³ If the pipeline goes ahead, however, Nabucco would deliver just 5 per cent of the EU's current gas consumption,⁶⁴ although even this quantity is doubtful, given that Turkmenistan and Azerbaijan have already committed to supply much of their gas to Russia (which in turn sends it to Europe). Russia is also planning to build another pipeline, South Stream, under the Black Sea through which Gazprom could deliver additional volumes of gas to Europe through Bulgaria (bypassing Turkey) from where it could branch into two spurs, one going north to Austria, the other south to Italy. The project, often described as a competitor to Nabucco, is a joint venture between Gazprom and Italian oil company ENI.⁶⁶ The irrationality of both projects suggests that cementing political relationships is more of an objective than simple "energy".

"Pipelines . . . require a more nuanced examination than just measuring the relative pulling power of Russia and the EU in a tug-of-war assumed to be about control over energy sources."

*Pavel Baev and Indra Øverland
"The South Stream versus Nabucco
pipeline race", 2010. ⁶⁵*

In the name of "energy security," the European Commission is also actively working to get access to land required for renewable energy projects. These include Desertec, a scheme that would build and connect a host of solar and wind energy plants in the deserts of North Africa and the Middle East to supply mainland Europe with up to 15 per cent of its electricity demands, at a cost of • 573 billion. The project, which is being developed by a consortium of European, American, Japanese and North African companies including big utilities such as E.ON and RWE,⁶⁷ would require industrial volumes of water – something of a scarcity in the Sahara despite a huge underground aquifer – to clean its mirrors and solar collectors, thus denying local people access to water.⁶⁸ It would also depend on massive subsidies required to make the electricity produced competitive with fossil-fuel generated power. Many people in the host countries such as Morocco regard Desertec as a distraction from the more pressing priority of supplying clean energy to their compatriots.

Encouraged by legislation in the EU and US requiring that an increased share of the liquid energy used for transportation be obtained from agrofuels (the EU has set a binding target of 10 per cent by 2020),⁶⁹ private sector investors are also pouring billions of dollars into acquiring land throughout the South to develop agrofuel feedstocks (such as jatropha, palm oil and sugar) for conversion into bioethanol and biodiesel. Bioethanol imports into the EU amounted to some 830 million litres in 2011, with supplies coming from Brazil, US, Guatemala, Nicaragua and Costa Rica. Biodiesel imports were higher, at 2,320 million litres,⁷⁰ the principal exporters being Argentina (1.4 million tonnes) and Indonesia (830,000 tonnes).⁷¹ Moreover, imports are expected to rise: according

to the European Commission, some 30 per cent of projected agrofuel feedstocks will need to be imported if the European Union is to meet its mandatory 2020 target.⁷² Such imports are expected to come mainly from the South. Preferential trade schemes have already been agreed with a number of developing countries, through the Cotonou Agreement and the Everything But Arms (EBA)⁷³ initiative, under which eligible countries can export ethanol to the EU without paying tariffs.⁷⁴

Investors and speculators ranging from national and international oil companies to private equity funds⁷⁵ have been quick to seize the opportunity. A recent report by Oxfam estimates that an area of agricultural land in developing countries the size of Western Europe – some 227 million hectares – has already been sold or leased to international companies, a considerable portion of which has been for agrofuels. Acquisitions often result in forced evictions, the enclosure of local water supplies, conflict, and increased malnutrition and hunger as local farmers are deprived of land on which to grow food for themselves and local markets.⁷⁶ In sub-Saharan Africa, 5 million hectares of land are currently under cultivation for such agrofuel crops as palm trees and eucalyptus.⁷⁷ In recent years:

- some 14,000 hectares in Sierra Leone have been leased to Addax Bioenergy Switzerland for a project, backed by a consortium of European public Development Finance Institutions,⁷⁸ to grow sugarcane to supply ethanol in Europe;⁷⁹
- Italian state-owned oil giant ENI has acquired 70,000 hectares in the Republic of Congo for a oil palm development to produce 250,000 tons of biodiesel a year;⁸⁰ and
- a 30,000 hectare Procana project has been developed in Mozambique by the London-based Central African Mining and Exploration Company (CAMEC) to produce 120 million litres of ethanol a year.⁸¹

Although promoted as a “green” technology, agrofuel has substantial negative environmental impacts, including on climate change: a report by the US-based Oakland Institute estimates that the:

“conversion of rainforests and native grasslands into fields to produce agrofuel crops will release between 17 to 420 times more CO₂ than the amount of greenhouse gas emissions that would be reduced following the replacement of fossil fuels with agrofuels.”⁸²

Carbon enclosures

The emergence of carbon markets has been another factor in land accumulation, as land gains speculative value for its potential as a “carbon sink” and source for carbon credit rents. For example, the mere prospect of ‘avoided deforestation’ credits (through Reducing Emissions from Deforestation and Degradation [REDD] and REDD+ schemes) is already encouraging land grabs across Africa, Asia and Latin America (*see also* pp.56ff). The Ministry of Environment in Peru plans to implement REDD+ on 54 million hectares of the Peruvian Amazon, which “would open the doors of more than half of its forested

territory to the carbon markets”.⁸³ Already, REDD+-type projects have led to evictions and conflict as local people have been not only removed from forests but also prevented by police or forest guards from continuing to use them (often a pre-requisite for earning carbon credits).⁸⁴ Other carbon credit programmes have also caused violence and deprivation. In Uganda, villagers report that over 22,000 people were forcibly evicted from the Mubende and Kiboga districts in Uganda to make way for the UK-based New Forests Company to plant trees to earn carbon credits. According to the *New York Times*:

“... [V]illagers described gun-toting soldiers and an 8-year-old child burning to death when his home was set ablaze by security officers.”⁸⁵

Grabbing a piece of the action

One characteristic of these (attempted) Energy (in the upper-case sense of the word) enclosures is that, in addition to interfering with local people’s access to land, water, forests, fishing grounds and other means of livelihood, they also generally deny or limit local people’s access to energy. Take the Baku-Tbilisi-Ceyhan oil pipeline, for example, that runs from Azerbaijan, through Georgia, to Turkey. Instead of being refined and used locally, all the oil carried through it is exported, even though many communities along its route do not have adequate supplies of fuel. Similarly, although Nigeria is now the largest oil exporter in sub-Saharan Africa, currently shipping some two million barrels of oil per day according to official figures (and four million according to unofficial estimates),⁸⁶ the oil consumed within Nigeria itself is mostly imported because the country now has few working refineries. In the case of Desertec, the electricity produced would become available to North African countries only if they invest heavily in extending and upgrading their grids and making linkages between countries – and even then the electricity produced would probably be too expensive for ordinary people, who currently benefit from subsidised electricity.⁸⁷ As Maïté Jauréguy-Naudin of the Institut Français des Relations Internationales in Paris asks:

“Why would investors sacrifice profits in the European market to supply local consumers at regulated prices far below production costs?”⁸⁸

Given such exclusion, these enclosures are often termed “energy grabs”. But are they a simple matter of purloining goods where the pickings seem easy in order to sell them on, as the term “grab” implies? Or are the motivations and outcomes more complex?

At least for those sources of energy that are traded on international markets (which comprise the bulk of the energy consumed today), the scarcity that “energy security” policies seek to address lies elsewhere than in “securing supplies” for any one country or bloc. The priority is to secure supplies that will be traded globally on “open markets”. Whereas before the 1970s, oil extracted in the global South by BP, for instance, would go on a BP tanker to BP refineries in Britain and thence to BP filling stations, companies today no longer exert routine, direct control over the entire process from extraction to consumer. Where

the oil goes, moreover, is determined as much by the moment-to-moment movements of the global oil market than by mercantilist, quasi-colonial or bilateral arrangements. As activist and author Greg Muttitt notes:

“The captain of an oil tanker from West Africa may not know as he sets off north whether he is headed for Europe or North America, and his destination may change several times mid-ocean as his load is traded and re-traded. If Britain doesn’t get a delivery from Nigeria, it can get one from Libya in its place.”⁸⁹

Thus the global oil market has been compared to “a big bathtub into which all producers pour their fuel and from which all consumers draw.”⁹⁰ As US energy economist Kenneth Medlock has said of oil from the Canadian tar sands, “It doesn’t matter which end of the tub you fill from, as long as you are adding supply. The oil is going to flow.”⁹¹ Chinese and Indian companies are no more in a position than European or US firms to insist that *all* the oil they extract abroad must go back home; among other things, the transportation costs would make this uneconomic and impractical.⁹² By the same token, there is no need for the US to try to “regrab” Venezuela’s oil out of the hands of its nationalised oil company, since, despite all the sword-rattling and smouldering accusations of devilry that characterise the relations between the two countries, the US continues to be Venezuela’s biggest oil customer.⁹³

For Energy companies, obtaining the largest possible share of the benefits that come from playing in global energy markets provides a further objective. What is at stake is not so only the loot itself – the oil, gas, coal, even sunshine – but also, and critically, a piece of the global action in which the loot plays a part – financial, construction, contracting, military, and so forth.

Because it is scarcity of access to the overall “accumulation action” that is the major concern, companies pursue a dual strategy of competing and cooperating with each other to get the largest slice of the pie. At times, they play rough. In 2003, for example a consortium of Dutch, US, Italian, French and Japanese oil companies operating the Kashagan oilfield in Kazakhstan (estimated to be the largest known oil field outside the Middle East but discovered only in 2000) blocked attempts by two Chinese oil companies, Sinopec and China National Offshore Oil Corporation, to obtain shares of the project. When such pre-emptive moves are not possible, however – China, after all, usually offers better financial deals to oil-producing states than other interests – Western companies have been quick to resort to joint ventures, partnerships and various legal strategies to reduce the threat to profits where rivals outbid them or refuse them direct control over a resource.

Thus, whilst European and US politicians try to fuel disproportionate fears about China “grabbing” the world’s oil (currently China is responsible for only 1 per cent of global oil production), Western investors and oil companies are actively collaborating with Chinese companies. In 2009, for example, BP formed a joint venture with the China National Petroleum Company (CNPC)⁹⁴ to win a lucrative oil contract from the Iraqi government,⁹⁵ whilst the French oil giant, Total, similarly profited from an Iraqi contract won in conjunction with CNPC and the Malaysian oil company, Petronas. Meanwhile, the US-based private equity firm

EMP Global has made investments in the China National Offshore Oil Corporation.⁹⁶ Despite aggressive noises about Chinese “competition”, Western companies have also been actively selling parts of their operations to China’s oil corporations. Recent sales to Sinopec include a 40 per cent stake in the Brazilian subsidiary of the Spanish oil company, Repsol, and a 9.03 per cent share in the Canadian oil sands company, Syncrude, whilst Shell sold a 35 per cent share in its Syrian subsidiary to CNPC.⁹⁷ Oil and gas giants BP and Shell have also been attempting to get a slice of fossil fuels within China. Shell, for instance, has signed an agreement to work with CNPC on extracting shale (or tight) gas in China,⁹⁸ while BP’s CEO Bob Dudley emphasises that his company is the only foreign investor in China’s first LNG re-gasification terminal and that BP is producing and exploring for natural gas in the South China Sea.⁹⁹

Similarly, despite the political accent on the threat from Russia, some German companies have actively sought out co-operation with Russia’s Gazprom through joint ventures such as WINGAS and WIEH while BASF/Wintershall and E.ON Ruhrgas have shares in the Nord Stream gas pipeline from Russia to Germany.¹⁰⁰ Alternatively, production-sharing agreements (PSAs) can be used to secure effective control over the resource no matter who owns it (*see* Box: “Contractual Colonialism”, pp.38-39).

Indeed, complaints that Russia, China and other countries are being “nationalistic” about “their” resources, or that too many of the world’s oil and gas spigots are in the hands of nationalised companies, are best interpreted as code for concerns over how the profit from oil and gas will be divided up, both now and in the future, rather than genuine concerns over supply. Nationalised oil and gas companies have no interest in *not* selling their oil and gas; and they are generally sold on commercial terms with prices set by world markets or indexed to them. The issue, therefore, is not only that nationalisation might restrict the *amount* of the stuff leaving the ground or expose the West to sudden price increases, but also, and perhaps more importantly, that the profit from oil exploitation and trading will not accrue to Western private interests. Indeed, when Western governments complain that Southern countries are not playing by market rules (the “resource nationalism” accusation), the complainants are usually indulging in their own form of “resource nationalism”: what they really mean is that the private corporations with which they work would like to gain greater control or access to the whole range of economic processes globally in which energy resources play a part.

Another form of accumulation by dispossession?

All the enclosures licensed and encouraged by the “energy security” discourse can be seen as falling under the rubric of what geographer David Harvey has termed “accumulation by dispossession”,¹⁰² a concept that encompasses more than the physical displacement of people

“Talk about the ‘oil weapon’, which has recently come back into fashion, simply does not make much sense. Once oil is sold on the global market, no producer can control where and to whom it goes.”

Andreas Goldthau and Jan Martin Witte
“Back to the future or forward to the past?” 2009.¹⁰¹

and embraces, *inter alia*, the commodification and privatisation of land; the conversion of various forms of common property rights into exclusive private property rights; the suppression of rights to the commons; and the commodification of labour power.

Delivered within the framework of Energy (with an upper-case “E”), many programmes ostensibly designed to bring electricity to the 1.3 billion people who currently have no access to it should be regarded not as efforts to secure the rights of people to the means of cooking and storing their food so much as avenues for extending markets, boosting the productivity of labour, extending the workday, increasing output, and generating new private sector subsidies through public-private partnerships and other government guarantees to investors.¹⁰³

Contractual Colonialism

In the early 20th century, most of the world’s oil was controlled by the “Seven Sisters”: five US oil companies (now merged into ExxonMobil and Chevron), and two European ones (BP and Royal Dutch/Shell). Concession agreements usually gave them exclusive rights to explore and extract oil within a country, paying some taxes and royalties to the host government in return.

By the 1970s, however, oil-producing countries had begun cooperating more with each other. They had formed the Organization of Petroleum Exporting Countries in 1960, which issues oil production quotas to its members. OPEC rose to prominence when it embargoed oil sales to the US, The Netherlands and Portugal among others because of their support for Israel in the 1973 Arab-Israeli war.

By this time, many newly-independent countries and others had managed to renegotiate the terms on which US and European oil companies could extract their hydrocarbons – or they had simply expropriated their assets outright, handing them over to national oil and gas companies. Given the number of nationalisations – 28 governments accounted for 62 per cent of all expropriations from 1960 to 1985¹⁰⁴ – oil

companies (and Western governments) had little choice but to accept them. Today, national oil companies control three-quarters of global proven oil reserves, while international oil companies control less than 10 per cent of them.

But international oil companies came up with a response of their own to growing national control over oil and gas operations, particularly in places where the country did not have sufficient expertise or money to run the operations entirely by itself: a production sharing agreement (PSA), now the “oil companies’ contract of choice in most developing countries”.¹⁰⁵

First developed in Indonesia in the late 1960s, an agreement to *share* oil production implied rejection of the colonial-era concession agreements that had persisted for more than 50 years previously.

In simple terms, a PSA divides “profit” oil (left over after all costs have been paid) between the state and the foreign oil company in proportions that allow a state to capture a reasonable share of the profits – or so it seems. The devil is in the complex detail of several hundred pages of technical, legal and financial language, which usually result in the country gaining a paltry share, even if it has a long experience of oil development.

“Risks”, for instance, are often transferred to the state (even though the foreign company is said to be risking its capital). These include:

- exploration risk (not enough oil and gas that is feasible or worthwhile to extract might be found, although this is hardly an issue in the Middle East, Russia or Central Asian Republics);
- development risk (it might take longer than anticipated to build the infrastructure before the oil and gas flow);
- price risk (the price at which the oil or gas is eventually sold might be lower than expected).

The complexity of a PSA throws up numerous ways in which companies can reduce their tax payment to the host government by the clever use of accountancy techniques:

“Not only do multinationals have access to the world’s largest and most experienced accountancy companies, they also know their business in more detail than the government which is taxing them, so a more complicated system tends to give them the upper hand.”¹⁰⁶

In practice, therefore, a PSA usually gives a foreign oil company “guaranteed comfortable profits”, and, if the

Likewise, agrofuel projects or oil and gas developments are not just means of extracting profit from sales of what the project itself produces – oil, gas and agrofuel – but are also mechanisms to lock whole societies into a neoliberal legal framework that privileges the interests of corporations and the market over that of the public. Investor-state agreements, nestled under wider international treaties such as the Energy Charter, are used to impose terms under which any new legislation that threatens corporate profits may be interpreted as “expropriation” (see Box: “Contractual Colonialism”).

Moreover, as explored in the next section, the extension of neoliberal systems of accumulation are not merely tolerated by mainstream energy security advocates: they form the core of their agenda.

project goes well and international oil prices remain high, “enormous profits”.¹⁰⁷

PSAs can thus deliver to an oil company the material equivalence of the old-style concession¹⁰⁸ – guaranteed access to oil reserves; predictability of tax and regulation; and the opportunity to make large profits – but with the politically-useful symbolism of the term production *sharing* agreement. This suggests that the state company or national government is running the show, even if the foreign company is doing so behind the camouflage of a legal title indicating the assertion of national sovereignty.¹⁰⁹

Protectionism

Major multinational oil companies have also strived to make their contracts even more secure against future governments changing their terms or profitability or simply sweeping them away without paying compensation. Clauses are often added to “stabilise” a production sharing agreement that effectively insulate the concession from altered circumstances, nationally or internationally. Governments agree to compensate companies for any changes in legislation that adversely affect their profits.

The production sharing agreement between company and government is often nestled under a government-to-government treaty, ensuring that any dispute is elevated above national law and contract law to a violation of international law. This treaty might be an existing bilateral investment agreement, a regional trade agreement such as NAFTA, or a new treaty drawn specifically for the project, such as that governing the Baku-Tblisi-Ceyhan pipeline.¹¹⁰

International law can define “expropriation” so broadly that that *any* national regulation affecting oil extraction triggers an obligation to pay compensation. The fundamental provision of the Energy Charter Treaty, for instance, is its Article 13, which defines “expropriation” not just as “outright takings of investments by the host state”, but also of “measures having equivalent effect to nationalisation or expropriation”, which would include any regulation or taxation measure that reduces the company’s profit.

The real prize

With the type of contracts signed today, therefore, oil companies do not need countries to be occupied or colonised as they were a century or so ago, or to surrender ownership of their oil as

they did decades earlier – the contracts themselves are the new colonialism.¹¹¹ They enable the companies to secure almost complete control over a country’s oil and gas reserves and to supersede national and international human rights and environmental obligations.

Oil analyst Greg Muttit points out that:

“the value of oil lies less in a single shipment (which is generally worth a few tens of millions of dollars) than in the long-term right to extract from an oilfield, which can provide many tens of billions of profit.”¹¹²

The real prize is the contract carried in a briefcase or on a laptop computer that gives a company secure and exclusive rights to oil over decades.¹¹³

Over the past few decades, oil companies have spent no less effort engineering such contracts, laws and policies than the physical project itself.¹¹⁴ The rights to extract oil and other resources confer not just wealth but power. While less visible than tanks and soldiers in the streets:

“the more abstract forms of power asserted through documents and institutions last far longer.”¹¹⁵

Financialisation and transition

“Markets need to be recognized as a source of security in themselves.”

Daniel Yergin, 2006¹

“Energy security is simply too important to be trusted to the uncertainties of energy markets.”

Flynt Leverett, 2009²

Many policymakers now accept the need to “change direction” from the current trajectory heading towards runaway climate instability within a few decades, if not years. But the economic mechanisms proposed to deliver that change amount to more of the same: markets, markets and more markets.

The neoliberal market-driven approach to energy policy in Europe and North America that is actively promoted throughout the world by the International Monetary Fund and the World Bank and through bilateral investment treaties and the Energy Charter Treaty is barely 30 years old. Prior to the 1980s, energy – oil, gas, coal and electricity – was largely provided either by state monopolies at prices determined by the state with investment centrally planned by government bureaucracies, or by private monopolies subject to government oversight and regulation to protect users from excessive charges. Markets, in which for-profit companies competed with each to generate, distribute and supply “energy”, were considered “hopelessly inadequate in providing appropriate energy supplies,”³ considered to be “the lifeblood of the world economy.”⁴

“Moving to the market,” however, was proposed as a way of ensuring investment in energy infrastructure – power plants, transmission systems and storage capacity – that would not only guarantee supplies to consumers at cheaper prices but would also direct investment to the most cost-effective means of reducing carbon emissions.⁵

But markets have singularly failed to deliver on these promises. Directly opposed to forms of social and economic organisation that seek to guarantee the shared right of all to survival, market-based energy policies have led to the exclusion of those who cannot afford to pay for the energy they require to meet their basic needs. The financialisation of “energy” – where the production and distribution of oil, gas and electricity is mediated and shaped not just by markets in general but by financial markets in particular,⁶ and where capital is accumulated primarily through financial speculation rather than production – is also jeopardising investment in the infrastructure that might enable a just transition to a sustainable and equitable climatic future. Investment is diverted into trading on money or the products of money, often creating energy shortages in the process through the speculative “gaming” of energy markets. Just as energy is now “saturated with the language of security”,⁷ so, too, it is “infused by the logic of finance”,⁸ even though financialisation is conspicuously absent from energy security narratives.

Market-led policies marginalise the role of communities and ordinary people in decision-making: instead “choices” about future energy technologies and use are left to those who have economic and political power within the range of markets that affect energy. The input of consumers is reduced to the (limited) decisions they can make within energy retail markets based on price signals alone: the cost of electricity or gas. Debates over how society might be differently organised to generate and use (less) “energy” in different ways are entirely sidelined, except where they might provide opportunities to make money.

Meanwhile, efforts to address climate change through carbon trading and other market mechanisms are fatally delaying the action that is necessary to prevent runaway global climatic instability, whilst at the same time creating new sources of conflict and insecurity.

Markets, markets and more markets

“The freedoms which the treaty guarantees European citizens – free movement of goods, freedom to provide services and freedom of establishment – are only possible in a fully open market, which enables all consumers freely to choose their suppliers and all suppliers freely to deliver to their customers.”

Official Journal of the European Union, 2003⁹

Within Europe, energy and climate policies propose “change” by means of new technologies and infrastructure projects – from windmills, solar panels and photovoltaic cells to supergrids and gas interconnectors to smart meters, smart buildings and smart electric cars – but the “direction” is fixed from the start because minimal change is contemplated in financing this “energy security revolution.” Policymakers and business leaders are adamant that the trinity of obtaining fuel supplies, minimising the numbers of people who do not have access to power, and preventing runaway climate change is possible *only* through more private ownership, more competitors, more open buying and selling of energy necessitating more deregulation of restrictions on such trading: in sum, more markets to mediate and control the generation, distribution and consumption of energy.

A range of markets is involved: *retail* markets (where domestic and commercial consumers buy from competing oil, gas and electricity retail companies); *wholesale* markets (where competing generators and suppliers buy and sell oil, electricity and, to a lesser extent, gas to retail companies), *capital* markets (where all these companies compete for finance) and what might be termed “*market failure*” markets (where prices are put on externalities,¹⁰ such as pollution or environmental degradation, so they can be bought and sold via permits to pollute or provide environmental services).

“Energy markets in the industrial era have invariably failed to reflect the true immediate and long-term social costs incurred by mankind’s ferocious hunger for carbon-based fuels, costs that have only recently become apparent, and are now accumulating at a rapid rate.”

Daniel Moran and James Russell, 2009.¹¹

Within this framework, the role of government is to design regulation that supports market competition – and then leave it to the price signals created by the subsequent interplay of supply and demand to determine how “energy” is generated and delivered. State intervention is restricted to policing markets for abuse (such as companies forming cartels), addressing “market failures” (prices do not reflect all the costs such as pollution or armed protection),¹² perhaps ensuring that safety nets protect vulnerable consumers,¹³ and providing those “public goods” that the market will not provide. Even where intervention is intended to promote one technology over another (renewables over fossil fuels, for instance), incentives are designed to mimic market mechanisms and to be neutral as to the particular renewable technology that is promoted or the means of delivering it.¹⁴

But creating a “genuine internal market for energy,” a priority of the European Commission for at least two decades, has proved far from easy. Attempts at reform have been resisted by consumers, stalled by governments,¹⁵ and delayed by national gas and electricity companies, none of whom are prepared to pay for the elaborate two-way interconnecting physical infrastructure of gas pipelines and electricity grids that need to be in place before energy can be traded competitively throughout all 27 Member States.¹⁶

Unsurprisingly, the European Commission seized on the (brief) cut off by Russian gas company Gazprom of gas to the Ukraine in January 2006 to justify measures designed to reinvigorate and complete the internal market, described as being of “paramount importance.”¹⁷ Emphasising threats to the security of energy supplies (without pausing to analyse how market pricing and privatisation have *created* insecurities of supply), the Commission insists that an open internal market in gas and electricity is central to addressing “the dependency on external supply including the possibility of supply disruptions”. Competition, it is argued, will break monopolies, allowing all suppliers, “especially the smallest and those investing in renewable forms of energy,” to compete, thereby contributing to “diversification and thus to security of supply”¹⁸ by allowing “energy” to flow around the EU wherever and whenever it is needed.¹⁹

To these ends, the European Commission is pressing hard for the break-up of vertically-integrated companies by “unbundling” their power generation, transmission and distribution into separate companies; for the construction of EU-wide transmission networks and interconnectors so that gas and electricity can be traded freely “from Lisbon to Helsinki and from Bucharest to Dublin;”²⁰ and for the extension of such networks, both physical and market, to North Africa and beyond, so that Europe can take solar energy captured through schemes such as Desertec.²¹ The consequence, however, is likely to be *insecurity*.

Privatisation: “Rationing out of the market”

In retail markets, energy goes to whoever will pay for it (and not to those who cannot). For consumers, market-driven energy policies have been experienced most directly through privatisation, usually resulting

in a few suppliers from which they can select their electricity and gas, and through the removal or weakening of state-regulated price controls. The outcome for many has been increased fuel poverty.²²

The first utility privatisations were undertaken in Chile in 1982 during the dictatorship of General Pinochet, acting under the tutelage of free market economists from the University of Chicago.²³ Britain quickly followed.²⁴ Its model of “unbundling” state-owned electricity and gas companies into their constituent generation, retailing, transmission and distribution parts and selling each part in the chain to the private sector (typically at a price of one-third of their valuation, representing a massive windfall subsidy to corporations²⁵) has since been implemented around the world as a condition of structural adjustment programmes imposed by the International Monetary Fund. A 2006 study found that World Bank loan conditions prioritise privatising energy utilities (oil, gas and electricity); only the telecommunications sector had more conditions entailed.²⁶

Far from delivering energy at affordable prices, however, the liberalisation of retail power supply has excluded poorer consumers from access to energy (in economists’ jargon, they have been “rationed out of the market”²⁷). According to several studies, electricity prices in the UK are some 10-20 per cent higher than they would have been without privatisation.²⁸ Similar conclusions have been reached in other European countries,²⁹ the United States and other OECD countries.³⁰ The Consumers Union Program for Economic Justice concludes for the UK:

“By any yardstick – service, price, equity, even competition itself – the deregulation of residential retail service appears to have had no benefits for consumers.”³²

Poorer households are also excluded from the most competitive utility tariffs when they shell out for their gas and electricity by pre-payment meter rather than paying the bills through a bank account, which many do not have (rates for direct debit customers are typically 25 per cent lower).³³ As Professor Steven Thomas of the University of Greenwich asks:

“Is it really a defensible policy for a service as vital as electricity (and gas) to impose a system that leads to low income households paying such a heavy premium to get the same service as richer, better educated consumers?”³⁴

In December 2011, one-quarter of households in England and Wales were officially defined as “fuel poor” – spending more than 10 per cent of their income on fuel – a rise from one-fifth in 2010.³⁵ Across the European Union, between 50 million and 125 million people are estimated to be fuel poor.³⁶

The sharp increase in fuel poverty in the UK in 2011 was not only caused by consumer price hikes of up to 18 per cent: class and financialisation are also major factors. For the past 30 years, the wages of working people throughout Europe and the United States have been

“If government has been characterized as a great dinosaur, impeding the agile private sector with its lumbering and ponderous movements, all deregulation achieved was to save business from the dinosaurs and serve it to the sabre-toothed tigers.”

*David Frenk and Mike Masters, 2010.*³¹

savagely suppressed, throwing them into debt, as the globalisation of production has been outsourced to lower waged countries so as to squeeze wages and discipline labour.³⁷ The current economic recession brought about by unchecked financialisation is crushing family incomes still further throughout the European Union to levels in some countries that are unrivalled since records began.³⁸

“The market itself generates a form of abstract violence where commodity relations structure everyday forms of hunger and displacement.”

Matthew Huber,
“Enforcing Scarcity”,
2011.³⁹

The safety nets that some countries put in place to protect – or to secure – people against fuel poverty are rapidly fraying under the austerity programmes now being implemented (Ireland has stripped back winter fuel allowances). Poorer countries have been less able to put in place energy welfare systems, so that price rises following privatisation translate directly into energy *exclusion* rather than any form of security. In Uganda, after the newly privatised electricity distribution company, Umeme, increased its prices by 24 per cent in 2005 and soon after by another 37 per cent, many poorer Ugandans were forced to take electricity themselves from the grid; Umeme’s

manager is reported to have called for their execution. In Tanzania, Songas has been accused of demanding “indefensible” hikes in gas transportation charges.⁴⁰ For East Africa as a whole, Public Services International Research Unit (PSIRU), which monitors privatisation worldwide, found “repeated evidence of overcharging” by private power plants run by multinational companies.⁴¹ In Asia, the experience is similar.⁴²

Poorer consumers are “blatantly unwanted by companies”⁴³ – as is the case with other for-profit services, such as privatised health care or water provision. Private sector companies are reluctant to extend electricity connections to deprived communities: for rural areas, the costs are deemed too high, while for urban areas, the insecure tenure of slum dwellers and the high risk of “power theft” from the grid are cited.⁴⁴ Yet David Hall of PSIRU notes that state-funded initiatives to connect poorer communities in South Africa to the grid have resulted in a significant increase in employment of women in rural areas.⁴⁵

Despite all this experience, markets remain a top priority for the European Commission; it emphasises “the 2014 deadline . . . to complete the internal market for electricity and gas” to obtain “secure, sustainable and competitive energy” for “the EU’s economy, industry and citizens”.⁴⁶ Far from “changing direction”, a market-based future is likely to replicate its recent past: more widespread fuel poverty, decreasing access to electricity and more insecurity in the wherewithal to survive.

Financialisation, speculation and underinvestment

By any token, “changing direction” towards ways of living that guarantee the shared right of all to survival will require massive investment in new technologies to generate and distribute sustainably-sourced energy, in insulating homes, redesigning the built environment to reduce the need for transportation, and in retrenching workers as old industries

give way to new ones. Market proponents argue that the best incentives for companies and individuals alike to change their patterns of generation and consumption are the price signals sent out by competitive markets. If the price of oil goes up, then people consume less and walk more while companies diversify towards cheaper sources of energy, so the theory goes.

Ambitious programmes have therefore been put in place to construct wholesale markets between generators and retail suppliers where price is supposed to reflect supply and demand rather than being set by government authorities. In addition to new rules and regulators, such markets also require considerable new physical infrastructure. To create an international wholesale market in gas (a goal often defended with the claim that gas is a “transition fuel” to a low- or no-carbon economy because it emits less sulphur, carbon, nitrogen and particulates when burnt than other fossil fuels) requires a vast network of pipelines, liquefaction and regasification plants, and dedicated tankers. All of these can rapidly be transformed into “stranded assets” by changes in policy or advances in technology (hydraulic fracking of shale gas in the US has seriously undermined the proposed global market for Liquid Natural Gas, LNG⁴⁷), generating huge risks for would-be investors (*see* Box: “It takes Energy to construct a gas market”, p.46). And instead of the grid being a means of bringing plant on line in times of shortage – in effect, acting as a form of “reliability insurance, a way of pooling plant outage risk,”⁴⁸ a means of security of supply – it becomes the sole means through which producers can compete on price. As US electricity policy expert Peter Fox-Penner comments, “Without access to customers via the grid, no power plant can sell a dime’s worth of power”.⁴⁹ To ensure competition, the grid must therefore be extended to each and every plant.⁵⁰

Even if enough finance could in theory be found to implement all the extra gas pipelines, liquefaction systems and grids needed to ensure that gas and electricity markets functioned across countries, competition has itself generated *disincentives* to invest in their construction. Because battery technology does not allow electricity to be stored other than in small amounts, supply and demand has to be constantly monitored and matched to prevent blackouts. In a market, generators typically specify every half hour the prices at which they are willing to sell their electricity to the distributor, which should (in theory) result in the consumer getting the cheapest available power. But such competition increases investment risks dramatically. The sheer volatility of prices, which can rise and fall within minutes by a factor of 300 or more as plants get turned off and on (wasting considerable energy in the process), makes it hard to predict revenues and thus to plan for multi-year investments in generating capacity.⁵¹ As energy policy professor Stephen Thomas explains:

“A company wanting to finance construction of a new power station costing perhaps £1 billion, would have to go to the banks to borrow the money. But they would not be able to assure the banks how much power they would be successful in selling nor would they know what price they would get when they were successful.”⁵²

The response of many generators in the UK, the only EU country to

It takes Energy to construct a gas market

It is far more difficult to transport natural gas than either oil or coal, because it is . . . a gas. It is moved predominantly through pipelines under pressure, which is difficult to maintain over long distances, 4,000 kilometres being the “rule of thumb” maximum over land, 2,000 kilometres under water.⁵³ Pumping gas through a pipeline takes more energy than moving the equivalent mass of crude oil.

Permanent fixed pipelines are expensive and require long construction times; producer and consumer are literally welded together. As a result, gas is usually sold in 15-, 20-, even 25-year bilateral contracts agreed between producer and consumer at either end of this inflexible direct connection.⁵⁴ The gas price is usually indexed to the prevailing price of oil. Russian company Gazprom prefers “take or pay” clauses in its long-term gas contracts.

The political dynamics of oil and gas are therefore fundamentally different because oil is a fungible commodity, while natural gas is not. The “tyranny of distance” combined with infrastructure constraints mean that gas tends to be sold in regional markets rather than global ones.⁵⁵ In June 2011, for instance, gas in the US cost less than \$5 for one million British thermal units (Btu), while in the UK it cost more than \$9, and in east Asia more than \$13.

Liquefied Natural Gas (LNG) has been predicted to change this: super-cooling the methane to a liquid reduces its volume 600 times, which can then be shipped in huge

insulated tankers over longer distances; at its destination, the liquid is re-gasified and sent through pipelines.

The whole LNG infrastructure, however, is far more than costly than building a pipeline and far less energy efficient. The gas market is still unlikely to be as flexible as that for oil, because so much capital is tied up in the LNG infrastructure that returns would be miserly unless locked in to 25-year contracts.

Nonetheless, while European countries deliberate over building new pipelines to transport gas from Russia, Central Asia and North Africa into Europe, the region in fact faces a gas glut because of recent developments in the United States. New techniques of hydraulic fracturing and horizontal drilling have enabled shale gas to be extracted in such quantities in the US that the country may not need to import gas for at least the next 100 years.

But companies in Russia, Nigeria, Australia and Qatar have all built massive and expensive LNG plants in recent years intending to sell gas to the US. Asian countries such as South Korea, Taiwan and Japan (the world’s largest LNG importer) already have more than enough gas from Indonesia, Australia, Malaysia and Brunei. For all the hype about emerging nations’ energy consumption, China, India and Brazil simply do not have the capacity to use much more gas.

The sudden evaporation of US imports and the lack of markets elsewhere means “there is literally nowhere else for LNG to flow to except Europe.”⁵⁶ The key issue for natural gas, whether in North America or in Europe, is not managing supply, but

creating new demand to soak up the increased production.

Furthermore, the US State Department is promoting its Global Shale Gas Initiative. The more that countries develop their own shale gas – China, India, Poland, Bulgaria, France – the more that exporters of LNG from Qatar and Nigeria will have to work to find a destination for theirs. Gas analyst Nick Greely concludes that the greatest risk for the UK in exploring for shale gas underneath urban areas of Lancashire is “locking itself into structures based on out-dated realities”.

With such a glut, it is not surprising that natural gas is considered to be the world’s fastest growing primary energy source. A June 2011 report from the International Energy Agency (IEA) predicted that the use of natural gas could rise by more than 50 per cent by 2035 from the previous year to overtake coal as the second-most used fuel, accounting for more than one quarter of global energy demand by that time.⁵⁷

Natural gas is often described as a “transition fuel” to serve as a bridge during a societal shift away from fossil fuels, but the Royal Dutch/Shell company (soon to earn more from gas than oil) is adamant that gas is its final “destination”.⁵⁸

Gas is promoted as the cleanest and most environmentally friendly fossil fuel because it releases less sulphur, carbon and nitrogen and fewer particulates.⁵⁹ But it was the IEA Executive Director who pointed out in June 2011 that natural gas is still a fossil fuel and no panacea for climate change.⁶⁰

have a full internal market in electricity and gas, has been to keep as much of their power *out of* the half-hourly wholesale market as possible by signing long-term contracts directly with the retail companies at prices not related to the market price⁶¹ (gas is sold between countries on a similar basis for similar reasons). Better still, from their perspective, the generators buy retail companies so that the power they generate is sold directly to their own consumers.⁶² As a result, trade in the visible market represents just 1-2 per cent of all electricity generated, which is so negligible that “price signals are unlikely to be dependable enough to base billion-pound investment decisions to build new power plant on”.⁶³

The crisis of overaccumulation

Underinvestment is now a feature of liberalised electricity and gas provision – despite the promise that ending (state and private) monopolies and creating competition would create the incentives to invest. The result is a cycle of poor maintenance, overuse of ageing assets and a lack of spare capacity that has brought blackouts to many countries (even when they have ample supplies of the primary generating fuel) and has severely hampered the development of new technologies to aid the transition away from fossil fuels.⁶⁴ In Brazil, the privatisation of the electricity distribution system was abandoned after investment in new plant collapsed, leading to severe energy shortages in 2001.⁶⁵ In Chile, market liberalisation’s poster child, the introduction of markets “encouraged power firms to postpone or avoid altogether the installation of additional generation capacity,”⁶⁶ resulting in shortages in 2007-2009 that triggered a 1,000 per cent price rise. The government had to intervene, spending over \$1 billion dollars in price support.⁶⁷

Market proponents blame underinvestment on the poor design of markets, insufficient or delayed permits for new plant, regulatory uncertainty or continuing government interference. The solution? To deepen and extend market mechanisms still further,⁶⁸ including invoking trade and investment agreements to “compel states to respect the liberalization promises that they make in order to attract foreign capital and technology in the development of their electricity production”.⁶⁹

What is not mentioned is the intimate connection between underinvestment and the priority of private sector companies to return profits to shareholders. Pressure to do so has been exacerbated by the dominance that financial markets and institutions have gained over manufacturing, rendering “material production somewhat irrelevant to the accumulation of capital”.⁷⁰

This shift reflects broader structural changes in the economy. The globalisation of production and growing price competition from lower wage rivals led to a progressive fall in rate of return on investments in productive industries. By contrast, speculating on the values of different assets – making profit out of price differences over time or place, such as those of houses or oil – has become increasingly attractive (and feasible). Moreover, the scope for extracting short-term profit from such speculation has been dramatically increased through the creation of derivative-based instruments put together by financiers in the wake of financial deregulation in the 1970s (*see* Box, “Derivatives”, p.48).⁷¹

Derivatives

There are three basic types of derivatives:

i) a *future*, a tradable agreement to buy or sell a specified asset at a specified price and date in the future;

ii) an *option*, which confers the right – but not the obligation – to buy or sell an asset in the future at an agreed price in return for a small down payment, known as a premium;

iii) a *swap*, which is an agreement to exchange assets – for

example, different foreign currencies or interest rates – at agreed prices on some specified date in the future.

In all three types, the value of the derivative depends on the future price of the underlying asset that is to be exchanged. When investors purchase derivatives, they are betting on the future direction of the market in a particular asset – will prices for the asset go up or down? – but without actually owning the tangible asset involved. They are speculating on the price, say, of

frozen orange juice without actually owning the orange grove from which the juice is made.

In financial markets, the quality, volume and price of the underlying asset do not matter – what matters is price difference: over time; across products such as different types of crude oil; across markets; or the difference between a price determined by financial market activity and the price of a physical product delivered somewhere and determined by other factors.

This “crisis of overaccumulation” – the desperate attempt to find profitable channels for surplus capital – has played out in several ways that affect investment in the energy sector. To keep a company’s share price up and enhance quarterly dividends to shareholders, management has diverted capital away from research and development,⁷² the deployment of new technologies, the building of new plants, and even from exploration for new oil fields and maintenance and expansion of old ones, channelling it instead to other avenues so as to boost “shareholder value”. One means of doing so has been for companies to repurchase their own shares, which keeps up the price. From 2000 to 2009, for instance, oil giant Exxon Mobil spent some \$163.7 billion buying back its own shares, “even as there is a need for large-scale investments in energy alternative”.⁷³ In 2005, the six largest international oil companies reportedly invested \$54 billion in production, but paid out \$71 billion to shareholders in the form of share buy-backs and dividends,⁷⁴ also benefiting senior management who made vast personal fortunes when they cashed in stock options at artificially inflated prices.⁷⁵ Pressure to maintain this shareholder value can translate into “cost cutting” if revenues are not high: paring down operating costs and slashing jobs. Shell announced some 5,000 job cuts in 2009 while shareholders still received their quarterly dividends.⁷⁶ Large utility companies have done likewise, losing irreplaceable skills and experience in the process. Safety at refining and generating plants can be put at risk. Most disruptions in oil supplies, for instance, are the result of refinery accidents or pipeline problems.

Speculation and market manipulation

Boosting quarterly returns to shareholders has also led to investors and oil, gas and utility companies deriving an increasing proportion of their profits from speculative trading in derivatives – futures, swaps, options and other contracts on the future sale of oil and power supply – rather than actual sales of oil, gas and electricity. The consequences are three-fold:

- first, many investors are unwilling to invest in production (including energy generation) because they make higher profits from financial speculation;
- second, oil and gas and utility companies themselves have fewer internal funds available for investment because they are diverted into speculation and dividend payments;⁷⁷ and,
- third, the speculative gaming of financial markets can racket up not only huge profits but also huge losses, which translate into even lower investment in real assets or even bankruptcy (US energy utility Dynegy lost \$14 billion from speculative trading in 2001 following the deregulation of the US electricity wholesale market, whilst several other companies went bust).⁷⁸

Many oil and gas and utility companies do not account separately for the profits they derive from trading in derivatives,⁷⁹ but some figures can be garnered from occasional filings to the US Securities and Exchange Commission and other regulatory bodies. In 2005, for example, oil multinational BP disclosed that it earned \$2.97 billion from overall derivatives trading, with \$1.55 billion coming from the oil market and \$1.31 billion from bets on natural gas,⁸⁰ suggesting that speculative energy trading accounted for one-fifth of the company's declared profits.⁸¹

Market manipulation and outright criminality are frequent features of the increased use of financial markets to ramp up profits. The most notorious example is Enron, the US energy multinational that went spectacularly bust in December 2001 after its bets went sour and billions of dollars of losses came to light. The European Commission believes that such speculation has led to higher energy prices, costing the consumer billions of dollars.⁸³ Enron and other energy traders also got power plants to shut down their power generation in order to push prices up, causing a wave of power cuts that affected Californians in 2000 (see Box: "Fat Boy, Get Shorty, Death Star", pp.50-51).⁸⁴ Such outages, however, are frequently cited in energy security stories as an illustration of fossil fuel supplies running out.

Although derivative-based energy trading in the US shrank dramatically in the wake of the Enron scandal, the practices still continue.⁸⁵ Indeed, derivative-based energy trading is coming full circle: the commercial extraction of shale gas in the US is prompting its resurgence because the "real money" lies not in its sales but in risky transactions.⁸⁶ European multinationals, such as EDF (France's state-owned energy group), RWE (the German power company), E.ON (Germany's largest utility) and Gazprom (the Russian government-controlled natural gas company) are all showing an interest in setting up US energy trading desks.⁸⁷

"Finance finances itself, but does not finance investment."

*Gérard Duménil and Dominique Lévy
Capital Resurgent, 2005.*⁸²

Price signals for what?

Speculation and market manipulation mean that prices do not reflect actual supply and demand, skewing the price signals sent to investors (signals that are distorted against public welfare anyway). But two

Fat Boy, Get Shorty, Death Star: Enron's rollin' California blackouts

*Rollin', rollin', rollin',
Though the state is golden,
Keep them blackouts rollin', statewide.*

(Chorus) *Turn 'em on, turn 'em off, Shut 'em down, block 'em out,
Turn 'em on, turn 'em off, statewide!
Brown 'em out, black 'em out, Charge 'em more, give 'em less,
Let the pols fix the mess, statewide!*

The "California Sing-along",
widely circulated among electricity generators and traders in 2001
(to the theme music of the 1960s' TV western *Rawhide*)⁸⁸

In 2000, blackouts rolled across California during a heat wave, affecting thousands, then millions, of people. In 2001, as they continued, the state governor declared a state of emergency. California's largest utility went bankrupt, as did its Power Exchange. By the end of that year, Texas-based wholesale energy trader Enron had also gone bust as its layer upon layer of accounting fraud collapsed. Subsequent investigations revealed its role in manipulating electricity prices and supply in California, creating electricity "shortages".

The process began in 1996 when California passed legislation to turn its system of regulated (privately-owned) monopolies into a competitive wholesale electricity market, which would "guarantee lower rates, provide consumer choice and offer reliable service, so no one literally is left in the dark," according to the state governor.

Before the legislation, three investor-owned, utility companies provided three-quarters of California's electricity under strict price regulation based on the cost of providing power. So that there would be more players in the market, the legislation "encouraged" the three utilities to sell or divest their fossil fuelled generating facilities (retaining the nuclear and hydroelectric ones) to five

large, wholesale energy companies known as merchant generators. Because the major utilities now produced less than half their customers' electricity, they had to buy additional electricity through a newly-created wholesale auction market, the Power Exchange or PX.

The merchant generators, however, could now ramp electricity generation up or down and thus largely controlled – and manipulated – the price of electricity in California, acting in concert with traders such as Enron.

They began to take power plants offline for "maintenance" in days of peak demand to increase the price. From July to December 2000, during the hours when Californians most used electricity, generators withheld on average enough electricity to power more than 1 million homes. On 8 occasions when the grid operator declared a power emergency, generators falsely reported that units could not be operated because of mechanical problems. Another 22 times during emergencies, generators simply shut down units. One major gas company withheld capacity on its pipeline system to drive up prices of gas-generated electricity. At the time of the blackouts, California had installed generating capacity of 45GW, but demand was just 28GW.

Withholding electricity to increase its price was just one of a series of "games" that came to light when California's Attorney General compelled Enron to make available its internal reports that detailed its strategies to manipulate the California electricity market.

Another game was "round-tripping" to inflate the market price, by definition the price at which the last trade took place.⁸⁹ One company sold electricity to another, but the second firm simultaneously sold the same electricity back to the first at the same price. The practice made both companies appear more successful than they really were, adding at least 10 per cent to trading revenues.

An additional ruse was to get paid by the state to relieve congestion without actually moving any energy or relieving any congestion. Because power lines can take so many electrons and no more, electricity transportation has to be booked (or scheduled) in advance. Scheduling more line usage than was actually required created the illusion of congestion, triggering the state's payment of various financial incentives to alleviate overcrowding on the major power lines.

A further ploy was to arbitrage

the (capped) price of electricity generated within California and the higher price of that imported from out-of-state.

Traders thus bought in-state power, flipped it out-of-state to an intermediary in another state, then bought it back for resale into California at the “imported” price. The technique was dubbed megawatt laundering, but Enron called the game “Ricochet”.

Indeed, so that its traders knew which game was going on at any one time, Enron gave all the different trades different

monikers: Fat Boy, Get Shorty, Death Star, Ricochet, Ping Pong, Black Widow, Big Foot, Red Congo, Cong Catcher.⁹⁰

In 2000, Enron CEO Kenneth Lay said of the efforts made by the California Power Authority to thwart the practices of the energy wholesalers:

“In the final analysis, it doesn’t matter what you crazy people in California do, because I got smart guys who can always figure out how to make money.”⁹¹

In 2001, the Federal Energy

Regulatory Commission intervened, imposing price caps that meant merchant generators could no longer generate profit by lowering their power output. Instead, they increased their hours of operation and the shortages faded.⁹²

The gaming shrank dramatically, but many of the trading practices still continue in California and elsewhere.⁹³ As the Chair of the California Power Authority said in 2002:

“a market approach for electricity is inherently gameable.”⁹⁴

further features of financialisation have important implications for innovation and investment, and are additional diversions from making a transition away from fossil fuels.

A market in which “energy” is (falsely) regarded as “just another commodity,”⁹⁵ (it is not because it is essential to survival) is predicated on the removal of government-set prices for oil, gas and electricity. Without price control, however, markets bring uncertainty, unpredictability and insecurity, often causing “a kind of trading frenzy that results in price volatility.”⁹⁶ To protect against such volatility, market participants have developed a range of financial arrangements such as futures and options to “hedge” against price rises and falls by “locking in” energy prices over a specified period of time to protect themselves. But this security system relies on speculation. An airline seeking to buy its fuel at a specified price in six months’ time, for example, has to find someone willing to sell the kerosene at that price. To ensure a buyer for every seller and a seller for every buyer, the market needs intermediaries who have no intention of actually taking physical delivery of what they buy – so many barrels of a certain type of kerosene or oil from a particular place at a specified time – but who “move in and out of trades in search of profits.”⁹⁷ The speculator is thus enshrined within the system: “without the speculator, the would-be hedger cannot hedge.”⁹⁸

The first market in oil futures and options opened on the New York Mercantile Exchange (NYMEX) in 1983, quickly followed by similar markets in London, Singapore, Tokyo and Dubai. Until the 1990s, the number of futures’ contracts a market participant could hold was limited.⁹⁹ But following lobbying by large investment banks with specialised trading departments, such as Goldman Sachs, exemptions were granted from the rules on position limits when banks hedged against derivative-based “swaps” they had arranged privately outside the official exchanges.¹⁰⁰ Speculators, such as wealthy High Net Worth Individuals,¹⁰¹ Exchange Traded Funds,¹⁰² pension funds, sovereign wealth funds and hedge funds, flooded into the market, buying oil futures, in effect “paper barrels of oil”. The oil market became “hybridized”¹⁰³: oil was no longer bought solely as a physical commodity to power airplanes,

ships, trucks and automobiles transporting oil-based goods, but also as a hedge against the dollar falling or conflict breaking out in the Middle East (when oil prices would rise and those of other assets would fall).¹⁰⁴

Such hybridisation opened up profitable alliances between oil companies and those buying oil futures as a hedge against inflation, as a former director of the International Petroleum Exchange in London explains:

Oil derivatives: crude oil and paper oil

A *futures* contract commits trading parties to make or take delivery of a quantity of oil on or before a fixed date at an agreed price fixed in the contract. The contract also fixes a specified location and a period (typically one month) during which the contract can be exercised. The contract can be settled physically – actual delivery – or financially – for cash.

A *forward* contract is very similar but, unlike a futures contract, its terms are not standardised. It is not arranged through an official exchange and there is therefore no requirement to put up an initial amount of cash or “margin”.

Most oil futures contracts trade on the relatively immediate future, but contracts exist that contemplate oil prices 6 to 9 years ahead. The value of an oil futures contract is heavily shaped by perceptions of insecurity and “scarcity” – whether due to conflict and war or to changing patterns of demand.

Where the value of a *future* barrel of oil is higher than its *current* price, as it has been recently, the market is said to be in “contango”. In such circumstances, it is financially more attractive to put oil on hold (rather than sell it). Indeed, high oil inventories over the past few years are partly a direct result of oil being held in storage (quite literally in oil tankers) to supply the futures market.

Swaps are purely financial.

Unlike futures, there is no obligation to make a physical delivery of oil: rather the contract is settled through a cash payment. Swaps take many forms, but the simplest and most common involves one party paying another for a specified amount of oil at a fixed price in exchange for receiving a payment for the same amount of oil at a “floating price”, an average of spot prices over the contract period.

More complicated swaps allow traders to exploit price differentials between delivery dates (“calendar spread”), two or more products (crude oil and heating oil, or crude oil, heating oil and gasoline), and across different types of energy (electric power and natural gas, or electric power and coal).

When a swap or futures contract confers the right, but not the obligation, to buy or sell oil at a specified price in the future, it is known as an *option*. The holder of an option pays a premium that reflects perceived market volatility: low premiums imply a perception of a less volatile market in the future, high premiums the opposite.

For the option to be profitable for its holder, the settlement price has to increase above the premium, not above the price fixed in the contract as in a futures contract.

Thus perceptions of future market volatility and of energy insecurity, expressed by means of an options premium, affect the price of oil actually traded.

Moreover, options allow speculation on the volatility of market volatility, as well as the volatility of the market price, exploiting not only price differentials, but also the difference in price differentials.

Oil derivatives – futures, forwards, swaps and options – are traded either on an exchange or over the counter (OTC) in direct transactions between two parties. OTC derivatives are the prevalent form of trade in physical oil, because they are more flexible in their terms: price, amount, quality and location of delivery. (OTC derivatives can now be settled, however, through the Nymex and Singapore exchanges and the London Clearing House.)

Derivatives derive their profits from arbitrage opportunities created by differences in prices of the same (or similar) asset across space and time. Because such differences are now so small and transient, however, profitability depends on the speed, flexibility and mobility of large sums of money. This means that derivatives’ trading not only contributes to market volatility but, in order for it to be profitable, depends on it.

Introducing a financial logic into “Energy”, particularly oil, introduces parallels in space and time between oil as a physical commodity circulating in physical (and financial) markets and oil as a financial asset circulating in financial (and physical) markets.¹⁰⁵

“The concept of ‘hedging inflation’ was originated in the mid 1990s by the ‘smartest kids on the block’, Goldman Sachs, as a marketing narrative for their Goldman Sachs Commodity Index (GSCI) fund. This innovative fund was invested in a portfolio of commodities – of which oil had the greatest share – through buying and ‘rolling over’ futures contracts from month to month.”

Over the years, other market participants cottoned on to the potential:

“Oil producers wishing to lay off or hedge the risk that oil would lose value relative to the dollar found that these risk averse ‘inflation hedgers’ aimed to do precisely the opposite by hedging the risk that the dollar would lose value relative to oil.”¹⁰⁶

Investment banks and traders brought these two opposing but complementary constituencies together, providing financial services to them that made massive profits despite little risk or use their capital. Oil companies such as BP and Shell accommodated these financial investments in the oil market, enjoying close relations with major market players: for 12 years, from 1997-2009, BP had the same chair as Goldman Sachs International, Peter Sutherland (who became the first director-general of the World Trade Organisation in 1995), while from 2005 Shell embarked on a joint venture with ETF Securities, which arranged the world’s first oil exchange-traded commodity. Through their selling and buying of crude oil contracts directly with each other – “off-exchange” instead of via the oil markets – “oil producers were essentially able to lend oil to the funds, and to borrow dollars interest-free from the funds in return”.¹⁰⁷

The combination of hybridised speculation and the sheer number of speculative trades (the volume of oil futures traded on NYMEX rose 30-fold between 1984 and 2004) means that the price of oil is increasingly volatile and increasingly detached from actual supply and demand. Instead, the price reflects “virtual demand” created by the trade in paper barrels – useless to guide future investment in actual delivery of “energy”.

Critically, financialisation and maintaining shareholder value also change the lens through which price signals are interpreted. Rising oil prices *should* translate into increased investment in cheaper forms of energy, but instead justify exploiting higher cost “unconventional” oil, such as tar sands in Canada and Venezuela, with their massive impacts on the environment and local communities (and higher carbon emissions). Why? One reason, suggests geographer Mazen Labban, is that oil companies are valued on stock markets by the size of their oil reserves.¹⁰⁸ Even though such companies make more and more of their profits from speculation, their value within stock markets remains rooted in their production of oil. To maintain such value (and thus returns to shareholders) reserves must therefore be increased (*see* Box, “The quest for bookable reserves”, p.54). Because burning all the fossil fuel reserves booked by major oil, gas and coal companies would push the world into runaway climate change, the bulk of these reserves should be treated as “stranded assets”,¹⁰⁹ leading investors to place their money elsewhere. That they are disinclined to do so suggests the market is the most *inefficient* means of incentivising and financing a transition away from fossil fuels to sustainable forms of energy production, distribution and consumption.

The quest for bookable reserves

“Reserves are an economic, not a physical, concept.”¹¹⁰

An oil company’s value on the stock market depends on perceptions about its ability to generate profit in the future rather than the value of its material assets in the present (which is practically impossible to determine anyway).

But this ability is associated with the company’s material assets in that shareholders measure an oil company’s prospects by the reserves from which it can extract in the future – the economically recoverable oil known to exist in fields for which the company has a contract with a host government. As a company extracts oil, “it must find more in order to maintain or preferably increase its level of reserves.”¹¹¹ If it does not, its reserves base will decline and thus its share price.

Thus, even when profits seem to derive from financial markets and investment is disciplined by the dictates of finance, profits are still tied to the realisation of value from the extraction and trade of

physical oil, in order for wealth in the form of “financial claims on expected future earnings” to materialise as profit.¹¹²

Although international oil companies have always been on the look-out for more oil, they now find it ever more difficult to replace their reserves,¹¹³ despite all the exploration by specialist companies in inhospitable, deep water and unconventional places. In practice, all the oil has been located even if it can’t be extracted. They have thus been striving to gain contracts in places where oil has already been found.

The world’s most substantial deposits of oil are in the Middle East, but are under the control of national oil companies. Each of them has different arrangements with international oil companies ranging from production sharing agreements to joint ventures to technical service arrangements to no involvement whatsoever.

The quest for bookable reserves casts a different light on the 2003 invasion of Iraq, whose vast oil deposits are easy and cheap to extract.¹¹⁴ At the turn of the 21st century, however, Iraq’s national

oil company was extracting from just one-third of the country’s known oilfields,¹¹⁵ because international sanctions prevented the Iraqi oil industry from rebuilding infrastructure damaged during the eight-year Iran-Iraq war and the First Gulf War. If it was just oil the West wanted, all it needed to do was drop the sanctions.

After the US and UK invasion caused more infrastructure damage and prompted many expert Iraqi oil workers to flee the country, some 60 billion barrels of known oil were handed over in contracts to international companies, the largest ever in the history of the oil industry.¹¹⁶

In September 2004, a British strategy document suggested:

“a modernised, transparent and investment-friendly energy sector in Iraq will be a strong exemplar to other Middle East oil and gas producing countries.”¹¹⁷

In other words, Iraq was only the start. The goal is to re-shape the whole region’s oil industry, not for the oil but for the reserves.¹¹⁸

Fickle finance

The investment that has taken place in energy systems is itself disciplined by the logic of financialisation, particularly the demands of investors for “above market” profits. As the financing of power generation plants, transmission systems, gas liquefaction systems and other infrastructure has shifted from the public to the private sector, companies have funded such projects (and their own expansion) by raising debt and equity – borrowing money and issuing shares. But the mechanisms through which they do so are rapidly changing.

Private equity funds are an important new source of finance in North and South.¹¹⁹ Such funds are pooled investment vehicles that buy majority shares in companies, take over their management, increase their profitability (often by stripping their assets) and then sell their shares at a profit after a few years. The contributors to the fund, the “Limited Partners”, are generally High Net Worth Individuals, pension funds, insurance companies, endowment funds and sovereign wealth funds.

These sources of money do not invest so as to provide public goods such as energy supply, but to make well above-market returns,¹²⁰ generally 30 per cent a year¹²¹ (although infrastructure investment is more in the region of 10-20 per cent).¹²² To avert catastrophic climate change, however, sustained, predictable and ensured streams of finance are needed to pay for the transition away from fossil fuels. Until recently, clean tech funds that invest in renewable energies such as wind and solar were enjoying a boom, accounting for some 10 per cent of private equity energy investment. But the surge began to falter in 2009,¹²³ with investment declining by 30 per cent in the third quarter of 2010.¹²⁴ In a predictable pattern of “fad” finance,¹²⁵ many predict that the clean tech bubble will soon burst as the financing moves to another sector in the hope that it will be more profitable.

The logic of financialisation acts still further against secure, long-term funding for a transition by necessitating the use of ever riskier financial instruments to leverage capital, enhance profits and off-load risk onto others.¹²⁶ When things go wrong, state funded programmes that could assist a transition have repeatedly been cut to pay for taxpayer bailouts. The “nationalisations” of UK retail banks in 2008 and the austerity measures being imposed across the eurozone are only the latest examples. In Spain, a government-subsidised feed-in tariff scheme for solar photovoltaic panels was slashed as part of the cuts imposed by the financial crisis.¹²⁷

Yet instead of reining in such financialised forms of finance, governments are seeking to expand their availability through the creation of new markets in carbon and ecosystems services, which will do nothing to avert runaway climate change and is likely to make it worse.

Carbon “market failure” markets – delaying action, furthering financialisation

Proponents of market approaches to “energy security” acknowledge that markets fail to send the “right signals” when it comes to adverse environmental impacts: hence, as they would explain it, continued investment in climate damaging forms of energy production and use. Other environmental impacts, such as those from the toxic pollutants emitted by power plants or the loss of “ecosystem services” (the disruption of hydrological flows due to coal mining, for example), are similarly explained as the consequence of such impacts escaping capture by current market mechanisms.

In the case of climate change, this failure is generally ascribed to a failure to “price” carbon. The envisaged solution is to make carbon increasing “scarce” through the limits on its use imposed by states and then to create tradable legal rights to carbon that can be traded. The ensuing buying and selling of those rights supposedly generate a price that reflects the value society (that is, governments) place on using the atmosphere as a “carbon dump”. Emitters who find ways of using the dump more efficiently are incentivised to do so because the market

enables them to profit by selling their unused rights to more backward producers. In the process, the market helps “society find and move along the least-cost pollution reduction supply curve”.¹²⁸ In theory, a structural shift to a low-carbon economy is thus delivered by an “accumulation of private enterprise carbon-reduction innovations”.¹²⁹

But far from enabling a transition away from fossil fuel sources of energy, carbon markets are delaying such a transition, whilst creating multiple new opportunities for further financialisation, posing systemic risks to the financial system.

Giveaway profits

In the case of the European Union’s Trading Scheme (EU ETS), now the world’s largest carbon market, carbon dioxide (CO₂) pollution rights were “produced” in a preset amount by strokes of politicians’ and bureaucrats’ pens. They were then sold or given away free to large private sector polluters – a pattern that holds for other markets. The effect was not to reduce the use of fossil fuels but to reward those who

Carbon trading – delaying a transition away from fossil fuels

If emitting carbon dioxide and other greenhouse gases is limited by permits that have a (high enough) price, companies will reduce their emissions. If these permits can be traded between companies upon which emissions limits have been set, the reductions will take place wherever it is cheapest to cut them. By setting the maximum volume of emissions that can be released, this market-based system will provide price and technology incentives to achieve the required reductions in the cheapest possible way. This is the theory upon which carbon trading is based.

Such an approach contrasts with straightforward bans on polluting technologies or taxes on emissions: instead, carbon trading attempts to regulate by setting a maximum permissible emission level.

In a typical “cap and trade” scheme, a governmental body sets an overall limit or “cap” on emissions over a specific period of time, and then distributes a fixed number of

permits, often for free, to entities releasing those emissions. Each permit is considered equivalent to one tonne of carbon dioxide, and a polluter included in the carbon trading scheme must hold enough permits to cover its emissions. The cap is meant to be gradually reduced over time, thereby reducing emissions to a pre-determined level.

If a polluter does not need all its permits, it is allowed to sell them to another entity that would exceed its legal limit without purchase of additional permits. The theory holds that polluters would be encouraged to reduce their carbon dioxide emissions so they minimise their expenditure on permits, or can even profit from selling their spare permits.

Accurate monitoring and measuring compliance with the set limits should play an important part in cap-and-trade theory. Once a cap is set and permits allocated, emissions have to be measured to ensure compliance. But because measuring carbon dioxide emissions is considered too expensive, or in some cases,

the technology to measure emissions directly does not even exist, emissions are approximated. Government officials, scientists and technical experts are delegated to calculate the number and movement of carbon molecules in their passage from underground fossil fuel deposits through smokestacks or tailpipes to cycling among air, water, ground and plants, while other officials use the criterion of physical location to assign responsibility for molecule flows to countries and corporations.

Offset credits are a supplementary source of permissions to emit. They can be bought from projects outside the cap. Offset credits allow an emitter subject to a cap to exceed its limit by paying someone else somewhere else to reduce *their* emissions instead.

Credits have been granted to hydroelectric dams, tree plantations, projects to capture methane from industrial livestock facilities, and urban waste dumps, often usurping land, water and air on which communities depend. Many offset projects

currently pollute most. For example, many European corporations sold or charged their customers for surplus emissions rights that they had received *gratis* under the EU ETS, ploughing the proceeds back into fossil-fuelled business as usual.¹³⁰ European power companies alone are set to gain US\$127 billion in windfall profits through 2012 through the EU ETS;¹³¹ the handouts given to only 10 of Europe's intensive industrial users of fossil fuels exceed the total EU budget for environment.¹³² Importantly, what the EU ETS creates rights to and distributes to the private sector is not merely a local or national public good, but a global public good.

Molecules or outcomes?

But the problems of carbon trading go far deeper – and are far more intractable – than the EU ETS's poor design.

A prerequisite for carbon markets is the transformation of carbon into a commodity that has equivalence in all the markets, wherever they might be, where it is traded. In order for the market to work, one tonne

are located in the global South where it is often cheaper to reduce emissions. Fundamental to the concept of offsets is that the credits they generate originate not just from emission reductions, but from *additional* reductions – without the offset project, they would not have occurred. Why is this important? Because the offset credit allows the purchaser to emit extra emissions over and above its cap. If the offset credit was not additional, these extra emissions would amount to increased emissions into the atmosphere.

The problem with this additionality requirement is that it relies on knowing what would have happened without the project. As investigative journalist Dan Welch put it:

“Offsets are an imaginary commodity created by deducting what you hope happens from what you guess would have happened.”¹³³

And because such imaginary offset credits are not verifiable, most emission reductions “exist” on paper only.

Carbon markets operate today under the aegis of the UN (the

Kyoto Protocol), the EU and a variety of state and non-state actors. The EU's Emissions Trading Scheme (EU ETS) is the largest by far, taking a 97 per cent share in 2010.

In the EU ETS, polluters have often been given more pollution rights than they need to cover their existing level of emissions. In addition, demand for permits fell further when production fell because of the ongoing financial crisis: cap-and-trade regulation of the volume of emissions did not provide for maximum emission levels to be adjusted if economic conditions changed. Emission reductions were achieved simply through reduced output. The result? Carbon prices dropped to record low levels.

To date, the price has never been high enough to force a significant transformation away from fossil fuels.

The “carbon” market has now expanded beyond companies with too many or too few permits and offset providers with credits for sale trading with each other. Some of the biggest buyers of credits are banks whose greenhouse gas emissions are not

covered by any cap: they are in the market not to reduce the cost of complying with emissions limits but to make money from price volatility and instability.

A wide variety of financial-sector speculators now sell a broad range of derivatives in the market: they buy permits and credits, bundle them together, repackage them and sell on. Trading in carbon derivatives has now overtaken simple transactions involving permits and credits. Indeed, financial speculation in 2010-2011 was the driving force of the carbon market rather than compliance with emissions targets.

Carbon trading may give the impression of action to tackle climate change, but its function is to create a new asset that can be bought and sold without affecting fossil fuel dependence and to keep other climate initiatives at bay.

Ultimately, carbon trading provides incentives in both North and South to delay making the structural changes necessary in our societies away from the extraction and burning of fossil fuels.¹³⁴

of carbon emitted or reduced in Indonesia, for example, has to be treated the same as one tonne of carbon emitted or reduced in the United States. Without such equivalence, trading is not possible.

To ensure such commensurability, carbon markets treat carbon solely as a molecule – CO₂. Climate benefits and harms are thus measured simply by quantifying flows of molecules, regardless of the degree to which a particular trade fosters or hinders structural change away from fossil fuels, and thus lowers CO₂ levels, over the long term – which must always be the criterion for effective climate strategy. Market architects in economics departments, trading firms, NGOs – and, ultimately, states and UN agencies – have this made possible through a cascade of profit-generating, but wholly implausible, equivalences: for example, that a cut of 100 million tonnes of CO₂ through routine efficiency improvements is the “same” as an equal cut that comes from investment in non-fossil-fuelled technologies, despite the two actions playing a vastly different role in the extent to which they help “change

direction” in terms of fossil fuel use; or that carbon reduced through the use of one technology (gas flaring, for example) is the same as carbon reduced through another (wind power); or that carbon reduced by conserving forests is the same as carbon reduced through keeping oil in the ground.

Still other equivalences between carbon dioxide molecules and other molecules (those of nitrous oxide, methane and various chlorofluorocarbons) are posited in terms of their potential to cause global warming, despite their qualitatively different behaviour in the atmosphere over various time spans as well as the different influence the control of each might have on fossil fuel use.¹³⁵

“The carbon market’s use of carbon dioxide molecules disembods climate change from the history of fossil fuel use and re-embeds it in the movements of molecules emitted ‘by’ bounded nation states and corporations. This is an ideological as well as economic operation.”

Larry Lohmann, *“Financialization, Commodification and Carbon”*, 2012. ¹³⁶

Incentivising delay

Such equivalences do little to incentivise any real long-term strategies for keeping coal, oil and gas in the ground. On the contrary, they permit – indeed encourage – delay in taking action to slow and, ultimately end, the extraction of remaining fossil fuels. For example, routine efficiency improvements at exceptionally dirty, coal-intensive iron works in rural India can generate cheap offsets that help high-polluting electricity generators in Europe – often, as elsewhere, sited in poorer communities – continue business as usual at the lowest possible cost in the face of EU restrictions on emissions.

Like some other ambitious forms of market environmentalism, carbon offset trading not only morphs existing environmental regulation toward ineffectiveness (for example, by punching holes in emissions “caps” and letting in offset credits from outside, thus “rolling back” part of the regulation that underpins cap and trade schemes).¹³⁷ It also helps head off demand for other regulatory measures more capable of addressing the fossil fuel problem in all its political complexity. It is probably not too much to say that since the 1980s, one of the unvoiced mottos of carbon markets’ more sophisticated supporters in government and the private sector has been to stop effective climate action before it starts.

New avenues for accumulation

Whilst carbon markets do little to “change direction” in energy use, the open-ended creation of equivalences has made possible a mass of new avenues for financialised profits. Invoking “equivalences” between CO₂ and other greenhouse gases, for example, the Mexican chemical manufacturer Quimobasicos is set to sell over 30 million tonnes of carbon dioxide pollution rights to Goldman Sachs, EcoSecurities and the Japanese electricity generator J-Power.¹³⁸ Assuming that destruction of HFC-23 (a greenhouse gas used in refrigerators and air-conditioning plants) can be carried out for US\$0.25 per tonne of CO₂ equivalent (CO₂e), and that a ton of CO₂ offset pollution rights can command \$19.50 on the EU ETS spot market (May 2011 prices), both the company and the financial sector intermediaries to which it sells can realise super-profits. Industrial buyers of the permits can in turn save \$128.50 a ton by using the rights in lieu of paying fines for not meeting their legal emissions requirements, while industrialists and speculators alike can turn to advantage the \$6 price differential between cheap Kyoto Protocol offsets (known as Certified Emissions Reductions or CERs) and more expensive European Union Allowances (or EUAs). Such “industrial gas” offsets – generated at a handful of industrial installations in China, India, Korea, Mexico and a few other countries – still account for the bulk of Kyoto Protocol carbon credits, helping to keep carbon pollution rights so cheap that they approach the status of a second “free allocation” of pollution rights to fossil-intensive European industry.¹³⁹ And if such offset projects help keep the wheels on fossil-fuelled industries in the North, neither do they interfere in any way with the further entrenchment of coal, oil and gas in the global South.

Relentless competition and the lure of new profit opportunities drive a similar process of continual, creative elaboration of the equation “actual CO₂e reduction = ‘avoided’ CO₂e emission” to maximize the number and type of activities that can be “avoided”. The greater the range and volume of “baseline” pollution sources that can be imagined and quantified, and the higher that counterfactual emissions “baselines” can be set, the more emissions that offset buyers and sellers can then claim to have “avoided” and the more capital they can accumulate. Thus JP Morgan, BNP Paribas, and the World Bank are avid proponents of a prospective multi-billion-dollar market in “avoided deforestation”, in which projects can produce carbon credits even if they allow an *increase* in deforestation, as long as the increase is less than what regulators agree “would have happened” without the credit. The mere prospect of “avoided deforestation” credits is encouraging land grabs across Africa, Asia and Latin America; their vast extent is directly proportional to the high-energy intensity and high carbon dioxide production of fossil fuels.¹⁴⁰

The algebra of expropriation

In general, accumulation in the carbon markets takes place not through “decarbonisation” or “defossilisation” but through the algebra of expropriation. Thus just as complex derivatives markets lost touch with what they were advertised as being “about” (the provision of certainty), carbon markets have taken the climate issue and decontextualised,

reengineered and mathematised it until little of relevance to global warming is left. Worse: in their efforts to make certainty and climate benefit “economisable”, and to deploy mass production techniques, both markets have increasingly interfered with delivery of the very social goods their proponents claimed they were providing.

One reason is what financier George Soros calls “reflexivity”, which in the financial markets involves investors’ observations, biases and calculative machinery disrupting the “economic fundamentals” they are supposed to describe, leading, if ignored, to crisis. In the carbon markets, nations or corporations, aware that they can be credited with “reducing” more greenhouse gas emissions in the year 2020 if they fail to clean up today have an incentive to stay dirty, or even to roll back pollution regulation.¹⁴¹ Firms may set up new factories to produce HFC-23 or nitrous oxide in order to cash in on the carbon market¹⁴² or start up new commodity production lines by persuading governments not to enforce or promulgate environmental laws. In Nigeria, for instance, Western oil companies (with the collaboration of UN carbon market regulators) have contracted to sell carbon credits to Italy and Norway for avoiding gas flaring activities that have been stipulated as the “baseline” in spite of the fact that these activities are illegal and unconstitutional.¹⁴³ All of this, of course, reinforces a trend toward additional emissions that can then, in turn, also be lucratively “avoided”.

Yet trying to “fix” the contradiction by recalculating the baseline against which savings are measured in order to take account of perverse incentives merely creates another perverse incentive to change the new baseline as well. As in the derivatives markets, the calculative machinery necessary for a novel market is itself undermining the possibility of market calculation as well as engendering systemic instabilities.¹⁴⁴ Just as the risk markets wound up ultimately increasing risk, their drive for expanded liquidity resulting in a catastrophic drying up of liquidity, so, too, the Kyoto carbon markets might so far even have contributed to increasing global emissions.¹⁴⁵

Unverifiable assets, systemic risks

In notable respects, the contradictions of carbon commodities are even more explosive than those affecting complex financial derivatives. In the world of finance, even a collateralised debt obligation (CDO),¹⁴⁶ although its underlying assets have been sliced, diced, and mixed in ways that make them virtually untraceable and unassessable, is, in the end, based on real, specifiable mortgages on actual houses. But the basis for a climate commodity that includes offsets cannot be specified, quantified or verified even in principle.

To manufacture offsets by counting “avoided CO₂ emissions”, a baseline must first be established with which to compare current molecular activity. This baseline must be unique, since a single value, however arbitrary, is required for exchange to be possible. Hence the calculation of “avoided emissions” not only demands the sort of knowledge human beings have never before attained, attempted or believed possible. (Which of all the scenarios that counterfactual historians and novelists have imagined might have followed a Nazi invasion of Britain is the “true” one?) It also demands, impossibly, that this knowledge come in

the form of an extremely precise quantification of the associated hypothetical molecular movements.

This impossibility of verification – and thus of regulation – gives corporations a licence to print climate money without much fear of sanction, since the distinction between counterfeit and legitimate currency is meaningless. In a carbon bubble characterised by continuing pressures to spin out fanciful equivalences involving climate and CO₂e molecules, the resulting asset valuation crisis and loss of confidence – some analysts use the term “subprime carbon”¹⁴⁷ – could trigger severe economic effects. Not only does (temporary) success in commodity formation mean failure in climate action; the functioning of the commodity itself is ultimately in question.

“Carbon commodities radically disembed the climate issue from the question of how to organise for structural, long-term change capable of keeping remaining fossil fuels in the ground.”

Larry Lohmann, *“Financialization, Commodification and Carbon,”* 2012.¹⁴⁸

energy democracy or Energy plutocracy?

“Markets” are often characterised as being irredeemably opposed to the “State”. But in political systems disciplined by financialised neoliberalism, the relationship is rarely so clear-cut: one relies on the other. The resulting interconnections create an elite that moves in and out of company and government, boardroom and parliament, restructuring both market and state to serve the narrow interests of a smaller and smaller minority.

Carbon markets, for example, are a joint project of neoliberal state and market elites. The distinction between public servants and private profiteers is often little more than a date on a résumé. Just as Goldman Sachs derivatives traders Robert Rubin and Hank Paulson both pushed for national regulation promoting the expansion of derivatives markets when they became Treasury Secretaries in the US government, so Christiana Figueres, as Executive Secretary of the UN Framework Convention on Climate Change (a.k.a. head regulator of the Kyoto Protocol carbon market) is merely continuing the carbon market work she earlier pursued in the private sector. Ken Newcombe, another leading figure, has moved smoothly from the World Bank’s Prototype Carbon Fund to Climate Change Capital (a City of London boutique merchant bank), Goldman Sachs’ North American carbon trading desk, and the carbon-trading firm C-Quest Capital.¹⁴⁹

Likewise, the expansion of private equity funds into energy infrastructure development, both North and South, has depended on state action. To attract investors, the Indian government, for instance, is rolling back environmental and social regulations, particularly those protecting poorer people against forced evictions. It has also set up a high-level committee (including the head of Goldman Sachs India) to identify “regulatory or legal impediments constraining private investment in infrastructure” and to “issue specific recommendations for their removal”.¹⁵⁰

Other countries are competing to put in place similar “investor friendly” infrastructure regimes. In The Philippines, the government recently announced that it would guarantee all infrastructure projects built on a public-private partnership basis against “regulatory risk”¹⁵¹ – the risk

that new environmental or social regulations might undermine profitability. In Indonesia, the government has set up a fund to compensate investors who “lose out” from “unpredictable” government policy changes.¹⁵² In Brazil, the government plans to spend half a trillion dollars over the next five years on infrastructure projects, including major new dams and nuclear plants,¹⁵³ and is offering private sector investors tax breaks if their infrastructure investment is part of the government’s Growth Acceleration Programme.¹⁵⁴ Even in China, where infrastructure development used to be entirely in the hands of state institutions, 60 infrastructure companies now trade on the stock exchange.¹⁵⁵

“Not only can speculation on hurricanes drive speculation on oil prices in the Gulf of Mexico, but the event of a hurricane can itself be traded as an object of speculation; similarly, changes in weather drive speculation on the price of heating oil (in cold seasons) and of electricity (in warm seasons), but they can themselves also be the underlying assets of futures and options contracts. To describe this process as the ‘financialization of everything’ does not even begin to capture the power of abstraction of the logic of finance.”

*Mazen Labban, “Oil in parallax”, 2010.*¹⁵⁶

With state and commercial interests intermeshing to promote energy markets, the role of the state in securing the public interest has become increasingly eroded. Public participation in decisions relating to energy generation, distribution and consumption is narrowed down to the limited decisions that people can make as consumers, notably their “freedom” to switch energy supplier. But market choices are no substitute for active debate and negotiation over how best to secure the right of all to the energy they need to survive. Where everyone, not just those who pay electricity bills, is involved in such a debate, the outcomes are invariably very different from those planned for them by financiers, corporate managers or state bureaucracies. As anthropologists Laura Nader and Stephen Beckerman point out:

“Historically the mode of energy use in industrialized society has been determined by producers rather than users . . . Utilities preferred central power systems so that they could retain control over all productive facilities . . . When quality of life becomes central, the dialogue on energy changes. In such a dialogue, the user must have equal time: production and per capita expenditures of energy may then be secondary to the purposes for which energy is used and to the forms of energy production.”¹⁵⁷

The financialisation of energy takes decision-making processes in the opposite direction. Key decisions as to how energy is delivered, using what fuel and for whose benefit become the prerogative of private investors and companies. Unsurprisingly, the infrastructure favoured is that which maximises their profits, regardless of any wider public interest and longer-term climate implications. Indonesia’s second largest thermal coal producer, Adaro Energy, for example, is explicit that its plans to build the country’s largest coal-fired power station are intended to “create a significant base demand” for its coal.¹⁵⁸ It is using infrastructure to lock society into an energy path that serves its corporate agenda, despite the devastating implications for climate change. If “a change in direction” is to be forthcoming in energy generation and use, the need to reclaim democratic control over such decision-making is paramount.

For what we have now is not democracy: it is plutocracy.

The problem with “Security”

“Bringing energy into the security domain is likely to affect the manner in which energy policies are pursued.”

Felix Ciuta, “Conceptual Notes on Energy Security”, 2010.¹

In an attempt to understand the term “energy security” and its politics, this report explores a crucial ambiguity between the multiple, vernacular “energies” of everyday subsistence – energies for cooking food, keeping warm in the winter and so forth – and the abstract Energy of industrial growth and capital accumulation. One source of confusion in the “energy security” debate is that it often mixes these historically and politically different senses of “energy” (*see pp.8-20*).

But the word “security” is also ambiguous – and can be another obstacle to clear thinking and good policymaking. This ambiguity, as well as that which afflicts “energy”, is an open invitation for deception and demagoguery. Even more than the ambiguity of “energy”, it can make it easy for politicians and their advisers to use fear to push regressive and militaristic social and environmental programmes.

Lower-case vs. Upper-Case “security”

Two opposed meanings of the word “security” are especially important. As with “energy,” “abundance” and “security”, they can be labelled with lower-case, small “s” and upper-case, capital “S” letters.

On the one hand are the mundane, plural protections of subsistence: holding the land you work and depend on; having a roof over your head; being able to count on clean water and regular seasons; knowing you can walk home without being assaulted by thieves or marauders; getting a good enough price for your crop to make ends meet; above all, knowing you have the right to the wherewithal for survival. Although terms like “secure land tenure”, and, more lately, “food security”, are bandied about, the abstraction “security” is not often used in such quotidian contexts, any more than the abstraction “energy” is commonly used to describe a red-hot stove or a horse pulling a plough. But such meanings have always been implicit even in official discussions of “security”, waiting to be called upon when needed.

The other sense of “security” is an upper-case sense. This is the Security that matters particularly to ruling elites: security of property and privilege, as well as access to enough force to contain any gains made by, or to counter the resistance of, the dispossessed or deprived. Traditionally the business of lord or state, Security has always had an uneasy, ambivalent relationship with the lower-case “securities” of the commons. The law was used to take people’s land and subsistence away, but it could also occasionally be mobilised in their defence. The lord or the state’s ability to make war was typically used against many of the common people both at home and abroad, but could also enlist a willing community to defend territory and livelihoods against common enemies.

“Energy security” as a common foreign policy?

Russia’s January 2006 gas price dispute with Ukraine (and subsequent disputes with Belarus) provided a “window of opportunity” for the European Commission to push not only for the completion of its internal gas and electricity market, but also for a common foreign energy policy strategy that would enable the EU to speak with one voice in the world² – in sum, a Common Energy Policy.

The European Commission has had a long-standing but faltering goal of a fully operational market across the EU for gas and electricity based on integration, liberalisation and competition: gas and electricity companies competing with each other to supply customers within countries and across national borders. A 2010 regulation to safeguard the security of gas supply “by securing the proper and continuous functioning of the internal gas market” requires all cross border interconnections between gas systems to be able to handle reverse flows by December 2013.³

But currently an internal energy market in Europe, unlike that in the United States, needs external energy supplies. The region overall possesses scant fossil fuel deposits: less than 1 per cent of world’s proven oil reserves; 2 per cent of the world’s proven natural gas reserves; and 4 per cent of the world’s proven coal (despite coal being the engine of the industrial revolution in England and Germany). The EU is the largest gas-importing region in the world, with 85 per cent of its natural gas imports coming from Russia, Norway and Algeria and almost 50 per cent of its crude oil imports.⁴ (If fully developed, however, localised renewables accompanied by social and economic change could reduce fossil imports substantially.)

The European Commission emphasises energy security as the rationale for its external energy policy, but in several respects, “energy” has become a proxy for a common foreign policy to complement its other proxy foreign policy to date, “Europe’s all-or-nothing reliance on the magic wand of membership.”⁵

The push for a common foreign (energy) policy to deal with an external “them” has gone hand-in-hand with attempts to craft a stronger internal “us”,⁶ and this has involved attempts to grab competence over energy policy away from Member States.

There has been no internal common energy policy (as opposed to an internal energy market), even though energy cooperation was the starting point of European integration. The 1951 Treaty of Paris establishing the European coal and steel community between six countries was the initial building bloc of today’s EU, while the 1957 Treaty launching the European Atomic Energy Community governing uranium supplies was signed on the same day as the Treaty of Rome that established the European Economic Community (EEC).

Most (but not all) EU countries, however, have been reluctant to cede authority over national energy policy to the EU Commission. Governments that maintain close links with national energy companies have sought to retain their (advantageous) relationships with individual hydrocarbon exporting countries. Germany, France and Italy, for instance, have generally been less enthusiastic about transferring too much responsibility to the European level.

The German government and companies have had close energy ties with Russia for decades; the gas pipeline linking the two countries is one of the longest in the world. When EU

external policies have (potentially) placed the European Union in a competitive or adversarial position with Russia, Germany has adopted a cooperative *Annäherung durch Verflechtung* (“rapprochement by interdependence”) strategy.⁷

Indeed, although the European project has prided itself on being united in diversity, it has experienced more difficulties over the past decade in turning “diversity” into “unity”.⁸

“Energy policy is the EU sphere where member governments have remained most national in their outlook, defying the trend toward growing integration”.⁹

This is one reason for EU support for the Nabucco pipeline; it serves as “one of the few available means to preserve unity and to mobilize public opinion towards a visible goal.”¹⁰

The 2009 Lisbon Treaty (finally) gave some direct power in the energy sphere to the EU Commission.¹¹ (It had indirect power from June 2009 after EU Member States adopted the binding targets proposed by the Commission of reducing the EU’s greenhouse gas emissions by 20 per cent and increasing the share of renewable energies in overall EU energy consumption to 20 per cent by 2020.¹²)

The Lisbon Treaty put energy under the “shared competences” of the European Commission and individual Member States, and gave the Commission a legal mandate to conclude agreements and memoranda of understanding with countries outside the EU to enhance the EU’s security of energy supply. Arguably, it provides the institutional framework to forge a common European foreign policy, at least in respect of energy (although Member States still have sole authority over their national energy mix).¹³

This gap between vernacular security and abstract Security arguably widened from around 1500 onwards, when enclosure or privatisation of land began to gain momentum in Europe as a counter-revolutionary initiative following a century of high wages and challenges to feudal authority. With the later productivism of the industrial age – which fed on and continued this enclosure – the antagonism became sharper still. Security became Security of access to the resources and assets needed for profit, whether at home or abroad. Upper-case Security was there to subdue recalcitrant or colonised peoples, to provide physical and political infrastructure, to assure the flow of raw materials, to break apart old social relationships in order to lubricate increasingly global channels of commerce. A quantitative, commodity logic opposed itself to the rights to survival associated with the commons. Like Energy, today’s version of Security came of age through enclosure, indefinite quantitative growth, the criminalisation of commoners and systematic violence.

This segued into today’s world of “secure investment” and “secure supply routes” – a world of defence treaties and host government agreements protecting the Security of transnational corporations against the local difficulties of national constitutions and popular resistance, of US Navy flotillas policing the high seas to make sure that oil tankers get where they are going (and, if need be, are blockaded from places where they should not go):¹⁴ what oil expert Mazen Labban calls the “militarised market” and others have referred to as “military neoliberalism.”¹⁵ This is a world in which the casualties of official wars are meticulously tabulated, but in which no one keeps track of the far greater body counts attributable to the “normal” workings of privatisation, economic “sanctions” and supply and demand. The updated version of upper-case Security at work here has also become the umbrella under which, through warfare, “excess” assets are periodically destroyed, inaugurating new “growth opportunities” (to borrow former US vice-president Dick Cheney’s terminology) in construction, engineering, services and other industries.¹⁷ And it is the meaning of “security” that is overwhelmingly dominant in the otherwise diverse permutations of the phrase “energy security” in use today (*see* Box: “Energy security: Many meanings, a single thrust”, pp.69-70).

Over time, Security acquired an even more deeply productivist sense. No longer was “Security” just a background condition for growth – something that the state attended to, purportedly in the interests of the nation, and which could be said to have been achieved when commodities were being successfully traded and wealth was being accumulated. Security itself became a scarce, global commodity – a quantifiable component of worldwide economic circuits that must itself be manufactured and consumed efficiently, and of which there can never be enough.

This transformation had several dimensions. In an industrial age, for one thing, weapons manufacture requires “continuous research and development and open production lines” and “cannot be easily converted into civilian use when demand for weapons slackens”.¹⁸ Yet

“Whereas previously the issue of security of supply was a technical issue reserved for the very specialised engineer or system operator, now the issue of energy security is on the table of every energy minister, as well as foreign, finance and industry ministers across Europe.”

*Andris Piebalgs,
EU Energy Commissioner, 2006.*¹⁶

traditionally, that demand was unstable: wars were only a sometime thing. The solution reached by big European producing countries around the turn of the 20th century was to export weapons in peacetime for the sake of maintaining capacity for war. Although by the end of the Second World War, the US, nervous about the implications, had decided that arms exports had to be guided by official foreign policy, the growth of firms dependent on military contracts ultimately made it impossible for either the US or Europe to ignore pressures to counteract excess capacity with highly-profitable foreign military sales as a matter of routine. Between the 1950s, when 95 per cent of US arms exports came in the form of aid, and 2000, when the figure dropped to 25 per cent, the weapons industry was transformed into “a highly profitable commercial industry” courting or bribing foreign officials to secure enormous international weapons deals.¹⁹

Food security or food sovereignty?

“Eating is the only obligatory energy input in our lives.”²⁰

While more food is being produced (and wasted) than ever before, undernutrition, starvation and hunger continue apace. Because food is sold on international markets to those who will pay for it, food insecurity is increasing for those in the South and North who either do not have the money to buy it or land on which to produce it.

The calorie intake of many of those who can afford to buy food now significantly exceeds the minimum daily requirement for a human being. Malnutrition resulting from eating too many calories and from vitamin and mineral deficiencies, often attributed to eating too many processed foods, has become as much of a health issue as malnutrition caused by not eating enough calories and protein.

Nonetheless, more people die from hunger and malnutrition every year than from AIDS, TB and malaria combined.

Given these realities, many state and regulatory bodies stress the importance of “food security”. Defined in at least 200 different ways, the concept generally refers to the availability of and access to enough

food that is safe to eat, whether imported, bought on national or international markets or grown domestically. Its scale ranges from the individual and household through to regional and national levels to discussions of global food security.

Many grassroots farmers groups, however, prefer to talk of “food sovereignty”, a term that emerged in 1996 in response to agriculture being included for the first time within the various agreements overseen by the World Trade Organisation. Food sovereignty encompasses not just access to food, but also local people determining their food systems, exercising rights to control land, water and seeds, and not being subject to market concerns whose priorities are profit rather than survival:

“Food sovereignty is the right of communities, peoples and countries to determine their own agricultural and food policies, including the protection and regulation of domestic agricultural production and trade in order to meet food security and sustainability objectives. Food sovereignty includes food security, food safety, diverse sustainable agricultural practices, and subsistence and small-scale farming. Diverse sustainable agriculture and food production is a key feature of food

sovereignty since it can better provide sufficient quantities of affordable, safe and healthy food for all and is the foundation of healthy rural and urban communities, cultures and environments.”²¹

The difference between food security and food sovereignty:

“may seem like mere semantics, but . . . it is not just a matter of word play.”²²

Farmers and peasant movements point out that more export-oriented monocrop production can exacerbate *insecurity* for those whose land, water, forests and seeds are enclosed, particularly when transnational interests determine how food is produced, traded and marketed.

Insecurity is further aggravated by the financialisation of food and land. As with oil, “energy” and “carbon”, derivatives are now issued on a range of food commodities so as to profit from speculation in price differences rather than to ensure a good price at harvest time. Although only 10 per cent of world food production is traded internationally, global prices determine the prices for which food and crops are bought and sold locally, and commodity speculation tends to push them up further.

Many of the new weapons buyers were found among Middle Eastern oil producers.²³ In 1963, the Middle East accounted for only 10 per cent of global arms imports, but in the decade following 1974 and the OPEC oil price hike, 36 per cent. A new “Weapondollar-Petrodollar” coalition took shape; oil-fuelled militarisation became both a cause and a consequence of the region’s growing energy conflicts, which in turn became a mechanism for setting oil prices that would maximise profits in the West.²⁴ Steady sales of weapons, as well as an optimal oil price, were supported by a US policy of prolonging and exacerbating local conflicts in the region,²⁵ as well as the military expansion undertaken by other Gulf governments in the 1990s.²⁶ Many of the weapons have been used against domestic protesters, notably in the Arab Spring of 2011.²⁷

The new commercial oil-arms nexus also became clearly visible in Angola, Colombia, Congo, Burma, Sierra Leone and Sudan, where oil money provides governments, rebels and warlords alike with more money to buy more weapons to continue more fighting and carry out more militarisation. Central Asian countries have, meanwhile, been “triply blessed”²⁸ with arms and other military equipment, bases and training from Russia, China and the US alike, “surely a rare feat in the annals of military diplomacy,”²⁹ with Kazakhstan being “the epicentre of competitive arms transfers”.³⁰ Such patterns of militarisation, justified and framed by threats of diverse kinds, not only “aim at establishing the ‘secure’ environment necessary for economic expansion,” but also “contribute directly” to it.³¹ And the phenomenon is repeated further down the food chain. In Nigeria, for example, some of the militias employed by oil companies join government officials in hacking into pipelines to obtain oil to sell on the black market to buy rifles, machine guns and rocket-propelled grenade launchers from the Nigerian military.³²

But if, as geographer Mazen Labban puts it, “capital does not follow the sword, as the adage goes, as much as it accompanies it, or inheres in it,”³³ the sword also follows and inheres in capital. For example, the Baku-Tbilisi-Ceyhan oil pipeline, pushed through by the United States administration supposedly to ensure Western Europe’s access to a source of oil outside the Persian Gulf or Iran, is aimed partly at cementing a new geopolitical order in the Caspian region. The pipeline passes through or near seven different war zones, including Abkhazia and South Ossetia in Georgia and the Kurdish region of Turkey. The “modest volumes of oil and gas in question” contrast dramatically with the colossal “energy” expended all round to promote or thwart various pipeline options.³⁴

Alongside the “Weapondollar-Petrodollar” coalition appeared another: a “Petrodollar-Bancodollar” coalition. Middle Eastern oil revenues deposited with Western banks (in addition to feeding offshore banking, hedge funds and speculative capital movements) were pushed out as loans to Southern governments. Tied into interest repayments they could not afford, the borrowing countries ultimately had to submit to foreign companies, privatise state-owned enterprises, remove any regulations perceived as obstructing the free movement of capital, enforce austerity, reduce trade barriers and implant a legal system geared toward defending the sanctity of contracts and private property.³⁵ As energy, water, sanitation, food and health care were increasingly rationed by the market, poverty and social divisions worsened – a structural violence that kills far more than any war.³⁶

In a still more recent movement toward the commodification of Security, armies and police have themselves gone private. Today, “security contractors” play a huge and growing role in military, prison and police operations alike and even serve as mercenaries for oil companies. Simultaneously, a wave of new trade agreements has made the investment environment for large corporations more legally Secure by transforming it into a “brand-new private property right for specific firms”.³⁷ Thus the North American Free Trade Agreement (NAFTA) and subsequent bilateral agreements (as well as, arguably, the Kyoto Protocol) offer private firms guarantees against being prosecuted for harms caused to the public, even if those harms are prohibited by national law. In 2003, US Executive Order 13303 went so far as to grant non-Iraqi companies blanket immunity from criminal or civil prosecution in relation to any action undertaken in that country with a view to oil

exploration, production or sale.³⁸ Later on, a profitable oil contract awarded by the new Iraqi government to a joint venture between BP and the China National Petroleum Company placed a duty on Iraqi armed forces to protect the exploration and extraction site, thereby shielding BP from liability for any human rights abuses committed by those forces, and also explicitly permitted BP’s outlay on private security companies to be reimbursed by the Iraqi government.³⁹

The logic of the commodity has steadily invaded the more traditional precincts of state Security agencies as well. “War as an economic problem” was already a topic for official discussion around the time of the Second World War, and in the 1960s, when Ford

Motor Company executive Robert McNamara took over the administration of the US war against Viet Nam, body counts and cost-benefit analysis became a routine part of war management. Greater mechanisation and capitalisation of Security commodity production was subsequently encouraged both by corporate competition and by the growing hostility of US and European publics to “labour-intensive” wars abroad that could cost the lives of friends and family. Law enforcement has been subjected to a similar commodity treatment.

The results have taken many forms. Private companies seeking government contracts have developed cruise missiles and other unmanned aerial vehicles; machine surveillance; advanced identification, monitoring and scanning technology; and weapons that offer their users a finer gradation of violent options (stunning, maiming, immobilising, suffocating and so forth) or automatically select their own targets by scanning (for example) racial characteristics. Mechanisation has also extended further into the human body. Whereas in the two world wars of the 20th century, soldiers often could not be trusted to shoot directly at their enemies, recent decades have seen modernised training procedures that result in soldiers’ bodies becoming more algorithmic in their reactions and thus better able to kill reflexively, improving efficiency and making them more productive per unit. Indeed, “Security” workers of all kinds have become more productive in measurable ways, as growing mechanisation has supplanted some of the slow, hands-on, labour-intensive brutality of the past in favour of what security expert Steve Wright calls the “mass production of torture and human rights

“Lawyers, bankers, brokers, economists, geographers, geologists, engineers and journalists speak of energy security with the same confidence as generals, development workers, defence analysts or environmental activists.”

Felix Ciuta,
“Conceptual Notes on Energy Security”, 2010.⁴⁰

“Energy Security”: Many meanings, a single thrust

Over the years, “energy security” has been used by governments to mean many things. But whatever significance the phrase is given – self-sufficiency in fossil fuels, confidence in purchasing contracts, militarily-defensible oil trading routes, protection of vulnerable centralised energy systems against accidents and attacks – the underlying concern has almost invariably been in maintaining a profit-centred industrial system, not in subsistence or a share for all. Typically, too, the phrase has come to imply “a logic of war”, and “a ‘total’ security logic”.⁴¹

In Europe, for example, the vast majority of official formulations focus on having a reliable and affordable energy supply. But the objective is not primarily to make sure everyone has the means to cook and keep warm. Rather, the emphasis is on sustaining “economic performance and growth”⁴² by providing energy to private firms, as well as on keeping “national borders defended”.⁴³ The European Commission stresses both:

“adequate domestic resources worked under economically acceptable conditions or maintained as strategic reserves”

and:

“accessible and stable external sources supplemented where appropriate by strategic stocks.”⁴⁴

What might be “economically acceptable” and to whom is not discussed. Nor are the subsidies and military expenditures that might be involved in making external sources “stable” – although discussions of, say, Russian gas export policies are pitched to provoke the maximum “feelings of fear, anxiety and vulnerability” among the public.⁴⁵

Both the preoccupation with

supply and the military overtones are longstanding: they are what Winston Churchill had in mind in 1912 when he pioneered the use of the phrase “energy security” to signify his concern about obtaining oil beyond Britain’s shores for the country’s newly petroleum-fuelled navy.

For the United States government, energy security is largely about avoiding “upward price shocks” and maintaining control, by force if necessary, of “geographic locations with the largest fuel reserves,”⁴⁶ particularly of oil. Since the 1970s, the US government has also intermittently identified energy security with (an impossible) “energy independence,” but its real focus is arguably about maintaining and expanding the militarised global energy markets required to keep prices within a certain range, neither too high nor too low. Historically, this integrated market-violence price system has relied as much on maintaining “tension without war” as on war itself.⁴⁷

Since at least 1980, when it was made official US policy that any attempt to gain control of the Persian Gulf would be regarded as “an assault on the vital interests of the United States of America”, successive US presidents have displayed “a consistent willingness to portray energy security and national security as virtually synonymous.”⁴⁸

“Energy is the lifeblood of the American economy. Cut off the flow of energy and the economy will die. For this reason, energy independence is a matter of national security.”⁴⁹

The “economy” in question, of course, is not an economy organised around the right of all to live but one of automobilised private householders, exclusionary politics and the structural production of waste.⁵⁰ The US, like Europe, also lays

stress on maintaining or building a stable and safe infrastructure for importing, storing and delivering energy, paying attention to “weather conditions, industrial relations and plant and infrastructure maintenance and investment”⁵¹ as much as to military factors.

In contrast to Europe and the US, energy-exporting countries often interpret “energy security” not as security of supply but as security of demand – but the demand is, again, that of the industrial system, not of subsistence. Even those countries or states that have made determined efforts to set aside some fossil wealth for targeted social benefits (Venezuela, Norway) or redistribution to their citizens (Alaska) are dependent for their “security” on a productivist market.

The Russian government, for which fossil fuel exports generate enormous revenues, accordingly focuses on fulfilling long-term export contracts by upgrading extraction technology or, if necessary, importing gas from Turkmenistan when it does not have enough of its own to send abroad, all the while struggling to reassert state control over oil and gas after the hurried privatisation of national companies following the demise of the Soviet Union in 1991. In the Middle East, meanwhile, countries that cannot easily expand their oil production at will need high prices for their exports, while those with excess capacity, such as Saudi Arabia, can maintain secure revenue flows when prices fall by ramping up production.

Landlocked countries in the Central Asian region see “energy security” in yet another way: as the security of prospective pipeline routes to Russia, Europe, China or India. For Ukraine, Belarus and North

continued on next page . . .

Sudan, energy security is related to the transit fees (paid in cash or energy) that they can charge for the use of pipelines routed through their territories. For many countries in the global South, on the other hand, energy security means avoiding volatile swings in the price of fuel (particularly oil), which can drastically affect their balance of payments, as oil is traded in US dollars.

While some formulations of “energy security” lay some emphasis on climate stability or other environmental considerations, as well as sustainable development, almost none put the right to live at the

centre. Nor do they cite the need to move away from the dynamic of infinite quantitative growth, provide every community with enough heat in the winter, decommodify electricity and the like. On the contrary, the focus is precisely on policies that threaten such survival-oriented measures. As political scientist Richard Wyn Jones remarks, “energy security” has largely been deployed by industrialised countries to justify:

“a status quo in which the vast majority of the world’s population are rendered chronically insecure.”⁵²

“Energy security for the West,” to quote the words of Doug

Stokes and Sam Raphael, also political scientists, “has often meant insecurity for the rest”.⁵³

Thus if Energy and Security are both concepts signalling hostility to the common right to live, their combination – Energy Security – is a double whammy. This is what one resident of the Niger Delta expresses, with the sense of wonder of one well positioned to understand the extremist nature of the concept, when he remarks of the oil companies that have set up operations around him:

“They don’t only steal from us . . . *They are also out to kill us.*”⁵⁴

violations”.⁵⁵ Like other things that were previously considered background conditions for economic activity, such as exchange rates or a clean environment, Security has thus been brought ever deeper inside what the late political economist and sociologist Giovanni Arrighi called the “economizing logic of capitalist enterprise”.⁵⁶

Essential throughout this process is a machinery of “demand management” that goes far beyond just cultivating export markets for weapons and surveillance technology. No more than any other modern business enterprise – or state – can today’s Security establishments be so foolish as to leave demand for their relentless productivity, or the services of their bureaucracies, to chance. The demise of the Soviet Union has only added to already-existing underlying pressures to find new Security issues everywhere.⁵⁷ Officially recognised “security threats” to industrialised societies today include disempowered young men in Arab countries; refugees and the destitute whose lives are threatened by drought, unemployment and landlessness; and indigenous peoples and environmentalists protesting extractivism. Even women in poor countries at risk of being raped by UN peacekeepers are transformed into a menace to “security” when they become infected with the AIDS virus.⁵⁸ It is no coincidence that the tone of this modernised language of criminalisation so closely resembles the idioms used to label forest-dependent villagers and other commoners resisting an earlier version of “growth for growth’s sake” in early modern Europe, who were branded, for example, “marauders without law or religion” bent on infecting society “with most dangerous leprosy”.⁵⁹ What civil liberties monitoring group Statewatch calls the “perpetuation of the sense of fear and insecurity”⁶⁰ is once again central to the economic enterprise.

The reign of Security, in sum, is not only an unequal one in which survival is uncertain, but also one in which the very *right* to subsist necessarily contracts, in which extinction of the right to live has become part of the “everyday ‘normal’ operation” of fossil-fuelled industrialism.⁶¹ Here, violence is unhesitating and, by those not on the receiving end, largely unremarked.

The insecure realm of “Energy Security”

Unsurprisingly, the antidemocratic biases of Security exert an inescapable hold on the theory and practice of “energy security”. For anyone who has the opportunity to look at the Energy system in its entirety, the direct, necessary relationship between upper-case Energy Security and lower-case, vernacular insecurities is obvious.

For example, the 30 million people living in the Niger Delta who depend on local creeks, mangroves, freshwater swamps and forestland for their livelihoods and survival have seen fish die, crops wilt and mangroves expire. The quantity of oil spilled in the region from ageing pipelines and other infrastructure over the years dwarfs BP’s notorious 2010 mess in the Gulf of Mexico. The 24-hour brightness of local skies, lit up by illegal gas flares that have been “roaring and crackling non-stop for over 30 years”⁶² – poisoning the atmosphere with benzene, benzo-pyrene, toluene, sulphur dioxide, nitrogen oxide, mercury, arsenic and chromium as well as augmenting climate change – contrasts sharply with the darkness of local homes that lack electricity or even clean drinking water. Life expectancy in the Delta is 41 years.⁶³ For *Financial Times* journalist Michael Peel, travelling in the region made only too plain the:

“obscene asymmetry between the smoothness of my oil-fuelled life in Britain and the toxic impact of crude on one of its main source regions.”⁶⁴

The pattern is repeated in country after country. In northern Colombia, for instance, indigenous and other communities have been forcibly removed to make way for the expansion of the biggest coal strip mine in South America, which sends 70 per cent of its exports to Europe.⁶⁵ In Bangladesh, villagers have been shot for resisting eviction from the area proposed for the country’s first coal open pit mine at Phulbari.⁶⁶ In China, as many as 20,000 people die in coal mining accidents every year. In Sudan, villagers ousted to make way for the Merowe Dam were relocated to a desert with totally insufficient water. In the Ecuadorian Amazon, according to local residents, Texaco (now Chevron) spilled more oil on their lands than was released when the Exxon Valdez supertanker ran aground in Alaska in 1989,⁶⁷ in addition to dumping untold amounts of chemical-laden wastewater in the river basins from 1964 to 1992. The Ecuadorean government calls it the “Amazon’s Chernobyl”. Yet it took until February 2011 before it became possible, as a result of a long popular struggle, for a court to issue an \$18.2 billion judgment against the company for its actions.⁶⁸

A subtler violence is felt where fossil fuels are burned. Coal is so polluting that people in Europe could not have brought it into their homes centuries ago without chimneys, which allowed the energy in the coal to “part ways from the attendant pollution,” sending away the smoke “to be suffered by the world at large”.⁶⁹ Electricity, while “squeaky clean” in the home, concentrates huge amounts of pollution at the point of its generation. The combustion chambers of cars, trucks, airplanes and ships spread pollution everywhere. One result is that in the EU alone, nearly half a million people die every year due to poor air quality. Air pollution from larger power stations, refineries, waste plants and factories costs Europe as much as •169 billion a year in health and environmental damage, estimates the EU’s environment agency.⁷⁰ This

is not even to mention the threat to human survival posed by continuing greenhouse gas emissions, which are heating the atmosphere.

In the US, extraction, transportation and refining of oil and gas “creates more solid and liquid waste than all other municipal, agricultural, mining, and industrial sources combined”.⁷¹ Water from drilling operations is often four times saltier than seawater, contains many toxins, and in some instances is 100 times more radioactive than nuclear power plant effluent.

Nor is the violence of Energy Security confined to dispossession and pollution. In many countries that find themselves in the position of raw material producers for the global oil system, deterioration of state accountability and the rule of law, widening gaps between rich and poor, militarisation, deprivation and unrest all become familiar phenomena. In Nigeria, for example, residents of the petroleum-rich Delta:

“know that the oil generates enormous wealth from which they do not benefit. This situation creates resentment, not only against the enterprises that produce this wealth but equally against the heads of the community who are accused of colluding with the companies.”⁷²

The impoverishment of the many at the expense of a corrupt few has “helped set the stage for the prolongation and expansion of the country’s internal war over crude”.⁷³ Other oil-producing countries as well are experiencing “an explosive expectation-gap”⁷⁴ among their publics. The disparities involved have been called the “single greatest threat to peace and stability, nationally and internationally”⁷⁵ and “become the fuel for insurrections, uprisings, and civil wars”.⁷⁶

Such disparities are also becoming sharper in countries such as India, where politically-powerful coal mining and fossil-fuelled manufacturing sectors are increasingly encouraged to treat rural dwellers as dispensable. Coal extraction is threatening indigenous people’s livelihoods, forests, land and water across a wide swathe of Jharkhand, Chhatisgarh and Orissa states. In Singur in West Bengal, it was only determined resistance by local people that forced the Tata conglomerate to abandon, in 2008, its violent attempt to seize rich farmland for an automobile factory that would have devastated the livelihoods of 15,000 people. Such cases are emblematic of conflicts that in many areas of the country approach the status of a civil war.

The internal instability of Upper-Case “Energy Security”

One of the ironies of upper-case Energy Security is that it is unavoidably insecure. Because its logic dictates a certain indifference to lower-case “securities”, its reign will always be conditioned by opposition: from those dispossessed by oil extraction to those impoverished by dam construction, made ill by power plant pollution or enslaved on agrofuel plantations. And the more extended and invasive a militarised energy system becomes, the more flavours of resistance and refusal it will provoke from communities obeying different logics: localistic, nationalistic, religious. Thus even the conversion of a “temporary” US

military base in Saudi Arabia to a permanent one on the grounds that the kingdom was a target for Saddam Hussein formed part of the indictment Osama bin Laden issued in his call to arms against the West.⁷⁷

By the same token, the more that an energy system is subjected to centralised control – that is, the more Securely it is placed in the hands of a few corporations or ministries – the more openings there are for accidents, storms⁷⁸ or the activities of energy traders or saboteurs to wreak havoc on giant generation plants, interconnected transmission lines, pipelines and waterways. “Risk spreading” through increased interconnection and “tight coupling” among elements of the system paradoxically opens yet more vulnerabilities.⁷⁹ As geographer Mazen Labban explains:

“the vulnerability of the network derives not only from its vastness . . . of the (physical) concentration of the infrastructure, but also from its connectivity: disruption of supply in one place might create shocks at the regional, or even global scale.”⁸⁰

One insecurity recently talked up involves the potentially “catastrophic consequences” of a cyber-attack on power plants and the electricity grid. The effects, it is said, would be equivalent to “the cumulative toll of 50 major hurricanes ripping into the nation simultaneously”.⁸¹ Proposed European Union “smart grids” with “intelligent metering and monitoring systems”⁸² making possible instant feedback between consumers’ energy use rates and the actions of generators magnify such “cyber-security” and data protection challenges.

The growing commodification of Security only adds to these contradictions. As Security evolves into a marketed product, it becomes increasingly opposed to Security itself. The reason is simple. As a commodity, Security tends to become whatever the Security market produces. But what a system of commodified Security produces above all is numbers, because Security products tend to be assessed for their quantitative efficiency: for example, so many kills per unit of money, energy or labour expended. Diminishing returns then set in. The increased production and accumulation of Security becomes of less and less use in dealing with the political and other human realities that must also be faced by any attempt to maintain Security. (It also, of course, tends to be at odds with any systematic defence of lower-case “securities”.) Thus even the overwhelming “shock and awe” piled on to the initial US attack on Iraq was unable to prevent the war from eventually costing 50 times more than predicted⁸⁴ and dragging on for years, just as the Viet Nam War “kill ratio” of 19 dead Vietnamese to one dead US soldier was powerless to forestall an eventual US defeat. Most people need only to be asked the question to realise that few of the hundreds of billions of dollars being spent today on Security are in the end making anyone safer. If security is “scarce”, accumulation of more Security is only making it more so.

Productivism, of course, has an ingenious way of dealing with such contradictions. The problems and catastrophes engendered by the gaps between Security and security, between Energy and energy, and even between commodified and noncommodified Security themselves become objects for market or market-like “solutions.” The deprivations

“Oil has no inherent power outside the social and political relations that produce it as such a ‘vital’ resource.”

*Matthew Huber, “Oil, Life, and the Fetishism of Geopolitics”, 2011.*⁸³

following on from the pursuit of Energy as a multiplier of productivity create a “need” for more and more Energy. The insecurities following on from the drive to produce more and more Security can be tackled by still more novel Security products and strategies. In a never-ending progression, production is offered as its own remedy, failure as an enhanced opportunity for success. From the “growth for growth’s sake” point of view adhered to by most of today’s political leaders, all of this

makes perfect sense. “Technofixes for technofixes’ sake,” “violence for violence’s sake,” and “war for war’s sake” are no more than rococo variations on the same underlying theme of ever-expanding opportunities for profits.

Thus when Energy Security undermines vernacular “energies” and “securities,” the resulting scarcities can then be used to justify more Energy Security. Lack of “energies” (mainly in the global South) becomes a lack of Energy. Endangered lower-case “securities” (especially in the North) become a lack of Security. To address the inherent vulnerabilities of

a centralised Energy system, for example, calls have been made for “the protection of the entire energy supply chain and infrastructure”⁸⁶ – refineries, offshore platforms, pipelines, ports and facilities handling imports and exports, oil and LNG tankers, power plants, high-voltage electric power transmission lines, electric power distribution wires, underground gas storage fields and natural gas pipelines. It may be obscure what will be “protected” against and how,⁸⁷ but that is hardly the point. The more complicated the Energy system and its associated financial services, transportation and telecommunications networks become,⁸⁸ the more jobs there are to be done:

“Energy security would mean the *security of everything*: resources, production plants, transportation networks, distribution outlets and even consumption patterns; *everywhere*: oilfields, pipelines, power plants, gas stations, homes; *against everything*: resource depletion, global warming, terrorism, ‘them’ and ourselves. At its maximum, this logic invests every single object of any kind with and in security. At least potentially, the result is a panoptic view of security that legitimates panoptic security policies.”⁸⁹

It is in this sense that the polyvalence of the word “security” serves an extremely useful political purpose. Because it can mean anything to anybody, the *Financial Times* once included the term in a list of bogus words and phrases that should be laughed out of use.⁹⁰ Others merely urge that the phrase be assigned a more unambiguously benign meaning and that discussions of “energy security” be reframed accordingly. Such reflexes tend to miss how deeply embedded in modern history the ambiguity of “energy security” is – and why redefining it or eliminating it from the dictionary will be accomplished, if at all, only through political organising that takes on a wide range of issues.

After all, it is precisely the way the term can almost unnoticeably flip back and forth between meanings that makes it such a convenient tool for politicians, bureaucrats and corporate chieftains locked into a commitment to quantitative “growth for growth’s sake”. The upper-case/lower-case ambiguity of “energy security” makes it easy, for example, to invoke people’s desire to keep the lights on and their homes warm when putting forward proposals for more Energy developments such

In Nigeria, the notoriously unreliable National Electric Power Authority was renamed the Power Holding Company of Nigeria (PLC). As the initials were switched, so did what they were said to stand for: “Never Expect Power Anytime” became “Problem Has Changed Name (Please Light Candle).”⁸⁵

as thousand-kilometre pipelines or gargantuan hydroelectric dams – or to claim (for example) that EU research aimed at establishing a “strong internal market for security” is really all about making people’s daily lives safer.⁹¹ Similarly, obscuring the distinctions between vernacular “energies” and Energy, and vernacular “securities” and Security, makes it possible to rewrite the history of events such as 9/11 – which abruptly, if briefly, exposed so many of the cracks in the systems these capitalised terms represent – as a tale that reinforces rather than challenges the commitments encapsulated in upper-case Energy Security.

Myth and fetish

Indeed, far from being a result of chance, carelessness or incorrect values, the ambiguity of “energy security” is the historical outcome of a painstaking, complicated, centuries-long process of myth- and fetish-construction. The myth is a myth about Nature and Society, Body and Mind that has been around at least since the time of Descartes. The fetish is a persistent habit of seeing the oil (or other fossil fuels or the machines they run) as having special or unique “magical” powers capable of driving history, rather than as a “social product of intense political battles over the production and reproduction of life itself”⁹² – a habit perceptible in phrases such as “the oil curse”, “peak oil”, “no blood for oil”, “the thirst for oil”, “energy grabs”, “the need to reduce consumption”, even “supply and demand”.⁹³

Neither myth nor fetish denies the destructiveness of the Energy and Security systems. They work, rather, to depoliticise it, decontextualise it and give it the dignity of inexorable tragedy. The myth and the fetish achieve this through multiple acts of translation.

In the key, overarching translation, the historically-specific dynamic of abstraction that has enlisted elites in a project of unlimited quantitative growth is reinterpreted as, and simplified into, an eternal, metaphysical, Cartesian opposition between Nature and Society. On the one side is a passive, rightless, limited reservoir of raw materials. On the other is an active humanity relentlessly, mathematically encroaching on this reservoir. The resultant unavoidable “scarcity” makes it simply unrealistic to hold that there is a right to life on either side. In the version of the myth propounded by the Reverend Thomas Malthus two centuries ago, it is Nature herself who extinguishes that right to live of both human and nonhuman beings: she “bids the poor man begone” at the same time that the “poor man” himself, like the rich, treats nonhuman beings as a mere “resource”.⁹⁴

In the myth, the peculiar logic of accumulation for accumulation’s sake that has become entrenched among a minority over the past few hundred years becomes a formal characteristic of human beings as such, in the form of needs that have always been in principle infinite. Thus demand for petrol or coal, instead of being the complex product of a complex history (*see* Box: “A story that is too simple”, p.77), is oversimplified into being an outgrowth of a primitive, unending “demand for energy” required to meet an inborn imperative for “development”. Upper-case Energy, instead of being recognised as a historical upstart, is treated as if it has always been there.

In the myth, the only promise of a secure future lies in either trying,

against the odds, to wring ever more from Nature forever, or in forcibly controlling humanity's inbuilt tendencies to take more and more, or both. On the one hand – in the realm of upper-case Energy – perpetual “productivity increases” must be undertaken and the quantities of raw materials or ecosystem services of which the nonhuman world consists given the human protection they need to survive. On the other hand, “population control” and similar measures must be undertaken to check inexorable human encroachment on these passive materials. Or to put it another way: the challenge of “energy security” becomes either to produce more Energy (find more oil, develop “alternative” oils such as agrofuels) or to “reduce consumption” (“change individual values”, develop “hypercars”). In a constant theme of the myth, endlessly increasing production relieves scarcity rather than being an integral part of it; mechanistic “consumption reductions” somehow make “security” possible even if they leave the logic of accumulation untouched.

American journalist Peter Maas recounts an exchange in 2003 between the Iraqi director of one of Iraq's three oil refineries (built by US firm Kellogg Brown & Root) and a US soldier. The director urged the soldier, belatedly assigned to round up looters of the refinery, to do more about security:

“I mean, you are occupying the country. Secure it! Act more violently!”

In response, the soldier admitted:

“We're not doing a good job . . . It's embarrassing to me. I don't know how to rebuild countries. I don't know what I'm doing. If we come to a country and destroy its government and destroy its army, we have to rebuild it. But I'm wondering, Where are the people who rebuild countries? I just jump out of planes and kill people.”⁹⁵

Thus the myth obliquely acknowledges that Energy only creates the need for more Energy, and Security for more Security. In an indirect way, it recognises the contradictions between Energy and “energies”, between Security and “security”. But it does so only to oversimplify them into the operations of destiny. Attempts to stave off this destiny through manipulating either the Nature or the Society side of the antagonism inevitably carry the air of stopgaps: there is no solution, the myth seems to say, beyond a cascade of temporary technofixes. This is the famous Malthusian “pessimism” that has served business so well for 200 years and whose constraining spirit continues to dominate technical writing about resources and the environment: a distorted translation of a contingent politics of endless accumulation into a poetic expression of fatalism.

The myth unfolds in countless variations every day. In 2003, for example, the belief took hold among many that what motivated the US-led war in Iraq was stuff – strategically valuable Nature in the form of oil – combined with human “greed”. People grab stuff, the myth tells us, to relieve scarcity: thus “energy grabs”. Energy security is a problem of “supply”. Not only is the complexity of the relationships

in which oil is enmeshed translated into magical qualities possessed by the coveted substance itself; even the landscapes that are its richest sources acquire a certain sinister mystique. Thus Dick Cheney muses on the enigma that “the good Lord has seen fit” to put so much oil and gas “where, all things considered, one would not normally choose to go”.⁹⁶ The myth transforms a scenario in which complex forms of violence connected with finance and empire create scarcities into a scenario in which, instead, a primitive, irreducible, inbuilt scarcity creates violence (*see* Box: “A Story that is Too Simple”). Reactionary fetishisms about oil stoke an obsession with “protecting” its sources, intensifying ethnic conflict, resentment against the West and an atmosphere of threat; “progressive” oil fetishisms suggest that the way forward is to control grabbing – maybe by lowering the number of grabbers, maybe by reducing their greed or militarism, or maybe just by giving them some

substitute stuff that will satisfy their urge to grab. Either way, the roots of scarcity and energy insecurity are left untouched. Repeating the myth of a primordial tendency to scarcity sanctions the processes that engender more scarcity, just as “securitising” everything tends to give rise to more insecurities.

A story that is too simple

Everyone knows how central fossil fuels, especially oil, have become to life in industrialised societies: manufacturing, heating, lighting, transportation, even agriculture. It is easy to assume, then, that tensions will fall when it is cheaply available, but when it is not, political leaders in the rich countries will have to resort to hard bargaining, tough diplomacy or even wars.

The reality is not so simple. So-called “oil wars” are not violent attempts to grab black treasure before someone else does. Nor are they necessarily about getting it cheaply. Oil prices – which in any case have little to do with supply and demand in any normal sense – are merely one part of a much larger picture. The prize is not the smelly oil itself, but the money and power that grow out of the productivity they help squeeze out of the whole business system as well as the speculative opportunities they provide. As critical geographer Simon Dalby points out:

“petroleum is not about scarcity at the margins: it is not about violence caused by shortages but about control over an abundant resource that is the key to so much in the global economy.”⁹⁷

It is, to quote another geographer, Matthew Huber, about “finding a balance between abundance and scarcity”⁹⁸ acceptable to various influential interests in the corporate globe.

In the run-up to the US-led war in Iraq, for instance, the “basic conundrum” was not how to get as much cheap oil as possible,

but “to design a system of organized scarcity capable of keeping the oil price low enough for capitalist growth” yet “high enough for corporate profitability” as well as the needs of OPEC’s “high absorbers” – countries like Venezuela that deploy petrodollars internally for development purposes and may not have much spare capacity.⁹⁹

Oil prices had fallen through the 1990s; and while OPEC had responded by cutting output, driving prices up slightly, no one believed that invading Iraq would be a recipe for price stability. As the war progressed, in fact, what became most visible in Iraq (in addition to the killing) was not a dash to rip off the oil and rush it to the US, but rather a bizarre mixture of untenable neoliberal attempts to privatise all state enterprises;¹⁰⁰ embezzlement of billions of dollars in taxpayer money by Western business interests; a construction and contractor gold rush; and the establishment of an unknown but enormous number of large military bases which now, in another strange twist, have been mostly abandoned.

Indeed, Iraqi oil extraction returned to its previous levels only in November 2011. Social historian Iain Boal and colleagues write that:

“What the Iraq adventure represents is less a war for oil than a radical, punitive, ‘extra-economic’ restructuring of the conditions necessary for expanded profitability – paving the way, in short, for new rounds of American-led dispossession and capital accumulation.”¹⁰¹

If oil was especially visible, it was:

“because, as it turned out, oil revenues were key to the planning and financing of the military exercise itself, and to the reconstruction of the Iraqi ‘emerging market’.”¹⁰²

In other places as well, the US’s aim is not so much to “grab” oil for itself as to keep oil flowing into the global market generally and to “discipline a range of unarmed social forces that seek to pursue alternative paths of economic [and political] development”.¹⁰³ In central Asia, the focus of Western interest is:

“not the control of oil per se but in the integration of the economies of the region, including Russia, into the global economy through the exports of oil in exchange for imports and opening for competing investment capital from the west and the east.”¹⁰⁴

Indeed, as long as some flow is maintained¹⁰⁵ and the oil does not run out suddenly, *reducing* output may be an objective as often as maximising it. Since the days when demand had to be created for gasoline (a formerly useless by-product of petroleum refining) and when oil wells in Oklahoma and Texas were producing too much crude for the market to handle, the problem of oil has generally been “not its scarcity but its abundance”.¹⁰⁶

Oil-exporting countries and oil-extracting companies have acted and reacted against and with each other over the years in multiple and varying attempts to restrict output.

Automobility, security and national identity

Oil is central to a defining characteristic of US society: automobility. Some 97 per cent of all US transport uses oil, accounting for two-thirds of the country's oil consumption.¹⁰⁷

This demand for oil was deliberately created in the 20th century by oil and manufacturing companies acting in concert with government to make cars affordable, limit public transport, build homes, workplaces and shops far away from each other, build roads and encourage a lifestyle based on consuming oil-dependent goods.

The cost of oil, much of it extracted within the US, was "so dirt cheap [that] the price was commonly called 'negligible'"¹⁰⁸ – until the oil price rises of the 1970s. In 1975, the US introduced Corporate Average Fuel Economy (CAFE) standards, which set a target fuel efficiency for the combined output of a vehicle manufacturer. The objective was to double the 1974 fuel economy average by 1985; since 1990, the target has remained at 27.5 miles per gallon (10 kilometres per litre), well below what has been achieved elsewhere.

CAFE standards distinguish between a car and a light truck. A car is a 4-wheel vehicle not designed for off-road use; a light truck is a 4-wheel vehicle designed for off-road operations, to transport goods or more than 10 people, or to provide temporary living quarters – and the CAFE regime did not set a target for light truck fuel economy.

The CAFE distinction thereby created a market niche for ever larger, heavier, more inefficient, more polluting and more unsafe vehicles. "Light trucks" became the favoured form of passenger vehicle and family car, exemplified by the Sports Utility Vehicle (SUV).

The boom in SUVs was launched by the Ford Explorer. Its design drew not only on the Jeep, used in the Second World War to transport troops and heavy machine guns, but also on the cultural militarism of the 1980s that emerged in response to US defeat in Viet Nam (illustrated by the Hollywood *Rambo* films).

It also embodied elements of the classic rhetoric of American identity: rugged individualism, wilderness, the American frontier. Even though 80 per cent of SUV owners live in urban areas and less than 13 per cent of their vehicles have been off-road, the 4-wheel drive offers the promise of unfettered freedom to drive anywhere into the great outdoors. SUVs have high front ends, towering driving positions to give maximum visibility, and bumpers and grills designed to evoke wild animals and the spirit of the Wild West with names to match: Tracker, Equinox, Escape, Defender, Trail Blazer, Navigator, Pathfinder, Warrior.

Many SUV owners acknowledge the energy, environmental and climate damage caused by their motoring decision, but justify it in terms of their personal security:

"It gives you a barrier, makes you feel less threatened."

The SUV thus becomes an urban assault vehicle (albeit one with comforts) for a homeland city that feels itself to be at war; the driver confronts, but is protected from, a world perceived to be insecure.

Yet much about the rise of the SUV is paradoxical. SUV owners are convinced that their vehicles are synonymous with security. But accident records for the 1990s show that the occupant death rate per million SUVs was some 6 per cent higher than for ordinary passenger cars because of the SUV's tendency to roll over – an additional 3,000 people died each year in the US because

they were in an SUV rather than a car.

Conversely, in a sideways SUV-car collision, it was estimated that the car's occupants were 29 times more likely to be killed than those in the SUV.

Other paradoxes involve the relationships between the individual and the collective. The SUV's popularity draws on its association with freedom. SUV owners tend to invoke their right to be free of government and regulation, even though the entire infrastructure of motoring – road construction, maintenance, law enforcements – requires government subsidies of trillions of US dollars each year.

The regulatory regime designed to increase energy efficiency and reduce oil dependence created inefficiency and gave rise to a class of vehicles that undermines those objectives. Indeed, many laws and regulations – fuel economy standards, tax rebates, trade tariffs, international environmental agreements and zoning codes – have all enabled automobility

The SUV is thus the material example of the US global (oil) security attitude. It functions as a huge capsule of excess consumption in an uncertain world. With its military genealogy and its claim to provide personal security through externalising danger, the SUV itself inscribes new geopolitical borderlands at home and abroad while shoring up a very US identity.

Meeting insecurities founded on oil dependence with products that consume more oil promotes the problem. Transition, however, requires more than exercising individual responsibility by not driving an SUV. It needs to resist the inscription of a homeland at war.¹⁰⁹

Challenging Upper-Case “Energy Security”

In the bewildering, sometimes frightening, talk about “energy security” that bombards the public today, two different “securities” and two different “energies” are often confused. To understand – and insist – on the different origins, structures, functions and interests of each of them is crucial. Just as the capital-E Energy that got its start during the Industrial Revolution is leaving millions bereft of the little-e “energies” of heat, light and subsistence, so upper-case Security names a multistranded historical process that is increasingly delivering up danger and insecurities.

How to challenge upper-case Security and upper-case Energy in a world in which both are so deeply entangled with their lower-case counterparts?

Critically, there is a need for public discussion and debate that correct the fatal political vagueness of the purely physical concept of “energy” and instead scrutinise societal goals in the light of global warming, resistance to expansion of fossil fuel extraction, the different characteristics, materialities and contexts of different energy sources, and so on. Questions that need to be asked include: What do different groups of people expect not from “energy policy”, but from policies that address housing, food, mobility, electricity and livelihood? What do these aspirations imply for constraints on capital accumulation and the scale and ownership of the financial sector? And what do such debates imply not for “energy policy”, but for future policies on oil, coal, gas, nuclear and agrofuels?

Likewise, to correct the unhelpful prevalent emphasis on “Security”, policymakers could highlight the unsustainable, insupportable long-term implications of continued fossil-fuel (and fossil-substitute) developments, thereby opening up for discussion the question of how a transition out of the fossil age can be achieved with the least pain and conflict for everyone.

To do this, they will need to call on the knowledge of a much wider field of participants than they currently do.

A first step is to look for friends who can help. Thai people have an expression, *chuaikan khit*: to help each other think. The initial task facing anyone who comes to the issues anew is to learn how to recognise potential allies and to find ways of helping each other think and act.

There is no need to look far. Hundreds of communities, social movements, activists and thinkers worldwide have been working for many decades, in one way or another, on the issue of Energy vs. “energies” and Security vs. “securities”. Campaigns against pipelines and the hydraulic fracturing of underground rock to bring out ever more supplies of gas have grown up in countries like the United States, France, Argentina and South Africa, joining longer-standing struggles against large hydroelectric dams in countries such as India, Thailand and Brazil. The

actions of “fenceline communities” against power plants polluting their neighbourhoods are being carried on alongside campaigns for public transport or electricity for all.¹

One group of social movements that stands out in this respect are those organising to address directly the below-ground to above-ground trans-

fer of carbon. These include those striving to “keep the oil in the soil, the coal in the hole and the tar sand in the land” in the Niger Delta, Canadian Alberta, Ecuador, South Africa, the US Appalachia and elsewhere; stopping the development of dozens of coal-fired power plants in the US, Britain, Thailand and other countries; fighting agrofuel projects whose effect would be to take acres and acres of land so as to sustain a transport infrastructure designed for crude oil; and working to stop banks and other financial institutions supporting fossil-intensive or fossil-extractive projects. Increasingly, such movements are aligning themselves with movements in support of ecological and peasant agriculture, more democratic

public health, welfare and energy provision, cleaner air and water, and an end to militarism, environmental racism and “neoextractivism”.³

Such groups have anchored themselves firmly to defend little-e “energies”, little-s “securities” and other constituents of life and livelihoods. It is for this reason above all that they contest the pollution that comes with fossil-fuel extraction, the brutality and violence that enables and enforces it, and the social and political disintegration that often accompanies it.

Yet in doing so, they quickly become aware that they are also directly challenging Energy and Security in all their global complexity. Their actions swiftly take them into confrontation with, among others, the legal and military apparatus that has been put in place to protect Energy and weapons companies, as well as governments who demand a “substitute” or “equivalent” for the coal and oil left in the ground. Such groups have had little choice but to assume their current role of intellectual as well as political leadership on “energy security”. Their knowledge and analysis will become increasingly valuable in the years ahead to any policymaker serious about planning for energy security in a progressive way that puts the collective security and survival of all at the forefront. Therein lies both the political challenge of “energy security” and the most pragmatic starting point for practical action.

“Our concern is not about the flow of electrons between the turbine and the switch in somebody’s house. Our concern is primarily about the framework of democratic and accountable resource allocation.”

*Keynote Address to African National Congress National Meeting on Electrification, University of Cape Town, 1992.*²

Looking ahead . . .

Some questions often posed in energy debates are: What are the alternatives to large-scale fossil fuel and nuclear energy plants? What are the alternatives to centralised infrastructure projects?

In fact, numerous, detailed and socially grounded alternatives have been evolved over the years by local communities and economic and social justice movements, often working directly with poorer people. These alternatives are not limited to technologies that would better serve the needs

of all; they also encompass alternative decision-making procedures that better reflect livelihood priorities in agriculture and climate policy.

The social and political processes through which alternative technologies are used or proposed are rarely mentioned, however, even though they are key to ensuring a just transition away from fossil fuels gets underway.

This is the focus of our next report.

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Introduction

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The International Energy Agency (IEA) was founded under OECD auspices (although a US initiative) in 1974 as a counter to OPEC (Organisation of Petroleum Exporting Countries) and to discourage countries, particularly those in Europe, from signing bilateral oil supply agreements with OPEC countries. The IEA now has 28 country members and is independent of the OECD.

IEA membership requires countries to hold oil stocks equivalent to at least 90 days of net oil imports and, in the event of a major oil supply disruption, to release those stocks, restrain demand, switch to other fuels, increase domestic production or share available oil, if necessary. It has released stocks from its Strategic Petroleum Reserve only three times in its history: in 1991 during the first Gulf war; in September 2005 after Hurricane Katrina damaged oil rigs and refineries in the Gulf of Mexico; and in June 2011 during the Libyan uprising against Colonel Gaddafi.

The International Institute for Applied Systems Analysis (IIASA) is an international policy-oriented research organisation focusing on global issues that can be resolved only by international cooperative action, such as energy and climate change.

The World Energy Council is an international network of governments, companies and institutions that holds a World Energy Congress every three years.

The Hudson Institute is a US-based policy research and analysis organisation focused on strategic transitions to the future.

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A barrel of oil equivalent (BOE) is regarded as the approximate energy released by burning one barrel (42 US gallons or 158.9873 litres) of crude oil. Approximately 6,000 cubic feet of natural gas is considered equivalent to one barrel of oil, although the amount varies depending on the type of gas. The BOE unit enables an oil company's output of oil (measured in barrels) and gas (measured by volume) to be quantified by one figure.
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"This dizzying growth has, in turn, brought the issue of global resource consumption to a head. Perhaps the most vivid illustration of the implications of current growth rates for natural resources is seen by simply following the logic of exponential growth rates to its logical conclusion. With annual GDP growth of 9%, China's economy doubles in size roughly every 7-8 years – with all of the resource use implications that this entails." (p.17)
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"Getting additional oil out of existing wells through enhanced oil recovery techniques uses 15 to 1000 times more water. Potentially game-changing new coal, gas, and oil shale-based unconventional fuels that are shaking up world oil and gas markets, meanwhile, almost all are roughly 3 to 5 times more water intensive and face various bottlenecks.
". . . Important renewable, clean energies, too, are often prohibitively water intensive. None is more so than irrigated corn ethanol . . . Rain-fed corn ethanol's water intensity is roughly 2 to 6 times greater than conventional oil; at over 1000 times more water-consuming, irrigated corn ethanol, a small but apparently fast-growing segment of the industry, is off the water intensity charts."
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The Commission states on its website:
". . . 'safety nets' are necessary to protect vulnerable consumers, or at the time of a supply crisis. EU energy policy aims to protect European citizens from such risks."
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Mitchell writes:
". . . markets should be designed to be technology and fuel blind so that outcomes are not 'picked'; if an outcome is wanted, the policy put in place should mimic markets as far as possible and should not intervene directly in the market or network rules or incentives (for example, the Renewables Obligation); as far as possible, direct regulatory measures should

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Barysch notes: "At their informal Hampton Court summit in October 2005, EU prime ministers and presidents expanded the definition of EU energy policy to include climate action and energy security, alongside the traditional objective of creating a competitive energy market."
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"Electricity and gas prices fell substantially in real terms between 1990 and 2003 (reducing the number of fuel poor). However since 2003, the prices of both types of energy have risen substantially (albeit with some fluctuation). As of mid-2008 average household bills for electricity and gas were round 40 and 60 per cent more than in 2003 in real terms."
(Michael Pollitt, "Keep your hands off the market, Mr Miliband", *Parliamentary Brief*, 24 March 2009, <http://www.parliamentarybrief.com/2009/03/keep-your-hands-off-the-markets-mr-miliband#all>)
Stephen Thomas notes:
"In a competitive market, the lowest prices go to those that can negotiate hardest. Making the electricity market competitive effectively requires small consumers to be as tough negotiators as an aluminium smelter or a chemicals factory. If they are not, the companies will offer their best prices to large consumers and they will make their profits from domestic consumers."
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Kevin Jewell points out:
"Commercial and industrial uses have been able to use volume contracts and aggressive negotiating to capture the benefits of dropping wholesale prices."
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 95. Daniel Yergin, *The Quest: Energy, Security and the Re-making of the Modern World*, Penguin, New York, 2011, p.166.
 96. Vito Stagliano and Sarah Emerson, “Energy Trading—The Market’s Response to Deregulation”, *Resources*, Spring 1997, Issue 127, pp.7-10. <http://www.rff.org/Documents/Resources/Resources-127.pdf>
 97. Daniel Yergin, *The Quest: Energy, Security and the Re-making of the Modern World*, Penguin, New York, 2011, p.168.
 98. Ibid.
 99. For further discussion, see Mike Masters, “Testimony of Michael W. Masters Managing Member / Portfolio Manager Masters Capital Management, LLC before the Committee on Homeland Security and Governmental Affairs United States Senate”, 20 May 2008, http://hsgac.senate.gov/public/_files/052008Masters.pdf
 100. Ibid.
 101. A High Net Worth Individual is generally understood within banking as someone who has at least \$1 million in financial assets, excluding their primary residence, collectibles and consumer goods.
 102. An exchange-traded fund (ETF) attempts to track the price of a particular set of assets – a basket of mining company shares or commodities such as different foods or oil and gas. As such they are similar to mutual funds, but, unlike mutual funds, their shares can be bought and sold throughout the day. First developed some 20 years ago, they have proliferated over the past decade, tailored to specific regions, sectors, commodities, bonds, futures and other asset classes.
 103. The European Commission notes that this is also a feature of other energy markets:
“energy wholesale markets have become increasingly hybrid physical and financial ones”.
See European Commission, *Public Consultation by the Directorate General for Energy on measures to ensure transparency and integrity of wholesale markets in electricity and gas*, 31 May 2010, http://ec.europa.eu/energy/gas_electricity/consultations/doc/2010_07_23/energy_market_consultation_document.pdf
 104. Daniel Yergin, *The Quest: Energy, Security and the Re-making of the Modern World*, Penguin, New York, 2011, p.169.
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Anna Zalik, “Oil ‘futures’: Shell’s Scenarios and the social constitution of the global oil market”, *Geoforum*, Vol. 41, 2010, pp.553–564.
 106. Chris Cook, “. . . slipper to boot”, *Asia Times*, 30 August 2011, http://www.atimes.com/atimes/Global_Economy/MH30DJ02.html
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 111. Greg Muttiitt, *Fuel on the Fire: Oil and Politics in Occupied Iraq*, The Bodley Head, London, 2011, p.48.
 112. Mazen Labban, “Oil in parallax: Scarcity, markets and the

- financialisation of accumulation”, *Geoforum*, No 41, 2010, pp.541–552 [p.550].
113. Greg Muttitt, *Fuel on the Fire: Oil and Politics in Occupied Iraq*, The Bodley Head, London, 2011, p.49.
 114. *Ibid.*, p.50.
 115. *Ibid.*, p.32.
 116. Nonetheless, Iraqi civil society prevented the passage of a new national oil law that would have protected oil company profits from future national legislation or other government actions. Iraqi law does stipulate, however, that oil contracts awarded to foreign companies require parliamentary approval. Because many of those awarded were not put before the parliament, if a future Iraqi government does try to amend or cancel a contract, an international arbitration tribunal to which an oil company might appeal could rule that the contract was not legally valid in the first place.
 117. Greg Muttitt, *Fuel on the Fire: Oil and Politics in Occupied Iraq*, The Bodley Head, London, 2011, p.xxiv.
 118. *Ibid.*
 119. *The 2010 Preqin Infrastructure Review*, Preqin, London, 2010, p.49.
 120. Dan Schwartz, *The Future of Finance: How Private Equity and Venture Capital will shape the Global Economy*, John Wiley & Sons, Chichester, 2010, p.23.
 121. In 1998, David Hess, a partner in Arthur Andersen’s Corporate Finance Group, told *morebusiness.com*, “Investors require a minimum internal rate of return of 30 per cent.” According to the British Private Equity and Venture Capital Association (BVCA), private equity investments in the UK have returned an average of 38.8 per cent net to investors each year for the past three years. Returns for some funds focused on Asia have been much higher. In 2011, Michael Shone, chief executive officer of Commercial Intelligence, a fund focused on emerging market debt recovery, told *Private Equity Asia*, “we worked out that the average net recovery was 4.5x the original investments over a period of three years”.
See:
David Hess, “Private Equity Alternatives”, 1 August 1998, http://www.morebusiness.com/running_your_business/financing/privateq.brc
“Profit from private equity – Investors Chronicle”, undated, <http://www.hotbed.uk.com/news/profit-private-equity-investors-chronicle>
“Five Minutes with Michael Shone”, *PE Asia*, September 2011, www.privateequityasia.com
 122. This might suggest that funds will hold an investment for the longer term if it is profitable; in fact they rarely hold an investment for more than 5 years, and most funds have a life of just 10 years anyway.
Investment and Pensions Asia notes:
“[T]he majority of unlisted infrastructure funds (83%) target a net internal rate of return (IRR) of between 10% and 20%, which is lower than the level of returns traditionally sought by fund managers operating private equity or real estate funds, and the potential for very high returns is also much lower in this asset class . . . [O]nly 1% of infrastructure funds target an IRR of 25%. Most institutional investors believe management fees should reflect this lower risk/return profile.”
See Cecile Sourbes, “Institutional Investors eager to invest in infrastructure”, *Investment and Pensions Asia*, 26 August 2011, http://www.ipe.com/news/institutional-investors-eager-to-invest-in-infrastructure_41732.php
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 124. Iris Kuo, “Clean Tech investment declines in Q3, ‘There’s been a bubble’”, 1 October 2010, *Venturebeat*, <http://venturebeat.com/2010/10/01/cleantech-investment-declines-in-q3-theres-been-a-bubble/>
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 126. For further discussion, see:
Frank Partnoy, *Infectious Greed: How Deceit and Risk Corrupted the Financial Markets*, Profile Books, London, 2004.
Nicholas Hildyard, “A (Crumbling) Wall of Money: Financial Bricolage, Derivatives and Power”, *Corner House Briefing* 39, October 2008, <http://www.thecornerhouse.org.uk/resource/crumbling-wall-money>
 127. “Turkey implements feed in tariff, Spain cuts”, *Renewable Energy Focus*, 7 January 2011, <http://www.renewableenergyfocus.com/view/14994/turkey-implements-feedin-tariff-spain-cuts/>
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See also FERN, *Designed to fail? The concepts, practices and controversies behind carbon trading*, December 2010, <http://www.fern.org/designedtofail>
 130. Michael Pahle, Lin Fan and Wolf-Peter Schill, “How Emission Certificate Allocations Distort Fossil Investments: The German Example”, *Energy Policy*, Vol. 39, No. 4, 2011, pp.1975–1987.
 131. Oscar Reyes, *The EU Emissions Trading System: Failing at the Third Attempt*, Corporate Europe Observatory and Carbon Trade Watch, Barcelona, April 2011. <http://www.corporateeurope.org/news/eu-ets-failing-third-attempt>
Free handouts to the private sector may be cut back after 2012, but will continue in key industrial sectors.
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See also Rob Elsworth, Bryony Worthington, Michael Buick, Patrick Craston, *Carbon Fat Cats 2011: The Companies Profiting from the EU Emissions Trading Scheme*, Sandbag, London, June 2011, http://www.sandbag.org.uk/site_media/pdfs/reports/Sandbag_2011-06_fatcats.pdf.
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 134. For more information, see:
FERN, *Trading carbon: how it works and why it is controversial*, August 2010, <http://www.fern.org/designedtofail>.
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- Carbon: The Contradictions of Neoliberal Climate Policy”, *Socialist Register* 2012, pp.85-107, <http://www.thecornerhouse.org.uk/sites/thecornerhouse.org.uk/files/Socialist%20Register%20Neoliberal%20Climate%20Policy%20Contradictions.pdf>
- Larry Lohmann, “When Markets are Poison: Learning about Climate Policy from the Financial Crisis”, *Corner House Briefing Paper*, no 40, September 2009, <http://www.thecornerhouse.org.uk/sites/thecornerhouse.org.uk/files/40poisonmarkets.pdf>
- Larry Lohmann, *Carbon Trading: a critical conversation of climate change, privatisation and power*, Dag Hammarskjöld Foundation, Uppsala, September 2006, <http://www.thecornerhouse.org.uk/sites/thecornerhouse.org.uk/files/carbonDDLow.pdf>
135. The Intergovernmental Panel on Climate Change claims comparative numerical estimates for the effect of each gas: methane (CH₄) is 72 times more harmful than CO₂ over a 20-year time span, 25 times more potent over a 100-year time span, and 7.6 times more potent over a 500-year period. Carbon markets abstract still further from these figures by discarding the time horizons to posit equations between carbon dioxide and methane, nitrous oxide and HFC-23, such as:
- $$\text{CH}_4 = 25 \times \text{CO}_2$$
- $$\text{N}_2\text{O} = 298 \times \text{CO}_2$$
- $$\text{HFC-23} = 14,800 \times \text{CO}_2$$
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137. See Larry Lohmann, “When Markets are Poison: Learning about Climate Policy from the Financial Crisis”, *Corner House Briefing* 40, September 2009, <http://www.thecornerhouse.org.uk/sites/thecornerhouse.org.uk/files/40poisonmarkets.pdf>.
138. United Nations Risoe Centre, “CDM Pipeline Overview” 2011, <http://cdmpipeline.org>.
139. In January 2011, EU member states approved a proposal to ban HFC-23 and nitrous oxide offsets from 1 January 2013 onwards. Industry lobbied for the date to be pushed back to April 2013, a delay that effectively nullifies 1-2 years’ worth of emissions reductions within Europe.
- See Corporate Europe Observatory, *Laughing All the Way to the (Carbon Offset) Bank: Collusion between DG Enterprise and Business Lobbyists*, April 2011, <http://www.corporateeurope.org/news/laughing-all-way-bank>
140. For examples, see REDD Monitor: <http://www.redd-monitor.org>.
- Much of this land is controlled by people who are the poorest in economic terms. They are likely to be displaced at high human cost (never included in any calculations) and to see their store of knowledge of low-carbon livelihood provision depleted (also not included). The carbon market’s claim to offer poorer people a lucrative opportunity to sell pollution rights to the rich conceals resource grabs and scams that disproportionately benefit the wealthy in both South and North.
- See:
- Herbert Docena, *The Clean Development Mechanism in the Philippines: Costly, Dirty, Money-Making Schemes*, Focus on the Global South, Bangkok, 2010, <http://www.focusweb.org/sites/www.focusweb.org/files/CDM%20Web%20version%20lowres.pdf>
- Mausam* (Indian climate change magazine): <http://www.thecornerhouse.org.uk/resource/mausam>
<http://www.thecornerhouse.org.uk/resource/mausam-issues-2-5>
- <http://www.thecornerhouse.org.uk/resource/mausam-0>
- More generally, because the restrictions on greenhouse gas emissions apply to nations and industries in the North only while those in the global South are allowed to continue polluting, the popular belief is that the Kyoto Protocol recognises the different historical and current responsibilities for global warming between North and South. In fact, the Protocol and carbon markets favour the North because:
- it provides exclusively nation states and private firms in industrialised countries with legal and economic guarantees that protect their power to harm others by overusing the earth’s carbon-cycling capacity;
 - the permission for Southern countries to continue greenhouse gas pollution does not come in lucrative commodity form, as in the North;
 - Even if Southern nations were brought under a global “cap” of emission limits and issued permits that could be bought and sold, the amount would only be in proportion to their much smaller historical use of fossil fuels;
 - The primary function of caps is not to limit emissions (most climate scientists believe the Kyoto Protocol’s caps are derisory), but to create commodities. They are set at a level low enough to allow a fossil fuel economy to continue, but high enough to create a climate commodity.
- See Larry Lohmann, “Financialization, Commodification and Carbon: The Contradictions of Neoliberal Climate Policy”, *Socialist Register* 2012, pp.85-107.
141. Michael Szabo, “Kyoto May Push Factories to Pollute More: UN report”, *Reuters*, 2 July 2010.
- “EU Lawmakers Wade into HFC Debate”, *Point Carbon*, 15 July 2010.
- Herbert Docena, *The Clean Development Mechanism in the Philippines: Costly, Dirty, Money-Making Schemes*, Focus on the Global South, Bangkok, 2010, <http://www.focusweb.org/sites/www.focusweb.org/files/CDM%20Web%20version%20lowres.pdf>
- The World Bank, similarly, by lowering its efficiency standards for thermal power plant loans, has been able to increase production of carbon credits and thus boost revenues from the 13 per cent brokerage fee it charges for the offset transactions that it mediates. (Daphne Wysham, “Nothing More than Hot Air”, *Earth Island Journal*, Summer 2011, <http://www.earthisland.org/journal/index.php/eij/article/wysham/>)
- In May 2011, carbon traders expressed opposition to a new European directive proposing cuts in energy consumption in buildings, vehicles and industry on the grounds that it would reduce demand for carbon pollution rights and depress carbon prices. (Pete Harrison, “EU Energy Plan Threatens Carbon Billions”, *Reuters*, 30 May 2011.)
- It is no surprise that a large proportion of Kyoto Protocol carbon offset projects that claim to be “reducing” emissions in fact directly support the expansion of fossil fuel use, which exacerbates global warming. Carbon offsets are providing extra finance for gas pipelines, fossil fuel-fired generating plants, coal mines and oil wells. (United Nations Risoe Centre, “CDM Pipeline Overview” 2011, <http://cdmpipeline.org>)
142. Fred Pearce, “Carbon Trading Tempts Firms to Make Greenhouse Gas”, *New Scientist*, 16 December 2010, <http://www.newscientist.com/article/dn19878-carbon-trading-tempts-firms-to-make-greenhouse-gas.html>
143. Isaac ‘Asume’ Osuoka, “Paying the Polluter? The Relegation of Local Community Concerns in ‘Carbon Credit’ Proposals of Oil Corporations in Nigeria”, in Steffen Böhm and Siddhartha Dabhi (eds.) *Upsetting the Offset: The Political Economy of Carbon Markets*, MayFlyBooks, London, 2009,

- pp.86-97. www.mayflybooks.org.
- <http://www.thecornerhouse.org.uk/sites/thecornerhouse.org.uk/files/UpsettingtheOffset.pdf>
- Osuoka's investigation of Nigerian carbon offsets devised by Western oil companies and carbon consultant firms found that it was nearly impossible to determine whether the gas that the companies claimed will be diverted from flaring to productive use would not in fact come from dedicated gas extraction operations, whose production is not flared.
- See also United Nations Risoe Centre, "CDM Pipeline Overview" 2011, <http://cdmpipeline.org>
144. George Soros, *The New Paradigm for Financial Markets: The Credit Crisis of 2008 and What it Means*, Public Affairs, New York, 2008.
- Edward LiPuma and Benjamin Lee, *Financial Derivatives and the Globalization of Risk*, Duke University Press, Durham, NC, 2004, p.36.
145. Dieter Helm, "Government Failure, Rent-Seeking, and Capture: The Design of Climate Change Policy", *Oxford Review of Economic Policy*, Vol. 26, No. 2, pp.182-196.
146. A collateralised debt obligation (CDO) is a derivative that gives an investor rights to the income stream from a pool of bonds or loans, such as mortgages. The assets are held by a special purpose vehicle and are structured into tranches according to their risk. Investors are paid according to the level of risk of the tranche they bought into. For further details, see Nicholas Hildyard, "A (Crumbling) Wall of Money: Financial Bricolage, Derivatives and Power", *Corner House Briefing* 39, October 2008, <http://www.thecornerhouse.org.uk/resource/crumbling-wall-money>.
147. Michelle Chan, *Subprime Carbon: Rethinking the World's Largest New Derivatives Market*, Friends of the Earth, San Francisco, 2009. <http://www.suv.org/pdf/SubprimeCarbonReport.pdf>
- The difficulties are more profound than those associated with the so-called financial subprime crash of 2007, although the economic stakes are not so high – so far.
148. Larry Lohmann, "Financialization, Commodification and Carbon: The Contradictions of Neoliberal Climate Policy", *Socialist Register 2012*, pp.85-107 [p.90].
149. Larry Lohmann, "When Markets are Poison: Learning about Climate Policy from the Financial Crisis", *Corner House Briefing* 40, September 2009, <http://www.thecornerhouse.org.uk/sites/thecornerhouse.org.uk/files/40poisonmarkets.pdf>.
150. Government of India, Press Information Bureau, "High level committee on financing of infrastructure", 18 November 2010, <http://www.pib.nic.in/release/release.asp?relid=67235>
- Regulations relating to land acquisition and environmental permits are both cited in press reports as obstacles that need to be reviewed.
- See:
- "Rakesh to head infra panel", *Deccan Chronicle*, 11 November 2010, <http://www.deccanchronicle.com/business/rakesh-head-infra-panel-103>
- Priya Ranjan Dash, "Rakesh Mohan to lead infrastructure investment review", *Asian Age*, 11 November 2010, <http://www.asianage.com/india/rakesh-mohan-lead-infrastructure-investment-review-482>
- Spriha Srivastava, "India sets up high-level infrastructure committee", *Infrastructure Investor*, 19 November 2010, <http://www.infrastructureinvestor.com/Article.aspx?article=57537&hashID=543AC880D4F1ECAD4F61312EB2C5F050486A6DFA>
- "Govt sets up panel to evolve infra funding strategy", *Mydigitalfc*, 18 November 2010, <http://www.mydigitalfc.com/economy/govt-sets-panel-evolve-infra-funding-strategy-871>.
- Other incentives now being offered by the Indian Government to infrastructure investors, including in the energy sector, include tax breaks and an \$11 billion fund to provide debt finance for infrastructure projects through tax-free infrastructure bonds. Private equity will benefit from proposed changes under direct taxation and changes takeover regulations. See:
- Vikram Utamsingh, "PE Investments are back but is the activity sustainable?", 4 August 2010, <http://www.finance30.com/forum/topics/pe-investments-are-back-but-is>
- Manoj Kumar and Matthias Williams, "India boosts infrastructure with tax-free bonds", *Reuters*, 9 July 2010, <http://in.reuters.com/article/idINIndia-50008320100709>.
151. Spriha Srivastava, "Philippine Government offers PPP guarantees", *Infrastructure Investor*, 18 November 2010, <http://www.infrastructureinvestor.com/article.aspx?article=57504>
152. "Hope Springs Eternal", *Infrastructure Investor*, 28 October 2010.
153. Fabiane Stefano, "The Decade of Infrastructure Begins", *Exame*, Issue 966, 30 December 2010, <http://www.thebrazilianeconomy.com/edition-966/infrastructure.php>
154. Ana Utumi, head of tax affairs at the Brazilian law firm TozziniFreire, writes:
- "In 2007, the Brazilian government started a program called Growth Acceleration Program (PAC) in which infrastructure projects are entitled to tax relief, provided they are expressly approved and enrolled in PAC by the government. PAC tax incentives are applicable to projects in toll roads, airports, ports, trains, energy, and other areas."
- Brazil has also reduced IOF tax rate on foreign investments in private equity.
- See:
- Ana Utumi, "Investing in the Country of Soccer", TozziniFreire, undated, http://www.theworldlawgroup.com/files/file/docs/BRAZIL-WORLD_CUP_IN_BRAZIL_MAY_BRING_INVESTMENT.pdf
- Private Equity International, *The Latin American Handbook*, March 2011, p.8, <http://www.privateequityinternational.com>
155. Matt Miller, "Trillion Dollar Baby", *The Deal Magazine*, 18 June 2010, <http://www.thedeal.com/magazine/ID/034781/featuresold/cover-stories/trillion-dollar-baby.php>.
156. Mazen Labban, "Oil in parallax: Scarcity, markets, and the financialization of accumulation", *Geoforum*, No 41, 2010, pp.541–552 [p.546].
157. Laura Nader and Stephen Beckerman, "Energy as it Relates to the Quality and Style of Life", in Laura Nader (ed.), *The Energy Reader*, Wiley-Blackwell 2010, pp.219-245 [p.220] (extracts available at http://books.google.co.uk/books?id=_5LIYBjZ7gwC&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false)
158. Adaro Energy, "Strategic Development Projects", http://www.adaro.com/project_development/80

The problem with “Security” pages 63-78

1. Felix Ciuta, “Conceptual Notes on Energy Security: Total or Banal Security?”, *Security Dialogue* Vol. 41, No. 2, April 2010, pp.123-144 [p.124].
2. Michal Naturski and Anna Herranz Surrallés, ‘Securitizing Moves To Nowhere? The Framing of the European Union Energy Policy’, *Journal of Contemporary European Research*, Vol. 4, No. 2, 2008, pp.71-89 [pp.71-72].
3. Sanam S. Haghighi, “Energy Security and the Division of Competences between the European Community and its Member States”, *European Law Journal*, Vol. 14, No. 4, July 2008, pp.461–482 [p.478].
4. EU Commission, “The EU Energy Policy: Engaging with Partners beyond Our Borders”, 7 September 2011, http://ec.europa.eu/energy/international/security_of_supply/cooperation_en.htm
Russia also supplies one-third of EU crude oil imports and just under one third of hard coal imports.
5. Albert Bressand, “Between Kant and Machiavelli: EU foreign policy priorities in the 2010s”, *International Affairs*, Vol. 87, No. 1, 2011, pp.59–85 [p.72].
6. David Campbell, *Writing Security: United States Foreign Policy and the Politics of Identity*, Manchester University Press, 1998.
7. Emma C Verhoeff and Arne Niemann, “National Preferences and the European Union Presidency: The Case of German Energy Policy towards Russia”, *Journal of Common Market Studies*, 2011, pp.1–23 [pp.7-8].
8. Albert Bressand, “Between Kant and Machiavelli: EU foreign policy priorities in the 2010s”, *International Affairs*, Vol. 87, No. 1, 2011, pp.59–85 [p.75].
9. Brenda Shaffer, *Energy Politics*, University of Pennsylvania Press, Philadelphia, 2009, p.128.
10. Pavel K Baev and Indra Øverland, “The South Stream versus Nabucco pipeline race: geopolitical and economic (ir)rationalities and political stakes in mega-projects”, *International Affairs*, Vol. 86, No. 5, 2010, pp.1075–1090 [p.1087].
11. Article 100 of the Lisbon Treaty states that “without prejudice to any other procedures provided for in the Treaties, the Council, on a proposal from the Commission, may decide, in a spirit of solidarity between Member States, upon the measures appropriate to the economic situation, in particular if severe difficulties arise in the supply of certain products, notably in the area of energy”.
12. Emil Kirchner and Can Berk, “European Energy Security Co-operation: Between Amity and Enmity”, *Journal of Common Market Studies*, Volume 48, Number 4, 2010, pp.859–880.
13. Giselle Bosse and Anke Schmidt-Felzmann, “The Geopolitics of Energy Supply in the ‘Wider Europe’”, *Geopolitics*, Vol. 16, 2011, pp.479–485 [p.480].
14. Oil tankers transport two-thirds of the world’s oil (other container ships transport manufactured goods and commodities). Several “chokepoints” – narrow shipping lanes that could potentially be closed by artillery fire, missiles, mines or obstacles such as a scuttled ship – are considered strategic: the Strait of Hormuz at the entrance to the Persian Gulf; the Suez Canal connecting the Red Sea and the Mediterranean; the Bosphorus strait; and the Strait of Malacca (through which travels much of the oil going to Japan, China and South Korea).
The 54-kilometre-wide Strait of Hormuz is the only sea passageway for oil from Iraq, Iran, Kuwait, Saudi Arabia, Qatar and the United Arab Emirates. They all have an interest in keeping the Strait open to ensure not only that they obtain revenues from their oil exports upon which their national budgets depend, but also to import goods, including refined oil. During the Iraq-Iran “Tanker War” in the 1980s, no more than two per cent of ships passing through the Persian Gulf were disrupted, despite 554 attacks on oil tankers, the deaths of 400 sailors and the wounding of 400 more.
See Bassam Fattouh, *How Secure Are Middle East Oil Supplies?* Oxford Institute for Energy Studies, September 2007. p.15. <http://www.oxfordenergy.org/wpcms/wp-content/uploads/2010/11/WPM33-HowSecureAreMiddleEastOilSupplies-BassamFattouh-2007.pdf>.)
15. Retort (Iain Boal, T.J.Clark, Joseph Matthews, Michael Watts), “Blood for oil?”, *Afflicted Powers: Capital and Spectacle in a New Age of War*, Verso, London and New York, 2006, p.72.
16. Quoted in Michal Naturski and Anna Herranz Surrallés, “Securitizing Moves To Nowhere? The Framing of the European Union Energy Policy”, *Journal of Contemporary European Research*, Vol. 4, No. 2, 2008, pp.71-89 [p.74].
17. Retort (Iain Boal, T.J.Clark, Joseph Matthews, Michael Watts), *Afflicted Powers: Capital and Spectacle in a New Age of War*, Verso, London and New York, 2006, p.41.
These authors point out (p.71) that if oil and gas are about Chevron, Texaco, Shell, BP and Eni, they are also about “Bechtel, Kellogg, Brown and Root, Chase Manhattan, Enron, Global Crossing, BCCI, and DynCorp”, and about the oil theft, money laundering and drugs of the other “black economies” that altogether comprise an “oil-arms-military-engineering-construction-finance-drugs nexus”.
18. Jonathan Nitzan and Shimshon Bichler, “The Weapondollar-Petrodollar Coalition”, chapter 5 (pp. 198-273) *The Global Political Economy of Israel*, Pluto, London. 2002, p.212. <http://bnarchives.yorku.ca/121/>
19. After many national arms companies were privatised in the 1980s, much of the Security developed by the state itself is now being put on the market. This extends far beyond sales of radioactive material and the like from the former Soviet Union. In November 2011, for instance, the UK government announced that GCHQ, its “intelligence listening station”, would repackage and market some of its security technology to the private sector to help protect power stations and other utilities from online attack. (Helen Warrell and James Blitz, “GCHQ emerges from the shadows to sell cybertechnology to private sector”, *Financial Times*, 26 November 2011. p.1.)
In 2006, the UK authorities were forced to abandon their criminal investigations into alleged bribery and corruption involved in the supply of fighter planes and associated services by Britain’s top arms company, BAE Systems, to Saudi Arabia. The £43 billion, 20-year deal, signed in 1988, was a government-to-government deal involving oil for arms. *See*: <http://www.thecornerhouse.org.uk/resources/results/taxonomy:90>
20. Vaclav Smil, *Energy: A Beginner’s Guide*, Oneworld, Oxford, 2006. p.127.
21. Friends of the Earth International, *Trade and People’s Food Sovereignty*, FOE International, Amsterdam, April 2003. p.2. <http://www.foei.org/en/resources/publications/old/tradepeoplesfoodsov.pdf>
22. Logan Cochrane, “Food Security or Food Sovereignty: The Case of Land Grabs”, *The Journal of Humanitarian Assistance*, Feinstein International Center, 5 July 2011. <http://sites.tufts.edu/jha/archives/1241>
23. Still today, those Middle Eastern countries that enjoy the support of the West “pay for the support received not with cash but by importing military hardware, goods and

- services, and offering military bases.” See Robert Mabro, “Political Events in the Middle East and their Impact on Energy”, *Oxford Energy Forum*, May 2011, Issue 84, pp.3-4 [p.3]. <http://www.oxfordenergy.org/wpcms/wp-content/uploads/2011/05/OEF-84.pdf>
24. Retort (Iain Boal, T.J.Clark, Joseph Matthews, Michael Watts), “Blood for oil?”, *Afflicted Powers: Capital and Spectacle in a New Age of War*, Verso, London and New York, 2006, pp.68-70.
 25. In 1980, US President Jimmy Carter said:

“An attempt by any outside force to gain control of the Persian Gulf region will be regarded as an assault on the vital interests of the United States of America and such an assault will be repelled by any means necessary, including military force.”

Using terms such as fear, anxiety and vulnerability to emphasise the threat of the US being cut off from oil, Carter began the process of reversing anti-military sentiments that had pervaded American public life since the end of the Vietnam War and of rebuilding American military capabilities. Since then, the US has showered countries in the Middle East, especially Iran, Saudi Arabia and the Gulf states, with arms shipments and military support that were matched, until 1991, by the Soviet Union’s shipments to Egypt, Syria and Iraq. During the 1980s, the US administration “tilted” back and forth between Iran and Iraq in the eight-year war between the two countries, “sometimes helping both countries simultaneously, sometimes covertly arming one side as a corrective to unanticipated consequences of having helped the other.”

See Jonathan Nitzan and Shimshon Bichler, “The Weapondollar-Petrodollar Coalition”, chapter 5 (pp. 198-273) *The Global Political Economy of Israel*, Pluto, London, 2002, p.256. <http://bnarchives.yorku.ca/121/>

See also:

Peter Haynes, “Al-Qaeda, oil dependence, and US foreign policy” in Daniel Moran and James A. Russell, *Energy Security and Global Politics: The Militarization of resource management*, Routledge, London and New York, 2009, pp.62-74 [p.72].

Amy Myers Jaffe and Ronald Soligo, “Energy security: The Russian connection”, in Daniel Moran and James A. Russell, *Energy Security and Global Politics: The militarization of resource management*, Routledge, London and New York, 2009, pp.112-134 [p.115].

Timothy Mitchell, “Carbon Democracy”, *Economy and Society*, Volume 38, Issue 3, 2009, pp.399-432

Timothy Mitchell, *Political Power in the Age of Oil*, Verso, London, 2011.
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Saudi Arabia is the biggest buyer of British weapons today. See Dinya Godrej, “Anxieties of influence”, *New Internationalist*, Number 448, December 2011, p.14.
 27. Robert Mabro, “Political Events in the Middle East and their Impact on Energy”, *Oxford Energy Forum*, May 2011, Issue 84, pp.3-4 [p.4]. <http://www.oxfordenergy.org/wpcms/wp-content/uploads/2011/05/OEF-84.pdf>
 28. Michael Klare, *Rising Powers, Shrinking Planet: How Scarce Energy is Creating a New World Order*, Oneworld, Oxford, 2008, p.215.
 29. Ibid., p.10.
 30. Ibid., p.214.
 31. Mazen Labban, “The Struggle for the Heartland: Hybrid Geopolitics in the Transcaspian”, *Geopolitics*, Vol. 14, Issue 1, 2009, pp.1-25 [p.20].

While some countries and states have made determined efforts to set aside some fossil wealth for targeted social benefits (Venezuela, Norway and Alaska), a more common response among highly oil-dependent governments has been to spend money arming the police, military and security forces. See Samuel R. Schubert, “Revisiting the Oil Curse”, *Development*, Vol. 49, No. 3, 2006, pp.64-70 [p.67].
 32. Michael Peel, *A Swamp Full of Dollars: Pipelines and Paramilitaries at Nigeria’s Oil Frontier*, IB Tauris, London and New York, 2009. p.xviii.
 33. Mazen Labban, “The Struggle for the Heartland: Hybrid Geopolitics in the Transcaspian”, *Geopolitics*, Vol. 14, Issue 1, 2009, pp.1-25 [p.20].
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- Peel also notes that Nigeria's dependence on a single, volatile source of income has echoes in Western countries that have grown increasingly – and dangerously – reliant on the apparent ingenuity of the finance industry and the invisible movement of money:
- "If the world's leading retail banks ever did fail – even temporarily – how long would it be before cash shortages and the inability to buy food brought area boys and girls of all classes to loot on London's streets?" (pp.68-69)
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- For more up-to-date information, see London Mining Network: <http://londonminingnetwork.org/tag/colombia/>
66. The Phulbari Coal Project is proposed by a UK-based company GCM Resources plc that has been financially supported by banks and hedge funds. After local protests, the Asian Development Bank (ADB) withdrew in 2008 its previous approval a project loan and political risk insurance to GCM. The coal mine would displace at least 50,000 people (one report claims up to 500,000) if it is realised and destroy much of the local environment. On 26 August 2006, three people were shot dead when security forces fired on a peaceful gathering of more than 50,000 people objecting to the project and at least 100 more were injured.
- For more information, see:
- Mines and Communities: <http://www.minesandcommunities.org/>
- Accountability Project: <http://www.accountabilityproject.org/downloads/Phulbari%20Factsheet%20with%20Footnotes.pdf>

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 Adds energy guru Daniel Yergin:
 "Assuring the security of global energy markets will require coordination on both an international and a national basis among companies and governments, including energy, environmental, military, law enforcement, and intelligence agencies."
 See Daniel Yergin, "Ensuring Energy Security", *Foreign Affairs*, Volume 85, No. 2, 2006, pp.69-82 [p.79].
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 "Every policy can be justified in the name of security. After all, who could be in favour of insecurity? Airports use the word ('For your own security, please ...') to make us do anything they want, and so do politicians."
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 This security landscape involves the outsourcing of surveillance to private companies, a focus on threats rather than root causes, a shift to proactive policing, excessive criminalisation, a clampdown on civil liberties, the targeting of suspect communities and the expansion of executive powers and security controls. Within these new security landscapes, it much more difficult to maintain democratic checks and balances.
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