NINE PRINCIPLES FOR A CRITICAL THEORY OF ENERGY

Jeff Diamanti and Imre Szeman

What is truly at stake in the energy humanities is the need to re-map *everything* with an awareness of the enormous import of energy in mind. Modernity as we know it would not have been possible without the energy of fossil fuels. The subject as we have come to understand it is one that cannot be fully thought without accounting for the expanded powers and sensibilities fossil fuels have afforded it. The modern state, too, and its extended military and surveillance systems—and yes, its welfare and social mechanisms, too—have to be reimagined in relation to the capacities afforded it by fossil fuels. The following nine principles for a critical theory of energy are meant to help fully initiate the project of the energy humanities, by gathering sites, concepts, and common cause to enable and enact decarbonization, decolonialism, and decapitalization.

A critical theory of energy, like a critical theory of anything, needs to work in the service of emancipating social life from the impediments to *being otherwise* in relation to energy, of defining a different rhythm to what could come next in light of how we got here, and of unsettling the given that got us into this mess. Many have a feel for the way that oil and its entanglement with colonialism, capitalism, political impasse, the brutality of soft coercion, and all measures of violence, generates a kind of tension in the reproduction of daily life that cannot be addressed adequately by any immediate form of action. We feel it too. Our aim is to name some of the terms around which this feeling and the desire for new modes of energy life crystalize into points of potential contest. Wanting to care differently for each other and for a world far stranger and infinitely more beautiful than the one figured by petroculture means applying pressure to these terms, opening them up for critical inspection. In the end, a critical theory of energy has to contend with the colonial, extractivist history of energy around whose indifferent forces global capitalism has been developed. Our sense of futurity has to escape the conceptual grasp of a fossil-fueled energetics whose operations have ferociously divided the planet into haves and have nots, and whose continued operations are now producing a world emptied of possibility not just for the many, but for everyone.

1. Capitalism and Modernity; or, Why Energy Matters

Why is it important to theorize energy? The basic reason is two-fold. First, because we have not sufficiently attended to the role of oil in shaping social life on the planet—shaping it in vastly differentiated and unequal ways that broadly mirror the history of global power and privilege—we are missing a key component of the narrative of modernity, including the processes by which power was organized. Moreover, the energy source around which we have shaped physical infrastructures and economies, and equally, individual affect and narratives of social being and belonging, is one that can no longer be used. Or rather, given its environmental consequences, it *should* no longer be used to generate energy (and all manner of other goods, such as plastics and fertilizers). In hindsight, we know now that it should *never* have been used. One hundred million barrels of oil burned in 2019 is 100 million too much; 99 million barrels of oil burned in 2018 is 99 million too much; 98 million… you get the idea. Understanding the role of oil in modernity is essential to ending the use of oil in modernity; it's how the ethical imperative contained in (and just as often, contained by) the verb "should" with respect to action concerning the environment might be mobilized to generate a politics genuinely alert to global warming. Changing an energy source is a distinct and legible political act. Changing the environment or changing the contours of all societies on the planet in order to attend to global warming is far, far more difficult.

Second, while capitalism and oil cannot be reduced to one another (for one thing, an easy equation of the two would be the most obvious of category mistakes), they are nevertheless involved in a complex relationship of mutual dependence. The availability of oil has animated a more intensive (and indeed, globally extensive) capitalism. In turn, capitalism has thrived on the substance, demanding ever more of it. Crises of capitalism are strongly linked to oil, including the 2008 financial crash, in advance of which oil reached its historic peak in price per barrel. The post-1989 period, in which processes of neoliberal governance re-shaped practices of governance and of production, depended heavily on the use of oil (e.g., to fuel global production chains). In *The Uninhabitable Earth*, David Wallace-Wells notes that "more than half of the carbon exhaled into the atmosphere by the burning of fossil fuels has been emitted in just the past three decades."[1] Post-1989, capitalism has turned up the heat on the planet, so it is easy enough to say capitalism has to go. But how to run the planet differently demands that we grapple with how to fuel

it as well. Discursively, there appears to be no shortage of shared agreement that the dominant energy system of the present needs to change. Materially, we could not be further from anything other than another petrocultural century, this one longer and more straining than the last.

2. Oil Is Hegemonic; or, Infrastructural Sublime

Oil is not the only energy source being used on the planet. While fossil fuels remain the dominant source of energy (according to the World Energy Council, in 2015, oil, coal, and natural gas made up 86 percent of fuel sources consumed globally; and according to the U.S. Energy Information Agency, they made up 80 percent of the fuel used in the US), other forms of energy are being used.[2] It is important to note that these figures don't account for vast differences in energy use both around the planet and within nations. The ease of access to fossil fuels that exists in the Global North is not found everywhere on the globe, where an experience of energy poverty can be the norm. Energy use is similarly variegated within the Global North, where riches for some means poverty for many others.

Even if it were not the case that oil is dominant by sheer numbers, it still has to be understood as hegemonic—the reason why we often speak here about "oil" instead of "fossil fuels" or "energy." For Antonio Gramsci, hegemony names a circumstance in which "the development and expansion of the particular group are conceived of, and presented, as being the motor force of a universal expansion."[3] In describing historical patterns of sociopolitical dominance, Giovanni Arrighi writes that "a state may become world hegemonic because it can credibly claim that the expansion of its power relative to some or even all other states is in the general interest of the subjects of all states."[4] Oil is not a "particular group;" nor is it a state competing with other states. It is, however, hegemonic in precisely the ways described here. It has long been understood as "the motor force of a universal expansion" and offers a force and power that has been presented as being in the general interest of everyone. The arguments that are made on behalf of the continued necessity of oil, even at a moment of environmental crisis, will often employ an appeal to just this necessity—evidence, perhaps, of a hegemon on the verge of losing its power.

There is, however, another way to understand oil as hegemonic. The practices of everyday life and the physical infrastructures of modernity have

long been organized in relation to oil. Strip malls and suburbs have little to do with nuclear power; the organization of production in relation to global shipping and free-trade zones owes nothing to wind or solar power. The sense and sensibilities of what it is to be modern, and the role that energy plays in these. are structured by oil *tout court*: lots of power generated by a small amount of stuff. To many, the electric car might suggest the first step in the upending of the hegemony of oil. To us, it simply confirms the degree to which oil remains hegemonic in shaping the sensibilities and imaginaries of the social, whether or not we continue to use oil to power our lives over the rest of this century: we can't imagine giving up the mechanical beast birthed by oil, nor the mobility and autonomy it affords. Even as the use of oil and coal declines (and natural gas use increases), it is this hegemony of oil that needs to be contested and overturned. It is a hegemony that could persist even when very little of the actual substance continues to be burned.

Overturning oil's hegemony means first looking for the crude materials that ground its earthly operations. If oil is hegemonic, it is because it has engendered a topography and typology of infrastructure for well over a century, so much so that its infrastructures now double as social infrastructures—a veritable sublime that is both present to the subject it habituates and forever receding into spaces made deliberately invisible by private and state interest.

But then, once in a while, it fails. And here the crude materiality of oil's hegemonic force over the long twentieth century looks a little different for a moment. When we encounter it, when we find it translated into cartography, surveys, or disaster sites, its broken invisibility fractures something in the smooth continuum of the subjectivities that depend upon it. Stephanie Wakefield and Glenn Dyer emphasize the sudden inversion that takes place when yesterday's commuters become today's blockade, making infrastructure politically operative at the same time it is made economically inoperative.[5] The hard fact of the parallel universe that sits beneath the dirt of virtually all nations on Earth exposes something about the parts of the entangled habits and habitats calibrated to the expansive powers of petromodernity. Any encounter with the sublime of infrastructure (as opposed to the shiny, reflective face of technology) is also an encounter with something fundamental about the social and our imagined relation to it.

Sometimes we are asked: why devote so much time to oil? why oil and not other forms of energy (hydro? nuclear?). The hegemony of oil makes this abundantly clear: Oil is the substance with which one has to tarry politically.

Burning oil produces global warming. It also produces the lived reality of petroculture, which demands a more substantive response to its operations than hoping that we might keep the lifeworlds of oil running on cleaner stuff.

3. We Are All Petrosubjects Now

Oil has given shape and form to human bodies. It has also had a determinate impact on the character of subjectivity. Movement through a world in which energy is largely confined to the body, and mainly generated by it, is distinct from the ways in which one inhabits a body in an era overflowing with energy (searching for wood for heat is not the same as turning up the thermometer to activate a natural gas furnace). The transition from a world organized around the flow of solar energy (the base capacities of human and animal bodies, reliant on the energy of plant and animal matter) to one reliant on the energies of fossil fuels brought with it the reconfiguration of time and space that so many thinkers have noted as a defining aspect of modernity.[6] The transition *away* from fossil fuels will demand the development of new relations to time and space—not a return to what once was, but time and space reimagined in the wake of the experience of the expanded, extended selves of fossil fuel modernity.

Exactly how has the body and subjectivity been shaped by oil (and energy more generally)? In *Civilization and Its Discontents*, Sigmund Freud describes the process through which humans had transformed themselves into "a kind of prosthetic God." He describes the multiple media and technologies through which humans had massively expanded the powers of their organs. He writes:

> Motor power places gigantic forces at his [*sic*] disposal, which, like his muscles, he can employ in any direction; thanks to ships and aircraft neither water nor air can hinder his movements; by means of spectacles he corrects defects in the lens of his own eye; by means of the telescope he sees into the far distance; and by means of the microscope he overcomes the limit of visibility set by the structure of his retina. In the photographic camera he has created an instrument which retains the fleeting visual impressions, just as a gramophone disc retains the equally fleeting auditory ones; both are at bottom materializations of the power he possesses of recollection, his memory. With the help of the telephone

> he can hear at distances which would be respected as unattainable even in a fairy tale. Writing was in its origin the voice of an absent person; and the dwelling-house was a substitute for the mother's womb, the first lodging, for which in all likelihood man still longs, and in which he was safe and felt at ease.[7]

It is the stuff of fairy tales, this enormously expanded terrain of humanity's aesthesis and memory media. The subject of modernity presupposes communication technologies, senses intermediated by combustion, and all the rest of the apparatus of the "gigantic forces" listed above. So much so that the prosthetic here named as an overextended body converts the force of fossil fueled *techne* into the formal arrangement of the body in place. Subject formation amidst these mediated extensions into a world means that fossil fuels condition the subject's naturalized experience of sensoria, not because any one individual suddenly gains the capacity to globally think, feel, act, and buy, but because the apparatus of energy becomes sedimented into the sensoria in which the subject feels out the world both directly and indirectly. Indeed, Freud suggests that (as of 1930) humans had come close to attaining all of the ideals they had in their stories projected onto gods—which is to say that the levels of energy used in Western countries today make its citizens into *more than gods*, creatures with powers greater than they could have imagined. Oil is thus a prosthesis for the imagination, firing it up and allowing it to expand beyond the originary limits established by psychology and neurology.

The "discontents" in Freud's title name the mismatch between the powers of the prosthetic and the limits of the flesh. Despite finding themselves to be gods, humans "do not feel happy in [their] Godlike character."[8] The theme of slow bodies, brains, and sensibilities in an era of speed and the ability to access spaces well beyond immediate experience (whether via the physical movement of cars and airplanes or virtually via communication technologies) is a familiar one in narratives of modernity, stretching from Walter Benjamin to Reinhart Koselleck and Jonathan Crary to Andreas Malm.[9] The crisis and confusion of modern abstraction and acceleration need not be essentialist—that is, the body as a limit needn't be figured as organic matter simply unable to adapt to the time and space of modernity (as Freud seems to do). Critics also point to the limits of the historical subject in understanding itself

in relationship to the scale of modernity, a subject that cannot help but lose track of the ends to which its activity is directed and which is absorbed by social structures and infrastructures that appear to be driven by logics and imperatives autonomous from either individual or collective will. The external limit that modernity bumps up against can also be understood as the extra-human and the environment, both of which have appeared in discussions of crises and discontents in more recent critical analysis.

Freud's focus—and the emphasis of other critics, such as Albert Borgmann—is on the technological apparatus of modernity rather than the sources of energy that propel these technologies.[10] By not including energy in an account of the subject, what is missed is the character of the commitments made by a mode of subjectivity to a whole way of being. When we are being asked to undertake changes in the ways we live in order to limit our impact on the planet, the demand is not to stop using specific technologies—telescopes, microscopes, or record players. The demand is to power down the energies that fuel the entire system of prostheses. The fear of each of us having less energy, which has impeded environmental transformation at the scale required, is the expression of a prosthetic being that has come to take for granted the gigantic forces available to it. And it makes sense that this being should have this fear. Petrosubjects inhabit a petroculture of quickened time and expanded space that requires oil to make it flow. That flow feels awfully good (for the most part), or if not good, then certainly like the given. Perhaps we ought to worry more about feeling less good, about feeling dislodged from the given. Doing so might feel bad, but at least it would help unsettle the givenness of the good, and hence the petrocultural conditions of a fully naturalized world felt (and in Freud's terms, seen and heard too) in the image of oil.

If we understand modernity as petromodernity, the political and conceptual challenges aren't to figure out whether it's possible to keep up with the speed of things (a speed that is inevitably connected to the extraction of value and labor). The task is to think about how to a convince a planet of demi-gods and gods, and creatures even greater than gods, that they want to be mortals. And specific kinds of mortals: ones who know the attractions and powers of having once been deities. A difficult task, especially when all around them the vast infrastructure of petromodernity will act as a constant reminder of the pleasure and powers they once had.

4. Oil Is Not a Thing, but a Social Relation

To say that energy is a social relation implies already that a politics organized around switching from one source to another—oil to solar, say—without altering the activities and social forms that energy makes possible is either fetishistic or reactionary.

But let's take a step back. What does it even mean to call something a social relation? And why is this admittedly vague claim so important to so many critical theories of capitalism? The reason that scholars such as Matthew Huber or Andreas Malm say "energy is a social relation" over and over again is because this is Karl Marx's formulation for demystifying surplus value against the largely positivistic and ahistorical account of value one finds in Adam Smith and David Ricardo.[11] Implicit, therefore, in the claim that energy is a social relation is that value is tied to energy at the site of production and to the energy system more generally across sites of social reproduction. Marx's name for tying these two spheres together is the "relations of production" (distinct from the forces of production, which is, paradoxically, where we might expect Marx to locate energy). After naming surplus value a social relation, Marx goes on to forecast an explosive contradiction embedded between the *forces* and *relations* of production. If you think "energy relations" when you read "relations of production," things get exciting:

> At a certain stage of development, the material productive forces of society come into conflict with the existing *relations of production* or—this merely expresses the same thing in legal terms—with the *property relations* within the framework of which they have operated hitherto. From forms of development of the productive forces, these relations turn into their fetters. Then begins an era of social revolution. The changes in the economic foundation lead sooner or later to the transformation of the whole immense superstructure.[12]

Read back through Marx's critique of positivism in economic thinking, energy is both the condition of possibility during a certain phase of development and the "fetters" for future development at a certain point of concentration, saturation, and exhaustion. Plainly, this is the world in which we live today, a world soaked in contradiction and threatened by mass ecological catastrophe, but nudged not a wink in the direction of social revolution or fundamental transition. Our claim here is that *the political economy of energy is not yet isolated*

from the natural environment from which it comes in the progressive positions that claim energy as the crux of climate change. This of course does not mean that a critical theory of energy needs to bracket the environment and materiality of a world rapidly warming, but that the compulsions of fossil-fueled capitalism keep flooding forward according to the availability and feasibility of surplus value—a calculus of, and mode of representing, value completely inoculated against one more attuned to ecological entanglement. In a strong sense, the turn to what Stacey Alaimo terms "transcorporeality" in the social sciences and humanities *ought* to form the praxis of relation dislodged from capitalism.[13] But the compulsions of capital appear to need more than a coming to ecological consciousness on the side of the relations of production to disarticulate accumulation from more and more resources. One way or another, the tension will need to be lodged between the relations and forces of production.

5. Real Estate and the Rights of Energy

The opening scene of Upton Sinclair's *Oil* is a flurry of activity.[14] Cars fly across the landscape, public assemblies collect the body politic, and the prospect of oil litters the prose with a kinetic frenzy. Someone is about to hit pay dirt. The only thing getting in the way is property.

Energy is embedded in land and immersed in the topography of landscape. It is drawn out from surface area and horizontal deposits in the form of resource. Energy requires geologists, surveyors, ordinance managers, and start-ups to converge in place, but also a discourse of property able to delineate what belongs to whom, and what the limits of that belonging look like from the standpoint of law. Renewable energy systems and fossil fuels alike begin with an assessment of property, but property is no neutral category or scale of reference: the drive to capture energy from land and landscape sits at the very origins of the concept of property. In John Locke's labor theory of property—cited widely by the U.S. Supreme Court to this day—it is every individual's natural right to mix his labor with the materials of common land in order to extend his property into it. The crucial section from Locke's *Second Treatise of Government* (1689) develops this connection between body, land, and labor:

> Though the Earth, and all inferior Creatures be common to all Men, yet every Man has a Property in his own Person. This no Body has any Right

> to but himself. The Labour of his Body, and the Work of his Hands, we may say, are properly his. Whatsoever then he removes out of the State that Nature hath provided, and left it in, he hath mixed his Labour with it, and joyned to it something that is his own, and thereby makes it his Property. It being by him removed from the common state Nature placed it in, it hath by this labour something annexed to it, that excludes the common right of other Men. For this Labour being the unquestionable Property of the Labourer, no Man but he can have a right to what that is once joyned to, at least where there is enough and as good left in common for others.[15]

Property requires the individual's own physical energy (their labor) at the same time that the improvement of land creates a surplus of resources relative to what was there to begin with. The surplus, Locke will argue, is a result both of the individual's industriousness and their application of reason. It is in this way that the liberal theory of the individual subject relied upon a benevolent concept of property, since to own was in turn to increase abundance for the whole. At the same time, the subject was bound to join the common with the property of its own labor in a calculus that tended toward the rational.[16]

Locke had an agricultural concept of improvement in mind when he made a case for the property principle of the modern state—a decidedly pre-industrial paradigm for thinking resource governance and the body politic. Even in this genealogy, however, we can see how real estate names the practical boundary and contents of a slice of space in time. The horizontal axis is just as important as the lateral. Across provinces, states, municipalities, and nation-states, the threshold of one's subsoil rights varies from zero to infinity.[17] Axonometrically, energy flows through the coordinates of the rights of property, both private and public. Until very recently, large pools of oil were considered in the same category as other common forms of property, such as air, water, wildlife, and the radio spectrum.[18] In the wake of increased investment in and wider availability of renewable energies that turn above-soil space into economic flow, pressure has been mounting on the sustainability of the commons concept in property law.[19]

The commons concept is a thorn in the side of late fossil capital because it runs against the discerning eye that would filter materials into commodity, waste, and overburden. Jennifer Wenzel speaks of the "overburden" that gets in the way of extractive industries. In order to see resources—to instrumentalize a *resource aesthetic*—"the extracting eye … peers through space rather than

time: to keep one's eye on the prize in this context means to home in on what's valuable, to espy the buried ore precious enough to make it worth the digging up."[20] As long-buried and dense matter gains import for the industrialist as a form of economic potential far exceeding the value of soil for the improving agriculturalist, the frame of property comes to fold in on the labor of stratigraphy, seismology, and infrared satellite sensing. Property in the Lockean sense becomes overburden for the fossil fuel revolution, while the demarcations of real estate remain its frame.

Energy cannot be understood outside of the frame of property, and it is hard to imagine anything approaching a revolution in energy without that oldest of revolutionary transformations: the return of property to the common. The law of property has sustained fossil-fueled modernity, whether because sovereign governments have control over a resource that generates income on which they depend, or because property owners spend resource dollars on political candidates that will allow extraction to continue. One of the real limits when it comes to imagining life beyond fossil fuels is the inability to connect transitions to renewable forms of energy (solar and wind farms, for instance) with a much more significant transition—a transition away from property. Renewable forms of energy are structured as forms of property, and as with all property, the desire to extract profit from energy remains, as does the desire of property owners to extract as much profit as possible from their property. Remember: in Jean-Pierre and Luc Dardenne's film *Two Days, One Night* (2015), the fact that the site of work is a solar panel factory seems to matter not in the least for the workers employed there. They are as precarious as workers anywhere, and the property owners are the ones who profit through their labor.

6. From Property to Imagined (Oil) Communities

In "Oil and the Origins of Middle Eastern Sovereignty," Rachel Havrelock narrates a surprising discovery.[21] In an effort to explain why the Jordan River became an international border, Havrelock first explores the possibility that it was the outcome of colonial surveying practices. British members of the Palestine Exploration Fund faced attacks when they crossed the river, and so assigned the far side of the Jordan River to the American Palestine Exploration Society, keeping the near side for themselves. Thus divided among colonial powers, the modern Middle East was born, with all its traumas and terrors.

Except that there's more to the story. The imaginary lines demarcating discrete zones of sovereignty in the Middle East have an even more unusual source than the safety concerns of colonial surveyors: pipelines. Havrelock argues that the planning and construction of the Iraq Petroleum Company (IPC) pipeline from Kirkuk to Haifa, which moved alongside the Jordan River from 1935-48, had a determining impact on the borders of Iraq, Jordan, Israel, Syria, and Lebanon. The divisions mapped out in the Sykes-Picot Agreement were inspired, in part, by plans for distinct British (from Kirkuk to Haifa) and French (Kirkuk to Tripoli) pipelines. And so, organized in relation to energy infrastructure, the modern Middle East was born, with all its traumas and terrors.

The Middle East offers perhaps an exceptional example of the role of oil (and oil infrastructure) in shaping nations and sovereignty. After all, borders don't typically trace the pathways of energy infrastructure in such a direct and unmediated way. A pipeline does not trace the border between Canada and the United States, for instance, nor does it lay out the discrete zones of sovereignty that exist all over (say) Africa or Asia.

Even so, the larger struggle over access to and control over energy and other resources *has* played a constitutive role in where one finds borders. Wars have been fought to access resources, and borders extended to absorb once-foreign territories into the bodies of nations hungry for oil. Havrelock reminds us that full sovereignty in the Middle East was restricted by concessions over rights to aquifers, oil, and minerals—mechanisms employed by foreign governments on behalf of international companies to make borders permeable to extraction. The wars that have been fought over resources (and there have been many) include revolutionary struggles, which aim to overturn such colonial concessions and return resource riches from foreign governments and private corporations to the people of the nation, giving the latter the full benefit (so to speak) of extracting oil and putting it on the market.

If property is one frame of energy—a legal frame—the nation-state constitutes another—a political frame sustained by a techno-military apparatus that is itself a consequence of oil. *The twenty-first century nation-state is saturated in oil and cannot be imagined in its absence.* One of the substantive functions of nation-states is to manage and legitimize the rule of property. Above and beyond the communication infrastructures that help constitute the "imagined community" of the nation—all of which, it has to be said, depend on enormous amounts of energy—another key

function of the nation-state is to create systems to manage the extraction, distribution, and use of energy.[22] The scope and scale of energy infrastructures necessitate a body with the capacity to effectively manage them; so, too, do the infrastructures which access to cheap and plentiful oil made possible. Think, for instance, of the Eisenhower highway system—indeed, think of any highway system. Often seen as just another collective good for which governments are obviously responsible (akin to schools and hospitals), it is in fact an example of the energetic commitments of the nation, and of the way in which the nation provides supports for capital under the guise of providing common goods. For much of its life, the state has been an *energy state*, managing not just populations but also the processes by which energy is produced and distributed, and making decisions about who benefits and who doesn't. There are reasons why wars happen where they do.

The strong link between the nation-state form and energy has serious consequences for what comes next. In a recent interview, scientist Philippe Charlez identifies three pillars of sustainable development as outlined in United Nations Brundtland Report: energy security, corporate competitiveness, and the environment. He points out that the first two are "fundamentally national," while the last—the environment—is global. Charlez observes: "The more nationalist a country's policy, the more it will tend to privilege security and competitiveness at the expense of the climate."[23] The existing form of the nation-state interrupts any possibility of responding to global warming. And so we need a new form of collective belonging, one that recognizes the environment, but which is attuned, too, to the weight and persistence of the infrastructures left by nation-states.

A challenge for left politics: not just to imagine new ways of being in relation to one another that presume different kinds of energetic relations, but also to think of political forms other than the petronation. The barest outlines of this difficult task have hardly begun to be sketched in the sand of a beach about to be swallowed by the sea.

7. There Has Never Been an Energy Democracy

At no point in the history of fossil fuels has their use *ever* been subject to democratic oversight and control. This is plainly true in the case of the industrial oil giants that have to be counted among the largest corporations ever to roam the Earth (their names are familiar to all of us: BP,

ExxonMobil, Shell, Total, and so on). In 2017, these four companies alone totaled almost one trillion dollars in revenue (clearly, it was an off year). These corporations extract oil wherever they can: deep in the ground using chemical solvents to help with the task, or deep in the ocean, despite the very real dangers for the crews involved and the oceans surrounding the rigs. As private corporations operating in a neoliberal world, they are responsible only to their shareholders and have increasingly less public oversight of their decisions and actions. In the United States, oil companies have used their considerable wealth to make sure that political decision-making favors them (e.g., in 2017, a government tax cut *quintupled* ExxonMobil's quarterly profit); and in Canada, Conservative Party leader Andrew Scheer participated in a day-long strategy meeting with oil executives following the election of yet another provincial Conservative government.[24]

The environmental and economic implications of unfettered energy use demand that energy become subject to true democratic oversight. But there is a corollary insight that arises from the insistence that energy be managed democratically. *However we might theorize the democracies of the future, the role and function of energy needs to be foregrounded in their figuration.* As in almost every other sphere of analysis, there is a problematic lack of attention to energy in most elaborations or speculations of the political future. Socio-political ideas and ideals from Rousseau to Autonomism (and likely before and after) have rarely attended to the material demands and environmental impacts of political forms and structures. The primary issue in political theory has been who controls what and why, not whether there's actually enough to go around, or if particular forms of governance or ownership threaten the very possibility of a political future due to the demands they place on the environment. If machines are supposed to set us free from work (as in Karl Marx's oft-cited "Fragment on Machines" in the *Grundrisse*), what is it that the machines will run on?[25] And what are the environmental *and* political consequences of using the fuels that make it all work? While it might have once been possible to imagine the Earth as constituting a resource bounty that at some point could be made accessible to all political subjects, in the wake of the post-World War II acceleration of energy use, pollution, and population, it is simply no longer feasible to articulate a common that does not attend to resources and the environmental consequences of their use.

Energy needs to be a focus of any future "common," which Pierre Dardot and Christian Laval have described straightforwardly as "in the most systematic

and profound manner possible, the widespread introduction of institutional *self-government*."[26] Every common to come will need to be imagined not just as an open political horizon, but also in relation to limits, perhaps especially in relation to energy resources. In the past, when the question of limits has been introduced as an aspect of political discourse, it has generally been seen as a reactionary gesture designed to impede political change, as opposed to a genuine attempt to attune the political to restrictions, whether social or environmental (Malthusian anxieties over population increase have long been a touchstone in this respect). But there are things we can learn from limits. In an era in which we now have to assess environmental *and* social possibilities in the language of parts per million of CO_2, older commitments to the common might no longer be the ones we want or need. Energy needs to be governed democratically; this conception of the democratic needs to be framed in relation to energy in the deepest way possible.

8. Extractivism Buries as Much as It Digs Up

Extractivism names a given economic form of organizing natural and social resources in which sustained profitability depends on the extraction, over time, of an increasing amount of natural resources from the Earth. In the language of macroeconomics, total-factor productivity (TFP) is a measure of cumulative increases in productivity that exceed technological, capital, and labor input (or cost share): growth over time depends on increased TFP, which is achieved both by optimizing inputs (or reducing lag, waste, and drag) and via what Harvard economist Dale Jorgenson famously described as the "somewhat surprising" correlation between "non-electrical energy and productivity growth."[27] In 1963, University of North Carolina economist Edward Renshaw offered a statistical image of this dependence on increases in energy for productivity gains over time, astonished as he was at the shift in energy requirements by midcentury, remarking, "nearly four times as much prime mover is required today to produce a dollar of real income as was required in 1880."[28] Between 1870 and 2009, roughly 135 billion tons of oil were extracted and unleashed into the global economy.[29] As of December 31, 2017, an estimated 1,114 billion (or 1.1 trillion) short tons of proven recoverable coal had been tagged for future extraction.[30]

Extractivism is the name for an economic problem internal to capitalism. It generates rather obvious environmental challenges. Less

obvious might be why is it also a source of socio-political conflict. Marx is very clear about the energic content of capital over time and its consequences for labor. Look closely and you'll see it spelled out in the all-important twenty-fifth chapter of *Capital:Volume 1*:

> The greater the social wealth, the functioning capital, the extent and energy of its growth, and, therefore, also the absolute mass of the proletariat and the productiveness of its labour, the greater is the industrial reserve army. The same causes which develop the expansive power of capital, develop also the labour power at its disposal. The relative mass of the industrial reserve army increases therefore with the potential energy of wealth. But the greater this reserve army in proportion to the active labour army, the greater is the mass of a consolidated surplus population, whose misery is in inverse ratio to its torment of labour. The more extensive, finally, the lazarus layers of the working class, and the industrial reserve army, the greater is official pauperism. *This is the absolute general law of capitalist accumulation.*[31]

More commonly known as the *immiseration thesis*, Marx is here revealing the two forms of energy that capital will acquire over time: first, as capital accumulates in larger quantities, reflected in the scale of operations, gross output, and relative command of individual firms and entire sectors, its need for less and less human labor time per unit of output generates a tendency (or energy; i.e., "the energy of wealth") toward contradiction. That contradiction is spelled out further in "the absolute general law of capitalist accumulation," which is the fateful fall in the rate of profit as capitalist accumulation reaches its zenith (even if its zenith is cyclical, rather than terminal). More and more wealth accumulates in fewer and fewer hands, while more and more laborers subsumed into the economic process are suddenly shed from the production process, causing rolling and irresolvable waves of unemployment. This is the first valence of energy used by Marx in this passage: ever-expanding stages of growth met by ever-intensifying forms of secular stagnation.[32]

The second valence is more literal: capital in its constant form—that is, the machines, buildings, hardware, and physical character of what capital employs as its own part of the bargain—is always both growing in magnitude and value relative to the variable form of capital (i.e., labor power hired to light it all up) *and,* as a logical consequence, animated by

more and more energy over time relative to the quantitative energy of human input. What Marx calls the general law of capitalist accumulation thus describes a historical trajectory to accumulation—namely, the rising surplus army of laborers that capital paradoxically produces in the measure that its physical character over time displaces that same labor—at the same time as it describes an environmental relation: *more and more resources will be needed from the Earth's subsurface to fuel the rising magnitude of capital's constant forms*—its machines, buildings, hardware, and so on. Of course, there are moments when capital appears to need fewer resources, or when it suddenly appears to do more with less, but these do not contradict the historical arc of the general law; they confirm it. Cutting costs is the *sine qua non* of capital as a logic, and so individual firms and sectors naturally find cheaper and more efficient forms of energy as others become costlier.

Yet the relative cheapness of a given form of energy becomes immediately compromised once it is no longer emergent, but is instead dominant. Hence cheap oil is largely credited for the golden era of U.S. hegemony, from the early 1950s through the late 1960s,[33] while cheap coal is understood to have provided the physical and economic conditions for large-scale industrialization in England, and then Germany and France, in the early- to mid-nineteenth century.[34] Flipped around, the same is true of the era of *expensive* oil that characterized the post-1970s period, most vividly expressed in floating average oil prices of over $100 per barrel between 2000 and 2008. Not coincidentally, this is the era of what Neil Brenner has influentially termed "the long downturn," when the rate of profit began its steady fall toward the negligible rates that mark the long present.[35]

Capital, in other words, will always be an extractivist mode of social organization not despite, but because of, its intransigent drive to cut costs. Using more and more physical energy from fossil fuels is a form of cutting labor costs, until it is not. When the cost of energy rises to the level of a constraint, capital seeks out either new sources of energy or innovative ways to extract what's left. That is to say, energy in the form of fossil fuels has typically been a *very* cost-effective means to economize and minimize human labor power (or variable capital), and when specific forms of extracting fossil fuels become too costly, some other form is usually just over the horizon.

9. Infrastructural Politics; or, Decarbonization, Decapitalization, Decolonization

Where do the previous eight principles bring us? What are the politics that arise out of a critical theory of energy? If we are serious about transitioning to a renewable and equitable relation to energy, and by extension, serious, too, about reshaping the social relations recursive to the forms of extraction, circulation, and consumption that underwrite that relation to energy, we have no choice but to focalize our critiques, attachments, and desires through the infrastructural. There is a reason why references to infrastructure haunt every one of the principles outlined here. We want to be clear, however: this insistence on the infrastructural is the *opposite* of saying that base trumps superstructure, or that so many cultural and ideological expressions (or delusions) amount to a veil draped over the real material conditions pulling us through the otherwise obfuscated and obstinate logic of fossil-fueled capitalism.

No doubt there is more than enough ideological and cultural delusion to go around. But unveiling is not what making infrastructure primary to a praxis of social and ecological justice opens up. Unveiling presupposes that seeing things for what they are, as opposed to what they appear to be, disposes with the sedimentation of material and discursive histories in bodies and landscapes: a debunking, rather than a sifting through. A critical theory attentive to the historicity and materiality of energy sifts through infrastructure, because it is in infrastructure where one encounters the dusty, bloody, and sedimented archive of capitalism's *longue durée* over the bodies and resources of the planet. The critique of energy infrastructure makes available a presentism that refuses the terms of the present. Epochal shifts have been dug into the depths of the Earth on the back of capitalism's drives and liberalism's attendant forms of reason. Entire geographies, cultures, and relations to the Earth have been upended, eviscerated, or shackled to the tides of a history written in the language of infrastructure. Plainly, we ought to be deeply critical of the ongoing violence that grids infrastructure in the present and future, but a critique of infrastructure also needs to be an *infrastructuralization* of critique: not more of the same—self-satisfying claims regarding the civil engineer's racism or investors who talk like Descartes—but a materialism both new and historical, intimate to what makes infrastructure dizzying and dazzling.

Kathryn Yusoff argues that colonialism was always a *geosocial* formation dependent on pressing certain kinds of bodies up against the threshold of

life and nonlife otherwise sorted according to the rationale of geology.[36] In the Black Studies tradition of Saidiya Hartman, Édouard Glissant, and Sylvia Wynter,[37] Yusoff identifies the racial displacements coded by the nomenclature of thepresent (today, the Anthropocene):

> Anthropocene origin stories ... pertain to the question of how matter is understood and organized, as bothextractable resource and energy, mobilized through dehumanizing modesof subjection and conjoining the property and properties of matter in sucha way that it collapses the body politic of Blackness into the inhuman—wherein a codification in law and labor becomes an epidemiologicalsignature, as Blackness is marked as property and Whiteness is marked asfreedom (political and geographical).[38]

The afterlives of slavery and colonialism reverberate in the eardrums of what Elizabeth Povinelli has named the "carbon imaginary" of late liberal reason, which is both incipient to the urgency of climate change and utterly incapable of recognizing the violence it unleashes legally, socially, and materially under its predicates of a white, propertied self.[39] Which is to say: the carbon imaginary is ontologically incapable of being troubled by the inhuman knotting of the properties of Indigeneity and Blackness with the category of nonlife, which has been taking place every day for centuries. The infrastructures of this colonial mediation of bodies are layered, material, and policed; it is incumbent upon us to follow the lead of Black and Indigenous Studies in abolishing the geosocial taxonomy of late liberal reason at a discursive level.

We have been arguing here that a critical theory of energy, like a critical theory of anything, is *critical* in the measure that it labors in the service of emancipation from that which we may not even fully recognize our desire or need to be emancipated from. But the conceptual scaling of energy from the historical to the experiential, from the geological to the ecological, and from the aesthesis of everyday life to the aesthetics of capital's reason and rampage over the Earth's human and nonhuman resources, means that what is at stake in a critical theory attuned to energy is effervescent. This is a critical theory fundamental to the Venn diagramming of concerns animating so much radical thought today. In our account, these spheres of the diagram conjoin around three critical concerns that matter deeply to the shape of things to come: decarbonization, decapitalization, and decolonization. Making infrastructure

primary means taking seriously the forms of experience, extension, and enmity that knot bodies past and present (and future, too) to the habits and habitats formalized by cables, ports, pipelines, roads, and refineries, and by political and economic structures as well (the apparatus of the nation-state and property). Taking these forms seriously means tracking them, looking at them with bifocals, and eventually finding pressure points that allow us, and those to whom we ally ourselves, strategic points of theoretical and material intervention. It means listening to those who know firsthand what infrastructural expansion means when the very grounds for life get chewed up and fenced off, and also learning what hurts those who want to dig deeper into the Earth.

Doxa dictates that infrastructure remains inoculated against social contest because it is only plotted into the landscape when it goes under the banner of the common interest, of a civil engineering of the technical and the necessary, of the property relation. Every pipeline blocked and every freeway called into question obstructs and challenges more than that pipeline and that freeway. Infrastructure is invariably *necessary,* but we know in the humanities and social sciences painfully well that the realization and naturalization of the necessary is always the expression of a strained and traumatic duration to social politics discursively forgotten once the ground is broken for construction. Fossil fuels are certainly not going anywhere anytime soon, because in truth they are both socially and materially intertwined with the most basic forms of freedom, mobility, and care which we take as necessary, as the given. The point is not to turn off the switch to prevent the delivery of plastic prostheses or the functioning of coal-powered hospitals; nor is the point to stop diesel-fueled containers from reaching port in places hungry for their contents (which is not that same as saying that the rhetoric of "keep it in the ground" is unimportant or ineffectual). Critical theory is about generating *a long view of the given.* It is a means of denting the soft and quiet violences (and the loud and hard ones, as well) of the infrastructures laced through landscape, and the displacements, genocides, and environmental racisms that they both historically and presently reproduce. If we are serious about transition, it will be a transition to an otherwise of the given.[40]

Demystifying the spatial and temporal entanglements of infrastructure with a sharper attunement to carbon, colonial, and capitalist imaginaries is a good reason to gather collective resources for a critical theory of energy. The principles outlined here are intended to help make this happen.

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NOTES

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