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Mining the Sun: Coal-to-solar transitions and energetic place-making in Appalachia

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Abstract

A striking effort is under way to use energy investment, a key feature of US federal climate policy, to build solar farms on former mining lands and in legacy mining communities in central Appalachia. Focusing on community solar initiatives, we consider the geosociality of energy transitions from the perspective of communities where many people have considerable knowledge of energy systems and how they work. We note that the politics of place-making in the context of environmental sacrifice and capital abandonment enables negotiations around energy that often seek to bridge deep social contradictions. We highlight how solar energy's diffuse networks of power, both social and electrical, privilege forms of temporal labor that are alliance-building, compositionist, para-ethnographic and intimately concerned with the capacity to build relations. Vernacular energy expertise can play a major role in creating novel forms of political sociality. In West Virginia, this both builds on and significantly shifts the emphasis of long legacies of energetic place-making. We expect the ongoing development of community-led solar investment to contribute to substantially important diversifying effects in West Virginian communities, especially when these efforts can more explicitly address the state's extreme geographical, race, and class-based inequalities.

Keywords

Appalachia, energy transitions, geosocial formations, just transitions, place-making, solarify

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Introduction: Dense powers of the Earth, diffuse power of the Sun

Mayor Cavalier was busier than ever when finally we were able to meet with her. It was a chilly January in southern West Virginia. The hills were brown with scrappy forest and leafless kudzu. As it was almost evening, she unlocked the front door of the town hall herself to let us in while one of her staff finalized some paperwork. The mayor of a small town, population 750, Dr. Cavalier was an energetic and elegant woman in her mid-sixties. The former college professor generously welcomed us to the new town hall overlooking the Kanawha River, a converted public school, long closed for want of students. A testament to her creative energy, she had spearheaded a deal to renovate the building for the town offices, yet lease out most of the space to local businesses since it was far more than was required. Meanwhile, the complex legacies of the coal industry literally loomed over the town: several million dollars needed to be spent to secure a mountain of mine tailings that had started to collapse over the local highway. The Clay Street Moving Mountain, as Mayor Cavalier called it, evoked a sense of geological insecurity that accompanied economic abandonment like an ever-present shadow.

At the same time, the underground was a honeycomb of caverns. Across the river, a dormitory had been built for the students of a branch of West Virginia University (WVU), one of the few remaining bright spots that employed about 300 faculty and staff and, of course, brought the welcome energy of the students. However, mining companies had worked underground beneath the whole town, and those mines collapsed under the dorm. The building had to be condemned, even though it was only about 15 years old. When WVU decided to close the campus in 2018, it was a major blow and an outright betrayal – another decision the residents of the city had no influence over. One of Mayor Cavalier’s big successes was securing the funding to remove numerous abandoned buildings that gave the town an ominous sense of desertion. Her dilemmas revolved around de-growth and regrowth in tandem for such a “forgotten place” (Gilmore, 2019: 31). The mayor’s personal energy seemed to herald the possibility of a future, sustained against the world’s vanishing interest in the town.

Increasingly, solar energy investment is becoming an integral part of an effort to rejuvenate the decimated landscapes of coal country. Mayor Cavalier’s next challenge was to find a way to put solar panels on the roof of their 30,000-square-foot city building. She enthusiastically shared her recent grant application to the federal Abandoned Mine Lands Reclamation Program. “If it works, it will be an example for the rest of the community. They will see it works, and it is good for all of us. Economically, socially, environmentally.”

Proof of concept was essential to moving past the sense of isolation and fatalism. The mayor told us a story about the effort to convince the townspeople that solar was worth it. “We put in solar-powered street lights and we had to spend a lot of time trying to convince people that this was going to work. We were spending tens of thousands of dollars on our power bill but people are pretty skeptical.” The mayor seemed to take pleasure not only in telling us the story but also in her own capacity to navigate the political terrain. “Have people changed their minds now that they’re up and working?” we wondered. “Well, I just

know that we're going to have a week of heavy clouds one winter, and the lights aren't going to come on and someone is going to shake their head and say, 'Mayor Cavalier should've never talked us into that!'"

Appalachia has emerged as a pivotal space to think about just energy transitions in the US context. Because of its violent and foundational place in the history of energy extraction and the cultural and structural position occupied by its coalfields, Appalachia has come to exemplify the promises and perils of the "energy transition." Today, a striking effort is under way to use energy investment, a key feature of US climate policy, to build solar farms on former mining lands and in legacy mining communities.

The most ambitious of these goals would place large solar arrays directly on the blasted, ecologically degraded mountains, following a pattern of redevelopment pioneered by prisons, server farms and shipping warehouses (Schept, 2022). Conservation groups like the Nature Conservancy have acquired significant acreage, pledging to support clean energy investment linked to landscape conservation, revitalization of abandoned mine lands, and community development. Small energy firms have opened up a space for tactical investment in comparatively small grid projects on mine lands and in mining communities. Funding is also being directed to communities and residents of these counties who want to install solar capacity on their homes, schools or public office buildings.

On the ground, small-town redevelopment efforts have paired solar investment with community organizations committed to cultural and economic revitalization, keenly aware of the social devastation that accrued through coal's violent past and again through the industry's collapse. Mayors work with regional consulting groups to try to break the impasse of social and economic abandonment. Additional lines of funding have subsidized job training programs and advisory services for solar, which, as a burgeoning yet small for-profit industry, have formed a frontline for trying to convince communities that they can find for themselves an economic and cultural future without coal.

Yet in coal country, such efforts to establish solar have not been an easy sell, not least because of the cultural association of renewable energy with urban, elite liberalism. While coal is less and less significant economically, the power networks that it built are deeply entrenched. The aggressively masculine cultural politics of energy transitions is expressed through big-dollar campaigns such as "friends of coal" and nostalgic slogans such as "coal keeps the lights on" (Kurlinkus and Kurlinkus, 2018). Culturally, however, the politics of energy transitions is squarely situated amid the dilemmas of economic and social revitalization and a shifting regional identity. The predicament is perhaps best captured by the savvy advertising slogan of a for-profit company that has been particularly adept at financing and building small solar installations. Their argument, which they bring to community meetings around the region, is that Appalachia is now "Mining the Sun." Many people are deeply skeptical; others welcome the possibility of moving beyond a fraught and violent past. Can the shift from coal to solar provide an adequate answer to the ongoing legacies of the past?

This article investigates the possibilities of community solar investment in legacy mining communities in central Appalachia. Community solar programs exhibit significant cultural investment in what we call "energetic place-making." We are interested in the

kinds of work that accompany energy transitions, and notice that one kind of work is especially germane – such as that exemplified by Mayor Cavalier. This labor involves its own form of energy that is focused on building relationships, bridging extant contradictions, and achieving near-term successes within a longer horizon of local redevelopment. This work is performed across the existing social topography and its underlying stratifications of race and class, constantly placing efforts to reform the status quo in tension with the ability to secure concrete achievements. It is also an especially temporal labor, intent on composing a habitable future. While commercial, grid-scale solar is bound to conventional property and capital structures, community solar promises access and inclusion for some actors in a way that potentially opens up an avenue for material redistribution and the partial enactment of more just futures. However, ongoing legacies of racialized environmental sacrifice zone constantly arise to unsettle these efforts.

In what follows, we toggle between ethnographic description and several interlinked concepts that help us piece together the forms of sociality at stake in the prospect of a just energy transition. While one of us (Whittington) has known one of these communities since 2010, the research on which this article is based is relatively new (since 2021) and ongoing. In coal country the abstract, bureaucratic language of “energy transitions” raises the specter of the long legacies of underground and mountaintop-removal mining in powerfully intimate and embodied ways. “Just transitions” refers to the social expectation and political prospect of turning away from the energy-dense carbon underground and toward the diffuse power of the Sun. To what extent can “mining the Sun” provide an answer to the complex claims of a violent, extractive past in central Appalachia? And what energetic futures can this heliotropism help sustain?

Geosocial transitions

Thinking about transitions geosocially helps us hold onto the forces and geological relations of material connections across wide-ranging temporal and spatial scales while not losing sight of the deep fractures of inherited racialized and colonial power relations that are at stake (see Povinelli, 2021). Energy regimes are dynamically embedded in structures of political power as well as classed, racialized, gendered, and sexualized subjectivities (Boyer, 2019; Cram, 2022; Daggett, 2021). Recent anthropological literature on renewables, while sympathizing with the importance of wind and solar, illustrates their likely role in reproducing existing inequalities (Howe, 2019; Lennon, 2020). Others question whether “renewable” energy is ever renewable, with its fossil-fueled supply chains that are predicated upon existing, colonial trade routes and violent conditions of mining work (Dunlap, 2021). Furthermore, it is clear that the new power capacity is currently additional to fossil fuel-based power and by no means yet represents a sign of the end of fossil fuels (York and Bell, 2019). These accounts cast doubt on the use of “the linear, developmentalist, and progress-oriented logic of the term ‘energy transition’” (Günel, 2022). Nonetheless, this research is situated within High and Smith’s effort to articulate “a more capacious approach to studying energy ethics that opens up energy dilemmas to ethnographic inquiry” (2019: 9).

By adopting the term “geosocial,” we follow Nigel Clark and Kathryn Yusoff (2017) in taking Earth relations, including forms of energy, as constitutive and generative of human practices. The stakes of energy transitions configure not only different regimes of energy, but also the long legacies of what are often called environmental sacrifice zones (Fox, 1999) wrapped up in intensely geological determinations of the existing economy. The contrast is often extreme between sacrifice zones subjected to multiple overlapping regimes of extraction and areas, sometimes quite nearby, that have been conserved in the interests of preserving the property values of the elite and well-to-do. On the one hand, people and place were rendered extractible, degraded and co-constitutively denigrated; on the other hand, ways of desiring and being human have operated across mineralogical and energetic relations around labor and technology. To be sure, we take the geological to implicate Earth relations in general, across rocky, atmospheric or hydrological domains, including Earth’s geological relations with the Sun that constituted both mineral coal and the ongoing dramatic emergence of a transformed planet (see Whittington and Oguz, 2023). We need to be able to think across eons, but also the vastness of spatial differences that would include both the Earth’s proximity to the Sun and the micro-millimeter scale at which coal dust inhabits the lung and constitutes its own “queer [...] inhuman agency” (Yusoff, 2015: 203).

Coal extraction was accompanied by parallel processes of “violence, racialization, and dispossession that superimposed orders within humans (also within living beings) so that the exploited bear the brunt of planetary volatility” (Clark and Szerszynski, 2021: 113). Much of the cultural politics and representation of Appalachia centers on the prominence of a racialized white underclass within a stratified hierarchy of access to land and capital, and the affective politics of grievance associated with subaltern white labor disenfranchisement (Lennon, 2017; Schwartzman, 2023; Smith, 2004). Research on Black coal-mining communities, frequently rendered invisible, significantly complicates narratives of whiteness and ruination (Brown et al., 2016). Schwartzman (2022) has shown how the unionization and mechanization of mining jobs was orchestrated as a racial project of enfranchising a higher paid, smaller, largely white workforce and significant out-migration of Black communities. Current energy transitions take place on highly stratified geosocial formations where racialized social orders carry the burden of the violent, dispossessing, and toxic effects of extraction and mining.

At the same time, we caution against a persistent tendency to overemphasize processes of dispossession and harm as the theoretical set-up for abject subjectivity (see Tuck, 2009). The reclamation of place today is frequently ecological, and the role of solar energy investment often amounts to a kind of energetic place-making that opens up a promise of moving away from the local hegemony of King Coal (Sheldon, 2023). Solar energy investment is coupled with these movements not only because it provides potential funding streams and a degree of decentralized energy independence, but also because the people involved frequently see the coal industry as a dead weight holding them back from a better future.

Inhabiting locality

Skepticism notwithstanding, solar generates interest here by virtue of the fact that it generates electricity. These communities are historically integral to US energy supply.

The widespread personal and kinship connections to fossil fuels and energy systems means that there is considerable vernacular interest in the day-to-day dynamics of how energy is produced, transported and used. At the same time, this vernacular energy praxis is closely associated with long-standing commitments to locality and place, which open up new cultural vistas partly in connection with the rise of local solar investment. In a context in which many people have left, the ones who have stayed are often committed to being there deliberately and explicitly. And people involved in solar investment have often returned with the sense of an optimistic future and commitment to the region forming a node of deeply held values and specific practices of value-making. These long-standing commitments are not homogeneous but they do cut across class, race, and political divides. We find this to be an optimistic point for the creation of shared values and projects, even while other differences seem insurmountable. Vernacular energy practices rest upon and enable a set of powerful commitments to place.

Mike is a retired lineman from the major electricity company who spent his career working on high-voltage power lines across the state. He lives in the upper reaches of a narrow valley – a coal holler – that branches directly off the Kanawha River, not too far from Mayor Cavalier's town. Above his place and riddled with abandoned mines, the hills are owned by an absentee land holding company. Now he helps run a local watershed association that has put a lot of effort into revitalizing the living environment and stream ecology of his community in the past two decades. When we visit, Mike and his wife Wanda host us in their comfortable home. It has a spacious stand-alone workshop and a gently sloping backyard that abuts the creek where there is a trout pond and a short bridge for access to the hills on the other side. His elderly mother-in-law is cared for by Wanda, who quit her job as a nurse to look after her full time. Mike's working-class background is apparent in his easy facility with tools, machinery and powerful machines – and the flecked scars on his arms from chemical burns from the highly toxic PCBs he had to work with as a lineman.

The hills are his backyard. The mines here closed in 1988 but active gas wells abound in the hills and the spare forest, much of it growing on mine tailings, is ostensibly protected by a carbon offsetting program, a combination that captures the paradoxes of a broken earth under late capitalism. The watershed association negotiates access with the land holding company, both for a local hunting club, which brings in revenue, and for community-managed water treatment ponds that work to capture the acid mine drainage that, for a long time, made the creek a virtual dead zone. Acid mine drainage refers to the acidic groundwater that pours out of mines laden with dissolved heavy metals, especially iron and aluminum, which has created extensive and essentially permanent damage to streams and, cumulatively, to sensitive downstream habitats. The water coming out of the mine is clear, yet once it interacts with the air the oxygen causes all of the metals to precipitate, smothering aquatic life – especially insects at the base of the food chain – with iron oxide, poisoning them with aluminum particulate, and killing them with acidity. The visual aesthetics of a bright orange stream is often striking.

This particular watershed association has won two awards and is probably exceptional, but it is not unique. Like many local watershed associations, this one was set up in the 2000s as part of a push to deal with overall water quality by empowering and funding

communities to do the work (Lukacs and Ardoin, 2014). One of us (Whittington) first worked with Mike during extended educational tours with students in 2010 and 2011, and he has been eager to facilitate our research since 2021. In the meantime, the watershed group hosts local educational events, college tours, and usually has a paid intern from AmeriCorps. When traveling there with students, we carried out water-quality testing, experimented with population surveys of benthic macroinvertebrates – Mike’s son is an aquatic entomologist – constructed trout habitat, toured abandoned and active mine sites, and helped stabilize the stream bank. He also taught the students to drive a small Cat bulldozer, which he had borrowed to fix up part of the stream bank. Small is relative, of course – the dozer weighted almost 20,000 pounds.

Across Appalachia, for people from a wide variety of class, race, gender, and political orientations, there is a strong commitment to locality and place that is historically unique, and one which helps give the region its distinctive cultural sensibility. Barbara Ellen Smith calls this set of cultural commitments “place-based organizing,” akin to the emphasis on place and social entrepreneurship by noted by Süsser and colleagues (2017; see also B. Smith, 2018: 50). Ruth Gilmore (2022) has marked how place and home become critical for practices of resistance, while Kathleen Stewart (1996) points to how Appalachian commoning practices were undercut by widespread absentee property ownership that produced a regime of “double occupancy” (see also Fisher, 1983). Appalachia’s geography was also vertically stratified in the legal regime that distinguished surface land rights from subsurface mineral rights and gave overwhelming priority to the latter (e.g. Turner and Traum, 1983). In this context, the region’s specific geography and geology of place play a crucial role in the arts of governing and not being governed, as Appalachians have long valued the independence of mountainous rurality; yet that became the geographical basis for outsider control and environmental sacrifice (Fisher and Smith, 2012; Gaventa, 1982; Smith, 2015). In this history, persistent localism was strongly characterized by the rise and fall of the coal industry, with the coal economy, as well as the political geology of mining, playing a predominant role in cultural identifications and in the power structures that continue to dominate political fortunes.

From the perspective of energy transitions experts and bureaucrats, the problem is how to roll out renewable energy investment quickly and with a high social impact. The policy goals are to decarbonize the grid and ensure a level of social equity in the process. From the perspective of this persistent commitment to place-making, however, the question revolves around how people might be able to see themselves in a future they have little control over. Investment in place is one primary way in which people work to secure a viable future – a politics of habitation – and the question of solar energy investment therefore always revolves around how it might fit into that future configuration. At the same time, energy is hardly an abstract notion for almost anyone we talk to.

Political geologies of energy

On our latest trip to visit Mike, it happened that we were driving into town while he was teaching his lineman’s training class at the local technical college. He wanted us to stop by and meet his students.

Mike introduced us as solar energy researchers and talked for a minute about his students, all men in their early twenties, almost all white, who were looking forward to becoming certified electricians to work on the power grid across the region. After we briefly presented our interest in energy transitions and local communities, a discussion about solar power morphed into detailed discussion on the wisdom and technical pragmatics of renewable energy. However, the conversation quickly became a referendum on our status as researchers and America's place in a world where other people make decisions that shut down manufacturing, power plants and mining in the region. "What's your goal – what's your main goal?" one student asked us emphatically. "Are you doing this for the environment, or to help society? Because then you need to break it down by country, financing, manufacturing, jobs, and then what it means for us. Because as Americans we're known to be the best but unfortunately we're not, at least financially any more. China owns us."

As New York and Europe-based researchers focused on renewable energy, one of whom is a non-American woman, it was unsurprising that we would be positioned as paradigmatic representatives of elite outsiders. Part of the implication was that solar and wind represented a naïve fantasy, while another aspect, though unstated, implied that climate change was not a serious problem but a Trojan horse for an alternative agenda. However, in reflecting back on the social drama (Turner, 1980) it struck us that the tension around American exceptionalism and the status of men in economic decision-making was a clear-cut demonstration of what Polanyi (2001) called the double movement of capital, in which a social formation extended a frank if overly anxious diagnosis of their political-economic position under conditions of capital abandonment. In that hyperbole, we detected the constant reminders of fear – which undoubtedly popular media and political discourse never lets them forget – of loss of the preconditions of their capacity to exist in the world. No doubt it also included a sense of the loss of the relevance of their knowledge, their capacities *of* existence within a materialized energy assemblage.

Energy and place were clear points of commonality that, from our perspective, enabled a kind of solidarity that bridged across their particular entitlements and ours. As the discussion heated up – in which we were suddenly enlisted in the work of energy praxis by virtue of our positionality – we talked about why we were interested in West Virginia and why we thought the issues here were important. We told them about the Kentucky Coal Museum in Harlan County that put solar panels on their roof a few years ago, only to get dozens of angry phone calls when local media made a big deal out of it. Mike's students were very interested to learn that it had been a project of the local technical college for people being trained, much like themselves, for electrician jobs. The very context that we unexpectedly found ourselves in, and the dilemmas of the social interaction as they played out in real time, exemplify the cultural work of "just transitions."

The young men wanted to hear about real solar installations and whether they worked. They wanted to talk about power inverters and whether those were a rip-off or if they were going to fail in three years or five. They wanted to remind us that the cost of financing solar projects needed to be added to whatever additional energy people still needed to pay for. They wanted to understand how this would affect power plant jobs and the lineman jobs they were training for. And constantly they returned to the gritty pragmatics of their

situations and those of the people they knew. “A lot of people here are on fixed income, they can’t afford any of this,” one pointed out. “People’s homes aren’t insulated – it’s going to take a lot of electricity to heat those drafty houses in the winter.”

No small amount of concern was directed toward a sense that the Sun itself couldn’t bear the expectations being placed upon it. “At least where I live, there is no way I get enough Sun.”

Mike put on a home video clip of a project he and some students had built up in the holler. It was a 30-second clip of a pipe that went back into the hillside, into a vertical shaft into what looked like a small engine, with water flowing out of it in a steady stream. “One thousand forty-five watts,” he told us. “We built this little hydro generator that powered our whole community center and it ran off of acid mine drainage. Now we want to build a bigger one. We also built a wind turbine that had six-foot long blades, but then we had a 65 mile-an-hour wind and it took off like a helicopter.” Later, he told us his dream was to build an energy education center where people could come from all over the country to learn about different kinds of energy and get their hands dirty building projects.

Our experience in the classroom helped to clarify and situate the active terms of a live social debate in which US climate and economic policy is attempting to trigger a substantial shift. “Just transitions” attempts to establish a bridge of collective possibility across the chasm of an existing status quo: using the language of environmental justice, it most often points toward the problem of how to manage the affects and entitlements of a privileged underclass of a protected racial and gendered formation. This is fraught terrain and difficult work, which raises the question of what sort of labor relations are germane to the cultural project of energy transitions.

Intermediate praxis

Energy-transition research has focused on intermediaries as a category of persons who professionally mediate between diverse social groups (Sovacool et al., 2020). In fact, in complex environmental situations one finds that specific individuals play a crucial role in working across systemic social and political-economic divisions. In the Hudson River valley, local environmental regulators know that frontline code inspectors play an especially important role in patiently explaining to property owners what they can and cannot do on their land (Vitale, 2012). They need to explain the value of ecological features like wetlands for people who probably only view them as a nuisance and likely do not understand their ecological importance. In Thailand, some Thai entrepreneurs have worked with large numbers of agricultural processing facilities to roll out renewable biogas projects that also treat large volumes of wastewater (Whittington, 2020). Shelton and Eakin (2022) review the forms of advocacy they claim are essential for achieving more just outcomes in an energy transition. Hess (2019a, 2019b) argues that intermediation for renewable energy coalition building amounts to a crucial political strategy. In the context of programmatic social change, intermediation can be defined as a kind of work that temporarily resolves the possibilities for political integrity and compromise. Intermediation recognizes the possibility for work on the conditions of the present and thus constitutes a form of temporal labor.

Intermediate praxis is a kind of world-building, compositionist work rather than a particular category of person or bureaucratic role. It crystalizes the seriousness of an array of complex demands on the present, and at times takes pleasure in bringing together heterogeneous meanings and assemblages. For Mayor Cavalier, that pleasure seemed linked to the pragmatics of future-building in which local defeatism was a roadblock. This labor echoes Myles Lennon's (2017) notion of little-e energy, the energy of relations among people and others, the energy of living embedded in flows of sunlight and plant life. Whereas "energy experts often appear so entrenched in their narrow technical apparatus that they lack any firm understanding of the social context and environmental ramifications of the Big-E systems they promote" (Lennon, 2017: 19), intermediate praxis is para-ethnographic and configured around the capacity to build relations (Holmes and Marcus, 2020). Mayor Cavalier, after all, seemed to be perpetually in motion.

The motivating, energizing sense of collective possibility helps us understand the pivotal role of people who are engaged in the difficult work of shifting the barometer of public acceptance of solar. One such person is the Democrat State Representative and environmental scientist Evan Hansen, who has now spent several years working in the legislature to convince the Republican leadership to change laws so as to enable solar investment. Evan, who otherwise runs an environmental consulting firm dealing with related issues, was elected to the state legislature as one of only a tiny handful of Democrats amidst a sea of deeply conservative and pro-coal Republicans. Much of his work has focused on delicate negotiations to bring about a legislative environment in which renewable energy is possible. Needless to say, Evan's work in the state legislature is difficult and thankless. It is particularly significant that his work spans the technical and the political, rather than focusing only on recruiting token support for renewables. He has been showing up in a hostile environment for years on end to push for incremental yet tangible changes. One key feature of his work, he told us, is that when he is successful his proposed legislation will be killed in committee, then rewritten by a Republican and passed without his name on it.

"Mining the Sun" is a striking catchphrase developed by Solar Holler, a successful small business that designs and builds small-scale solar projects. One employee – a white woman in her mid-thirties – regularly organizes community meetings for Solar Holler and spends a lot of time talking to people who are interested yet skeptical. They emphasize energy continuities rather than transitions, much as their branding implies, to argue that solar investment continues a long and important heritage in the region. Another dynamic force for bringing into being a new future runs the Solar Finance Fund, which connects homeowners and others to federal grants and other resources. A significant amount of the work of the director of the Solar Finance Fund involves narrating success stories, building working relationships and countering persistent myths. It also involves creating alliances across extant social divides, such as actively developing programs to bring young men into the fold by developing jobs training programs, specifically meant to smooth over the prickly skepticism we experienced in Mike's classroom.

Solar energy networks are diffuse and difficult to bring together, raising questions about the work of people heavily involved in rolling out new solar investments, since they are the ones actively involved in having difficult but substantive discussions about the real

possibility of building projects. One reason intermediate praxis may be important for just transitions is because renewable energy projects are projects: that is, structured, goal-directed, and contingent efforts to bring together unlikely combinations of people, matter, and energy into a stable configuration. These community and residential projects are small, of the order of tens of kilowatts, yet require a good deal of coordinating effort. In this respect, solar energy's diffuse networks of power, both social and electrical, privilege forms of temporal labor that are alliance-building, compositionist, para-ethnographic and intimately concerned with the capacity to build relations in Appalachia.

Many of the pivotal figures in the energy-transition work taking place in Appalachia are women, who emerge not as power brokers but as facilitators. The form of these relations, all of which are instantiations of public policy commitments under conditions of late liberalism, echo what Katherine Gibson (2020: 170) has called collectively performed reciprocal labor. They create modalities of economic vitality in constant tension with the contexts of market capitalism in which they are embedded. The challenge of transitioning is to build a lot of these projects, but each project stands or falls on its own – as every developer knows, any number of mishaps can lead to failure. If intermediation points toward the temporal labor of composition, then the form of work involved seeks to create or finesse a sense of shared values, guard against the threat of entropic dissolution, and top the barriers of an existing social impasse. The impasse is the topography of change, which implies that the social labor will always rely on and, to a greater or lesser extent, reproduce an existing status quo, even as it seeks to remake that topography around social values that are sharply critical of the entrenched power networks of the coal industry. Moreover, the contradictions that are acknowledged and worked upon are likely to be those that are both tractable and directly relevant. To use Tania Murray Li's language, these are "fragile and contingent accomplishments [...] practices worked out [...] in the compromised space of cultural intimacy" (1999: 295).

Energetic place-making

Yet it is not only cultural intimacy, but also the geosociality of coal and the heliotropism of solar that makes those intimacies possible. Mike likes to make a joke about West Virginia and electricity. "You know, we have the West Virginia Rule when it comes to energy. Watts equals Volts times Amperage." In other words, West Virginia, WVA, is $W = V \cdot A$, the basic equation that describes the relation between power output, voltage and amperage. "We are just not there yet," he insists, when renewable energy comes up. "There is no way to run our power grid on wind and solar, even if you have enough storage. We are always going to have some reliance on coal or gas."

Social stratification and disenfranchisement fracture through existing property regimes, relations of harm, and networks of social entitlement and cronyism, frequently beset by the casual naturalization of risk in the context of public disavowal (Ahmann, 2020). In 2015, a tanker train of about 100 cars of crude oil derailed in Boomer, West Virginia, a few miles from Mike and Wanda's place. Many of the tanker cars went into the river, but at least 14 exploded, according to Associated Press (2015). Miraculously, no one died. Incidents like these could be listed indefinitely. If there is hope in blasted landscapes,

there is also – more frequently – a nonchalant familiarity with naturalized harm (see Kirksey et al., 2013; Sultana, 2022).

In this context, the local commitments of community-led, frequently grassroots organizing take the form of watershed groups that work to remediate toxic mine ecologies, community farms that attract funding for non-profit land investment, prominent home-grown intellectual activity such as the Appalachian queer movement, and the extensive regional production of podcasts and other intellectual media, and, in eastern Kentucky, the strong presence of black Appalachian organizations. As Caroline Merritt argues, this can be seen as a collective effort at “healing the encounter between people and place” (2019: 1).

We want to be careful not to glorify or romanticize solar energy’s sociopolitical potential. Emergent ecologies of solar energy are only slowly coming to be built up within the genealogies of thought and practice through which they may embody a future that can answer to a more just world. As anthropologists have demonstrated, taking solar energy as a techno-fix for climate change runs the risk of reproducing capitalist or heteronormative power structures (Bell et al., 2020). Writing about the activities of the solar company WakaWaka in West Africa, Jamie Cross argues that, despite its presentation of itself as “ethically untainted,” and thus in ethical opposition to coal, “the combination of solar power with care for distant others and the alleviation of suffering is no less entangled in the pursuit of commercial interest, and no less bound to carbon in a history of energy, capitalism, and humanitarianism, than coal or oil” (Cross 2021: 124). Yet it is important to note that, for many grassroots groups in Appalachia, the coal industry has long been a threat to their existence, as a cause of their dispossession, anchor to hypermasculine forms of white social power, or, more generally, as a historical dead weight that has made it impossible for West Virginia to find new ways to flourish (Schwartzman, 2013; Scott, 2007). Solar offers not a utopian, but a practical way out of this chokehold. It is no surprise that community organizations have been leaders in installing small-scale solar.

A community project can demonstrate. New Roots Community Farm is a non-profit organization with 82 acres (33 hectares) outside of Fayetteville, West Virginia. Sitting on the edge of southern West Virginia, the town serves as a key access point to the New River Gorge recreation area, perhaps the most prominent of government-led efforts to rework West Virginia’s nature as a new source of non-extractive natural capital. If anything, the interest in solar energy in the state must be understood in the context of small-town redevelopment efforts directed at bringing value to areas that have long been viewed almost solely as sources of extractive value. Fayetteville boasts a bevy of boutiques, bars, restaurants and other recreational tourism-focused services, making it a magnet for young people eager to create a vibrant cultural dynamic. Established in 2016, New Roots conceives of its role as underpinning the development of a more equitable and diversified local economy.

New Roots’ investment in solar was part of what might be thought of as an ensemble of efforts related to community redevelopment and environmental protection. The farm conceives of itself as an anchor for establishing local farming and for community, with most of its labor orchestrated through volunteer days, providing the basis for a farm store and a pipeline for new farmers who, after completing an internship, ideally would go into

business themselves as independent farmers. They also used the space for community events and parties.

The farm has a complex funding structure tied to a non-profit agrarian land holding company partly funded by grants and federal funds. The land was initially secured through a county farmland protection board, which sold the land to the agrarian trust, partly provisioned by a conservation easement in which the rights to develop land for non-farm purposes were permanently removed. In operation for a few years, they were focused on securing their production capacity and slowing growing markets while finding themselves limited by inputs such as labor and clean compost. It might be tempting to view the non-profit as an unworkably idealistic endeavor, but people in the nearby town had strongly favorable opinions of it and its success was far more limited by what it had the capacity to produce than by what it could sell.

The solar installation figured into that vision as a kind of best practice that could contribute to an overall regional shift while providing an economic benefit over the life of the investment. Especially given their strategic director's role in promoting local small-scale solar investment over the prior decade, New Roots' 13 kW installed solar capacity was fully part of a package of elements directed at holistic community development. Expected to provide some 95% of their current energy demand, the farm anticipated savings of \$77,000 over the 25-year life of the panels. The federal subsidy of \$7,500 – just under a quarter of the cost – was thus an enabling factor toward building out that vision of community.

Perhaps the distinguishing theme of the project was how straightforward it was once the elements were lined up. Two organizations played pivotal roles in making it possible. The Solar Finance Fund facilitated the project, including access to the \$7,500 government stipend, and Solar Holler was the contractor that did the design and installation. With a staff of around 45, Solar Holler has a neatly packaged set of services, designed to be as efficient as possible, quickly and easily putting new solar installations in place. Since the community farm already had their own money on hand for the investment, they were able to work with the contractor to design the installation on the roof of their community center and barn. The fact that it was a rooftop solar installation obviated many of the difficult issues around land value for siting the project, essentially bypassing many of the complicated issues about alternative land uses that come along with many renewable energy installations. Indeed, rooftop solar in general plays into a dominant theme of revaluing what now appears to be undervalued or underutilized space, that is, space that already has some pre-existing function to which solar panels can be added unobtrusively. In fact, one common tactic for solar entrepreneurialism is the creative reimagining of existing heliotropic spaces, while there is also a counter-discourse that cautions against the haphazard application of solar. "You can't just slap a solar panel on it!" We were reminded by one project developer.

Yet New Roots does more for promoting solar than it seems the solar does for New Roots. The energy investment sits lightly within the overall objectives of the community farm, whose primary goals concern building community agricultural practices and resources to preserve and create anew an agrarian sensibility for an area that has seen continued out-migration of young and talented people for decades. Working against the

onslaught of brain drain and net depopulation, the farm only exists because of public access funding for non-profit based land holdings. Indeed, after the conservative “red wave” that elected staunchly right-wing Republicans in 2016, these mechanisms were undercut, apparently because conservatives did not want any sort of government support that would establish communities with left-leaning political and cultural sensibilities. Thus, while the solar installation does not itself play a pivotal role, the overarching sociality of the community farm it supports establishes an institution around which a certain kind of community can thrive in relation to collectively oriented agricultural practices. Considering the commonality between solar panels and food producing crops, one could say that this complex collective overall is doubly heliotropic, oriented toward the Sun – none of which would be possible based on market forces alone.

Conclusion: Transitioning away from the chokehold

In this article, we have examined some of the actors and organizations that operate on the uneven terrain of energy transitions in a region deeply entrenched in coal mining and its world-making effects in relation to classed and racialized forms of stratification. Here, where endeavors to champion solar power are met with skepticism from residents, intermediaries’ commitment to place-making casts solar energy as a means of revitalizing communities and promises to remake what local identity indexes in Appalachia. Yet the world-making environmental violence that coal mining has brought to Appalachia is not something that can easily be “transitioned from.” However, the appeal of solar (Szeman, 2020) for many Appalachians who are committed to place-making lies in its promise to begin to tackle the complexities of this violent order of racial and economic stratification. Rather than a utopian promise, solar offers a practical way to begin to loosen the chokehold of coal mining (and its demise) under racial capitalism.

Building small-scale projects takes considerable investments in the temporal labor of renegotiating the enmeshment of energy and society. This is partly true also for grid-scale solar projects, which usually are relatively small compared to their thermal or wind counterparts, and developers must invest time and effort into what they refer to as the social license to operate. With community solar projects, the work of intermediation is intimately caught up with the revaluation of place, and seeks to bridge long-standing social divides without getting caught in the fatalism that is often present in places that have been systematically abandoned. In our rather limited experience in eastern Kentucky, there is a stronger sense of political radicalism, with Black-led organizations that link solar to an explicitly anti-racist politics. By contrast, in West Virginia there is a strong tendency to discursively emphasize continuity with the past and, in practice, to overlook the long legacies of racial division. Since the topography of change is the status quo, it is likely that pre-existing social stratification will be reproduced to a greater or lesser extent. Moreover, we expect that the complexities of social life that are addressed in practice will be balanced between those that are comparatively tractable and those that are especially urgent.

Federal programs of utility-scale solar projects may run the risk of pursuing energy transitions without challenging the classed, racialized, and gendered fault lines through

which resources have been distributed. In other words, transitions like the one taking place in Appalachia promise to manage the feelings, solicit the support and reconfigure the entitlements of white working-class heteromascularity. An earlier political logic would have seen that as a politics of co-optation. In contrast, in alliance with place-making projects, community solar programs seek to surmount the social impasse through which coal has retained a chokehold on the state's political economy and its cultural politics. Yet this is inevitably partial. Community solar, in contrast to utility-grid solar investment, helps to build diffuse social networks and thus lends itself to coalition- and alliance-building, and the reconfiguration of space around practices of living and vernaculars of energy. We expect the ongoing development of community-led solar investment to contribute to substantial and important diversifying effects in West Virginian communities, especially if these efforts can more explicitly address the state's extreme geographical, race and class-based inequalities. The power of solar energy in this respect, stems from its capacity to mark the commitment of many Appalachians to a politics of habitation that, in spite of its limitations, promises a major departure from the devastation of the United States' dependence on coal.

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