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Geopolitics in the Petroleum Quagmire

Or: International Conflicts at the End of the Fossil Energy Regime

1 Introduction: From “Grand Chessboard” to the Great Quagmire

After the demise of the “socialist system” at the end of the 1980s the discourse on “globalization” became dominant in the social sciences; the volume of literature published on the subject since then is immeasurably vast. For the most prominent proponents of the idea of a new era of “geo-economics,” E. Luttwak (1994) or K. Ohmae (1992), its main characteristics are economic competition on global markets in place of political conflicts in international relations, and the transformation of the binary logics of political enemies and hostile nation-states into the peaceful rules of (by definition) an era of multilateral systems, of free trade. In the meantime, however, and especially after September 11, 2001, the binary interpretation of the world as divided into accepted friends and hostile foes has returned into favor, forcefully pushed particularly by the Bush-administration and the neo-conservative think tanks and media which are ideologically backing it.

Is it only neo-conservative or neo-liberal ideology which guides the US-government in following the path of a “unipolar moment” (announced by Charles Krauthammer immediately after the end of the Soviet block and since then incessantly repeated) or as the “only superpower” which remained after the collapse of the Soviet Union (Brzezinski 1997)? Or are powerful economic interests leading it towards the unilateralism of a superpower? How important is it for the geopolitical stance of the USA that leading figures such as Cheney, Rice, Rumsfeld and many others, including Bush himself, have strong ties to the California-Texas oil industry? Is the Bush administration driven by a Wall Street-military-CalTex-complex?

I will try to give an answer to these questions by *firstly* analyzing the implications of the predominant fossil-energy regime and the dependence of modern capitalist countries on the secure supply of petroleum and by *secondly* dealing with the – in

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most analyses of geopolitics disregarded - relationship between the development of financial markets and the foreseeable exhaustion of fossil resources. *Thirdly* it is then necessary to analyze the socioeconomic and political dynamics arising from a harsher conflict over oil supplies at the end of the fossil-energy regime. Is a period of a new “oil imperialism” coming back again, and what are the consequences of the greenhouse effect on world peace? Is mankind becoming engulfed in a grand “quagmire,” of which US Defense Secretary Rumsfeld spoke during a Press conference after the provisional end of the war against Afghanistan on November 27, 2001 (Giesenfeld 2004)? Is the quagmire of the Afghanistan and Iraq wars and of potential “conflicts among the great powers, arising from their competitive pursuit of strategic advantage” (Klare 2004: 181) in the Gulf and Caspian Sea areas an outcome of the so-called “strategy of maximum extraction” (Klare 2004: 82 passim) of oil for capitalist accumulation and valorization? These questions have to be addressed by taking the dynamics of modern capitalism into consideration. *Fourthly*, in my concluding remarks I give a brief outlook on the necessary future transition to a renewable energy regime, to a “postpetroleum economy” (Klare 2004: 197 passim), because “a bold policy to end the nefarious addiction to oil would... be the best strategy to win the epic struggle against terrorism – and may be the only one that works” (Kleveman 2004: XX).

Generally, the dynamics of capitalism are the outcome of science and technology (Industrial Revolution), of the social form of surplus-value production (capitalist mode of production) and, last but not least, of the massive use of fossil fuels (energy regime).¹ The access to energy resources has always been a major cause of conflict and violence (Clark 1991). As we approach the end of the fossil-energy regime, we are witnessing increasingly sharp conflicts about the access to resources, as well as conflicts resulting from the ecological degradation of large territories as a major consequence of the extraction and combustion of oil. The dimensions of these conflicts take the form of disputes over trade, or they appear as diplomatic pressures and extortions or as economic blackmailing. But conflicts about oil have also led to

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¹ I am fully aware that also the political revolution and the creation of a modern bourgeois system are of utmost importance for the further development of capitalist societies, but cannot deal with these here.

open wars, waged by the “only superpower” against Afghanistan and Iraq² or between informal warlords and formal governments about the access to oil fields and extraction of oil in Africa (Sudan, Angola, Nigeria) or Latin America (Colombia). The fossil-energy regime is highly conflict-prone. The “Grand Chessboard” (Brzezinski 1997) has become a great quagmire covering large parts of the world, but with its deepest spots in the Gulf, the Caucasus and Central Asian regions.

2. The Congruence of Capitalism and the Fossil-Energy Regime

Before coming back to the quagmire we must discuss the reasons for the dependence of modern societies on oil. Without a continuous supply and massive use of fossil energies modern capitalism would be locked into the boundaries of biotic energies (wind, water, bio-masses etc.). In ancient societies (in Europe as well as in Latin America and Asia), although capitalist social forms had already put down some weak roots, these could not flourish because of an insufficient technological basis and the lack of fossil energy. The economy was restricted by reliance on “slow” biotic energies which did not allow a capitalist acceleration of production, i.e., a decisive increase of productivity. Conversely, fossil energy would not have played the decisive role which it has done since the Industrial Revolution of the late 18th century without the social formation of capitalism and its all-encompassing dynamics. Three forces drove that development: (1) the “European rationality of world domination” (as Max Weber called it), (2) the dynamics of money in the form of capital (as Marx analyzed it) and (3) the comprehensive use of fossil energies in the course of a “Promethean Revolution” (Georgescu-Roegen 1971). This combination was the main cause of the take-off of modern societies into an era of accelerated growth.³

² The war against Yugoslavia of 1999 can be interpreted as part of the geopolitical “Great Game” about resources, too. It helped to establish military bases in the Balkans and bridge the territorial gap between Central European NATO-members (Hungary) on the one side and Greece and Turkey on the other. Moreover it thus became possible to lock up Russia and other competing powers in a geostrategical line-up of Eastern European (Georgia, Ukraine) and Caspian states (Azerbaijan, Usbekistan, Kirgistan, Afghanistan).

³ With regard to the transition of the energy system, the Industrial Revolution is comparable to the Neolithic revolution several thousand years ago, when mankind discovered how to systematically transform solar energy into crops etc. by establishing sedentary agricultural systems. The development of agriculture resulted in an increase of food production and, moreover, in a greater reliability of food supplies. The surplus produced by the farmers – in the terminology of the 18th-century “Physiocrats,” the sole “productive class” – made possible the feeding of the “unproductive classes” of artisans, clerks and rulers. The division of labour within society included the divisions of labor between urban

The transition to industrial systems is much more dramatic than that which transformed societies of hunters and gatherers into a social order of sedentary agricultural systems, for the Neolithic revolution did not fundamentally change the solar-energy regime: it resulted “only” in a more efficient transformation of solar energy into secondary energies for human use. Under a fossil-energy regime, however, it is no longer the flow of solar radiation that serves as the main energy supply for the system of production and reproduction, but the use of the mineralized stocks of energy in the crust of the earth. Consequently, the Industrial Revolution is a transition from an *open* energy system (virtually unlimited radiation of the sun) to a *closed* energy system (based on limited stocks of fossil resources).

One *caveat* is necessary: Although the capitalist “growth machine” is nearly entirely powered by fossil energy (and thus stuck **in** a closed system), human and natural life in general is almost entirely dependent on solar radiation (i.e., on an open system). Daylight, the warming of the atmosphere, of the water and the soil, the growth of living beings, the provision of food, etc. result from solar radiation and only to a small extent from the use of fossil-energy consumption. The satisfaction of primary human needs is only possible by using energy in the form of organic foods (containing proteins, fats, carbohydrates, vitamins, minerals and water) and, in a transformed manner, as clothing and shelter, not to mention the availability of oxygen.

This contradiction between life conditions (in an open system) and economic conditions (relying on a closed system) on Earth is of utmost importance. Capitalism has constructed something like a “Berlin Wall” between the open system powered by solar energy and thus with constant entropy and the closed system powered by fossil energy, characterized by increasing entropy. Today, and possibly forever, it is impossible to power the machine of capitalist accumulation with solar radiation. It simply does not have the advantages, i.e., the potential of time and space compression, that fossil energies have. On the other hand, the fossil-energy regime of the capitalist economy has a highly destructive effect on the living conditions on Earth, i.e., on life which is “powered” nearly completely by solar radiation. The

and rural areas, between the sexes, between intellectual and manual labour and between the rulers and the ruled. The Neolithic revolution is an important example which shows that it is possible to vastly

degradation of nature, e.g., the greenhouse effect, ozone-layer depletion, the loss of biodiversity, desertification, the disappearance of tropical rain forests etc., i.e., the deterioration of the systems of transforming solar radiation into useful energy for the evolution of nature, is due in great measure to the working of the fossil-energy system. Thus, the capitalist socioeconomic formation is deeply based on a system reproducing an “energy apartheid”.

Although nature contains all the resources necessary for mankind to survive, fossil resources allow an increase in “the wealth of nations” which, since Adam Smith, has been attributed to the historical mission of capitalism (a highly influential belief which was even shared by Marx and Engels, as is evident in the *Communist Manifesto* of 1848). The undeniable advantage of fossil (and nuclear) energies over solar energy is the congruence of their physical properties with the socioeconomic and political logics of capitalist development:

- *Firstly*, they can be used without having to consider space and place. The location of energy resources is no longer the main reason for the location of industries, for it is simple to transport energy resources to any place in the world. The fossil-energy system spreads itself far and wide by creating logistical networks which today cover the globe. It is, so to speak, “*autopoetic*”, for it allows the transport of energy to remote places of the Earth, thus drawing them into the fossil system and then into the world of capitalist value- and surplus-value production. Energy supply therefore is only one factor, amongst many others, in decisions about where production is to take place. The availability of local sources of energy has only a minor impact on the competition for locations in the global space.
- *Secondly*, and in contrast to solar radiation, which changes its intensity depending on whether it is day or night, summer or winter, and with the rhythms of the seasons, fossil energies can be used 24 hours a day, 365 days a year with constant intensity. They allow the organization of production processes independently of social time schedules and biological and other natural rhythms. The time regime of modernity follows the logics of profitability and shareholder value. The reason

increase the productivity of labour and of resources on the basis of a solar-energy regime. Therefore, a similar increase after the transition from fossil energies to a “solar society” cannot be excluded.

is that fossil energies can be stored and consumed without reference to natural time patterns, and only in accordance with the timetable that will maximize profits. “Time is money” therefore appears not as a crazy statement but as an adequate norm for human behavior in “modern times.”

- *Thirdly*, fossil energies enable the extreme *acceleration* of processes, i.e., the “compression of time and space” (Harvey 1999; Altvater and Mahnkopf 1999). Their use namely promotes an increase in productivity – that is, the production of more commodities within a given time span or the reduction of the time span needed to produce a given quantity of products. Since time and space are the coordinates of the natural world in which we live, their compression implies a serious disregard of the natural conditions of work and life.
- *Fourthly*, fossil energies can be used very flexibly with regard to the quantities of energy consumed or the temporal distribution and spatial location of consumption. The development of electricity networks and of the electro-motor, the illumination of whole cities at night, the gasoline and diesel engine are decisive indications of an increasingly flexible use of energy-inputs, of the mobilization and acceleration of economic processes and of an individualization of social life that had never existed before in human history. Managerial decisions in capitalist firms can now follow the logics of profitability without having to take into account energy restrictions or spatial and temporal constraints. Therefore, accumulation and growth must be understood as increasingly independent of natural conditions and their limitations.

This congruence is the major cause of high rates of economic growth. Since the emergence of modern capitalism, world population has increased faster than ever before. Moreover, economic growth became independent of population growth because of the enormous increase in productivity. Therefore, contrary to Malthus’ predictions, per capita incomes have also increased. In an OECD study Angus Maddison has shown that in the first millennium of the Common Era, from 0 to 1000 CE, the world’s population grew at an average annual rate of 0.02%, from 230.8 million to 268.3 million. From 1000 to 1820 CE the number increased to 1041.1 million. GDP per capita followed a similar trend: in the first millennium CE there was a slight decrease from an average of \$444 to \$435 per person per year (in the

1990 equivalent dollar standard which Maddison uses).⁴ Between 1000 CE and 1820 an increase to \$667 per capita took place. It is interesting to note that in the first millennium the income divergences of calculated monetary income in Western Europe, Japan, Latin America, Eastern Europe, Africa and Asia were very small. In the second millennium, however, the divergence of per capita incomes increased remarkably. Average world per-capita income increased from 1820 to 1998, i.e., in merely 178 years, from \$667 to \$5709 (in Maddison's 1990 international dollar standard). Income distribution in the same period became more uneven. In 1998 average per-capita income in Western Europe was \$17,921, in North America (USA, Canada) \$26,146 dollars, in Asia (excluding Japan) \$2,936 and in Africa \$1,368 (Maddison 2001: 28).

Table 1:
Level and growth rates of per capita GNP in different world regions from the year 0 to 1998

<i>Year/period</i>	<i>0</i>	<i>1000</i>	<i>1820</i>	<i>1998</i>	<i>0-1000</i>	<i>1000-1820</i>	<i>1820-1998</i>
<i>Region</i>	In international dollars of 1990				Average annual growth rates		
Western Europe	450	400	1232	17921	-0.01	0.14	1.51
Western settlers, colonies	400	400	1201	26146	0.00	0.13	1.75
Japan	400	425	669	20413	0.01	0.06	1.93
Average of group A	443	405	1130	21470	-0.01	0.13	1.67
Latin America	400	400	665	5795	0.00	0.06	1.22
Eastern Europe and former SU	400	400	667	4354	0.00	0.06	1.06
Asia (except Japan)	450	450	575	2936	0.00	0.03	0.92
Africa	425	416	418	1368	-0.00	0.00	0.67
Average of Group B	444	440	573	3102	-0.00	0.03	0.95
World	444	435	667	5709	-0.00	0.05	1.21

Quelle: Maddison, Angus (2001): *The World Economy – A Millennial Perspective*, OECD, Development Center Studies), Paris, Table 1-2, p. 28.

⁴ Maddison, of course, is aware of the problems arising by measuring monetary flows over 2000 years in the dollar-denominations of 1990. Therefore interpreting these figures requires extreme caution. Nevertheless, the data are plausible, even though their precision can be legitimately doubted.

Economic growth has become a kind of a fetish worldwide, not only in economic theory but also in political discourse. Interestingly enough, classical political economy, whose founders were still living in a predominantly agrarian environment, established only the foundations of a theory of growth, but did not develop the theory. On the contrary, some of the classical political economists praised the virtues of self-sufficiency and a contemplative life – e.g., John Stuart Mill. Only in the 20th century did economic growth come to be seen as the most important goal of economic activity. Growth and growth theory first became a central concern in the planning processes of the socialist Soviet Union. It then became the dominant economic discourse in the course of the competition between the capitalist and the soviet-socialist systems and with the development of Keynesian economics. Today, growth is the most unchallenged concept of economic theory and policy, from the World Bank to local governments, regardless of the paradigmatic approach chosen. Growth is advocated as the main remedy for the problems of the world: these extend from unemployment, poverty, underdevelopment to the fiscal crisis of the state, etc. Of course, real income growth does enlarge the funds to be distributed, thus facilitating political processes. But the question is: is growth possible forever, is growth "triumphant" (Easterlin 1998)? Of course not, because nothing on earth keeps on growing eternally, limitlessly: in a closed system (the planet Earth is an open system, but the fossil-energy regime is closed) stocks of resources (in our case, oil) are limited and their exploration and extraction over time become more and more difficult, expensive and – last but not least – conflict-prone.

3. “Valorization” of Resources and “Financialization” of Capitalism

The problems arising from the limitedness of fossil-fuel supplies are still accentuated when we consider the tendency toward the valorization⁵ of natural and social resources and the modern “financialization” of capitalism. Valorization is nothing other than a general subordination of labor and nature under the regime of capitalist

⁵ «Valorization» is both: surplus value-production and the initial stage of a transfer of resources (which until then were not values) into the world of values where they are subject to the conditions of

surplus-value production and accumulation – which thus drags them from the open solar-energy system into the closed fossil-energy system. The historical forms in which this general tendency appears vary and allow us to distinguish between the historical stages of capitalist development, between modes of regulation and regimes of accumulation. I will not present the narrative of “historical capitalism” or discuss the theory of regulation, but rather build on a quite recent debate which stresses anew the exploitative character of “accumulation by dispossession” (Harvey 2004): Modern capitalism, comparable to pre-industrial capitalism and to the forms of original or primary accumulation, relies on “unequal exchange,” on appropriating profits by expropriating third parties, peoples as well as classes. “Enclosures” thus are not restricted to early capitalism, such as in 16th-18th century England, as required for so-called “primary accumulation.” They remain a common feature of capitalism up to the present (De Angelis 2004). “Enclosure” establishes private-property rights. It involves the predatory seizure and private appropriation of former natural and cultural commons and produced public goods, such as infrastructure. Comparable to “rent-seeking,” this is not an outdated form of deprecation practiced by ruling elites in less developed countries, but a highly sophisticated strategy to increase “shareholder value” without productively creating it. It includes methods of “creative book-keeping,” grand corruption and frauds, as demonstrated recently in the Enron, Parmalat and numerous similar scandals. It also relies on wage reductions, cuts in social expenditure or a considerable prolongation of the working time in countries which in the past decades have built up a comprehensive welfare system. The all encompassing privatisation of public goods and services also is expropriation of people for the benefit of financial investors. Last not least dispossession has been organised on a large scale by the Bretton Woods Institutions by means of structural adjustment plans which allow TNCs to buy out the state owned industries of indebted countries from Argentina to South Korea.

With regard to accumulation by dispossession it makes sense to use the Marxian distinction between absolute and relative surplus-value production (Marx, *MEW* 23, 3rd-5th part). The first method is geared towards an increase of working time, while reducing wage costs in order to increase surplus value or profits; it is only “formal subsumption of labour under capital.” The latter is the appropriate method in modern

value and surplus-value production. The French and German terms are clearer than the English word

capitalism, the “real subsumption of labour under capital” (Marx, *MEW* 23, 14th chapter): increasing surplus value and profits by increasing productivity in the production of wage goods. The production of *absolute* surplus value has again become of decisive importance; the reason is that profits gained with the methods of *relative* surplus production, i.e., by means of increasing productivity,⁶ are not sufficient to meet the claims of capitalist firms and monetary-wealth owners. Under the conditions of globalization interest rates are set on global financial markets; they are applied as benchmarks of profitability by globally operating rating agencies. Therefore profit rates or “shareholder value” produced in the “real economy” have to be pushed to the level of interest yields on global markets. However, real interest rates (the benchmarks of profitability) since the end of the 1970s have become much higher than real growth rates (Table 2). This difference is an indicator of interest rates exceeding the profits produced by means of relative surplus-value production. The “hard budget constraint” exerted by high interest rates on investors now works as a profit squeeze. Table 2 below sheds some light on the relationship between real interest rates and real growth rates in the last two decades. The data indicate a level of real interest rates which is consistently higher than the level of real growth rates.

Table 2
Real Growth Rates and Real Interest Rates

	GDP (real growth rate; nominal growth rate less inflation)				Real Interest Rates (%) (interest rates on 10-year government bonds less inflation rate)	
	World	G7	Developing Countries	Western Hemisphere	USA	Euro Region
1980-89 (annual average)	3,41	3,01	4,2	2,11	4,94	X
1990	2,8	2,8	3,6	0,6	3,15	X
1991	1,6	1,0	5,0	4,0	3,63	X
1992	2,2	2,0	6,2	3,6	4,02	X
1993	2,4	1,3	6,3	4,0	2,92	X
1994	3,7	3,1	6,7	5,0	4,47	X
1995	3,7	2,4	6,1	1,8	3,77	X
1996	4,0	2,7	6,6	3,6	3,51	5,08
1997	4,2	3,2	5,9	5,2	4,01	4,38
1998	2,8	2,8	3,5	2,3	3,71	3,61

valorisation: “*mise-en-valeur*,” “*Inwertsetzung*.”

⁶ Increasing productivity under the “Fordist regime” was accompanied by wage increases and reductions of labor time, thus creating a growing demand for a growing supply of goods and services. Since the 1970s, however, this “Fordist equation” has lost its historical validity.

1999	3,6	3,0	3,9	0,2	3,35	3,58
2000	4,8	3,5	5,7	4,0	2,65	3,06
2001	2,4	0,8	4,1	0,7	2,19	2,92

Source: IMF, World Economic Outlook, Database, <http://www.imf.org/external/pubs/ft/weo/2003/02/data/index.htm> (1 February 2004), author's own calculations; more elaborated: Altvater 2004.

In Asia, too, real interest rates have been extremely high. A publication issued by the Central Bank of the Philippines on real interest rates (difference between prime rate and inflation rate) in Southeast Asian countries in late summer 1999, reviewing the time after the Asian crisis, reveals real interest rates of 5.34% in the Philippines, 17.23% in Indonesia, 14.60% in Hong Kong, 9.30% in Thailand, 8.95% in South Korea, 7.25% in Taiwan, 5.28% in Singapore, 4.6% in Malaysia (Central Bank of Philippines, News Release, October 22, 1999). In Brazil, real interest rates reached more than 10% in 2002 and 2003 (Folha de Sao Paulo, December 18th, 2003). The “monetary economy,” particularly stock markets and institutional investors, exert “financial repression” over the “real economy”⁷, because it is highly unlikely that real interest rates of 7% to 17% can be surpassed by real growth rates. This situation that revenues on financial investment are higher than those on real investment has been called a “financialization” of modern “post-Fordist” capitalism (Aglietta 2002; Chesnais & Serfati 2003). The financial sectors of the global economy are expanding rapidly, whereas the real economy is growing only slowly, hamstrung by economic, social and ecological factors limiting growth (Altvater 2002; 2004; Felix 2002). This is a major reason for the current application of the methods of absolute surplus-value production to boost accumulation.

Another consequence of the prohibitive burden of debt service resulting from high interest rates are the financial crises that have hit most of the world's indebted countries since the early 1980s. The Asian crisis of 1997 is a telling example of the destructive effects of financial markets and their inherent instability on the real wealth and living conditions of ordinary people. After the crisis of 1997 Indonesia

⁷ In economic literature “financial repression” is understood as the regulation and control of financial markets by government. “...In this view financial repression refers to a set of policies, laws, formal regulations, and informal controls, imposed by governments on the financial sector, that distort financial prices – interest rates and foreign exchange rates – and inhibit the operation of financial intermediaries at their full potential... Successful financial repression increases the demand for credit, and at the same time, creates disincentives to save...” (Denizer, Desai & Gueorguiev 1998). Here, contrary to the neoclassical concept, the term is used to make the pressures exerted by financial claims on the real economy better understandable.

had to divert about 40% of its GDP into the collapsing banking industry in order to bail out creditors and investors. In 1995 Mexico lost about 20% of its GDP; in 1994 the Czech Republic 15%; 1994-98 Russia about 40%; South Korea 25%; Thailand about 22%; 1994-97 Argentina about 30% and, again after 2001, a large chunk of its GDP (World Bank 2000: 8; de Luna Martínez 2002: 77). High real-interest rates require high real-growth rates in order to fulfill the necessities of debt service or else a financial crisis inevitably breaks out. In such cases monetary-wealth owners simply satisfy their claims by milking the economic substance of the unfortunate country. Large parts of the population sink into poverty.

This is where the “financialization” of modern capitalism is linked to the growing demand for oil. Hence the valorization of fossil resources comes in: High real-interest rates demand high GNP growth rates. Under the prevailing patterns of technological deployment, growth can only be achieved by an intensive use of fossil energy. Thus the operation of global financial markets has an impact on oil extraction and oil markets.⁸ Moreover, the globalization of Western production and consumption patterns results in a growing demand for oil. Newly industrializing countries crowd into the oil markets and add to the already insatiable demands of the OECD countries. The financial claims and the demand arising from the spread of Western life-style patterns can grow without acknowledging any social or natural limits. Financial claims follow the auto-referential logic of money and capital. However, the availability of oil – the fuel of the growth-machine – is subject to natural limitations, as its extraction and exploitation are dependent on the limited production capacity of oil fields and on the limited carrying capacity of natural sinks.

3 The crisis of the fossil-energy regime

Generally, in capitalist calculations ecological limits are recognized only when they increase the costs of economic processes,⁹ either on the input or output side of

⁸ It can only be mentioned in passing here that two other pressures are also exerted by the financial system on the quantities and prices of supplies offered on the world's oil markets. One arises from the speculation in the futures markets. The other results from the heavy “petrodollar” and “petroeuro” investments of rich Gulf oil producers in financial assets, which has meanwhile led to their income being just as dependent on interest flows as on oil revenues.

⁹ Gold is a telling example. Notwithstanding its very nature as a limited resource, gold functions socially and economically as money. Since capitalist accumulation ignores natural boundaries and

production, for oil stocks are limited and over the next decades inevitably run out. Oil production has now probably reached its peak; i.e., production is larger than the new reserves being found. Moreover, the exploitation of known reserves has become more and more expensive as the pressure, viscosity and other physical properties of oil deposits deteriorate with further extraction. The last 10 percent of oil in a field are much more difficult and expensive to extract than the first 10 percent. On the output side the limits of the combustion of fossil fuel have become ever more evident because of its deleterious effects on the climate and the social, economic and political consequences.

3.1 Possible Climate Conflicts

One major result of the combustion of fossil energy is the enormous increase in greenhouse gas emissions and hence the warming of the atmosphere. According to the Intergovernmental Panel on Climate Change (IPCC 2001), the average global temperature has risen by approximately 0.6°C during the twentieth century. The average surface air temperature is expected to rise 0.4°C to 5.8°C by 2100 relative to 1990, and the sea level is projected to rise by 0.09 m to 0.88 m by the same year.

In recent years much scientific progress has been made in realistically assessing the effects of an increase of world temperatures on sea levels, coastal areas, small and low-lying islands, desertification, agricultural climate zones and biodiversity, although the totality of the climate effects resulting from the combustion of fossil energies is still uncertain. Nevertheless, only a few studies flatly dismiss any negative effects of climate change; most studies present serious scenarios, with dramatic effects for the future living conditions of humankind on earth. The greenhouse effect is expensive: its annual costs have been calculated to reach 2000 billion US\$ by the middle of this century. According to these calculations Asia will have to bear 840 billion US\$, the USA 325 billion US\$, Europe 280 billion US\$ (Kemfert 2004).

The number of weather- and climate-related disasters in the world has more than tripled in the last decade compared to the 1960s. The average cost is estimated at

money is a social construct, the function of money has been de-coupled from the natural form of limited gold and assigned to paper money or electronic bits and bytes. The natural form of money has completely disappeared. Attempts to revive gold as the natural form of money are doomed to failure.

more than 430 billion US-dollars from 1990 until 1999, of which less than 100 billion Us-dollars were insured (cf. Munich Re Group 2003 http://www.munichre.com/default_d.asp). Paradoxically one of the most pessimistic worst-case scenarios of climate change has been presented in a study commissioned by the Pentagon and carried out by Peter Schwartz and Doug Randall (2003) of the Global Business Network. Since the effects of global warming are not (or will not be) felt equally everywhere, the various regions of the world may exhibit different patterns of climate change. Some regions will suffer under a rising water level, others will be hit by severe droughts (Southern China and Northern Europe). Some regions may even be hit by a colder climate in the near future because of the changing global air and water circulation. The study is based on the maximum assumption of the IPCC that the average global temperature is likely to increase by up to 5.8⁰ C by 2100. Once this rise in temperature causes the Greenland ice sheet to melt, the Gulf Stream may change its direction owing to the lower density and salination of the waters in the North Atlantic. The time period of this deviation is assumed to be very short. The resulting collapse of the thermohaline circulation is “disrupting the temperate climate of Europe ... Ocean circulation patterns change, bringing less warm water north and causing an immediate shift in the weather in Northern Europe and eastern North America...” (Schwartz & Randall 2003: 9). Europe would be heavily affected by the event of abrupt climate change; “it’s likely that food, water, and energy resource constraints will first be managed through economic, political, and diplomatic means such as treaties and trade embargoes. Over time though, conflicts over land and water use are likely to become more severe – and more violent. As states become increasingly desperate, the pressure for action will grow.” (ibid.: 16)

Even if climate change does not prove to be so dramatic and does not occur as suddenly as assumed in the Pentagon-scenario (this is the opinion of the majority of climate researchers), it is obvious how conflict-prone and costly (also in human terms) the use of fossil energies actually is, on both sides of the production process: the “input side” and the “output side”, with their greenhouse gas emissions and impact.

3.2. “Peakoil”

Since the 1990s the peak of fossil-energy production has been reached in many oil regions: the number of barrels explored and found in new reserves is lower than the annual increase of oil production, meaning that oil stocks are obviously declining (Global Challenge Network 2002). Nobody knows exactly when oil and gas fields will be depleted, but we have convincing evidence that the peak of oil production in some areas has already passed, and that the peak of global oil extraction and production will arrive fairly soon. In the case of the USA, oil production since the 1970s has been declining, whereas consumption is still growing exponentially; this means that the gap between the supply from domestic production and domestic consumption has to be filled more and more by increasing oil imports (Klare 2004: 14-17). For the USA, the “peakoil problem” can be temporarily resolved by tapping foreign reserves. But the growing US oil imports mean that the problem will become relevant in other oil regions, earlier. In summer 2004 the Organization of Petroleum Exporting Countries revealed that its members drilled 6.5% fewer wells in 2003 than in the previous year (*Financial Times*, August 25, 2004). If this decline is not just a one-time occurrence, it will be an unerring sign that the peak of oil extraction will have been reached. Table 3 below shows the static extent of oil reserves (assuming present reserves and production and excluding increases in oil demand):

Table 3:
Reserves and annual production of mineral oil and gas

	Reserves		Share of global reserves (%)		Reserves, Production in years	
	Oil (Mil barrels)	Gas (1000 billion m ³)	Oil (Mil barrels)	Gas (1000 billion m ³)	Oil	Gas
Middle East	686	56.1	65.0	36.0	92	>200
Latin America	111	7.3	11.0	5	30	53
Africa	77	11.8	7.4	8	27	89
Russia	60	47.6	5.7	31.0	22	81
Asia/ Pacific	39	12.6	3.7	8	14	42
USA, Canada	37	6.9	3.6	4	10	9
Europe	19	5.8	1.8	4	8	20
Caspian Region	17	6.6	1.6	4	28	57
World	1048	155.8	100.0	100	41	61
OPEC	819		78.0		82	

Source: Müller, Friedemann (2004): *Klimapolitik und Energieversorgungssicherheit*, SWP-Studie, Berlin, April 2004, 17.

The table presents a much more optimistic view on oil reserves than the “peakoil” calculations. The reason is that it does not take into account the greater difficulties

and costs of extraction in the course of exploiting and exhausting the oil fields. Oil production is dependent on extraction technologies and on the evaluation of reserves in relation to the demand for oil. The first factor is emphasized by neoclassical economists, who recommend capital investment in the exploration of oil fields and in oil-extraction logistics in order to increase oil supplies in pace with the growing demand. Natural scarcity, interpreted as a lack of “nature capital,” can be compensated by inputs of money capital. The second factor, evaluating the reserves, is highly dependent on the interests of all the parties involved in oil markets: producers, consumers, dealers and last, but not least, politicians. Thus the estimates of world reserves vary substantially, ranging from 1149 billion barrels (BP) to 780 billion barrels (ASPO) in 2003.

The data published by BP are based on information provided by private oil companies and hence biased by dint of the strategies employed by the companies concerned.¹⁰ For their part, OPEC countries are interested in high reserve figures for two reasons: First, oil producers increase their reserve estimates in order to get a higher OPEC oil-production quota. Typically, during the late 1980s “six of the 11 OPEC nations increased their reserve figures by colossal amounts, ranging from 42 to 197 percent, they did so only to boost their export quotas.” (Campbell & Laherrere 1998; available under <http://www.dieoff.org/page140.htm>). In 1983 (during the war against Iran), Iraq reported an increase in its reserves of 11 billion barrels even though no new fields had been discovered. In 1985 Kuwait also announced an increase of its reserves by 50% without offering any proof. The second reason for reporting high reserves is to reassure oil consumers. High reserves in the oil-producing countries signalize that even in the future there will be no shortage of oil and therefore no search for alternative energy sources is necessary. On the other hand, reserves may be deliberately underestimated in order to increase the hidden reserves of an oil company or to inflate the oil price so that exploring unconventional oil (deep-sea oil, oil sand; polar oil, heavy oil) and high investment in new infrastructure (pipelines, tankers, refineries etc.) seem profitable. The uncertainty

¹⁰ The case of Shell in 2004 is telling. In early 2004 the company had to reduce its published highly overvalued reserve figures by 3.9 billion barrels, i.e., by more than 20% to fulfill stockmarket-supervision requirements (*Financial Times*, August 25, 2004 et al.). A major reason for such an “error” and its corrections is “creative book-keeping.” The company blew the reserves up for their annual reports in order to face-lift its financial performance and to hide the discrepancy between its actual reserves and production figures.

about the real amount of reserves is therefore considerable, as a comparison of the reserve figures of BP and ASPO conspicuously shows. But it is absolutely certain that reserve stocks are declining – and that oil prices will rise.

An oil-price increase especially hits oil-importing countries. However, the import burden is not equally distributed throughout the world. Countries with a low income per capita have relatively higher import expenses than those with a high GNP per capita. Countries with currencies subject to revaluation vis-à-vis the US\$ suffer less from an oil-price increase than those needing a devaluation vis-à-vis the US\$. The “oil-seignorage” position, however, will continue to be held by the USA as long as the oil price is invoiced in US\$.

Table 5:
Imports of fuels and Export revenues of selected countries, 2002 (in mil. US\$)

Country	Imports of fuels	Total export-revenues	Share of fuel imports in total imports (%)	Share of fuel imports in export revenues
Argentina ^a	798	26610	3.9	2.9
Brasil	7549	60362	15.2	12.5
Peru	1034	7688	13.7	13.4
Mexico	4455	160682	2.3	2.7
Pakistan	3004	9913	26.7	30.3
South Africa	3269	29723	13.0	11.0
China	19285	325565	6.5	5.9
India ^a	15935	49251	31.7	32.4
USA	121927	693860	10.1	17.6
European Union ^b	129868	939804	13.9	13.8

^a 2001; ^b imports and exports from or to third countries

Source: author's own calculations; data from: WTO, Trade Statistics 2003

These figures were calculated before the dramatic oil-price increases in 2004. The difficulties of paying the oil bill are thus now even more serious for many oil importing countries.

“According to the results of a quantitative exercise carried out by the IEA in collaboration with the OECD Economics Department and with the assistance of the International Monetary Fund Research Department, a sustained \$10 per barrel increase in oil prices from \$25 to \$35 would result in the OECD as a whole losing 0.4% of GDP in the first and second years of higher prices.... The OECD imported more than half its oil needs in 2003 at a cost of over \$260 billion – 20% more than in 2001. Euro-zone countries, which are highly dependent on oil imports, would suffer most in the short term, their GDP dropping by 0.5% and inflation rising by 0.5% in 2004. The United States would suffer the least, with GDP falling by 0.3%, largely because indigenous production meets a bigger share of its oil needs. Japan's GDP would fall 0.4%, with its relatively low oil intensity compensating to some extent for its almost total dependence on imported oil....

The adverse economic impact of higher oil prices on oil-importing developing countries is generally even more severe than for OECD countries. This is because their economies are more dependent on imported oil and more energy-intensive, and because energy is used less efficiently. On average, oil-importing developing countries use more than twice as much oil to produce a unit of economic output as do OECD countries. Developing countries are also less able to weather the financial turmoil wrought by higher oil-import costs. India spent \$15 billion, equivalent to 3% of its GDP, on oil imports in 2003. This is 16% higher than its 2001 oil-import bill. It is estimated that the loss of GDP averages 0.8% in Asia and 1.6% in very poor highly indebted countries in the year following a \$10 oil-price increase. The loss of GDP in the Sub-Saharan African countries would be more than 3%.” (IEA 2004 http://library.iaea.org/dbtw-wpd/textbase/papers/2004/high_oil_prices.pdf)

Thus poorer countries are worse off than the richer ones. Whereas oil-producing countries in the Middle East, Russia and North Africa benefit from very high oil revenues, oil-importing countries, especially the poor Sub-Saharan oil importing economies suffer from the burden of big oil bills. Thus high oil prices, together with high real interest rates, exacerbate the already existing global inequalities. This scenario will have serious consequences for oil importers who, like China, are projected to import over five times more oil in 2025 than in 2001 – under the premise that economic growth and the transformation of society will go on (Klare 2004: 165). China is no unique case; many countries will increase their oil demand in the course of further industrialization. The reserves, however, will not grow, but decline. This is the reason why under conditions of increasing scarcity conflicts about access to oil reserves are likely to become sharper.

4 Oil Imperialism

The access to oil, even in the hands of individual countries and private corporations, can be understood as the provision of a (global) public good because oil is of such decisive importance for energy security – under the premises of the fossil-energy regime. Either its distribution can be left to market forces and to the processes of price formation, so that those oil consumers which cannot afford to pay the oil invoices are prevented from access. Or it could be organized by a democratic, just rationing of oil reserves – an unrealistic prospect, however, at the moment. The third mode of distributing oil reserves is that of the exercise of political power and military violence. It is rather likely that the first and the third mode and a mixture of both will rule the “Great Game” or the “Grand Chessboard,” respectively, and its

transformation into a quagmire. The battle is over control of scarce oil resources in the coming future. These are the forces at play in the new “petrostrategy,” which combines geo-economics and geopolitics. All “powers have a vital stake in the global flow of oil, and all... seek some degree of control over the political dynamics of the most important oil-producing regions.” (Klare 2004: 147). From the standpoint of an individual nation, control of remote oil regions is part of an oil-security strategy. Therefore the USA, the EU, NATO, Russia and China and many other nations have set up national strategies of energy security. The new Constitution of the European Union, which has not yet been ratified, provides a common European military power for intervention in all parts of the global space in order to strengthen European security. The new concept of security also includes energy security. As long as this is identical with the secure supply of oil and gas from the oil regions, the dependence on fossil energy will remain conflict-prone.

Table 5 below gives an impression of the regional dependency of oil-importing countries. It shows that Europe is heavily dependent on the countries of the former Soviet Union, whereas the US imports the largest part of their oil imports from Latin America and the Gulf-OPEC countries.

Table 5:
Flows of Oil, 2002 (mil. barrels per day)

	To	USA	Europe	East and Southeast Asia	Rest of the World	Total	
From							
Gulf-OPEC			2.31	3.24	11.29	1.22	18.06
Former Soviet Union			0.20	4.35	0.40	0.42	5.37
North Africa			0.28	1.77	0.20	0.37	2.62
West Africa			1.12	0.71	1.04	0.26	3.13
Latin America			3.95	0.47	0.19	0.32	4.93
Canada			1.94	0.01	0.001	0.00	1.96
Rest of the World			1.56	1.35	3.21	1.44	7.56
Total			11.36	11.90	16.34	4.03	43.63

Source: Müller, Friedemann (2004): *Klimapolitik und Energieversorgungssicherheit*, SWP-Studie, Berlin, April 2004, 16

In the USA, too, energy security is one of the priorities of US-American foreign policy (Cheney Report 2001; Klare 2004: 56 passim), not just since the publication by the Bush-administration of the report on the “national energy policy” in May 2001, but already since the “Carter-doctrine” of the late 1970s. An energy-security policy

refers to several dimensions: first, to strategic control of oil territories; secondly, to the strategic control of oil logistics (pipelines, oil-tanker routes, secure refineries and storage); thirdly, it aims to influence price levels by controlling supply and demand; and fourthly, it aims to determine in which currency the price of oil is invoiced. When we consider the many complex strands in a strategy of oil security (or “oil imperialism”), the formula of “blood for oil” seems too simple. Yet it is essentially correct. More and more countries are explicitly trying to secure their access to oil fields which have already passed their peak. Thus the distribution of oil is that of a scarce and not at all abundant resource. The means of distribution are either cooperative or competitive, so that conflicts between oil-importing and oil-producing countries are ever threatening to break out.

The combination of market forces and (military) power is a core element in the ideologies of American neo-conservatives – the neo-liberal glorification of a free market in a “geo-economy” and a “geo-political” recourse to military power in order to get exclusive access to a common good. The invisible hand of the market must be assisted by the visible fist of the American army, in the cynical words of Thomas Friedman. Only at the first glance is this a contradictory position. Considered more closely, it refers to a long “oil-empire” tradition. American wealth, power and supremacy are founded on “cheap and abundant oil flows” (Klare 2004) from the Rockefeller-Baku connection in the 19th century to the war against Iraq and the grip on the Central Asian and African oil reserves.

Firstly. The US government aims to secure strategic control over oil regions, either by means of diplomacy and the establishment of friendly relations or by pressure and subversion as in some Latin American and African countries, or by using massive military power as in Iraq and to a lesser extent also in Central Asia. The Iraq war and the attempt to gain control over a country with estimated reserves of more than 100 billion barrels, however, does seem irrational, because a military occupation imposed on a country against the resistance of a hostile population is extremely expensive and, in ways that are difficult to assess, may well have a demoralizing impact on the hegemony and the often cited “imperial overstretch” of the global superpower¹¹, not to mention the many victims among the civil population of the devastated country.

The conclusion follows that militarily enforced access to oil territories is, at best, a “second-best” solution compared to other means of exerting pressure on governments.

Secondly. The strategic control of oil logistics is expensive, too, albeit to a lesser extent. It requires the collaboration of many governments in countries transversed by pipelines, and in countries along whose coasts the tankships are routed and need protection. The waters around the Horn of Africa at the entrance of the Red Sea are protected against “terrorist attacks” by the German navy in collaboration with the navies of other NATO-members. The Straits of Malacca are protected against pirates and supposed terrorists by the navies of the coastal states Indonesia, Singapore and Malaysia. In Central Asia the US has created what is sometimes designated as “*Pipelineistan*”: transit territories for pipelines like the one under construction from Baku via Tbilisi to the Turkish port of Ceyhan (BTC-pipeline), which avoids transit through Russia, or the projected transcaspian-pipeline from the Tengiz oil field in Western Kazakhstan to Baku and along the eastern shores of the Caspian Sea via Afghanistan to Pakistan. But conflicting interests are at play. The US has deployed major military bases in the region and American oil firms are present. Relying as it does on corrupt, authoritarian regimes, the US dominance here is precarious, however, and faces challenges, not only from “terrorists,” but by considerable parts of the population.

The presence of other players in the “Great Game” cannot be overlooked. China needs Central Asian oil to fuel its domestic economy. Iran is a regional power with close ties to China. And Russia, too, has an important stake in the region which until 1991 was part of the Soviet Union. This story could be continued by pointing to pipelines in Nigeria or Sudan and Chad or to the pipeline from Yopal and Arauca to the port of Covenas in Colombia. Their protection under “Plan Colombia,” devised by the governments of the USA and Columbia, calls for an outlay of more than 200 million US\$.

Thirdly. The influence on oil supplies is only possible either by influencing OPEC or by putting diplomatic pressure on individual oil producers or by carrying out oil

¹¹ The Cheney-report lists eight countries of particular weight for US-American oil diplomacy: Mexico, Colombia, Russia, Azerbaijan, Kazakhstan, Nigeria, Angola and Venezuela. These countries

exploration (i.e., valorization of resources) in parts of the world which up to now have not been fully included in the “oil empire.” The occupation of Iraq and the establishment of a US-dependent government, only formally sovereign, enable the USA to exert some influence on OPEC-decisions since Iraq is a member country. Diplomatic pressure on oil producers to increase their exports is a measure quite commonly practiced by rich oil-consuming countries, not only by the USA. It is doubtful whether the global supply will be significantly enlarged by newly discovered oil reserves, for it is unlikely that the new reserves can keep pace with the growing demand for oil.

Is it possible to influence the demand? Yes and no, because, on the one hand, the USA is still the most important oil consumer – and the most inflexible one because of its inability or unwillingness to reduce oil consumption. On the other hand, new oil consumers are crowding into the market: China, India and other newly industrializing countries. China and India alone are responsible for three quarters of the additional oil demand in 2004. It is unlikely that this situation will change in the foreseeable future.

Fourthly. The last aspect of an energy-security policy concerns the currency in which the oil bill is invoiced. In the 1970s the US dollar fell sharply against other currencies and the inflation rate in the USA increased. Faced with this situation, the oil-exporting countries had only one alternative. No currency was available, apart from the US dollar in the near future, in which oil could be priced. What they managed to do was to exploit the opportunity of the Israeli-Arab Yom Kippur war of October 1973 to increase the oil price, a move experienced as a severe “shock” by oil-importing countries. Thirty years later, however, the situation has changed, because an alternative currency exists, namely the Euro. But in June 2003 the OPEC decided to continue to invoice in US dollars, although some governments had earlier been planning to switch to the Euro, above all Venezuela and (pre-invasion) Iraq. The domination of all the other dimensions of “oil governance” and oil security by the USA ensures that no change in the oil currency is going to take place. However, it is not certain that this favorable situation for the USA will last forever. The loss in value of the US dollar vis-à-vis the Euro and the huge twin deficits being borne by

the US economy (current account and the federal budget) are factors which make the Euro as an oil currency more attractive for oil exporters.

Moreover, this option could also become attractive for other countries, particularly Japan, China and also Russia, much of whose huge official reserves consist of US financial assets. According to the *Economist* (January 10, 2004) at the end of 2003 Japan held reserves totalling \$673.5 billion, China \$406 billion, Hongkong \$114.1 billion, South Korea \$150.3 billion, and Taiwan \$206,3 billion; Russia is estimated to also hold more than \$100 billion. There is the threatening possibility that these reserves would lose part of their value in the event of a devaluation of the US dollar, already under way in late 2004. It is probable that the strategy of these countries will be to switch their reserves from US\$ to alternative currencies, above all to the Euro, but to do it slowly to avoid creating turbulence on currency markets. Senior officials of the People's Bank of China have in fact declared their intention to increase the share of the Euro in its reserves. However, the Euro share of the reserves of the Asian central banks today is only 6%, so that the degree of movement towards the Euro should not be overstated (Solans 2004: 12). But there is more likelihood of such a switch to the extent that further increases in the twin deficits in the US budget and the current account occur. Again, we have to take into account the intertwined structures of global oil and global finance, so that a strategy which aims to prevent conflicts from breaking out must include regulation of both the oil market and the global financial markets.

The switch from the US\$ to the Euro as an oil currency would have a major negative effect on the US economy and thus on the world economy as a whole. The annual imports of 4 billion barrels by the US according to the Cheney Report are supposed to increase to 6.8 billion barrels by 2020. The requirements of Euro-currency would therefore rise from an annual 200 billion US\$ (at 50\$ per barrel) to about 260 billion Euro (or 340 billion US\$). The current-account deficit of 630 billion US\$ in 2004 must be transformed into a surplus. This is not possible, only as a brutal economic crash. The oil quagmire slops over into the world economy.

5 Transition to a renewable energy regime

Thus, looming on the horizon of the disputes on energy security, i.e., on oil, is a serious conflict between the US\$ and the Euro, between North America and Europe. Oil imperialism obviously brings with it conflict dimensions that have the potential to jeopardize the peaceful co-existence of peoples throughout the world. Thus the persistent dependence on fossil-energy combustion beyond the “peak-oil” point to the brink of exhausting reserves has not only further deleterious consequences on the global environment (above all because of the greenhouse effect), but an increasingly negative impact on the global public good of world peace and of ecological sustainability. Therefore the transition to a “post-petroleum economy” (Klare 2004: 197 passim) is a vital necessity, entailing improvements in energy efficiency, more reliance on domestic energy sources and reducing the dependency on imported fuels. Moreover every effort should be made to develop an alternative energy regime based on renewable resources, i.e., on the radiation energy of the sun (photovoltaic, wind, water, biotic energies etc.). The necessary technologies and appropriate social institutions are already available, although research, political support and economic subsidies in the industrialized world are still largely directed into traditional fossil- and nuclear-energy production instead of the promotion of renewable energies. However, in the long run, i.e., during the next decades, the “energy apartheid” system must be overcome by working towards a transition from the closed fossil-energy system with its increasing entropy to the open solar-energy system with constant entropy. Such a transition is possible and the “window of opportunity” still open, for “renewable energies are becoming constantly cheaper, through the mass production of the plants and technical optimizations. Atomic and fossil energy in contrast are becoming constantly more expensive, through increasing extraction costs and environmental damages as well as the increasing technical and military safety measures.” (World Council for Renewable Energies: Renewable Energies instead of Nuclear Power

http://www.eurosolar.org/new/en/downloads/Anzeigenkampagne_Englisch.pdf)

The transformation of the energy system will only succeed through transforming the social system since the energy system does not exist independently of production, reproduction, politics and culture. It is necessary to surmount the above-mentioned energetic “Berlin wall” and the related “ideological mind-set“, separating the fossil-

fuel regime and the life energies from the sun. This is a long term project which includes deep changes of daily life patterns, of technologies, of the built environment, of political participation, of the global financial architecture...

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