Solar Materialisms

Solarity is a material prospect that invites a materialist response—but, which materialism? There is the historical materialism we have inherited from the Marxist tradition, with its attention to structural transformations in the forces, relations, and mode of production; class exploitation; antagonism and struggle; and the ideological and subjective forms and practices attached to these. And then there are the so-called new materialisms, brought to us by thinkers and practitioners arrayed across feminist science and technology studies, Indigenous place-thought and practice, postcolonial and Black anthropology, geography and fiction, and the ontological turn in European philosophy. In various and distinctive ways, each of these calls our attention to material relations with and between the nonhuman beings formerly known and treated as objects, beasts, resources, environments, and machines. These materialisms are often positioned as opposed, but it seems clear that comprehending solarity requires both of them, historical and new materialisms proceeding not in parallel but roped together in a braid.

For example, capitalism conditions us to regard the sun as a source of abundant energy that, in turn, frames our relations with other, Earth-bound beings and materials as one of limitation. In this view, solarity is frustrated by material limits on storing the sun’s energy as fuel. This poses a problem for fueling the future in the
same ways as the present, ways that privilege capital at the expense of human and more-than-human beings and environments. Perhaps this is one way of explaining why such a widespread harnessing of solar energy seems for some a faraway dream. At the same time, this current material reality signals the ways in which solarity might resist the legacies of extractive settler colonialism and capitalist modes of accumulation bound up with life in the fossil economy. On the other hand, despite the potential for environmentally clean energy on a large scale, solar economies may nevertheless be haunted by the history of colonial extractivism, labor exploitation, and capital accumulation bequeathed to them by the fossil fuel era. Sorting through the diverse material possibilities of solarity will require multiple materialisms, not just one.

A persistent strain of petrocultural studies insists that the culture and politics of societies energized by carbon-based fuels are not just incidentally related to the distinctive material properties of coal and oil.\(^1\) Infrastructure matters, but so does, well, matter. There is an environmentalism in which deploying solar energy to sustain existing social and economic relations while slowing global warming by reducing greenhouse gas emissions associated with fossil fuels is good enough.\(^2\) Solarity holds out the promise of more. This is partly because transitions are always periods of uncertainty, overdetermination, and potential. Things can be different. It is also because the sun in the sky is different from the oil in the ground in ways that suggest a range of alternative possibilities for organizing our relationship to it and to each other, possibilities that differ substantially from how our relationships to fossil fuels have been

---


arranged. It is not without reason that the potential of the sun to energize fundamentally transformed economic, political, and social relations has captured the imagination of a range of otherwise quite divergent thinkers.

Writing about solar communism, David Schwartzman sees the promise of initiating a transition from a bleak capitalism to a brighter, more communal future organized by the energy of the sun. For Andreas Malm, the prospects of a solar future amount to a return to the “flow”—a return to harnessing inexhaustible energy sources that necessitate a reconfiguration of the rhythms of everyday life in a way attuned to that flow, rather than to the rhythms of capitalist production.³

Does solarity by its very nature offer a brighter future? Is solar energy necessarily communist, and communism necessarily solar? Brightness is how we perceive the sun, but the layers of mediation necessary to harness its abundance create conditions for replicating the same uneven bleakness found in the fossil economy. It is here that materials reappear to temper the solar imaginary. Mining the sun for its energy requires solar photovoltaic systems (PV) and batteries to store the energy they generate. It requires inverters for converting the direct current electricity produced by PV systems to the alternating current common to most appliances. At scale, it also requires advanced computing and data processing technologies to manage the grids into which solar-generated electricity flows. The process of creating and operating PV systems is materials and energy intensive. It involves the use of poisonous and toxic chemicals, including cadmium compounds, hexafluoroethane, silicon tetra-chloride, and lead, the life cycles of which exceed the anthropocentric circuit of extraction, manufacture, use, and disposal. Lithium ion batteries are the ones most commonly used in PV systems. There are a range of issues associated with using lithium, including the

amount of water required in its mining process (half a million gallons per metric ton of lithium), the generation of toxins in the process of lithium processing, and the colonial displacements that nearly always accompany its extraction. South America’s Lithium Triangle (a region that includes Argentina, Bolivia, and Chile) is estimated to hold more than half of the world’s supply. Whether this fact places these countries, all former colonial and existing neocolonial extractive zones, in a position of strategic advantage or intensified environmental, economic, and social precarity is a historical question. We do know that Latin America is a region in which the burdens of mining (and resistance to its injustices) have fallen heavily on women, Indigenous peoples, and workers, while its benefits have flowed and accumulated elsewhere.\(^4\)

The environmental and political implications of the large-scale extraction, processing, and disposal of other elements involved in battery production—cobalt and nickel—are as troubling as all the others listed here (and this is far from a complete list). Solar power also has implications for land and water use. Depending on the system in use—utility-scale PV systems or concentrated solar thermal power (CSP) facilities—3.5–16.5 acres are required per megawatt generated. Even if we believe the energy of the sun to be limitless, the availability of land is not, and land used for solar is land that can’t be used for other purposes. CSP plants also need water for cooling and cleaning, as dust, dirt, bird droppings, and other organic matter greatly reduce the efficiency of solar panels. These facilities are often located in areas with dry (i.e., sunny) climates, adding an additional and lucrative source of demand upon already limited

supplies and competing with small- and medium-sized farmers who rely on groundwater from the same sources for their livelihoods. Additionally, extracting value from large-scale, infrastructural transformation to solar power will likely require a variety of forms of compensated and uncompensated labor, in industrial and social factories, under varying (but largely exploitative, racialized, and gendered) conditions, the world over. Finally, the project of financing, building, and operating these infrastructures will deliver considerable economic and political power to those positioned to harvest the material wealth of extractive solarity. These people rarely live with or near the externalities produced by their activity.

So much for universal, immediate access to unlimited energy that skips all the steps normally involved in producing fuel and turning it into energy. Large-scale mineral extraction and industrial manufacturing. Chemical toxicity. Energy intensiveness. Resource plun-
solarities

der and depletion. Territorializing occupation of lands and waters. Gender inequality. Labor exploitation. Unequal concentrations of wealth and power. At the level of its materials and infrastructure, all of a sudden, solarity sounds a lot like every form of environmental injustice that has preceded it. This is not the whole, or the only, story of solarity, but it does recommend against uncritical investment in techno-utopian imaginings in which, as Joanna Zylinska so aptly puts it in critiquing masculinist narratives of environmental tragedy and heroism, “men repair the world for me.”

The possibility of other solarities demands that we attend to our relationships to materials and to the infrastructures that mediate these relationships. Solarity must be about turning to face these as much or more than it is about turning to face the sun. In so doing, we are likely also to encounter alternative materialities and fugitive infrastructures that hold the possibility of plural and heterogeneous solarities and the plural and heterogeneous subjects these materialities and infrastructures mediate. It is here that the truth of solarity will be found: like all mediated conditions, solarity names a condition and terrain of contingency and political struggle. Infrastructure matters, not least because, along with mediating our relationships to matter, its contingent configurations bear strongly on the sorts of subjects we might become.