

Fossil Fuels, Capitalism, And Class Struggle

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The development of the vast non-conventional tar sands in Alberta, Canada are a last-ditch attempt to find a source of fossil fuel energy capable of maintaining and expanding capitalist economic growth in an era when supplies of conventional oil—the energy source which powered 20th-century industrialism—are peaking and entering an irreversible period of decline. Despite massive investments in new technologies of oil discovery and recovery, conventional oil production and non-OPEC countries has been steadily falling for the past decade or more while the large OPEC producers have been unable in recent years to significantly boost their own production. The shift to non-conventional "alternatives" such as the Alberta tar sands bring with them a host of problems—including dramatically increased greenhouse gas emissions, the poisoning of the water and the destruction of the land, the dispossession of indigenous peoples, and the exploitation of the vast and ever-growing pool of domestic and foreign labor—all of which sharpen the contradictions of class struggle and fossil fuel use in 21st-century capitalism.

This article will seek to put the development of the tar sands in a much larger historical context—that of the process of capitalist growth and development over the past 500 years. I will suggest that in order for us to truly understand and successfully oppose the growth of the tar sands into what has been dubbed the largest industrial project in the history of humanity, we need to develop theoretical perspectives which address the weaknesses at the core of the divide between most environmental and class struggle politics today. Our ecological framework has to gain a class analysis of the historically specific

dynamics of capitalism and its reliance on energy sources, and our class struggle politics has to integrate an analysis of the importance of the flow of energy and materials to continued capitalist growth and development.

This paper will argue that over the course of its history, capitalism has faced a number of potentially terminal crises that have arisen from the consequences of ecological disequilibrium, the resistance of the exploited and dispossessed, and the way in which particular energy regimes have constrained or enabled capitalist expansion. I am going to suggest that today the global capitalist system stands on the threshold of another such moment of crisis, one which is intersected by the fault lines of ecological collapse, thermodynamic limits and the intensification of class struggle caused by these conditions.

In focusing particularly on developing a theory of how capitalism as an economic system uses energy, we have to clarify not only what we understand capitalism to be, but understand how it evolved. I am building on the Marxist influenced work of Robert Brenner which draws on Marx's insight that the economic "laws of motion" of capitalism and other class societies can be best understood by looking at the concrete social relations that govern the dynamics between those who produce society's wealth and those who appropriate it.¹ In the 1970s, Robert Brenner developed a convincing thesis that capitalism had its origins in the English countryside, when after the devastation of the black plague in the 14th century the English landed class, consolidated and united by the Norman invasion of 1066, pioneered a new economic model fundamentally different than the tradition bound feudal system that it replaced. In this new system landowners enclosed common fields and pushed off peasant laborers, and then rented the land to capitalist farmers who in turn hired the displaced peasants as wage laborers to work the land.

Capitalism, Brenner convincingly argues, was thus in its origins, an agricultural system which drew its profits and surplus value from the agricultural working-class it exploited. As agricultural productivity expanded in England and peasants were displaced from their lands, capitalist relations shifted to new industries—textiles and handicraft production—in which new norms of work discipline and management were enforced and which laid the framework for industrial capitalism.

While this may seem like ancient history to many activists today, the constraints the capitalism faced in its infancy can provide insights

1 See Robert Brenner "Agrarian Class Structure and Economic Development in Pre-Industrial Europe" in Aston, T.H. and C. H. E. Philp, *The Brenner Debate: Agrarian Class Structure and Economic Development in Pre-Industrial Europe*. Cambridge: Cambridge University Press, 1995.

to its present contradictions as it faces a future of declining fossil fuel availability. Early capitalism—while it was still an agrarian system and before it became firmly established in the rest of Europe—faced seemingly insurmountable obstacles to its further development. The first and most obvious of these barriers arose from the disruption of the old feudal and subsistence modes of production capitalism replaced and the ever larger numbers of people it dispossessed and exploited. Although forced migration to colonies absorbed a significant share of this “surplus” population, the fact remains that resistance to capitalist exploitation was very real and repeatedly took the shape of armed uprising—we can think here for example of the Beggars’ Christmas Riot of 1582, the Plaisterers’ Insurrection of 1586, the Felt-Makers’ Riot of 1591, the Southwark Candle-Makers’ Riot of 1592 to name but a few. The openly revolutionary perspectives of the Levelers and Diggers in the English Revolution of 1648 took this to an even higher level in an attempt to overthrow agrarian capitalism itself.

The other major problem for early capitalism was that it was creating an ecological crisis that threatened to destroy it. As the economy boomed, England’s forests were devastated as they were the primary source of both heating fuel and energy for smelting iron. By the 1600s so much of England’s forests had been cleared that capitalists were forced to ship English iron ore to Ireland where a plentiful supply of wood still remained. The second major ecological crisis arose from the intensive agricultural nature of early capitalism, which led to the declining fertility of the soil. A “metabolic rift” was created due to the fact that while city dwellers were fed with the fruits, vegetables and meat produced in the countryside, the nutrients contained in these foods were not returned to the fields, and this created a serious and increasing problem of soil depletion.² In an era before synthetic fertilizers, the failure to recycle nutrients represented a steadily advancing ecological disaster that was so serious that the British dug up human remains from Napoleonic battlefields to spread the bones of the dead on their fields as fertilizer and also initiated a global search for bird guano which was transported in the millions of tons to use as fertilizer.

At a point when capitalism faced serious ecological limits and when working-class resistance threatened to overthrow the system altogether, capitalism was saved by the discovery of widespread and accessible fossil fuel resources within England. England had huge reserves of high-quality coal that were located near the surface and near to river systems which facilitated its transport. This use of coal

2 John Bellamy Foster, *Marx’s Ecology: Materialism and Nature* (New York: Monthly Review Press, 2000).

not only solved the problem of household heating and iron production, but also encouraged the development of fossil fueled machinery in the form of steam engines in order to drain the coal mines. These new machines became the basis of the industrial revolution as they produced significant amounts of power and were capable of operating around the clock. The construction of steam ships and steel hulled vessels enabled the projection of imperial might across the globe, the conquest of indigenous people, and allowed the import of foodstuffs and fertilizers necessary to take the pressure off of English agriculture until fossil fuels themselves could be used to create the synthetic fertilizers necessary for modern agriculture to overcome the problems of declining soil fertility.

The capturing and unlocking of fossil fuel energy made it possible for capitalism to go beyond the limitations of “biotic energies” dependent upon solar flows of energy. This in turn made possible the development of capitalist globalization by unifying national economies and enabling the projection of economic and military power on a global scale. As Elmar Altvater argued:

As long as as ‘the societal relationship with nature’ was based on biotic energies, on the soil and the fruit it bore, on the speed and range of an ox or horse drawn cart, on the tonnage, maneuverability and speed of a sailing vessel and on the art of navigation, the material possibility of overcoming these limits of space and time was slight and the capacity of creating a world order remained restricted.”³

Altvater suggests that this appropriation of fossil fuel energy made possible for the first time a true “world order” in which “the ‘metabolism’ of humankind, society and nature reached a global scale.”⁴ Altvater goes so far as to argue that “without fossil energies neither the process of capitalist production and accumulation nor the modern monetary world market could exist.”⁵

In addition to resolving early ecological crises the integration of fossil fuels with capitalist production has played a key role in containing working-class resistance. Capitalism produces surplus value from the exploitation of human labor in two ways—in absolute and in relative terms. Absolute surplus value extraction comes from making workers work harder, faster, for longer hours a day, and for less pay. Relative surplus value extraction involves increasing the productivity of workers so that they are able to produce more per hour that they work.

3 Elmar Altvater, “Global Order and Nature” in *Political Ecology: Global and Local*, ed. Roger Keil, David V.J. Bell, Peter Penz, and Leesa Fawcett (New York: Routledge, 1998) p. 20.

4 Altvater, p. 21.

5 Altvater, p. 21.

Increasing relative surplus value through the introduction of machinery in the production process has been the preferred strategy of capitalists, because it means that since the total economic output grows, capitalists can afford to increase wages at the same time as continuing to reap increased profits. The key to increasing relative surplus value lies in machine-based production, and the building of a machine based society was impossible prior to the development of a fossil fuel energy regime.

Under capitalism, Marx argued, machinery is not just a “superior competitor to the worker” but a “power inimical to him. It is the most powerful weapon for suppressing a strike, those periodic revolts of the working class against the autocracy of capital.”⁶ Indeed, he added, “it would be possible to write a whole history of the inventions made since 1830 for the sole purpose of providing capital with weapons against working-class revolt.”⁷ Machinery was thus a crucial aspect of the process of primitive accumulation and dispossession as capitalists struggled to overcome and discipline a new industrial workforce against the old habits of communal solidarity and village living. And key to the proliferation of machinery as an antagonist to working class self-organization, is the exosomatic energy source required to power it.

When we step back and look over the long-term on the growth of the capitalist system from a thermodynamic perspective, we see that capitalism as a system has always been able to bring online more and more energy with every passing year. Capitalism is geared towards constant growth, and this growth requires increasing energy inputs to power the continual expansion of machinery used to discipline and displace living human labour from the production process. This dynamic becomes particularly clear when we consider the rapid and dynamic industrialization now taking place in China, India and Brazil.

Marx distinguished between dead labor (the machines, computers, fixed capital or factories etc.) and living labor (people) in the production process. As capitalism has grown and created an ever larger and more massive apparatus of dead labor, global energy inputs play an absolutely key role in keeping this vast array of machinery, transport systems, computers, lights and electricity grids going. Without a constant flow of such energy capitalist accumulation would grind to a halt.

The reason that the tar sands and other non-conventional sources of oil is are now being developed is that we are at a turning point in capital’s fossil fuel energy regime. With conventional supplies of crude oil having been steadily depleted over the course of the 20th century,

6 Karl Marx, *Capital Vol. 1*, p. 562.

7 Marx, p. 563.

the tar sands of Alberta and Venezuela are the most significant remaining energy reserves on the planet. They may be messy, dirty, toxic, and disruptive of human life and the natural environment, but capitalism only cares about making profits and keeping its economic system functioning. But unfortunately for capitalism, its conquest of the world and its domination of the global working class it created have been largely predicated on the availability of cheap energy sources that are now beginning to peak. Capitalism, in order to maintain its growth has to transition to a new energy regime to replace declining fossil fuels. But it not only needs a new energy regime, it needs one with a high energy return on the energy invested. If it fails to do this, rising energy costs and a terminal decline in fossil fuel availability will lead to intensification of class struggle and resistance against capitalism.

The consequences of rising oil and natural gas prices are most immediately felt by workers and low income people as their costs of subsistence are directly increased. As oil prices rise, the cost of transport to and from work increases, as does the cost of basic food products produced with synthetic fertilizers derived from fossil fuels and formed and transported by oil driven machinery. Oil and natural gas byproducts are used as a feedstock in a wide variety of consumer goods, including synthetic clothing and plastic household goods, and also for a range of industrial applications as well as for power generation. Consistently, where ever there has been a serious interruption of fossil fuel supply or a sharp rise in the costs of fossil fuels, the effects have been felt by the working class and have often resulted in protest and resistance.

In a very real sense then, capitalism has turned full circle from the point at which some 500 years ago it arose as an exploitative, ecologically destructive, but incredibly dynamic economic system in a small island backwater of the world system. Only now, after capitalism has conquered the globe, aided in large part due to its appropriation of fossil fuel energies, the ecological crisis that it has created is now global in scope, and will affect the entirety of the human race and the natural environment.

With the peaking of world oil production capitalism will face a historic turning point. Its new short-term strategies of accumulation will be based upon securing the declining high quality sources of energy, most of which remain within the Middle East, as well as by making massive investments into tar sands in the desperate hopes of finding some technological breakthrough that will relieve thermodynamic constrictions and allow for continued global economic growth. Capitalism, if it is to survive, must shift to some alternative energy

source in a manner every bit as transformative and revolutionary as its move from biotic energies to fossil fuel was. This source of non-carbon based energy must be cheap, nonpolluting, avoid contributing to global climate change, and be capable of integration within existing energy distribution infrastructures. Should capitalism not develop such a source of alternative energy in time, we can expect that the climate change feedback loop will be accelerated as tar sands oil, coal and biomass are increasingly used to replace declining stores of oil and natural gas. At the same time, international competition for remaining stores of conventional oil will be accelerated, and dramatic increases to the cost of living will almost certainly lead to a global intensification of local, national and international class struggles.

As industrial capitalism matures and its machines devour ever increasing amounts of non-renewable fossil fuels, a point of crisis will be reached when capital will no longer be able to externalize its contradictions. Rosa Luxemburg's famous posing of the choice between "socialism or barbarism" serves to remind us that the failure of the great revolutionary wave of her generation was perhaps even more of a historic failure to transform capitalism and the fate of the human species than is commonly recognized. Capitalism, should it now be overthrown and replaced by some kind of socialist system, will leave its inheritors with ecosystems potentially stressed beyond recovery, and with little left in terms of viable low-entropy energy resources. If any future socialist society is required to build socialism under conditions of declining labor productivity and under the energy constraints bequeathed by an exhausted 20th century industrial capitalism, the implications for revolutionary theory and practice are significant, and deserve to be put at the center of a reconstitution of the socialist project. Ultimately, doing so will be necessary if humanity is to avoid a kind of barbarism far worse than the fascism which destroyed the revolutionary hopes of Rosa Luxemburg's generation.

