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Solar Flux:
Remaking landscapes, labor,
and environmental politics in California

by

Keith Brower Brown

A dissertation submitted in partial satisfaction of the
requirements for the degree of
Doctor of Philosophy
in
Geography
and the Designated Emphasis
in
Women, Gender, and Sexuality
in the
Graduate Division
of the
University of California, Berkeley

Committee:
Professor Sharad Chari, Co-Chair
Professor Nathan Sayre, Co-Chair
Professor Leslie Salzinger
Professor Jon Kosek

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Abstract

Solar Flux: Remaking landscapes, labor, and environmental politics in California

by

Keith Brower Brown

Doctor of Philosophy in Geography

Designated Emphasis in Women, Gender, and Sexuality

University of California, Berkeley

Professors Sharad Chari and Nathan Sayre, Co-Chairs

From 2015-2020, massive booms in solar power and high speed rail reconstructed landscapes across California's San Joaquin Valley. Globally rare alliances of construction unions with environmental justice and immigrant movements won breakthroughs in regional politics. How did construction workers reshape their power in response to the booms–and what formed their politics in this extraordinary direction? This dissertation argues that construction worker power hinged on unions' capacity to reproduce the workforce for urgent landscape transformations, while labor alliances were driven by shared political exclusion and common household struggles over social reproduction of the region's working class, Mexican-American majority. Drawing on five years of ethnographic and archival research, I compare the Fresno-Madera region, where these construction labor-immigrant-environmental justice alliances prevailed at crucial moments, to the Bakersfield region just to the south, where limited household ties, unstable overall employment, and conflicts over oil fractured potential coalitions. In conversation with environmental justice, Marxist feminist, and Marxist geography approaches–including Gramscian interpretations of Clyde Woods, Ruth Wilson Gilmore, and Matthew Huber–I develop a theory of environmental leverage, explaining how landscape transformation and the labor involved can challenge or entrench hegemony. The breakthroughs made by San Joaquin alliances in winning municipal office, jobsite power, and infrastructure redistribution help show how working and oppressed people can build pressing climate transitions by their own blueprints.

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For J, my island in the bright, blue sea.

Chapter 1:
Introduction

Let's begin with the title, *Solar Flux*. This dissertation seeks to understand how three kinds of flux, each tied to solar power, shaped a half decade of political breakthroughs in California's San Joaquin Valley. This is a research work about politics, and it begins, like politics, with the earthy, sun-warmed substance of life.

First, solar flux means the radiant energy from the sun; a force that can be caught in the crystal lattice of solar panels, then turned to electricity on the wire. This dissertation follows the San Joaquin's solar power boom from 2015-2020, which reached a scale rivaling any on the planet. This was a famed cradle of agroindustry for the modern world. When climate change drove a drought that left millions of its acres bone-dry, San Joaquin land was transformed by the mile to farm solar power instead, and to lay tracks for a high-speed train set to be run by those watts. That solar-powered transition of the San Joaquin Valley, reaching record pace in the late 2010s, bounds the focal place and period of this text.

Second, flux is a crucial material of construction work: the fine minerals melted for welding bonds, or in soldering, to protect contacts while still conducting electricity. Solar Flux is in fact already the brand name of a welding agent, invented in California to help bond the steel of fighter planes, and now occasionally used on solar panels. This dissertation is interested in the gritty material and elbow grease of construction labor as a crux where landscapes and power are remade.

Third, flux means a state of change. Most of all, this dissertation is about how the solar fluxes above–of land and labor–shaped a flux of San Joaquin Valley politics writ large. For nearly a century of scholars and activists, the San Joaquin has been an emblem of fierce rule: a landowning white minority dominating a working, largely-immigrant majority from field to home with repression, austerity, and deprivation from clean air or water. But in step with the solar boom, San Joaquin construction workers, unions, and immigrant social movements sprang into power over labor and landscape like they had never won here before. For decisive moments, they made active coalitions out of environmental justice and construction labor activists that have elsewhere, nearly the world over, been notorious foes.

The San Joaquin's solar flux, at its best moments, may light the way for a flux at global scale. The climate crisis is shredding the fabric of life on earth more irrevocably by the year. During the focal years of this study, 2015-2020, transitions to cleaner energy reached their record pace globally, including California, yet they still fell alarmingly short of Paris Accord goals for the transformation needed to avert an utter collapse of life's web. Amid this dangerous lag, in research and politics, tens of thousands of journal papers and

policy platforms continue to describe "*the* green transition", made by an incoming tide of "green infrastructure".[1]

But there is no single climate transition, defined by technology alone, or heading to a single destiny. How and where transitions are made, by whose design, and to what end; those are not givens, but vital factors of political power. Climate transitions demand much more than construction of greener infrastructure. They hinge on the construction of politics and landscapes, shifting with the climate themselves. Where landscapes are being transformed, political relationships and possibilities are transformed too.

When mainstream researchers and politicians have considered political "obstacles" to "the transition", their remedy has usually been sharper messaging, timing, or bait to win over "economic interest groups in support of decarbonization".[2] The sharpest versions of these strategies, like proposed US bills for a Green New Deal, sought mass support for a more just transition with promises of "good-paying union jobs" by the millions, and by "prioritizing frontline and vulnerable communities" to get the infrastructure first.[3] But for all the promises of "a seat at the table" for representatives of the working and oppressed, these climate strategies largely presume that mass support will follow raw economic self-interest or frontline vulnerability.

Rather than assuming those pre-made interests drive politics, a decade of massive clean energy transitions allows research to trace the political practice which they made from their place in the flux. The task of this dissertation is to understand how San Joaquin workers and activist allies formed their politics, on the tide of a solar and rail boom. It shows working and oppressed people forming collective interests around their strategies to build power, through a shifting terrain of hegemony and challenged social reproduction. Their political formation has global implications. Three decades in, the lacking pace of energy transitions shows ending the climate crisis demands much more than another year of technological tinkering or a better marketing job. What has lacked is political power. How can clean energy transitions forge conditions for working and oppressed people to build power on their own terms, capable of ending the climate crisis–and the racialized and gendered capitalism that forces the crisis?

---

[1] As counted loosely by Google Scholar in early 2023, there have been nearly 150,000 research texts published on "sustainable" or "green infrastructure", and nearly 15,000 on "*the*" climate, green, or renewable energy transition. A strong example of the research approach focused on policy advice for technology selection is Sepulveda *et al.*, 2017.
[2] Meckling *et al.*, 2017. Chapter 3 discusses "green jobs" pitches aimed at winning support for a transition.
[3] Ocasio-Cortez, 2021.

A. Framing the task

On the cusp of an earlier global calamity, in 1938, C.L.R. James opened his most remembered history with the aim it would speak from the present, made of "our age… with something of the fever and the fret".[4] In an era no less feverish or anxious, the first concern of this dissertation is a contribution to political strategy, for movements rooted far–if never wholly separate–from the polite halls of the academy and the patter of journals. My primary object of research lies with the words, acts, and relationships of the San Joaquin's working and oppressed people.

Though it bears that focus, this is a dissertation, aimed to be conscious of its constrained footing from the academy–and intent to make interventions in researchers' ways of seeing and supporting strategy. The metropolitan mainline of Marxist geography–exemplified by the essential work of David Harvey–focused principally on the spatial strategies and global machinations of capital.[5] Instead, this project builds on the linked traditions of Gramscian geography and agrarian Marxists, especially their focus on "identifying the factors shaping the most likely forms of collective action" from the oppressed and exploited.[6] Three leading figures of the field recently named "a large door for young scholars to walk through", through deeper research on how concrete aspects of social reproduction shape action, especially on climate politics.[7] If this dissertation takes a step through that door, it is by tracing the labor, landscapes, and strategies of largely Mexican-American construction workers, their family members, and their political allies in the San Joaquin.

Any account of contemporary US political movements has to confront an essential starting problem: the gaping lack of them. In other words, atomization or disorganization. As historians like Melinda Cooper and Gabriel Winant argued, state and corporate projects of privatization, austerity, and repression since the 1970s sowed a profound atrophy of communal institutions, like the union halls or local clubs that previously stitched together collective life for many working and oppressed people in the United States.[8] Parallel versions of this atomization have been witnessed across the globe with terror all over the pages of the *New Left Review*, as a vacuum in which liberatory politics flailed from Brazil to Italy to India.[9] Amid that disorganization, political movements or even "communities" of

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[4] James, *Black Jacobins* (1989 [1939]), p. xi.
[5] Landmark works in the metropolitan Marxist geography lineage include Harvey's *Limits to Capital*, *Spaces of Global Capitalism*, and Smith's *Uneven Development*. A more detailed discussion of this line and its limits lands in Chapter 3.
[6] Levien *et al.*, 2018. As discussed in Chapter 2 and 4, three of my guides from the agrarian & Gramscian tradition were Woods' *Development Arrested*, Huber's *Lifeblood*, and Hart (2006).
[7] *ibid.*
[8] Cooper (2017) and Winant (2020).
[9] On atomization in Brazil, Marcelino (2022); in India, Bag (2011); in Italy, Anderson (2011).

working and oppressed people can never be taken for granted, though they do spring up in startling places. Instead, this dissertation hopes to show collective political formation in all its tenuous construction.

Out of that atomization, one focus of this dissertation is how workers and unions–even in a sector as reputedly reactionary as construction–can become an engine of immigrant and working-class environmental movements. Despite the long neoliberal and far-right onslaught against worker power, workplace relationships and actions persist as sources of labor leverage that are stubbornly difficult for employers and their politicians to strip away entirely.[10] Climate transitions demand enormous degrees of work, often in construction.[11] The question is how this urgent labor provides leverage for working and oppressed people to build power at the base of transforming industries, fit to steer and push transitions further.

Construction workers are the sector of labor perhaps least expected to lead on climate. Thirty-five years ago, labor scholar Michael Kazin summed up how "construction unionists have been widely vilified, by the few historians who study them, for being overpaid, inefficient... and politically conservative". [12] But owing to their long-term strength as one of the most widespread sectors for unions, he argued "no group of American wage-earners more needs investigation and understanding than do the building trades."[13] Just one book-length ethnographic account of construction work has arrived since Kazin's call.[14]

Where research exists, it usually argues that the boom and bust cycles of construction labor demand tend to drive building trade workers and unions towards reaction: whether in "jobs first" priorities on state policy, race-to-the-bottom competition between trades, and destructive racism and sexism in the workplace.[15] Like for other unions, building trade leaders' reactive posture has only been sharpened by a corporate developer offensive since the 1970s, which brutally routed unions from the vast residential sector.[16] The era of climate crisis has hardly improved their reputation, as frequent building

[10] In different registers, this argument for labor's resilient leverage is persuasively made by Moody (2017) and McAlevey (2020).
[11] As of 2020, an advocacy group report based on public data claimed construction comprised 51% of California's 537,000 "clean energy jobs", nearly triple the share of the next largest sector ("professional services"). For the future, Governor Newsom (State of California, 2022) trumpeted California's state climate plans as a sure bet to create 4 million jobs by 2045.
[12] Kazin, 1987, p. 4.
[13] *ibid.*
[14] For a history of building trades' unique historical strength and span, compared to unions in other sectors, this dissertation drew from Palladino (2005) and Kazin (1987). The most recent ethnography at book length is Paap, 2006.
[15] *ibid.*, Silver (1986), Stevis (2019).
[16] Palladino, 2005.

trade leader resistance to climate action drew activist and scholar outrage at the "unions betraying the Left".[17]

This dissertation expands beyond these accounts of construction worker vulnerability and reaction, by analyzing the foundations of their collective leverage in relation to employers and the state. Based on ethnographic and union archival evidence, I argue that construction unions wielded crucial leverage over the reproduction of the workforce needed for the rapid transformation of vast San Joaquin landscapes, through their union-run training, hiring, and jobsite coordination roles. I show how this "reproductive fix" to surging solar and rail construction demand became a backbone of union power, equipping inclusive membership growth and mounting contract gains. Despite these advances, I argue an overarching challenge for construction unions has been their pressured deference to let their employers and private investors decide the aims of development, instead of challenging capital over what world will be built.

A second overarching intervention of this dissertation is to show how politics and alliances are formed not simply in the workplace, but in broader struggles over what Marxist feminists call "social reproduction" at a specific level: household and community conditions to make healthy people and decent lives. This is far from a new insight, following scholars who showed how formal workplace organizing often hinges on what can be brought home to family, while the harsh, gendered, and often unpaid conditions of reproductive labor are a wellspring of movements to fight austere states and exploitative employers.[18] While these studies usually focused on politics formed around teaching, healthcare, and cleaning labor, this text argues the leverage of construction workers in a massive climate transition has been politically oriented by their household experience of social reproduction struggles.

At the base of San Joaquin breakthroughs were largely Mexican-American working people who perceived segregated austerity, severe pollution, landlord profiteering, exploitative work, and repressive policing as standing in their way of a decent life. These shared household struggles set up what I call a "reproductive bond", allowing a shared agenda to make sense across construction unions and immigrant environmental justice activists. As they built collective organization and confidence, they forged a regional majority that challenged the profiteer overseers of their social reproduction crisis: land developers, and their accomplices in state office. Although far from a revolution, and with ambitions far more limited for now, the insurgents of the San Joaquin made proud elements

[17] The quoted left despair at the building trades is from Loomis (2017). Further accounts of left and environmental frustration with construction unions are in Nugent (2012) and Vachon (2021).
[18] Insights about the role of reproductive labor in political formation have been explored on a theoretical level by Mohandesi & Haider (2015) and Ferguson (2019), and with historical research in the US by Mohandesi & Teitelmann (2017).

of power to challenge racial capitalism and its climate crisis, and they deserve to be learned from.

B. The path of research

This research was stronger for both the San Joaquin's proximity and distance from my personal and political home in Oakland, a four-hour drive away. I came to the Valley first for work in a corner of its energy transitions, as a 23-year-old consultant helping track renewable energy installations and, as a nonplussed vegan, advising steam efficiency upgrades for a Visalia cheese-whiz factory. In a new gig after, I came a few seasons each year to Fresno as a touring musician, lucky to learn wry jokes about "the No" from the city's eccentric, exceptionally multiracial punks and musical dreamers.

Though frequently out of view from the Bay Area, these working years and my research after taught how the San Joaquin was another bank of the same watershed, literally and figuratively. For smog from millions of Bay Area cars, the Valley is downstream by prevailing winds, and ringed with mountains liable to trap and layer Berkeley's particulates for months on end. Flowing the other direction, the San Joaquin is the headwaters of the food, electricity, and many commuting, working hands on which Bay life depends.

Dead-ends in my earlier directions on climate politics helped set the core questions of this project. Lured by the private sector's dazzling promises of leading the climate transition in California, three years working inside it left me convinced that public mandate and subsidy–not private genius–were sparking the state's clean energy boom. In a state with phenomenal wealth, both public and private transitions were still plainly at an inadequate pace for the climate. Hoping to build popular awareness into pressure that would drive state action, I brought together a scrappy non-profit to map the looming impacts of the climate crisis down to neighborhood scales for popular audiences in the US. But awareness was not enough. I gradually found not so much an information deficit, but an organizing deficit was hobbling climate movement-building; an atomized void of collective organizations from which climate information would be trusted, let alone acted on with force.

That led me to seek research on the roots of power and political formation, drawing me back to the transition I knew in the San Joaquin–and its landmark 2017 experiment in participatory budgeting for climate infrastructure. For the few years before and just as my dissertation work began, my political activism also grew–in the Democratic Socialists of America and my union, the United Auto Workers. While I sensed that activism would help guide this research towards urgent uses, I also chose this project to be a step apart from my direct political roles, to foster the more fresh-faced trust of a researcher with San Joaquin activists in their tricky terrain.

From April 2017 until November 2021, this research built on a dozen stretches of San Joaquin fieldwork, ranging from a month to a long weekend in length each, buttressed by scores of phone interviews in between. That long span, if punctuated, provided space for the research to learn and adapt with the movements themselves. On the other hand, my project's window for the deepest fieldwork arrived just in time to be disjointed by a pandemic.

Construction work, by and large, never ceased for the virus in the San Joaquin. Fieldwork for this project focused on contact-building, interviews and observations at solar and rail worksites, movement meetings, and training halls I was invited to join. These were rich grounds for witnessing and asking concrete questions to learn dimensions of the work and the organizing around it: "What's that machine for? Who does that job? Why?" Earth movers and sawzalls, scissor-lifts and quick flash; the tools of the trade were often bridges from which to learn about their bodily toll, their inter-union politics, or an ironworker's opinion of what they were building.

To grow trust, it was crucial to find ways to collaborate and contribute as a researcher. I routinely asked my contacts the key question: "What research could I do that would help you?" At the request of those I met along the way, I led a study on municipal construction contracts, and collaborated on locally-led research on gender equity in Fresno construction training and transitions from oil drilling in the Valley's southern end of Kern County.[19] Among largely second-generation immigrant workers, family members, and activists, my passable Spanish was rarely the primary language needed, but came in handy for understanding side conversations, interjections, and *chistes*.[20] To protect the anonymity and trust of my collaborators and interviewees, I have changed the names of those quoted throughout, except for a few leading figures speaking at public events or explicitly willing to be named.

For all the trust I was glad to earn, this account is no replacement for the more private, socially-enmeshed, work-calloused perspectives that workers and participant activists themselves can write, given time and support. As apprentice carpenter and feminist sociologist Kris Paap did two decades ago with her *Working Construction*, more works in that vein could strike vital depths.[21] If not an insider account itself, this dissertation builds from the accounts of scores of insiders, contributing a broader picture of collective politics.

What was largely off-limits from the pandemic, for this fieldwork, were interviews and observations among family members and social life, at homes and bars, daycares and clinics. These are often crucial places where politics are formed, as my interviewees told

[19] Brown (2021), Brown *et al.* (2023).

[20] *Chistes*: jokes, playing around.

[21] Paap (2006).

me–especially among those, largely women, picking up the extra shifts of care while dads worked overtime shifts in construction. That remains a terrain in need for future research.

Ethnography, based on nearly two hundred interviews and on-site observations across five years, formed the backbone of this project. In making this research into a dissertation, my method involves as much interpretation as reportage. The narrative itself is a tool: weaving common threads found from my collaborators' words and observations, situating them with the context of findings in archives or figures in prior scholarship, and making tenuous sense of the whole through theory and deliberate expression. Whenever possible, this work begins its theory and chooses its words from how the San Joaquin's construction workers, immigrant activists and allies reckoned themselves and their landscape.[22]

C. A chapter blueprint

The second chapter, "Grid, Well, Fulcrum", lays out the dissertation's groundwork in historical and theoretical terms, showing how the San Joaquin Valley has been a laboratory for both liberal environmental justice and Marxist geography modes of seeing landscape. On the former, I show how 2010s state efforts at mapping and budgeting for environmental justice tended to reduce space to a "grid" of competing blocks of populations, bounding solidarity and skirting the construction of power in the San Joaquin. Then, I revisit three canonical Marxist geographies of the Valley, finding they made potent contributions on how landowners transformed land to squeeze profits.

In these works, I argue much was left unearthed on the making of political power through the terrain itself. Recounting how the Valley became one of the planet's most transformed landscapes, I argue the region's infamous landowner hegemony was no accident. Building on a line of Gramscian geographers, I develop a theory for understanding landscape as a fulcrum of political power. Transformations of the landscape shape what I term "environmental leverage": how both rulers and rebels use their relationship with the terrain in their struggles toward hegemony. I close by returning with this approach to the Valley landscape, using regional archives to offer a brief, revised history of how the reengineering of land and water, since its colonization, has been wielded to multiple ends: to entrench cruel hegemony, and to make ground for rebellions.

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[22] I have sought to describe people how they described themselves, with adjustments only to keep the narrative clear. For example, though many second-generation immigrant construction workers termed themselves "Mexican", I generally describe them as Mexican-American to clarify they were not foreign nationals. When writing about the ethnicity of regional movements and peoples as a whole, I use Mexican-American, Chicano, or Latinx, reflecting that these movements–which included far more than only men–used this spectrum of terms, without consensus on one as perfect.

Third, the chapter "Solar Leverage" accounts for how the San Joaquin solar & rail boom reshaped construction worker power on the job, and in their unions. I begin from a review of leading political discourse and research on "green jobs", where I identify a need for study of worker power in these transitioning sectors, beyond simply wages or quantities of jobs. Next, I draw together interviews with participant activists and archival research to explain the union leverage over landscape transformation and workforce reproduction that turned the San Joaquin into a national outlier: a leading solar growth region where construction jobs were heavily unionized.

Gleaning from ethnography at jobsites and union halls, this chapter shows how construction workers and their union organizers understood the qualities and hardships of these uniquely steady but repetitive solar & rail jobs. On balance, they understood these jobs as a boon to their leverage with employers and the state, because of the steady union membership, contracts, and inclusion–especially for Latino workers–and used this leverage, for one union, to end divisive workforce tiers in all their regional solar contracts. Yet the particular fulcrum of the central San Joaquin landscape, and a general reluctance to challenge employers, set horizons on their workplace power.

For the fourth chapter, "Welding Breakthroughs", I seek to explain how the solar and rail booms shaped a shift in power and alliances beyond the worksite. Based on ethnography and archival research, I describe how Fresno and Madera's construction unions, social-democratic Latino activists, and environmental justice NGOs built extraordinary coalitions in elections and planning battles, and in under half a decade broke the century-long hold of a hostile, landowner elite on their municipal states. I compare these breakthroughs with the relative stasis of Bakersfield, a hundred miles south in the San Joaquin. In this parallel bastion of rightwing political rule, construction unions also grew with solar work and faced household hardships, but kept far from forging insurgent alliances. As opposed to Fresno, Bakersfield's solar construction workers commonly lived far outside the county, limiting their household ties as a local political factor, while continued aspirations for oil jobs reinforced their conflicts and doubts with the city's less-developed immigrant and environmental justice movements.

In contrast to Bakersfield, in Fresno and Madera I show how activists, workers and their families welded alliances at three crucial seams. From the green jobs boom, growing construction union memberships and war chests were dedicated to bolstering electoral challengers, who often came out of immigrant and environmental justice organizing. Second, the long exclusion from state power of union, Latino, and environmental justice activists fostered these outcasts' shared daring for political independence and confrontational challenges to the ruling developer bloc. Last but not least, these movements were able to find shared goals across the bond of common household struggles–over austerity, pollution, housing, and more–that had thwarted the region's largely immigrant, working class majority from a decent life. From this ground, Fresno and

Madera's insurgent movements swept elections, redistributed infrastructure, expanded unions, and began planning shifts in the landscape by their common vision.

In the conclusion, I draw out strategic lessons from the San Joaquin for organizing the earthly transformations needed for climate action. I begin with portraits of two of the most imaginatively transformed landscapes in the whole Valley: an immigrant's underground garden refuge, and an elite surfing wave engineered in a rural pool. These illustrate horizons for a politics of intentional, creative reconstructions of land for working and oppressed people. Landscape transformation, I argue, should be aimed not just to make jobs or profit, but to open space for pleasure, learning, and forming new kinds of solidarity with the landscape, a kind of insight demonstrated by the San Joaquin lyricists and poets cited throughout this dissertation. I argue that the mounting hard choices of climate transition, in California as much as anywhere, makes conscious, transformative environmental politics an urgent means to build movements and alliances for a green commons, instead of labor alliances with fossil capital. The breakthroughs of San Joaquin construction workers and immigrant activists, in the workplace and state, show the potential of climate transitions to build virtuous cycles of power and ecological transformation by working people. Reaching that horizon–and freer, more beautiful worlds beyond–will depend on who seizes the immense environmental leverage of this era of climate transition, and to what end.

Chapter 2

Grid, Well, Fulcrum

After a day in the grape fields near Rolinda
A fine silt, washed by sweat,
Has settled into the lines
On my wrists and palms.

Already I am becoming the valley,
A soil that sprouts nothing.
For any of us.

- from Gary Soto, "Elements of San Joaquin"[1]

The classic way of telling the story of California's San Joaquin Valley goes like this: an Eden turned into a machine. In the words of the US Geological Survey, this is the "largest human alteration of the Earth's surface".[2] On this bed of a vast ancient lake, 300 miles tall by 80 miles wide, a century of transformation turned wetlands and clay-panned soil into profit for a few, built on toil and smog for the rest.

[1] Soto, 2018. The left photo above is from the Merced National Wildlife Refuge, March 2021, by the author: a conservationist's vision of a little Eden restored. The right photo, by Formulanone (CC-BY), features the Los Banos Creek Detention Dam, farmlands, and California Aqueduct on the west side of the Valley from Madera, in 2015.
[2] Galloway, 1999.

Foggy expanses of marsh bottoms, thick with tule reeds and Yokuts homes, were claimed by settler canoe, evicted at gunpoint, and drained for the till.[3] Early homesteaders came to call their trade "skyfarming", waiting for rare rain to spring wheat to life. Tired of patience, later, richer settlers remade the landscape by force. The snowmelt torrents from the Sierra were diverted into irrigation trenches past the horizon, while fresh wells drank deep from the aquifer in the old lakebed below. Orchards and cottonfields grew flush while the Valley bottom dried.

Within only a few decades of the first irrigation, the most extensive freshwater lake in western North America, Tulare, had been wholly disappeared. Largely gone too were its vast wetlands, and its seasonal flocks of hundreds of thousands of migrating cranes and teals. The tule elk that had run thick alongshore turned to rare shadows in the fog. As wells and irrigation drained the aquifer below, and topsoil was tread tight from above, vast sections of the valley floor sank, often thirty feet below its former height.

Re-engineered, the San Joaquin became an organic machine, churning out forty percent of the nation's fruits, nuts, and vegetables.[4] The machine, by a notorious name, was made for "factories in the field": a regime of vast private landholdings and migrant labor ruthlessly exploited.[5]

The San Joaquin's profound transformation makes it a unique archive to ask: how does remaking a landscape remake power? In its long transformation, the San Joaquin Valley has been a formative place for two widespread, consequential understandings about environments and power.

First, *the grid*: the liberal environmental justice convention of understanding a landscape in blocks, filled with a varied degree of harms, like pollution, poverty, illness, or racial marginalization. The Valley has been a defining site for California's state and nonprofit strategies to assess and win environmental justice, and of a landmark experiment in participatory budgeting based on this logic. I argue the grid model can help identify symptoms of injustice, but when used as a liberal state's arbiter of remedies, it can obscure severe needs beyond the resident majority, avoid understanding or changing power, and set up competition between its blocks instead of solidarity.

Second, *the well*: Marxist geographies of landscape as a reservoir tapped to make wealth. In this figure, the Valley has been the site of canonical studies of landowner profiteering, in tales of agroindustrial zeal from Carey McWilliams to Richard Walker. I argue the well casts light on an essential aspect of landscape transformation under capitalism, but largely treats the land as a resource or backdrop. The focus on landowner

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[3] This opening tale of the San Joaquin's transformation summarizes the environmental histories of Preston (1981) and Igler (2005).
[4] My framing here of the "organic machine" uses the elegant term of White (1996), who used it to describe the Columbia River's reengineering with dams, locks, and irrigation.
[5] The moniker in quotes comes from the polemic geography of McWilliams (1939), discussed in detail below.

strategies to squeeze profit is just one part of how power is made and fought over in the land, from many angles.

I propose a third figure: *the fulcrum*, working to understand landscape and its remaking as a means of power. As a starting point, I work towards a synthesis of Ruth Wilson Gilmore, Clyde Woods, and Matthew Huber's critical geographies of landscape transformation and power. Expanding, in their footsteps, on Gramscian concepts of hegemony and Erik Olin Wright's scheme of associational and structural leverage, I flesh out a theory of *environmental leverage*: how relationships with the landscape can be a pivotal dimension of rule or rebellion. To transform the landscape is to remake the fulcrum on which that leverage turns.

In closing, I return to briefly retell the history of the San Joaquin Valley from regional archives, arguing that landscape transformation was key to founding both racial capitalist rule and a social reproduction crisis for its working class immigrant majority. At the same time, the labor of landscape reconstruction provided an immanent insurgent potential to upend that reign from its depths.

A. *A grid of harms*

> so long, it seems, I've been
> in this valley off the 99,
> watching the children play in this dust,
> watching mothers cry out
> to God for justice for peace for death,
> watching the honda civics passing by, passing through,
> never stopping on this side, this scary side violent side,
> this side of misspent anger.
> -from Andres Montoya, "the rains have left and ernesto is dead"[6]

Official lip service to environmental justice has been, for at least three decades in the United States, no rare event. But beyond nearly any other state, California has retooled organs of its government to track, deliberate, and bankroll by a certain strain of environmental justice logic. At the analytical and political crux of California's official effort has been the San Joaquin Valley.

Here, I evaluate the "grid" at play in the state's primary tool and its consequences, drawing from interviews with San Joaquin activists and critical scholarship on environmental justice. I argue the grid provides potent information on the *symptoms* of injustice, particularly on the distribution of pollution and poverty. However, its ranking of general aggregates can obscure local minorities, while its focus on residents can conceal

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[6] Montoya, 1999.

transient people and life beyond a place of residence. Worse, when made into the means of distribution from a liberal state, the grid can obscure the powerful *causes* of injustice and the potential *power* of the people it casts as passive victims or funding recipients. By picturing working and oppressed people as divided census blocks competing for funding, and a budgeting process with starkly lacking participation, the grid avoided the harder tasks of challenging and building power in connection with landscape.

In California, the state arbiter of environmental justice is a mapping tool named CalEnviroScreen. Launched in 2013 by the state Environmental Protection Agency, under guidance from nonprofit staff, this public database and website maps every census tract in California, and colors them in two dimensions of environmental justice. Each tract is ranked by cumulative scores of "pollution burden" and "population characteristics"–with worse scores (and darker shades) for higher poverty, air pollution, and asthma rates, among many other odious indicators. These two dimensions are combined again in an overall "CalEnviroScreen percentile", with the highest scores for tracts with the most pollution and undesired population characteristics, in the state's eye.

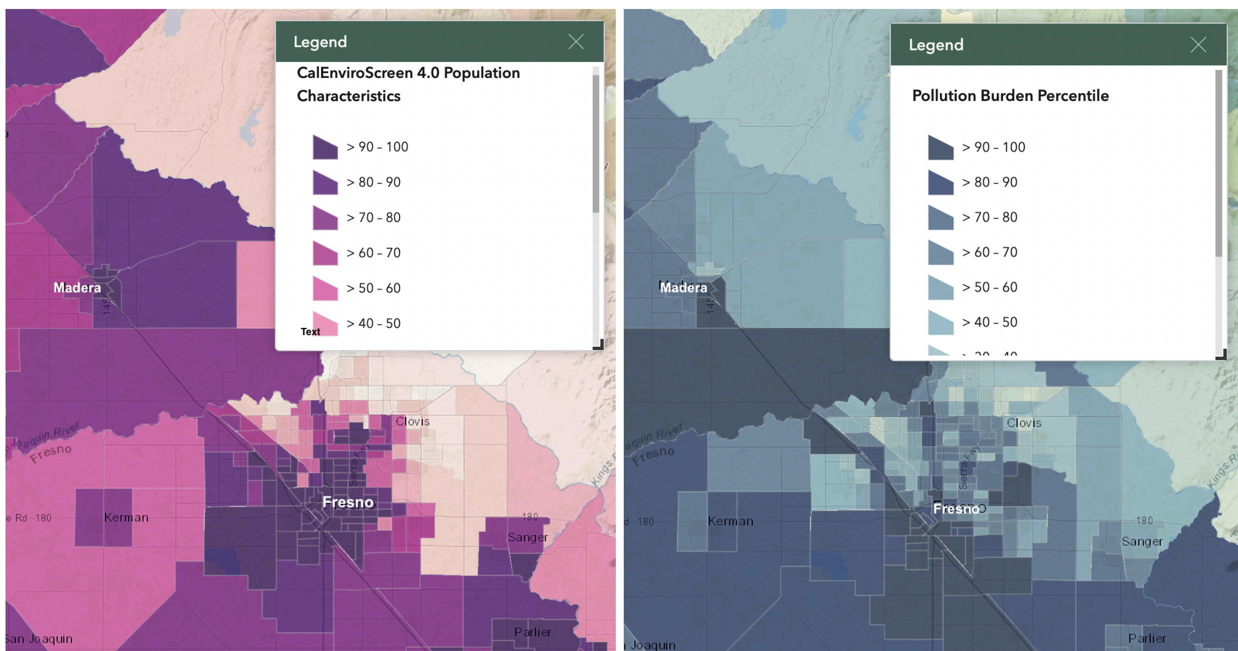

Figure 1: CalEnviroScreen in action. (California Environmental Protection Agency, 2021)

More than projecting food for public thought, within just five years, CalEnviroScreen became the decisive basis of funding and planning decisions for eight state agencies.[7] Major shares of public budgets for solar subsidies, toxic cleanup, electric vehicle chargers, passenger rail lines, and more were earmarked for the tracts in the worst rungs of rankings. For the decade after a 2012 legislative decree, a quarter of all proceeds from California's

[7] Eng, 2018.

cap-and-trade system, cornerstone of the state plan to reduce climate pollution, were dedicated to clean transit and energy projects that benefit the worst-ranked quartile of tracts in CalEnviroScreen.[8] In a tidy application of a distributive justice principle, the zones most full of harms–at least in this state view–are first in line for a share of remedy.

More than any other region as a whole, the San Joaquin Valley has been the chasm of harms this state calculus was designed to visualize, and relieve. As Figure 2 shows, the CalEnviroscreen practically highlights the San Joaquin in a long swath of red-orange at the state's center, reflecting both intense poverty, austerity, and pollution levels that routinely rank in the nation's worst.[9]

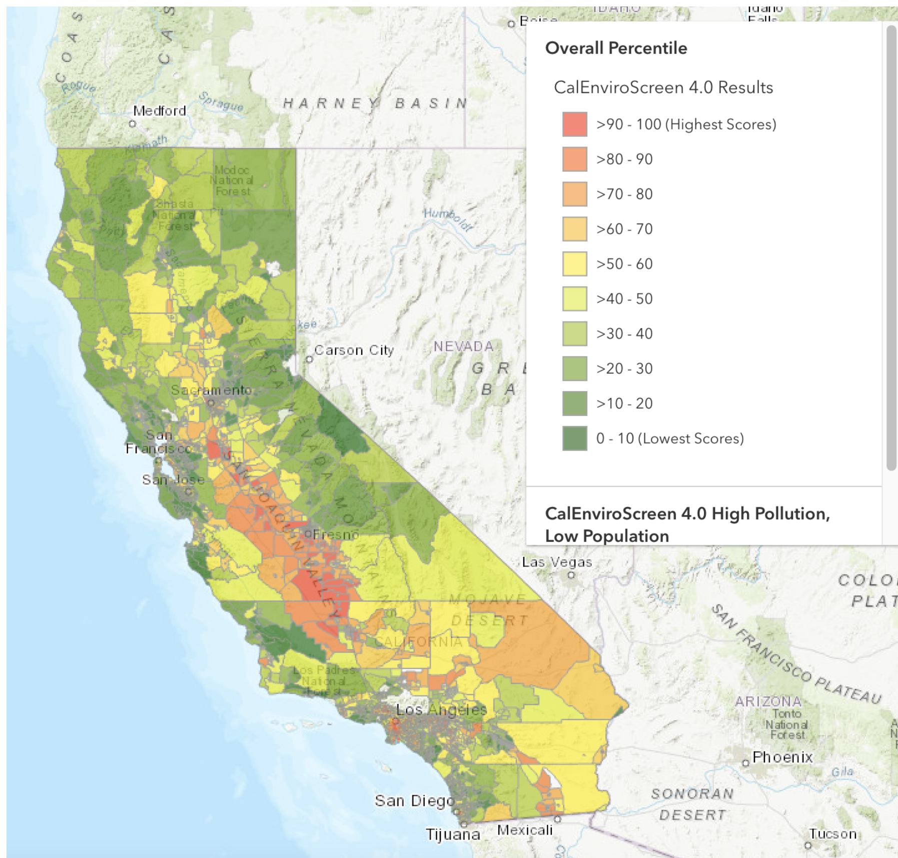

Figure 2: A state view of the state of the state (Cal EPA, 2021)

The San Joaquin Valley is defined, here, as a massive swath of environmental hazard and poverty. Its form is a grid of jagged, bounded tracts. In each, varying levels of harms and boons, defined from on high to mete out mercy. This is the state environmental justice approach exemplified by CalEnviroScreen. What are its consequences?

A critical line of geography and political ecology scholarship has argued the dominant politics of environmental justice–as exemplified by CalEnviroScreen–have erred

[8] California Climate Investments, 2022.
[9] American Lung Association, 2022.

towards a liberal, distributional vision that sustains elite control. An underappreciated forerunner of this line should be found in Michel Foucault, the critical historian of state techniques of measuring subjects to constrain their politics. CalEnviroScreen's mapping and distributive method fits closely with what Foucault terms biopower: techniques of state and capitalist power that emerged in late 18th century Europe, in response to working-class and anticolonial revolts.[10]

Biopower's key techniques are systematic tracking and regulatory interventions into the "population" and "environment", seeking to foster social life in elites' preferred "equilibrium" of power.[11] Biopower seeks to constrict politics to a question of state management of resources for making certain kinds of life, which in turn equips state racism or xenophobia that pits one population against others. By defining a given role for the state in tracking, regulating, and achieving certain metrics of environment and population, biopower attempts to take real challenges to underlying power off the table. This critique does not condemn metrics as useless, but instead argues they should not be posed as a replacement for politics. Instead of biopower's constrained terms, Foucault argued insurgent politics must take into account–and challenge–the means by which power was made and maintained, like property ownership.

Contemporary critics of dominant environmental justice pick up on these themes. In 2004, geographers Erik Swyngedouw and Nik Heynen argued the core problem is that "the environmental justice movement speaks fundamentally to a liberal and, hence, distributional perspective on justice, in which justice is seen as Rawlsian fairness and associated with the allocation dynamics of environmental externalities." Instead of such a limited focus on evenly sharing harms, they call for a strategy that reshapes power and its systemic roots: "although much of the environmental-justice literature is sensitive to the centrality of social, political and economic power relations in shaping processes of uneven socioecological conditions, it often fails to grasp how these relationships are integral to the functioning of a capitalist political-economic system." However, aimed at a synthesis of existing scholarship, this critique offered little direct guidance for environmental justice strategies that would shift power.

For prominent environmental justice researcher Laura Pulido and her co-authors, a reliance on the state is the heart of the movement's problem: "Instead of seeing the state as a helpmate or partner, it needs to see the state as an adversary and directly challenge it. While the early EJ movement did this, over the decades it has been increasingly co-opted by the state and lost much of its oppositional content. It can regain its radical position by not only challenging the state, but refusing to participate in regulatory charades."[12] This

[10] Foucault, 2010.

[11] This aspired equilibrium, or "homeostasis" based in biopower, is one version of what Gramsci described as hegemony.

[12] Pulido *et al.*, 2016

advises activist abstinence or opposition to state efforts like CalEnviroScreen and its ensuing budget battles, in favor of a loosely-defined movement building outside.

In response to Pulido, Marxist geographer Matthew Huber argued, “the environmental justice movement could also think about a broader strategy that could build popular left power within the state itself".[13] By his view, environmental justice strategies have been limited by presuming the most marginalized people will be the prime agent of change. In Huber’s words, "those struggling directly against the poisoning of local communities are often on the margins of society as a whole. Struggles like this… are obviously important matters of survival for those involved. Yet the strategic question of how to translate local livelihood concerns into a broader mass environmental movement able to take on capital remains unclear.”

As opposed to an environmental justice strategy hinged on the most marginally oppressed as the political vanguard, Huber calls for an "ecological politics for the working class", seeking mass movements with power from organized labor and vast numbers, rallied around universal provision of social and ecological goods. In the “fulcrum” section of this chapter, I develop on Huber’s suggestions, in combination with counterposed strategies that have found potent roles for environmental justice and antiracist struggles. Huber pursuit of a powerful majority bloc is a vital guide, but could grant fuller credit to how, when oppressions are widespread, uprisings of the oppressed can sometimes traverse wide margins.

For all their insights, these scholars remind us environmental justice ideas were formed in movement and nonprofit practice. Given that, it's crucial to judge the dominant environmental justice approach in its practice, beginning from the nascent critical views of its activists.

The dawn of CalEnviroScreen, in 2013, came just ahead of the rise of San Joaquin Valley environmental justice nonprofits, who built formidable staff and influence across multiple levels of the state. By the end of the decade, five of California’s most active EJ NGOs were heavily rooted in the San Joaquin: Leadership Counsel for Justice and Accountability; the Central California Environmental Justice Network; the Center for Race, Poverty, and the Environment; Building Healthy Communities; and the Dolores Huerta Foundation. The purview of the latter two groups went well beyond environmental justice, in the sense discussed here.

Common strategies between these nonprofits hinged on pressuring state planning, regulation, and budgets with policy lobbying, lawsuits, and community mobilization to hearings or rallies. Some of these nonprofits were active in the process that formed CalEnviroScreen itself, and the state laws or budgets that turned it into material consequence. According to public records, nonprofit growth was aided by an influx of foundation funding, particularly from coastal environmental donors and the California

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[13] Huber, 2019.

Endowment–funded by for-profit healthcare company Blue Cross as a concession to win state approval of an unprecedented corporate merger in the 1990s.[14]

State efforts at environmental justice also helped these nonprofits gain a foothold, even as these groups sometimes offered modest challenges to state designs. California's greenhouse gas cap-and-trade program listed 36 separate programs to which nonprofits could apply for funding from its proceeds, reaching over $3 billion in 2020.[15] With CalEnviroScreen dedicating a major share of these funds to San Joaquin tracts, its nonprofits stood especially to gain.

As they grew, many San Joaquin environmental justice nonprofits became majority Latina and Black in their staff and leadership, often with young Fresnans who had decamped to top-tier universities like UC Berkeley, then returned after. Most staff I asked cherished how nonprofit growth had opened their path to advocacy as a profession. In Fresno, that growth helped yield welcome wins against local pollution, including closure of a meat rendering plant and urban planning shifts to restrict warehouse truck traffic in residential, majority Latinx neighborhoods.

Despite the boons of this state approach to their perch, some San Joaquin nonprofit staff shared critiques of how the CalEnviroScreen method pitted different areas with incommensurate needs against each other. As Ashley Werner, a locally-esteemed attorney at Leadership Counsel, told me from their Fresno basement offices, "CalEnviroScreen has become more and more contentious. Bay Area legislators like Ting and Bonta have opposed basing funding for infrastructure based on it, because even their poorest areas rank much better than ours in the Valley."[16] Following a 2016 public letter by these legislators calling for readjustment of CalEnviroScreen's weighting–to better suit their districts–an in-depth study concluded that the relative weightings of pesticides versus airborne smog, for example, had dramatic impacts on the tool's cumulative ranking of traffic-clogged cities versus orchard-side towns.

In particular, Werner was sympathetic to claims that CalEnviroScreen had neglected East Palo Alto, a historically Black and Latinx district on the San Francisco Peninsula. A long history of industrial emissions, toxic dumping, and austere public investment in the neighborhood, according to health journalist Kate Bradshaw, made it "a poster child for the environmental justice movement". Yet as venture capitalists and tech startups sprang up around Stanford University on the town's westside, since the 1990s, wealthier new homebuyers in East Palo Alto raised CalEnviroScreen scores to hover at the top or above the worst quartile–cutting them off from priority state funds. Though the proportions of extreme poverty had shifted–and toxic exposure remained grim–thousands in the

[14] This assessment of nonprofit donors is based on author review of major trends in 2012-2020 IRS Form 990 for the listed nonprofits, when available, through the Guidestar platform. Background on The California Endowment comes from Hall & Conover, 2003.
[15] California Climate Investments, 2021.
[16] Ashley Werner, Jun. 14, 2018.

neighborhood still suffered the illness and deprivation of past years. But owing to their new neighbors, environmental injustice here no longer registered as a state priority.

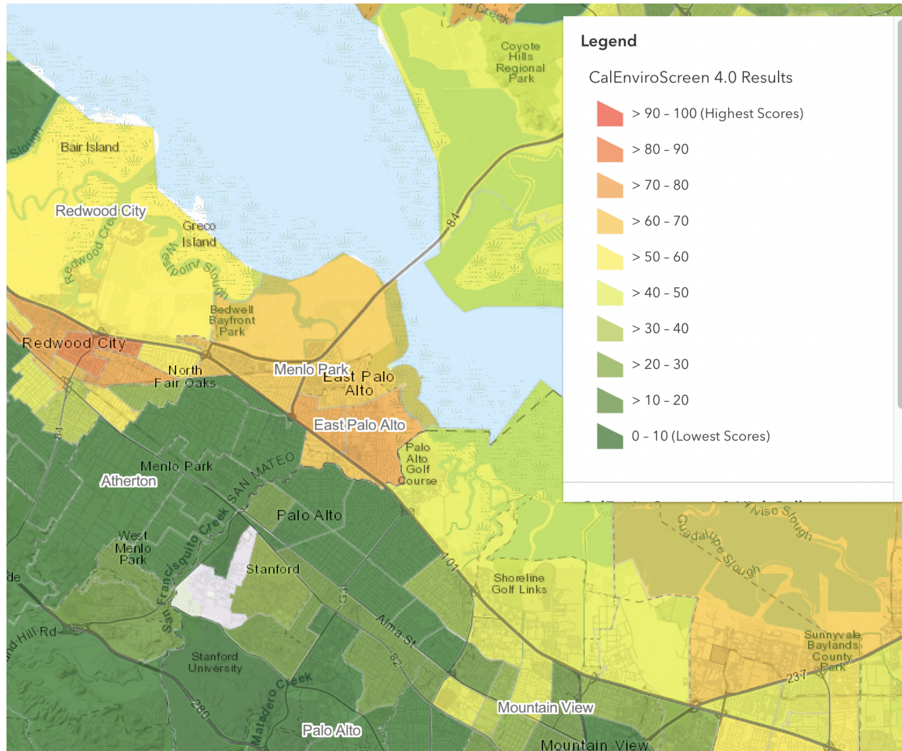

Figure 3: East Palo Alto, just outside the "disadvantaged" 75% percentile. (Cal EPA, 2021)

The exclusion of East Palo Alto from state support is not a simple story of gentrification's ills, as much as a show of how a particular state way of seeing space obscured the needs of thousands, subsumed under the generalized rates of their block in the grid. Worse still, the grid method for seeing landscape fostered competition between different places for limited funds, often in esoteric battles by professional representatives with the referee of state metrics. As southwest Fresno and East Palo Alto sought a slice of the budget, their legal advocates and legislators had to ensure these neighborhoods were defined in the harshest quarter of all in the state, to the exclusion of others. At its worst, the environmental justice grid fragmented lines of potential solidarity, and turned them into fronts of competition.

The grid model, by judging "burdens" on populations based on their official place of residence, also tended to obscure transient people and parts of life beyond home. Few people work in their same census block as their home, especially those living in California sprawl. Pollution exposure essentially does not count for a person in CalEnviroScreen if it is experienced away from home: at work, a rally, a church, a park one neighborhood away. Even more invisible in this grid are those who have no stable official address of residence. That's a sizable omission in a state with almost two hundred thousand people living

unhoused even in winter, as of 2020, or a San Joaquin Valley with many thousands of migrant farmworkers.[17]

Competition between districts, turned to political horse-trading, also helped buck up state attention on San Joaquin environmental injustice. Through the 2010s, even as their districts often became majority Latino and working class, Republicans and conservative Democrats continued to dominate many levels of San Joaquin elections, and in office were often hesitant or furiously opposed to climate and environmental legislation. This encouraged Democratic state officials from the coastal cities to view climate budget commitments to the Valley as legislative enticement, not mere justice.

One landmark climate justice program, a focus of months of my fieldwork, was particularly instructive on the limited horizons of state efforts in the San Joaquin. Wooed by Republican Mayor Ashley Swearingin in Fresno, Governor Jerry Brown piloted a $70 million "participatory budget" for climate infrastructure there in 2017. Staff from both officials' camps told me Brown's goal was to win broader allies for his climate agenda.[18]

This "Transformative Climate Communities" program became the largest participatory budget in the US to-date. Adults who lived, worked, or owned property in Fresno's Southwest and Chinatown neighborhoods could become a voting participant in meetings which choose which local clean transit, housing, energy, and parks projects would receive a share of the $70 million budget, sent down from the state cap & trade fund. These Fresno neighborhoods fit in the worst five percent of CalEnviroScreen rankings. Now, not only would state money be sent there, but it would be put into action by an experiment in "community" democracy at a nationally unprecedented scale.

Fresno's program took environmental justice one step beyond a task of top-down redistribution, adding a twist of liberal democratic process to the means to dish out state investment. But in practice, democracy was hard-won. A private consulting firm was hired to facilitate, while local nonprofits gained as well; some gleaning resourceful reputations by organizing membership to join the meetings, and others receiving millions to implement the projects funded.[19]

Voting participants needed not only work, reside, or own a deed in these districts, but to attend at least three multiple-hour meetings, including the final vote. Most participatory budget meetings took place in Black Protestant churches, like the Westside Church of God. Notice of the meetings went out through newspapers with limited subscriptions, uneven city listservs, church parishes, and nonprofit contact lists. Nonprofit organizers lamented how hard it was to get participation from those most; as one told me, ""In West Fresno there's a lot of distrust and hurt in the community, and rightfully so. This is partially as a result of racism, historical neglect, eminent domain that took people's

[17] US HUD, 2021.
[18] Kim Costa, Jun. 5, 2019; Sandra DiMaggio, Dec. 18, 2018.
[19] Karner *et al.*, 2018.

homes away, and misuse of funds that were meant for Black and brown bodies and then used elsewhere."[20]

These factors meant the participating "community" in Fresno's climate justice budget was self-selected and often far from representative across race and class, as my interviews and meeting observations found in 2017 (see Table 1). While the census tracts as a whole might rank high in environmental injustice, that did little to guarantee decisive participation from those most affected by it–the state's explicit goal. Participation on the whole landed at just about one from every five hundred local residents. The area's working class, Latinx majority participated far less often than that, and a relatively organized Black middle class held decisive sway. This reflected a degree of hard-won political formation that others had yet to build, limiting the budget's goals to express the will of a neighborhood-wide community.

	Residents, Southwest, Chinatown, and Downtown Fresno (US Census, 2016)	*Voting Members, Fresno Transformative Climate Communities 2017, Observational Survey*
Count	**47,481**	**131**
Black alone (not Hispanic or Latino)	13%	52%
Asian alone (not Hispanic or Latino)	8%	3%
White alone (not Hispanic or Latino)	12%	22%
Hispanic or Latino of any race	64%	21%
Other	3%	2%

Table 1. The gulf of participation in Fresno's participatory climate justice budget (Karner, Brown, Marcantonio & Alcorn, 2018)

Even in the ranks of nonprofit staff who had organized most energetically around Fresno's participatory budget, some frankly criticized the limited democracy of the process. As Grecia Elenes, an organizer at a local environmental justice nonprofit described, "The language barrier is really hard for me with the southeast Asian community, who speak Punjabi, Hmong, Cambodian, and many other languages. Work and familial obligations are a major obstacle for folks in the community. And many of the folks who have lived here for generations, especially the black community, haven't forgotten how their community was turned from a thriving, self-sufficient neighborhood to a heavily industrial area that's now ranked as one of the most polluted communities in California.."[21]

[20] Grecia Elenes, Apr. 4, 2017.
[21] Grecia Elenes, Jun. 11, 2018.

A specific politics of neighborhood restoration was championed, at Fresno's final climate budget meeting, by Mary Curry, a Black elder and longtime homeowner. She was locally celebrated for her long leadership in an ongoing Southwest neighborhood fight against noxious emissions from the Darling meat rendering plant in its midst. In her sole remarks during debate, Curry principally spoke not directly for the solar or parks projects she favored, but against the multistory, privately-developed affordable housing proposal that had been featured in many of the city options. Curry said, “What we're hoping for in our community is to have some market value homes built… nice homes. We don't want to impact our community any further with low-income housing. I think all of Fresno deserves to have some low-income housing, not just West Fresno.” To my ears, this closing line received the night's fiercest applause from other voting members.

Meanwhile, as Fresno rents rose faster in this period than any city in the US, no renters spoke up in this meeting to make any case for the subsidized apartments. Ultimately, the voting members voted unanimously to reject the city's proposed affordable housing development, in favor of a slew of smaller transit, solar power, recreation, and marketplace projects, largely to be built by nonprofits.

Environmental justice, it turned out, lay in the eye of the beholder. State efforts to define it either simply from above, or through local deliberation, could neither set a single, cumulative measure of injustice, nor a surefire, single goal of justice. Justice had to be defined and fought for by the organization, consciousness, and power of particular people and the groups they formed.

The state, like much liberal environmental justice strategy, simply assumed a "community"–singular, preexistent, bound by the census tract–was ready to spring into action to represent itself, given the chance. But community must be made. Amid the immense atomization, oppression, and exploitation of US society in general and for working class people of color in particular, a consistent kind of community can't be an assumed precondition.[22] To be wrought, community must be fought for.

The point here, to be clear, is not at all to argue that Southwest Fresno's Black homeowners were unjust or wrong to fight for their vision for the neighborhood. Their decisive role in Fresno's climate budget was an achievement of their political formation in response to generations of segregation in city policy and capitalist loanmaking.[23] The Black middle class political achievement only registered as outsized in the vacuum of others'.

Instead of a problem of too much representation of one group, Fresno's climate budget was defined by the lack of political formation for almost every other group around. Its dim emblem should not be its skewed racial shares, but the figure of 131 self-selected

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[22] On atomization as a defining feature of contemporary US society, influential and convincing works are Cooper's *Family Values* (2017) and, in a more popular register, Putnam's *Bowling Alone* (2000).

[23] Fresno's history of segregated housing development, loanmaking, and environmental health are chronicled in Zuk, 2013.

members voting on behalf of nearly forty-eight thousand residents. Given that gulf, the success of a participatory process should not be weighed on the representativeness of a single flash of discourse, but on its lasting support to political formation and power among the oppressed. In that light, an environmental justice nonprofit organizer was especially critical of the lack of enduring political shifts owing to the program: "The city is going back to old ways, not notifying or including people. So people have dropped off, feeling like, 'What's the point?'"[24]

The meager outcomes reflect common structural limits which participatory budgets face in fostering political formation. Fresno's 2017 climate budget was a one-off, giving less reason to sustain ties built in its process. Even where participatory budgets have been annual recurrences, they still direct a small minority of overall state spending even at their largest.[25] While they distribute, they do not exactly *re*-distribute; participants can not decide how much overall to tax, draw loans, or spend, but only play with the funds deemed available by higher government bodies. Above, limited actual participation reflects how this liberal democratic approach assumes a community, able to rise up automatically to express its will–instead of a dearth of political power, which must be continually forged.

The state-made grid and participatory budget, as means to assess and address environmental injustice, fell short; they bounded solidarity while obscuring the construction of injustice and power. The harms that filled the CalEnviroScreen grid were not just commensurate numbers, apt to be simply addressed with state funds. Whether divvied out by the legislature or a self-selected local pool, those infrastructure funds alone could not form a liberatory politics. In different ways in different places, the symptoms of injustice were made by two centuries of migrant persecution, labor repression, racist dispossession, and landscape transformations that underpinned it all. A strategy to win environmental justice, on the terms of the oppressed, would require tracing the construction of powerlessness and power. To that end, a long line of geographies of the San Joaquin plumbed the lucrative depths of its harsh rule.

B. A *well for profits*

> The sky went black in the ninth hour of rolling trays,
> And in the distance ropes of rain dropped to pull me
> From the thick harvest that was not mine.
> - from Gary Soto, "Elements of San Joaquin"

[24] Grecia Elenes, Jun. 11, 2018.

[25] The most comprehensive dataset of participatory budgets in the United States and Canada is from Peabody, 2019. Every case shown is under $10M, with most allowing participants from entire cities or council districts a budget of a mere few million each.

For decades in Marxist geography, the San Joaquin Valley has been something of a canonical landscape: rich soil under domination by a landowning, white minority. The leading geographers of the region richly chronicled the profits and the profiteers, and largely agreed on the means of wringing out fortunes: consolidated land ownership, aggressive labor exploitation, and voracious technological augmentation. Studies by McWilliams, Henderson, and Walker form the core of this canon, while books by Igler, Mitchell, Gilmore take crucial steps beyond it. At the essence of the canonical schemes, the landscape is a well, to be transformed and operated so that riches could best be wrenched from its depths.

These works shrewdly dissembled capitalist strategies to eke more out of land and labor. But in this focus, the canonical geographers often depicted capitalist hegemony over the San Joaquin as nearly total, instead of always contingent and contested. Where the Valley canon included vignettes about resistance, they were confined to brief farmworkers' struggles to gain more share of the profit themselves: heroic acts of collective daring, beyond a doubt, but just one slice of a greater fight.

I argue the well is one essential aspect of landscapes under capitalism, but not complete. What needs to be added are accounts of the shaky construction of capitalist power–in the San Joaquin, for a start, through native genocide, ecological re-engineering, migrant persecution, union repression, and gendered reproductive labor–and how the oppressed have sought and often succeeded at forging their own powers.

In 1939, John Steinbeck published *The Grapes of Wrath*, indelibly narrating the cruelty of the Valley's regime over a new crop of Dust Bowl-refugee farmhands. That same year, California journalist and Communist Party activist Carey McWilliams' synthesized a decade of research into what could be called a nonfiction counterpart: *Factories in the Field*. This polemic, quickly a popular touchstone, pinned the San Joaquin's penury for farmworkers–and extreme fortunes for landowners–to its uniquely concentrated ownership of land.

San Joaquin Valley land consolidation was fierce, even as early as 1870. Fresno County's average farm owner held five times the state mean acreage; a mere forty-eight men owned at least seventy-nine thousand acres *each*.[26] McWilliams attributed the concentration to American settlers and corporations' cutthroat land grabs from Mexican-Californians that followed the 1848 war of annexation, along with a state government recklessly keen to get marshes and grasslands into private claim and commercial exploitation. Such concentrated land ownership formed "the root of the problem of farm labor in California", while equipping "a mechanized industry, owned and operated by corporations".[27]

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[26] McWilliams, p. 20
[27] McWilliams, p. 22 and 172, respectively.

McWilliams briefly acknowledged the epic transformation of San Joaquin “deserts” into hyper-productive orchards in less than fifty years. His account even briefly nods to the labor involved, mentioning 3,000 Japanese immigrant wetland reclamation workers who perished in a Fresno County disaster of flooding, unsafe housing, and contaminated water supply.[28] Yet beyond these moments, the remaking of the land played little explicit role in his polemic of land concentration and working-class immiseration.

Resistance is not missing in this tale, but constrained. McWilliams celebrated the epic courage of fieldhand uprisings from Wobbly-assisted Fresno revolts in 1910, to the 18,000 strong, Communist-backed cotton-pickers strike in 1934, just south, beside the Tulare Lake bed. Yet suiting his station as attorney and reform advocate for farmworkers, McWilliams finds more hope in how these acts nudged state officials towards modest experiments in supporting smallholder agriculture, rather than strikers' workplace gains. Ultimately, he fixed his strategy for busting the landed empires on alliances with rural middle classes and professional reform advocates, like himself, rather than the actions of fieldhands themselves. The hegemony of the "corporations" in the fields is behemoth, in this tale, and loath to be broken from within.

Following McWilliams' track, at the cusp of the millennium, two lodestones of a revived Marxist geography traced the copious acreage and abuses of the San Joaquin’s elite. In *California & the Fictions of Capital*, George Henderson focused on how international and regional flows of capital transformed land as an *object* of power, not as a *tool* of power's reproduction. After the bust of California’s 19th century mining boom, Henderson argues "agriculture had essentially rescued regional capital" with lucrative prospects in grain & ranching, followed by an 1890s shift to specialized fruit agriculture.[29] The landscape, in his exacting charts and diagrams of financial flows, is a well into which loans are sunk, like a bucket into a well, so that profits can be pulled out.

[28] McWilliams, p. 110.
[29] Henderson, 1996, p. xvi.

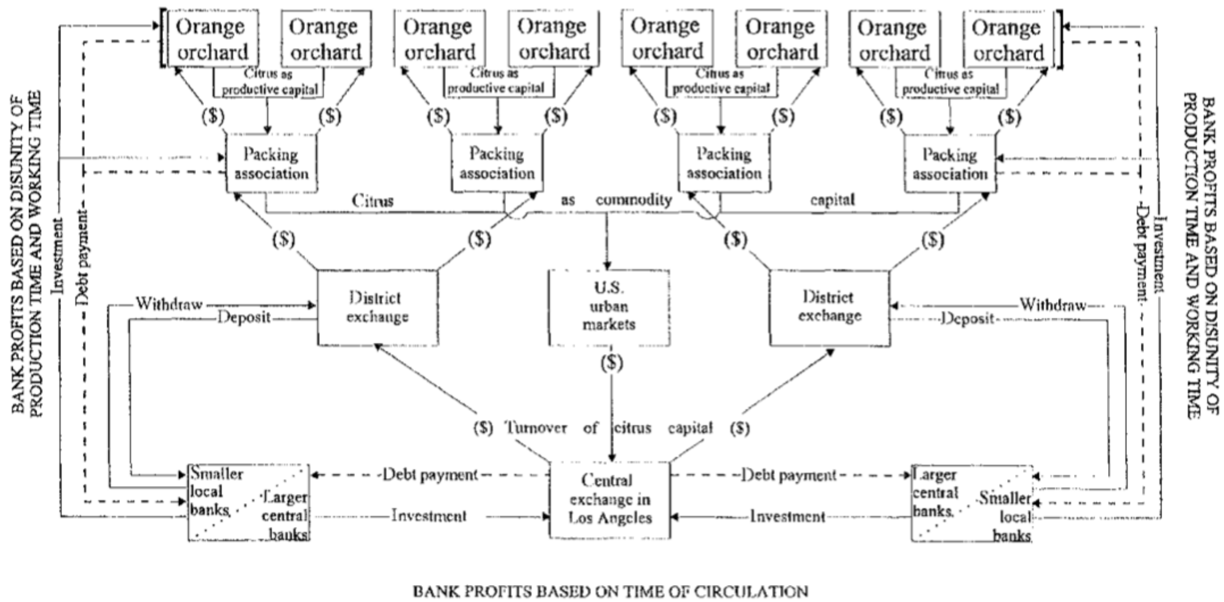

Figure 4: Henderson's upside-down well: drawing profit from orchards. (Diagram from Henderson, 1996, p. 70)

Henderson does not skimp on how land transformation enabled profits, with hints at its role in politics. He argues irrigation investment was key to orchards and farming of any kind on the dry San Joaquin westside. Yet irrigation demanded extensive capital, which banks offered most readily to landowners of the greatest scale, setting up a vicious cycle of a "baronage" outcompeting for loans, then draining waterways that smaller farmers relied on. Henderson traces another form of land transformation as key, with real estate speculators buying large tracts, leveling the soil, developing irrigation, then subdividing to sell to small farmers for a slice of yeoman dreams–which often quickly fell to ruin in debt or drought. Henderson offers an intriguing aside on "exploitation" from a transformed landscape: "when capital… confronts nature in agricultural production it is not just a matter of vulgar extraction. … it also exploits the very conditions by which nature poses interruptions or 'obstacles' to its exploitation."[30] In this two-step, capital gains doubly from extraction and from turning obstacles to its advantage, exploiting scarcity or instability. Yet Henderson's insight essentially shows a second well from nature for capital's profit, still without otherwise exploring how it structures politics.

Capital is a behemoth in Henderson's account, pillaging with aplomb. On how such power was made, beyond simple loan-making, Henderson is generally quiet or paper-thin: drawing on regional fiction, often by novelists in landowner families, to show the "fictions of capital". In his view, their prose draped San Joaquin society in lucrative illusions: of the hardscrabble virtue of the vast orchard owner, or how "the engineered landscape… was a

[30] Henderson, p. 77.

social good from which both factions [the corporation and the farmer] potentially benefit."[31] Fraught as the fiction might be, Henderson leaves unclear how such prose mattered in political practice; by whom and how these visions were contested, taken up, or replayed in action. That practical step is essential to any account of hegemony.

The visions and efforts of the San Joaquin working classes glean just the briefest nods. Henderson mentions major fieldhand strikes as demonstrations that "control over the farmworker was not hegemonic", but dourly notes this resistance was followed by police crackdowns, organizer jailings, banner farm profits, and consolidation of landowner forces. More jarring still is his account of racism in exploitation, describing oppressed groups as preformed wholes who played all too well at the bosses' game: "Chinese workers excelled at exploiting themselves", or Japanese workers "(u)nderbidding the prevailing cost of labor power and thus pitting themselves against other racialized groups".[32] Although Henderson is sharply critical of how white landowners constructed racist scorn and dispossession, in his account, the racially-oppressed seldom supplant those terms with their own. The bank and the landowner seem to have won total domination and consent from the racialized working class, except for brief episodes of basically futile revolt.

Soon after, another landmark in Marxist geography seized on the San Joaquin: Richard Walker's *Conquest of Bread*. More than capital flows in the abstract, Walker's account often hinged on ruthless technical innovation, arguing that "California represents an historical vanguard of sorts, in which many features of agribusiness found around the world were originally worked out (or very nearly so), from the irrigation district to scientific agronomy to mass marketing."[33] While irrigation and wetland transformation played valuable roles in Walker's telling, he argues they were a result of landowners' "untrammeled power", rather than an enabling force themselves.[34] Instead of land concentration alone, Walker argues the root of San Joaquin agroindustrial power and profit lay in how "capitalist class formation and solidarity could hardly have been more ideal".[35]

How such an "ideal" formation was made bears more explanation than the mechanized ingenuity or violence of its champions. Beyond most predecessors, Walker stands out for documenting recurring strikes and rebellions of farmworkers-often uniting across racial lines–and their sanguine repression by landowners and police. For Walker, labor's resistance sprang from the site of exploitation in the fields, and especially the settled working classes around packinghouses, where capital had already transformed land and fixed investment. Conflict flared over labor's share of the wellspring.

Yet resistance over the terms of building the well–over land transformation itself–is not explored. Henderson's insight on developers' yeoman real estate lots finds a

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[31] Henderson, p. 195.
[32] Henderson, p. 84-85.
[33] Walker, 2004, 17.
[34] Walker, 299.
[35] *ibid.*

counterpoint in *Conquest*: as much as the rifle, Walker argues it was the lure of class mobility through small farm ownership or subcontracted independence that proved crucial to breaking apart labor solidarity in the fields.[36] The development of such smallholder lots, demanding irrigation, road, and fencemaking at very least, alludes to the use of land transformation in shaping politics.

What politics were made in the reengineering of this landscape; one so profound and avant-garde that this Valley left its names on the tools of transformation used the world over?

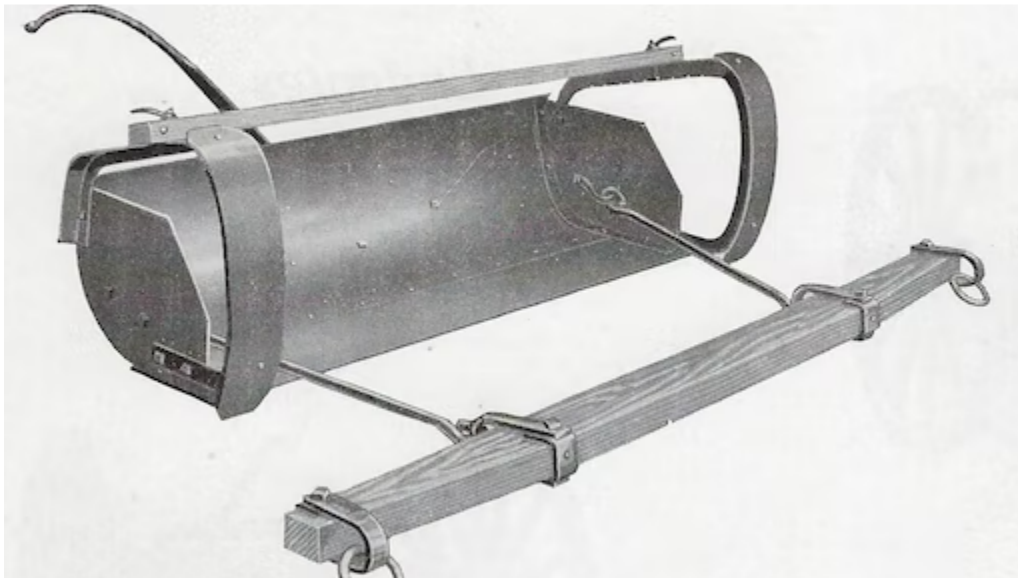

Figure 5. "The Fresno Scraper transformed the backbreaking labor of land leveling, ditch digging and road and railroad building. It helped to change the way that earth could be scraped, moved, dumped and leveled… "Fresnos" were sold throughout the west and when their reputation for efficiency, reliability and ease of operation was established, they were shipped to practically every state as well as South America, India, The Orient, South Africa, Australia and Europe. The "Fresno" played a vital role in the construction of the Panama Canal." Fresno County Historical Society, 2018. (Photo: Smith & Sons Mfg. Co. catalog, n.d.)

Three countervailing geographies of the San Joaquin–by Igler, Mitchell, and Gilmore–laid foundations to understand how its transformation set terms of power. David Igler's *Industrial Cowboys* documents how the Valley's all-time largest land barons, Miller & Lux, pursued ecological re-engineering, particularly draining marshes and irrigating scrublands, to craft a ranching empire. Reclamation and engineering "turned the San Joaquin Valley into the world's most productive, and altered, agricultural landscape", but this in turn created new problems for agroindustry, as irrigation created huge salt buildup

[36] Walker, 297.

and drainage problems, or the destruction of wildlife led to eruptions of crop-eating pests like rabbits.[37]

Despite these disruptions, Igler concludes glumly with the continued grip of landowners through the 20th century, tightened with concrete, dams, electric pumps, and computer-managed aqueducts; "Wealth and power remained with those who could engineer the landscape and temporarily elude the environmental and social consequences."[38] Igler portrays this power essentially as an effect of wealth; in how the riches that resulted from land transformation enabled exponential profits, control of wage laborers, drying out smallholders downriver, and wielding bribery or capital flight threats against state officials.

Nonetheless, Igler's story of labor and ecology hints at a more potent interplay of the two. First, he documents how American and Mexican military genocide of Yokuts society transformed the San Joaquin's landscape through its drastic halt to longstanding indigenous stewardship, via controlled burns and careful game hunting. The idyllic scenes with which early Anglo-American settlers described the Valley, of rampant elk and overhead brush, was no original Eden but instead an overrun after the culling of its caretakers.

Second, Igler shows how further transformation for agroindustrial profiteering also required colossal ongoing labor: digging, leveling, scraping, tilling, watering. "Human labor… was the integral link between resource exploitation and large-scale production. Miller & Lux's power ultimately derived from the ability to tap both human and natural energy for its own ends."[39] This points a step further than Igler went: if labor was pivotal to landscape transformation, and that transformation was pivotal to landowners' power, then transformative labor held a profound, immanent leverage to reshape politics.

Influential since the 1990s among budding radical and Marxist geographies, Don Mitchell's *Lie of the Land* explicitly set out to demonstrate the complex link of landscape and hegemony, with the Valley as its site. However, his account focuses narrowly on elite representations of landscape (and of workers) as both the means and evidence of how power was wielded. By taking landowners' yarns about the San Joaquin as overwhelming tools of power, at face value, Mitchell tends to assume landowner hegemony was profound and secure. Though Mitchell proposes to document those who "made the landscape" with his depictions of farmworker actions in the early 20th century, the book does not study the visions and actions of those who reconstructed the land itself.

For moments, however, Mitchell keys in on the transformation of housing and public spaces to found certain terms of politics. In particular, he shows how these places of social reproduction were consciously crafted to reshape possibilities of political formation: by

[37] Igler, 2005, p. 121.
[38] Igler, p. 183.
[39] Igler, p. 124.

landowners to secure hegemony with restricted movement or atomized lodging, and by restive workers using impromptu strike camps to foster militancy and a sense of liberation. At another point, Mitchell offers a potent, but underdeveloped theory of how landscape is an "important medium for the construction of a hegemonic discourse about race; a discourse about insiders and outsiders within a solidifying historical bloc."[40] Landscape, in this figure, is not so much a well as it is palette and canvas with which elites can depict an order, the better to enforce it. But this argument only raises the stakes for what Mitchell barely begins to explore: how landscape exceeds elite representations, and is materially remade as a foundation for many kinds of politics.

One of the most celebrated geographies of the last two decades, Ruth Wilson Gilmore's *Golden Gulag*, persuasively traced the political economy driving the explosion of California's mass incarceration, centered in the San Joaquin Valley. Beginning in the 1980s, on the former banks of the disappeared Tulare Lake, Gilmore argues that landowners and developers in towns like Corcoran turned surplus land and capital–no longer profitable enough for cotton or dairies–into the hotbed of a prison construction boom. As she shows, the transformation of fields to cell blocks was a wellspring of riches for the developers. But more than that, Gilmore argued carceral development was a means by state and allied capital to restructure politics, managing California's Black and poor surplus labor with cages, "premature death", or their threat.

While Gilmore evocatively studies resistance to incarceration from mothers and comrades of the imprisoned in distant cities, the potential of labor resistance at the site of prison building is a stone left unturned. Gilmore's book makes a crucial contribution by showing how land–its surplus and transformation from farm to prison yard–was an essential component for making carceral power.

Geographies of the San Joaquin showed its claypan to be a deep well for returns to landowners and the destitution of the working poor, whether through transformation into vineyard, real estate, or cages. Beyond the state's "grid" conception of San Joaquin environmental justice, these geographies of the "well" made crucial steps to show how and why such injustice was made, in great part, in a quest for profit. Yet the canonical geographers of the well tended to imply the inevitability and totality of capitalist rule, and the futility or narrow redistributive goals of resistance.

Like the mainstream of metropolitan Marxist geography since the 1970s, typified by David Harvey's work, the overwhelming focus of the San Joaquin canon has been on the financial predations and repressive strategies of capitalists.[41] The machinations of capital

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[40] Mitchell, 1996, p. 92.

[41] Harvey's work on capitalist strategies have been especially influential–often deemed the world's most cited geographies because of their ambitious breadth, including economic theory tomes like *Limits to Capital*, accounts of global politics like *A Brief History of Neoliberalism*, and breakdowns of urban development like in *Social Justice and the City*. In

are essential for study. But geography has limited lessons to offer countervailing political strategies without deeply learning from the efforts of working and oppressed people to remake our world.

Despite its reputation as the planet's most altered landscape, the formative labor of reconstructing ecology–with only modest exceptions–is left out of the canonical geographies of the San Joaquin. That transformative work is instead subsumed into the landscape itself as a backdrop; a platform for the well, on which farmhands and financiers throw punches over their take. As Gilmore, Igler, Walker, and Mitchell began to ask, a standing question is how power–to support such lush profits and fierce inequity–could be made and challenged in the material of the land.

C. *A fulcrum of power*

> i came looking for aztlán
> but couldn't find it
> it had been hidden with names
> like fresno   parlier   earlimart
>
> i came asking questions of my family
> but my family could only remember
> how the last paycheck
> was swallowed mysteriously
> by the valley's hot air
> –from Andres Montoya, "in search of aztlán"[42]

The epic re-engineering of the San Joaquin was not a coincidence with its notoriously entrenched landowner rule, its polluted air, or how, in Montoya's words, paychecks dissolved into both.

Beyond a grid of harms or a well for profits, geography could show the landscape as a *fulcrum*: how ecological remaking can restructure the terms of political formation and power. A fulcrum is the point at which a lever pivots; the point of a triangle on which a see-saw swings. In a literal sense, a fulcrum is the space on which power turns. Crucially, a fulcrum is not unidirectional, simply a tool of domination from above. While a fulcrum lends mechanical advantage to some angles, it can be leveraged from any side.

Chapter 4, I expand on this critical discussion of the limits to Harvey and related geographies that begin and largely end with capitalist strategies.

[42] Montoya, 1999. *Aztlán* holds deep double meaning: in Aztec-Mexica cultural tradition, it means their sacred place of ancestral origin; for many in the Chicano movement since the 1960s, it is used to name the regions of Mexico seized by the US, including California, as a potentially reclaimed homeland beneath their feet.

Building here on Gramsci, Clyde Woods, Huber, and Gilmore, I aim to clarify how landscape can be a fulcrum to many ends, lending a form of power I call "environmental leverage". Offering a step beyond both a liberal concept of environmental justice and sociology's understanding of structural and associational leverages, I hope to sharpen a geographic method that can help liberatory movements reconstruct relationships with land to build power.

I define environmental leverage as how people use their relationship with landscape for power. The fulcrum is the landscape itself, and how it can be transformed to reshape those relationships and the possibilities of environmental leverage. Both ruling and oppressed groups of people can seize and wield this leverage, to many ends.

Power itself needs a definition here. Like the lineage of geographers I follow below, I start from Antonio Gramsci's understanding of political power, itself a development on Marx. For Gramsci, power is fundamentally a collective capacity; how some groups and their alliances can influence or control others. That means how groups and alliances form is paramount to what kind of power they can build. Gramsci, observing Italy and the United States in the first third of the 1900s, argued political groups tended to form around class–a shared relationship to the means of production, like that of Fiat workers, merchants, or landowners. But class alone was seldom enough. Shared cultural ties and shared experience–especially in prior struggles–were key to groups forming a collective identity, ideas, and action. Political formations were frequently loose and shifting, and so too was any power they achieved.

Gramsci's most famous concept of power, "hegemony", meant the rule of a leading alliance over the "passivity of the majority", established through coercion, consent, and resignation.[43] But though many groups might seek this kind of power, Gramsci emphasized hegemony was only ever won partially and impermanently. As Gilmore aptly put it, there are always "productive breaks" in rule, created by the ever-shifting "mix of people, histories, political and economic forces, and landscapes".[44] No power is permanent.

Landscapes were rarely clear forces in Gramsci's account of power. As John Bellamy Foster observed, like many Western Marxists, Gramsci could often "neglect… the coevolution of human beings and nature".[45] But we should note Gramsci's loamy analytical terms, strangely unmentioned by scholars to date, that hegemony in civil society forms "trenches" and "earthworks" behind the state, crafting a "terrain" of hegemony.[46] Politics and ideas did not float in ether, but were always grounded by the "absolute… earthliness of

[43] Gramsci, 1971, p. 183. Instead of resignation, this translation of Gramsci uses the term "passivity", as well as "social disintegration", which guided this dissertation's emphasis on atomization and disorganization as key means of hegemony.
[44] Gilmore, "Forgotten Places and the Seeds of Grassroots Planning", p. 31.
[45] Foster, 2000, p. 244.
[46] Gramsci, p. 238.

thought".[47] Gramsci's metaphors convey a sense of the material, ecological dimensions of power. Where authority is dug in, it's dug in the land.

Geographers drawing on Gramsci have sharpened a sense of how landscape can be a fulcrum for power. Like none before him, Clyde Woods' geographies of the US South showed the role of ecological transformation in forming the region's unstable but enduring racial capitalist regime. In my read, Woods keenly argued that epic works of irrigation, flood control, housing segregation, and railroads established a racialized order of ownership and labor on which the Mississippi Delta's "plantation bloc" depended for their goal: "control over resources and over the ideological and distributive institutions governing their allocation".[48]

Yet that dependence on a certain ecological order made the power of landowners and bankers deeply vulnerable. Unruly hurricanes, floods, riots, and workers could destabilize the landed foundations on which the plantation bloc rested. In Woods' account, it was murderous attempts by plantation owners to maintain control, in the ruin of a 1919 flood, that "radicalized an entire generation" of Black survivors to believe "the entire plantation system had to be immediately dismantled".[49] Landscape had been a fulcrum to establish plantation bloc power, but it could turn both ways. Either through such disruptive revelations or through a smallholder and cooperative agriculture, Woods' strategies for the liberation of Black and multiracial working classes were often rooted in transformations of the land.

A complementary argument about landscape and hegemony comes from geographer Matthew Huber, particularly *Lifeblood*'s account of how oil-dependent infrastructure and housing reshaped US politics. Against a focus in much political ecology work on visibly "naturalized spaces" of "nature-based engagement", like exploited forests or reefs, Huber argues more study is needed on "denaturalized geographies of nature-society relations–geographies constructed as highly unnatural and dominated by large scale technologies".[50] To that end, Huber argues that capitalist development of fossil fuels in the US was a partly-conscious project to build a certain hegemony into the landscape. By privatizing mobility and atomizing housing in the suburban landscape, capitalist developers co-opted working class desires for a sense of independent freedom, while forming a material basis for the neoliberal subjectivity of competitive individuals and families.

To challenge that hegemony, Huber later argued, a working-class ecosocialist movement is needed, rallied around bounties for working people and sustainable ecosystems alike, by bringing immensely productive capitalist systems under public and worker control. Huber contrasts this strategy to what he deems the dominant approach of

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[47] Gramsci, p. 465.
[48] Woods, 1997, p. 26.
[49] Woods, p. 118.
[50] Huber, 2013, p. xviii.

professional-class environmentalists for a century and ongoing, who in his view generally romanticize a bucolic past to push an austere localism.[51] Through state regulation but continued private ownership, this affluent green lobby narrowly aimed to hike prices or block access to commodities for which working people have little present choice but to depend. Meanwhile, environmental justice activists had vital goals, he argued, but had been derailed from mass movement building both by their *a priori* focus on the most victimized as political agents, and a resulting *de facto* leadership by nonprofit professionals.

Instead, Huber argues a working class ecological movement will likely find its start in labor unions and activist groups for "the decommodification of basic needs" (such as for public healthcare or social housing).[52] He sees these incipient forces, especially major industrial and care sector unions, as having the roots, numbers, disruptive capacity, and political potential to build the first steps of ecosocialist power. But as Huber readily acknowledges, examples of this kind of movement are fairly sparse, and their success rarer still. As Huber implies in his case for utility workers as a “strategic sector”, especially in the concentrated workplaces of nuclear or fossil power plants, then where and how these movements arise appears to hinge on specific landscapes.[53] If left-labor advances for the climate have been rare, there is use in looking generously for less clear-cut insurgencies, from which sparks and support might spread.

A useful counterpart to Huber is offered by Ruth Wilson Gilmore's essay, "Forgotten Places and the Seeds of Grassroots Planning", a 2008 followup to *Golden Gulag*. Seeking to contribute to movement strategies against mass incarceration, Gilmore recounts the experience of Joining Forces, a San Joaquin Valley organizing conference that sought to connect activists fighting construction of new prisons. Organizers built movement connections across "disparate places" by "following the spatial patterns laid out by United Farm Workers campaigns and emergency relief, by environmental justice cases", among largely Chicano immigrant "grassroots activists in small towns". Gilmore argues these activists were more ready able to form shared politics by collectively being "keenly aware of what they have to lose: they have endured Jim Crow, Japanese American internment, farm fascism, NAFTA. Their marginality is not simply metaphorical but rather a feature of a spatial dilemma. Their consciousness is a product of vulnerability in space coupled with unavoidable and constant movement through space".[54]

The San Joaquin's landscape, shaped by enforced hostility to migrant settlement and worker power, had forged literal margins: often, right *there* was the potential of shared, insurgent politics. Beyond Huber's pessimism about environmental justice struggles, Gilmore observes that these–despite nonprofits' significant roles–were right alongside

[51] Huber, 2022, p. 38-39.
[52] Huber, 2019.
[53] Huber, 2022, Ch. 6.
[54] Gilmore, 43.

union ties as the best available prior links from which Latino political formation and anti-incarceration movements could be made. In a society of intense atomization, sometimes nonprofits are a rare joiner for vital links among working and oppressed people, if on limited and insufficient terms.[55] If not the crux of strategy, neither can they be dismissed as a whole.

In Gilmore's telling, the movements assembled from the San Joaquin margins hinged their strategy on wielding leverage in the landscape: stopping construction of new prisons with permit battles, disruptive direct actions, or by compelling municipal government allies to cut off water access on which proposed prisons would depend. By turning dry land to their advantage, activists stopped incarceration before space for it could be built.[56] This is environmental leverage, if not by name.

Unaddressed in Gilmore's account was what potential might loom among contemporary labor activism, especially construction workers, to challenge prison building. Despite the hands-on role of labor in prison development, its possible leverage via work stoppages, and how the region's majority Latinx construction workers might share experiences or ties with the migrant margins, Gilmore does not mention efforts or weigh prospects to build a politics of labor against mass incarceration. Combining Woods' hegemony through landscape transformation, Gilmore's environmental leverage, and Huber's labor leverage points to a potent strategy for liberatory movements.

History demonstrates the immense leverage construction workers can wield towards making a landscape of their choosing.[57] For a decade, Australian building laborers used strikes and pickets to stop construction that would destroy forests, grasslands, or working-class housing–often helping gain permanent protections for those sites.[58] Brazilian construction worker strikes at the Belo Monte dam in the Amazon, although principally

[55] Few have offered a more searing criticism of the "nonprofit industrial complex" than Gilmore, with her essay "In the Shadow of the Shadow State" (2017) skewering the managerial, often counter-revolutionary reformism of foundations and most of their fundees. That makes her careful case for the rare but useful connecting role of some nonprofits, particularly environmental justice and anti-incarceration organizations, all the more compelling–if still knowingly limited.

[56] Stopping construction of new prisons at a given site is no guarantee to stop the incarceration of all those who might have been held there, and Gilmore doesn't claim otherwise. Different prisons could be built elsewhere, or existing cells simply overcrowded to horrific extremes, as the California Department of Corrections and Rehabilitation has often done ruthlessly. However, given Gilmore's case in *Golden Gulag* that expanded prison development had a mutual, causal relationship with expanded sentencing in California, this movement strategy to block prison construction would appear to wield a degree of environmental leverage against the expansion of carceral politics as a whole.

[57] More extensive background on the ill repute of construction unions' environmental politics is provided in Ch. 4.

[58] Burgmann & Burgmann, 2017.

motivated to improve pay and brutal living conditions, were celebrated by indigenous and environmental activists as acts of solidarity that bought needed time for efforts to legally block the project.[59]

A lever between landscape and strike power appears even stronger given how it has been wielded both ways. Geographer Andreas Malm argues the 19th century transition to fossil fuels in England–a formative moment for the global climate crisis–lay in how coal provided capitalists mobility to escape hotbeds of strikes.[60] While hydropower was ostensibly cheaper than coal, it depended on specific riverside sites with apt topography. Those far-flung sites often had a locally-limited labor pool, providing both intergenerational experience and leverage to textile workers to organize and strike. Coal power instead allowed factory investors to transform landscapes of their choice, far from rivers and closer to desperate armies of reserve labor, crafting factory sites where workers would have less leverage. Capitalists used a spatial shift seeking similar ends in what Beverly Silver chronicled as the late 20th century relocation of manufacturing centers, from unionized, relatively militant cities of the global North to areas with more labor disorganization and repression.[61]

Together, these insights on the spatial and ecological dimensions of power call for an addition of "environmental leverage" to the two canonical forms of labor leverage in social science. In what is now often termed (and oversimplified) as the "power resources approach", Marxist sociologist Erik Olin Wright influentially proposed two essential dimensions of worker power in conflict with capital: structural leverage, based largely on capital's demand for specific worker skills in the labor market; and associational leverage, based on workers' breadth and depth of organization.[62] Developing this approach, Silver's empirical studies persuasively showed the pivotal role of these powers across global capitalist history, but largely reinforced the sense that such leverage springs up independent of place.[63]

Instead, landscape tends to shape leverage of all kinds. Where Wright described "structural" leverage, the structure is not in a void, like lines on a blank chart of supply and demand. "Associational" leverage likewise does not come together in a vacuum, simply a phone tree in the ether.

Leverage happens in space, in real specific landscapes. Both oppressed and oppressors can seek to transform or use their ties to land for advantage. This is environmental leverage; not wholly separable from structural or associational dimensions

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[59] Movimento dos Atingidos por Barragens, 2013.
[60] Malm, 2016.
[61] Silver, 2003. Based on a study of auto manufacturing, Silver argues capital relocation largely failed in its intent to avoid labor militancy altogether, generally only displacing labor conflict to new places.
[62] Wright, 2000.
[63] Silver, *ibid.*

of power, and thus all the less fit to be ignored. This is not only leverage for workers. In Table 2, I offer some potential forms of environmental leverage, and then explain them in greater detail to follow.

Forms of environmental leverage	**Examples of capitalist use**	**Examples of use by oppressed and working people**
Opening access	A highway to a mine; deregulation of pollution; an invasion for pillage	A land occupation for a collective farm; a mass border crossing
Blocking access	Fencing a common pasture; hiking electrical bills; a trade embargo	A picket line; a coal train blockade; a mass sit-in surrounding an arrest
Construction & transforming land	Building a border wall; an atomized suburb; a dam for corporate farm irrigation	Building an organizing center; public electrification; prescribed fire for forest health
Blocking construction	Austerity that prevents a clinic; policing that evicts an encampment	Strikes, blockades, or wielding state pressure to stop a pipeline
Claiming space for political formation	A gated country club; Davos; a corporate boardroom	A neighbor's porch; a break at work; a soapbox in the square

Table 2. Environmental leverage (some possible forms and uses)

Environmental leverage begins from the terms of relationships with ecological flows in space. Agriculture demands fresh water, careful hands, and topsoil; construction requires loose gravel, forged minerals, and stable earth in the right places; electric generation needs fossil seams or windy passes. Flows like these are reengineered by human labor and infrastructure to do new work, often pulled into new places. Marx said it was this "necessity of bringing a natural force under the control of society.. appropriating or subduing it on a large scale by the work of the human hand… that plays the most decisive role in the history of industry".[64]

Reengineered wholly or barely at all, these flows are set in space in ways that structure access, use, and thus leverage. For example, diffuse flows like solar radiation are harder to leverage with blockage. Flows with narrow pinch points are more readily blocked, like the Strait of Hormuz that bears all shipboard oil from the Persian Gulf, or a lone entry gate at a Ford plant, easily picketed to block the whole.

[64] Marx, *Capital*, Vol I, 1867 (1977), p. 649.

Environmental leverage is always conditioned on knowledge made from relationships with the landscape. A Diné shepherd's familiarity with watering holes, an investor's data on an oil reservoir, or a pile driver's sense of the bedrock shapes how they can work and relate with the land. That knowledge can come from cultural practices, recreation, oral history, and much else beyond work in a capitalist context. How ecological knowledge is shared can be a huge part of the associational side of environmental leverage; of cultural traditions, organization building, and political formation.

Many capitalist strategies for landscape, like geographers of the San Joaquin well show, do their best to treat the landscape as passive, raw material to be gutted or remade for profit. But as Woods' Delta geographies argued, ecological flows are anything but wholly passive or predictable. Especially in a mounting climate crisis, shifting ecosystems can upend the leverage previously built there. For example, drought and over-irrigated salination upended San Joaquin agroindustry, helping a solar fulcrum emerge for unions to leverage. The fulcrum shifts by more than human design.

This idea of environmental leverage does not presume the land is a passive fixture to be used by boundless human choices. Relationships of caring stewardship, fostering non-human life and its unpredictably creative complexity, are often the basis of leverage. Examples might be found in Miwok prescribed fires, agroecology in the occupied lands of the Movimento Sem Terra, or wetland restoration to dampen the charge of Louisiana hurricanes. Each of these forms of care for land are done to equip a certain kind of life. In this way, environmental leverage often depends on "hybrid labor", in the term of political theorist Alyssa Battistoni, that combines much more than human will and craft.[65] The non-human dimensions of landscape aren't passive resources to be used for leverage. They are more like "co-laborers", with their own initiative and ends; able to foster rebel life, like fast-growing Tulare reeds that hid Chumash and Yokuts homes, and to rumble would-be hegemons, like Delta floods did to planters. The more one leans on environmental leverage, the more that environment can leverage you back.

How does this relate to the classic terms of leverage? For Wright, an essential part of structural leverage was labor supply relative to demand. That "relative" depends on terms of ecology, access, and construction: on how many potential workers are already nearby enough to be hired, the length of travel to an Andean mine, or the will of prospective farmhands to pick cotton in the Arizona heat. This environmental leverage can be restructured by design, with a highway, a barricade, air conditioning, subsidized housing; that makes the transformation of landscape a fulcrum on which structural leverage hinges.

Associational leverage–building organization and forming collective politics–also depends on flows in space: where people live, work, congregate, learn, and express themselves. Bosses claim space in the city hall and the golf course from which to coordinate their power, while often repressing public protest, raiding movement offices, or

[65] Battistoni, 2017.

developing atomized housing and transit.[66] Yet many working and oppressed people ingeniously find space from which to organize and build their politics; in the carpool to work or the bar after, in the park between housing projects, in conversations as kids are handed off to family or school.

A prime axis of environmental leverage for association is spatial dispersal versus concentration. As Marx and Engels observed in the *Manifesto*; "with the development of industry, the proletariat not only increases in number; it becomes concentrated in greater masses, its strength grows, and it feels that strength more."[67] This effect of concentration is not only on a factory floor, but in life beyond: the difference between knowing and assembling neighbors in *Lifeblood*'s white-picket suburbs, versus the tight-knit working-class apartments of rebellious Santiago or Harlem.[68] Where the life-making work of social reproduction can be made shared and interdependent–on childcare downstairs, a public clinic, a night's rest requiring quiet upstairs–all the better to build associations from which leverage could be made. That's a reason that Red Vienna built common childcare, laundries, and community meeting rooms in its social housing; to make grounds for working-class life and politics, inseparable.[69]

Landscape transformation has a tactile role in hegemony because what is built stays there. That redefines relationships to an environment, at least for a time. Physical presence reshapes a sense of political possibility. To forge resignation, what could be more direct than a border wall keeping you out, or a conveyor belt that takes your handiwork into the boss's depot? The tangible space alone does not guarantee a certain politics, but provides a gravity pulling politics a certain way: a fortress tends to make a rebellion feel less viable. Standing on a Bakersfield oil field, pitted and fuming, hopes to transition to a solar power plant stare sobering questions in the face: what becomes of all this sunk investment, all those working here, and how would one clean it up? Hegemony, in Gramsci's metaphors, rests on "trenches" and "earthworks"--to build a certain kind of society into the landscape, so that others seem less possible.

This is just a start at understanding the landscape as a many-headed fulcrum, rife with possible points of leverage to be wielded and transformed. Adding to ways of seeing a landscape as a grid of harms or the well of profits, the fulcrum can better understand the roots of power–the better to pull them up.

The following chapters will aim to deeply trace the environmental leverage sought and won in the Valley's recent solar and rail boom. To situate these land politics, this

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[66] This example about the hegemonic role of atomized housing and transit draws on Huber's *Lifeblood*.

[67] Marx & Engels, 2002 (1848).

[68] For the importance of militant neighborhood networks in Santiago, Chile: Winn, *Weavers of Revolution*; in Harlem and many other US cities: Mohandesi & Teitelmann, "Without Reserves", in Bhattacharya, *Social Reproduction Theory*.

[69] Duma & Lichtenberg, 2017.

chapter will close with a new telling of the San Joaquin, beyond the classic tale of an inexorable, profitable fall from Eden with which the chapter opened. In the epic transformation of the San Joaquin, environmental leverage was consciously wrought and fought over from many sides.

D. *An unruly retelling*

> "Nowadays this flattened stark land is etched by railway crossings and a remarkable symmetry of river channels, as if God has impressed a circuitry down onto the earth and given it reason. So we have the low hill civilizations of Pixley and Porterville, the lights of Buttonwillow and Tulare.
>
> I've read... about the waves of immigrants who came here with their music of languages—Tagalog, Spanish, Italian, Chinese, and Japanese—to cut open the ditches for irrigation, to turn swamps into fruitland, or to mine asphalt in the intense heat, as my maternal grandfather did, working practically naked, coated in that oil they used for flux for what they were mining near the spur line of Asphalto. Just another place named after a mineral on the map of the world. How many are there? A greater number, I suspect, than named for royalty."
>
> -Anna, in Michael Ondaatje, *Divisadero*[70]

Tulare Lake's vast wetlands of thick, overhead reeds were not simply wilds; in their midst were towns of Yokuts floating homes made on woven tules.[71] That relationship to the wetlands became a backbone of native rebellion under Mexican rule, when missionaries termed "los tulares" to be "the refuge of wicked men", believing it to be the operating base of Chumash warriors after an 1824 revolt.[72] This was not the only way a relationship with the land lent leverage to the San Joaquin's oppressed and working people, in the early years of colonial bloodshed. In the decades after the 1848 US takeover, amid vast dispossession and expulsion of most Mexican-Californians, *vaquero* ranchhands found they could use their intimate knowledge of landscape, and their familiarity with Spanish place names that signified ecological features, to land a premium on wages and job security.[73]

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[70] Ondaatje, 2007.
[71] On Yokuts society during the 19th century, Mayfield (1993) remains the most detailed primary account, albeit questionable given its romantic stylizations; its telling of Yokuts floating tule homes is reputable enough to used as a reference by the eminent contemporary historian of indigenous California, Madley (2016).
[72] The quoted missionary appraisal of "los tulares" as a native rebel refuge is found in Geiger, 1970.
[73] Igler, p. 125.

Just as soon as it began, re-engineering the landscape was a front of conflict. A developer consortium's canal to drain Tulare Lake and the San Joaquin's vast wetlands was funded by state grants as early as 1857, with hopes of "rendering them among the most valuable lands in all the world" for wheat, dairies, and cotton able to flow down the canal to San Francisco.[74] Yet "the people of Tulare County", largely poor lakeshore settlers at the time, mounted "bitter opposition" that led the next legislature to repeal the grant.[75]

More furious still was the fight of a "Grand League" of homesteaders against the railroad monopolies, which voraciously plotted tracks as means to legally expropriate and develop miles of surrounding lands. At Mussel Slough between Tulare Lake and Fresno, when police attempted to evict settlers for the Southern Pacific Railroad's claim in 1880, a gunfight left two marshals and five settlers dead. When the surviving settler gunfighters were released after five months in jail, residents of nearby Hanford threw them a grateful feast with three thousand in attendance–over ten times the population of the town.[76] The stakes of landed power were mass politics of the day, edging on insurrection.

The next phase of San Joaquin transformation–the reengineering of water–began as a race between different classes of landowners. In 1873, about thirty landowners of "limited means" formed the People's Ditch Company, for "transforming their desert acres into homes of future productiveness".[77] Downstream were larger landholders, who quickly "tired of upstream irrigators controlling their fate". Thus was a Pennsylvania oil driller brought out in 1894, to dig the first deepwater well for groundwater irrigation in the US, just twenty miles south of Fresno.[78]

Witnessing the transformative power of irrigation, capital from as far as England soon flowed in, pressing a well-funded advantage over smallholders' ditches to gobble up riverflow and turn vast tracts into agricultural real estate.[79] Before long, pre- and post-irrigation land barons fought each other bruising, decade long legal fights to claim water rights, flexing power that left smallholders even further from the tap.[80] Yet smallholder settlers fought for their own share of the snowmelt, even banding together in armed occupations to open headgates and free water into their older, plebeian canals.

[74] Cronise, 1868.
[75] Thompson, 1892.
[76] *ibid.*
[77] Menefee & Dodge, 1913.
[78] Interview with Terry Ommen, eminent folk historian of the Tulare area, Jun. 13, 2019.
[79] Henderson, *California & the Fictions of Capital.*
[80] The history of these intra-land baron fights, particularly the landmark *Lux v. Haggin* case at the California Supreme Court, is best recounted in Igler, 2005.

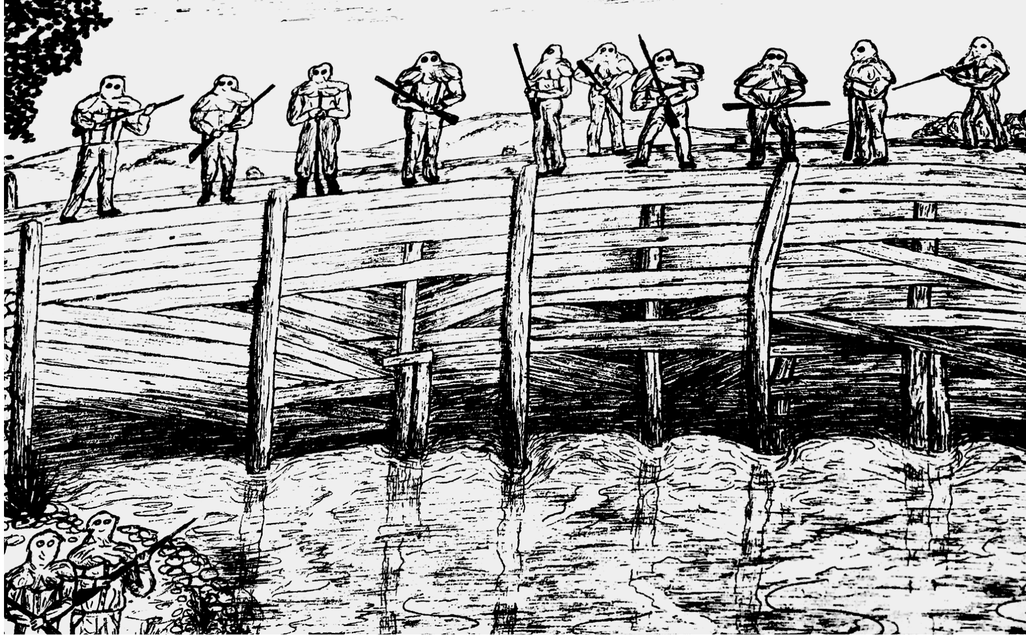

Figure 6. Kings River canal, east of Fresno, May 1887. "More than two dozen masked, shotgun-wielding farmers lined up across the Fowler Switch headgate, ignoring court orders as they seized this and other headgates to keep water flowing in order to save their crops." (McFarland, 1980)

As yeoman farmers were increasingly dried out, the magnates of San Joaquin's long 20th century boom in agroindustry and land transformation thirsted for labor. Landowners wooed and contracted laborers from southern Europe, Latin America, and East Asia. In turn, developers found a novel opportunity for leveraging the landscape via housing and loans for the newcomers. Racial lines were wrought through land ownership and financing; while Asian immigrants were legally banned from land acquisitions for nearly the first half of the twentieth century, some Armenian, Italian, and Portuguese immigrants wooed loans to become major landholders.[81] Many of these land developers' descendants persist as parts of the region's ruling dynasties today, in what a Fresno mayor's aide described curtly as "multi-generational clans with a lot of power".[82]

Where they had once subdivided orchard plots into yeoman mortgages, by the mid-20th century developers increasingly turned their San Joaquin farmland into vast suburban housing tracts, offering private family estates at a wide range of incomes. In so doing, developers frequently built divisions of race and class starkly into the landscape,

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[81] Henderson (1999) and Igler (2005) evidence this history of racial formation through land and finance, though do not describe it in those terms.
[82] Kim Costa, Jun. 5, 2019.

either in explicit segregation with deed restrictions, or simply by their private planning of where rich and poor neighborhoods would be made.[83]

Housing developers built sprawling Fresno, the Valley's largest city, in half-mile square block tracts of homes and commercial strips. The state would one day see this grid as its blocks of environmental harms in happenstance, but developers designed and built this street grid of class and race. Fresno's city planners would later use this gridded map as a way to mark lines of advancing blight, like a flood to be stymied, largely by wooing new developers.

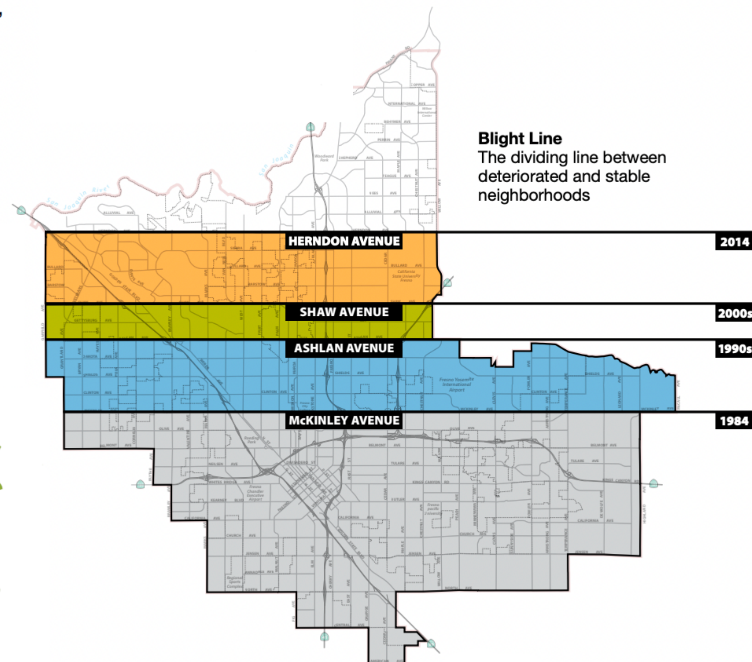

Figure 7: Fresno's grid and its creeping "blight" (shaded), in city government's eyes. (City of Fresno, 2016)

From the mid-20th century to the present, San Joaquin cities boomed as landing hubs for new immigrants seeking affordable enclaves, but with dim prospects for power. In 1997, Fresno became a national emblem for failed immigrant integration after Ann Fadiman's nonfiction bestseller *The Spirit Catches You and You Fall Down* described the lethal failures of its austere healthcare and social services for a Hmong refugee family.[84] Reflecting stark migrant persecution and austerity in the region, a statewide study in 2012 deemed Fresno and the San Joaquin Valley dead last in cumulative score of immigrant integration across

[83] Among the sharpest chronicles of Fresno's segregated development are Thebault (2018) and Zuk (2013).
[84] Fadiman, 1997.

California, lagging particularly on "civic engagement… the ability of immigrants to be a part of the civic and electoral fabric of the region".[85]

The developer bloc built vicious exclusion and isolation into the landscape not only through sprawling tracts, but in the austere public budgets that developer allies in office sent to poor blocks of the San Joaquin.[86] Austerity, of course, did not touch largesse for notoriously racialized policing and jailing regimes in the region, which often relied on targeting arrests by district.[87] The Valley's air pollution as a whole ranked routinely worst in the nation, but worse still for poor neighborhoods built next to highways, dusty fields, trucking hubs, and processing plants.[88] Extreme levels of fertilizer, pesticide, and heavy metal pollution concentrated in the wells to which farmhand barrios and exurbs were abandoned to drink, denied pipelines to treated water networks.[89]

Developers and their allies repressed working-class organizing both in the workplace–with union-busting infamous in its violence, and legal constraints that became models for the nation–and with the segregated austerity that atomized reproductive labor out of decimated public institutions and into isolated, gendered, often desperate work in households. On the level of personal and familial survival, the San Joaquin's crises of social reproduction were plainly written in alarming rates of chronic illness, educational abandonment, and incarceration for working class people, especially those of color.[90] The remaining question was whether these amounted to a crisis for the reproduction of the San Joaquin's social order as a whole, either by whittling down to an inadequate workforce or by fostering an open rebellion against its rulers.

In sum, dynasties of land owners and developers wrought power from transforming the San Joaquin landscape, then wielded it through the state to more deeply entrench working class majorities of color in terrains of despair and alienation.

Yet even in those margins, the San Joaquin's oppressed working classes repeatedly found creative means to turn the landscape's fulcrum to their advantage. The San Joaquin's

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[85] Pastor *et al.*, 2012.
[86] The segregation of the Valley landscapes through public budgets–with grand parks for a few wealthy heights, coffers starved by business incentive tax breaks, and not even sidewalks, public water, or classroom AC for many poor, largely Latino neighborhoods–was a recurring grievance voiced in my interviews with labor, electoral, and environmental justice activists in Bakersfield, Fresno, Huron, Madera, and Sanger. An example, from Madera mayoral candidate (and soon to be winner) Santos Garcia, Oct. 23, 2020: "There were no streetlights until election year. Then the city budgeted 150 streetlights, and gave only 20 to the east side, the rest to the west and north side, which are more wealthy. The resources are spent on (that) side of town."
[87] Thebault, 2018.
[88] American Lung Association, 2022; CalEPA, 2022.
[89] Balasz *et al.*, 2011; Vaughan & Vera, 2020.
[90] CalEnviroScreen compiles these health, education, and unemployment rates, alongside poverty, from state data sources.

itinerant farmworkers, from the start of the 20th century through the United Farm Workers' campaigns of the 1960s, turned their packed and temporary housing camps into spaces for organizing union drives, strikes, cultural expression, and mutual support.[91] On the unincorporated fringes of Fresno County, in 2020, it was a crowded mobile home park and its hundred members of an extended indigenous Oaxacan immigrant family who became the epicenter of a landmark campaign for rent control.[92]

Figure . Shady Lakes Mobile Home Park, seedbed of Oaxaqueño militancy. (Amaro, 2020)

These are just glimpses of how fulcrums of power in the landscape could be leveraged many ways, including by the San Joaquin's oppressed right back at the landowners. The following chapters of this dissertation are dedicated to deeply tracing how environmental leverage, in construction sites and fights over landscape transformation in the municipal state, became pivotal in Fresno and Madera's political breakthroughs of the late 2010s.

Understanding the landscape as a fulcrum offers a way to recast state, scholarly, and movement ways of seeing, to better offer tools of leverage for oppressed and working people. The conventional state and nonprofit view of environmental justice tends to reduce landscape to a two-dimensional, present-tense grid of generalized harms and population averages in blocks; instead, the fulcrum view seeks the tangled fight for power that made those environments and peoples as they are. The Marxist geography canon often saw landscape as a well for profits, forging this view in studies of the San Joaquin and its land

[91] On early 20th century farmworker organizing: Mitchell, 1996. On the United Farm Workers: Bardacke, 2011.
[92] Vaughan, 2021.

barons. While deeply insightful on strategies to eke wealth from the tilth, and often informative on labor battles to retake a share, the well mode could obscure the role of landscape in making hegemony beyond profit margins, along with the roots and strategies of movements beyond the fight over surplus value. Environmental leverage, and the fulcrum it relies on, offers an approach to understanding and building power with landscapes, to many ends. It's not simpler; but means to break entrenched hegemony rarely will be.

The San Joaquin has been a crucible for modes of seeing landscape precisely because of its profound reengineering: a standout and a testing ground for an utterly transformed globe. With that transformation, the Valley's infamous elite and its stirring rebels were no coincidence. Their power was wrought by the fulcrum in the clay.

Chapter 3

Solar Leverage

Figure 1. Building Aquamarine Solar. (Author, 2021)

On the valley floor, dawn broke over a hundred and fifty construction workers stretching hamstrings, limbering up to build what might become the largest solar power plant on the planet. Bunched by trade, union foremen and their crews talked out the tasks of the coming day: laborers and operating engineers would drive beams into the hard ground; ironworkers would fasten thousands of yards of aluminum racks, soon to carry miles of photovoltaic panels and tilt them to the sun.

Two centuries ago, the land under their boots was the shore of Tulare Lake, long disappeared into vast irrigated cotton fields. In a fierce last decade of drought, those fields dried up too. Soon, silicon would shade the ground and farm the sky. This was the Aquamarine branch of the mammoth Westlands Solar Park, set to lace across nearly 30,000 acres of the parched San Joaquin Valley westside, and assembled with union labor nearly down to the last bolt.

With its union labor, the San Joaquin boom in solar and high speed rail stands nearly alone. Even as renewable power plants grew to generate a fifth of all electricity in the United States by 2020, 94% of solar and wind energy construction workers were non-union nationwide.[1] In the sliver of union-built projects, few were built on terrain where unions had long been as ferociously repressed as the San Joaquin Valley. This soil from Fresno to Bakersfield was dark with a century of landowner violence against farmworker unionists, and home of the first city bans on public construction union requirements in the nation.[2] Despite those odds, in the 2010s, over five thousand union jobs arrived on high speed rail and solar construction, especially in the four counties around Fresno.[3] In turn, long-besieged building trade unions long under siege suddenly swelled in membership. Ironworkers doubled their active ranks in just a few years.

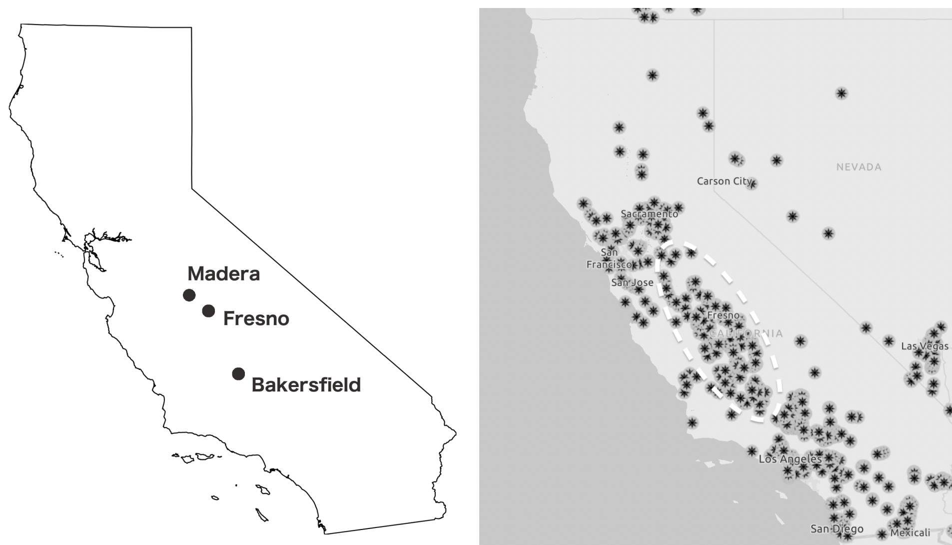

Figure 2: Parallel maps of California: the case cities, and San Joaquin solar power plants (dots within the dashed ellipse). (US EIA, 2022)

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[1] Foster, 2020.
[2] Three major waves of landowner repression of San Joaquin Valley farmworker organizing have been deeply chronicled. The first decades of the 20th century are told in Don Mitchell's *Lie of the Land* (1996). The massive cotton strike of 1934, arguably the largest work stoppage of the decade nationally, and its deadly attempted suppression are told in Justin Akers Chacón's *Radicals in the Barrio* (2018). The United Farm Workers organizing drives of the 1960s are carefully recounted in Frank Bardacke's *Trampling on the Vintage* (2011). A brief history of Fresno's municipal bans on union labor requirements: Brown, 2021.
[3] I refer here to five thousand jobs in the sense of equivalent "annual full time employment", following a state and labor research convention. Few solar jobs lasted a whole year each for any given worker, meaning each "job" in this count is usually a composite across multiple workers and jobsites. Though instructive on an overall trend, this kind of job count can miss the challenges of instability and transience for construction workers. Solar and rail work, as I show in the chapter, were welcomed by workers for providing much steadier, longer-term work than most other jobsites.

This chapter seeks to explain how this solar and rail boom reshaped construction workers' power in their workplace and union, while Chapter 4 focuses on their power and alliances *outside* the workplace. In each, I compare two Valley regions, surrounding the hubs of Fresno and Bakersfield. At the close of the decade of booming work, I interviewed construction workers and union leaders at union training centers, hiring halls, and jobsites, backed up with employment figures and construction archives, to answer a set of questions about power and landscape.

Why did this green jobs boom land in the San Joaquin, and how was it so uniquely unionized here, of all places? What did workers themselves find to be the virtues or hardships of these jobs? Above all, nearly a decade in, how did the rising tide of union solar and high speed rail change the *power* of construction workers on the jobsite, in their contracts, and in their unions? As I show in the next section, these are questions with international stakes.

I argue construction unions built environmental leverage through a two-sided reproductive fix: to solar & rail capital, offering the reproduction of the workforce it urgently needed to transform the landscape; while to prospective state and community allies, offering a pathway into that workforce for long-excluded, largely immigrant laborers. This was based on the long-established control of building trades over workforce reproduction, with in-house operations to run the hiring, training, dispatch, and jobsite coordination of construction workers. Using their reproductive fix as a case to unionize solar and rail contracts, Fresno construction unions grew starkly in active membership, and often transitioned to become majority Latino in both membership and leadership. After establishing a foothold, unions continued to use these points of leverage to press employers and the state into raising wages, ending job tiers, and expanding union accords for coming projects, setting up a virtuous cycle of leverage to come.

These gains were not without limits. While in Fresno, solar and rail jobs brought an overall union membership boom, in Bakersfield, a drop in oil and other construction jobs alongside even larger solar growth blunted union leverage. In both cases, union members sometimes faced challenging limits to steering their unions, while leaders generally deferred to employers' tiered terms and plans for what would be built. But in the context of global disappointments for worker power in clean energy, the San Joaquin union solar & rail boom held milestones of leverage won.

A. A world of promised work

For at least two decades, plans for "green jobs" by the millions have been a fixture across the neoliberal center to social-democratic edges of the political mainstream in the global North and parts of the South. In the US, the center's version was exemplified by Al Gore's 2000 pledges to "spur the creation of new jobs" with clean energy tax credits and

other gifts to the private sector.[4] Alexandria Ocasio-Cortez's 2018 Green New Deal bill put forward a social-democratic version, seeking to publicly invest trillions to "put millions to work in good-paying, union jobs".[5]

Taking different shades from Scotland to South Africa, what green job plans have consistently shared is a logic: imagining prospective jobs are the lure to win working class support for what must be done on climate.[6] In the argument of a US presidential advisor, for urgent climate action, green jobs were the material lure "that could win over a critical mass of U.S. citizens and inspire them to launch a crash program in conservation and renewable energy".[7] Meanwhile, green jobs would provide unions "a tremendous opportunity to both expand and diversify their ranks", launching a virtuous cycle that would turn labor into a potent lobby for further climate action.

For critics on the left, construction unions–commonly known as the building trades–generally seemed labor's least likely ally, hostile to any politics that might constrain their fossil fuel and real estate employers.[8] As leaders of the building trades opposed indigenous movements at Standing Rock or attacked a Green New Deal, pundits and academics often saw these "unions betraying the Left" as a lost cause.[9]

To accept that loss would be to give up on the construction workers themselves, who have profound potential to transform political economy and ecology on their terms. That leverage has been demonstrated from Australia to the remote Amazon, when construction worker strikes stymied luxury developments or dams they deemed socially or environmentally destructive.[10] Without those hands, investors were powerless to remake the world to their blueprint. The power to directly stop construction, until it met the demands of workers and social movements, could provide a fundamental environmental leverage for swift climate action.

With construction work pivotal to every built environment, its political potential has a vast scale. In the United States as of 2020, over 3.5 million people worked construction, more than ten times the national number of agricultural field workers.[11] The social roots and ties of these workers open political possibilities. Compared to any other sector in the US, construction had the single highest number of Latino men working–a solid majority of

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[4] Gore, 2000.
[5] Ocasio-Cortez, 2018.
[6] A range of non-US green jobs plans were sharply assessed by Chandrashekeran *et. al.* (2017) and Sweeney (2017); their logic critically evaluated by Knuth, 2018.
[7] Jones, 2009.
[8] Vachon, 2021.
[9] Loomis, 2017. In Sweeney (2017), the director of the NGO Trade Unions for Energy Democracy provides a more sympathetic, but still sharp critique of US building trades leadership for their persistent defense of fossil fuels.
[10] Burgmann & Burgmann, 2017; Movimiento dos Atingidos por Barragens, 2013.
[11] US Bureau of Labor Statistics, 2021.

the field-while construction managers were 90% white. As much as any sector, class and race fuse in a blunt hierarchy here, and not just in the US. From Dubai to London, construction work has depended profoundly on immigrant hands and minds.[12]

Yet social scientists have paid scant attention to construction workers or the making of their politics. Among the few major studies of construction labor, it's a habit to begin with how the sector "remains poorly understood" by academics; decades passed between the most recent two books of ethnography with construction workers, in 1986 and 2006.[13]

The metropolitan Marxist current of geography, exemplified by David Harvey and Neil Smith, has also largely avoided study of those who wrench together the built environment. In the words of Michelle Buckley, the labors of construction have been "largely overlooked as sites for research and theory" in these works.[14] Instead, she found an "overwhelming" focus on "what Harvey calls the secondary circuit of capital", or accumulation and power within "already-built fixed capital". Since that writing, the "infrastructural turn" arrived in geography and social sciences. Reviewing that turn, Kendra Strauss found "scholarship on infrastructure has had relatively little to say about labour".[15] Strauss argued deeper geographical work was needed on the racialized work of building infrastructure, especially in relation to "escalating debates about a Green New Deal or green transition (to what, for whom)?" This research attempts to answer that call.

The field of environmental labor studies, emerging over the past decade, has made its core task the study of the ecological politics of workers' organizations at work and beyond.[16] However, construction work has been barely studied in this field, and like by left punditry, instead is held up largely for its hostility to such alliances.[17] Due to largely non-union construction work on renewable energy to date, these scholars argue, building trades' economic interests have been rigidly tied to fossil energy developers, who are more often unionized. In parallel with the mainstream left's green jobs logic, environmental labor researchers claim that if the clean energy transition were unionized, the politics of construction labor could shift towards "a powerful pro-green political alliance".[18]

In practice, such a virtuous green jobs cycle has been elusive, because the jobs have shirked the numbers, unions, and qualities so grandly promised. By 2020, industry analysts estimated US renewable energy jobs numbered around 360,000–still less than a third of

[12] On migrant construction labor in Dubai: Buckley, 2012. In London: Datta & Brickell, 2009.
[13] The quote is from Silver, 1986; the most recent two ethnographic books on construction work are that one and Paap, 2006.
[14] Buckley, 2012.
[15] Strauss, 2019.
[16] Rathzel et. al., 2021.
[17] Vachon, 2021; Kojola, 2021.
[18] Vachon, 2021.

fossil fuel jobs.[19] At only 6% unionized, renewable energy jobs were even below the dismal union rates of the US workforce in general, which hovered around ten to twelve percent at the decade's end.[20]

This missed opportunity for union green jobs is especially galling because, in construction, union jobs boost pay over non-union jobs more than any other US industry: to the tune of a 49% increase, or $407 a week as of 2020.[21] For Latinx workers across all sectors, unions correlate to a particularly huge difference in pay; generally 40% greater than the boost for white workers from union to non-union jobs. A dearth of unions in the growing green construction sector may have meant more than missed income, but also a missed chance at breaking down the racial hierarchy of the industry.

The disappointment of green job promises did not escape the notice of labor researchers. As told by scholar Lara Skinner, "The vast majority of solar and wind work, although they're adding up quickly, are lower wage, lower quality jobs." The problem, in her assessment, lay with public clean energy policies for which the jobs are barely an afterthought: "A lot of the environmental movement approach is mandated emission reduction targets. I think those are really important, you have to be moving at the pace science demands. But I don't think those are enough to bring labor in, or to ensure equity."[22]

Even for public policies explicitly aimed at boosting green employment, a narrow focus on sheer job numbers has been a routine and dangerous failing. Nikki Luke diagnosed a "genealogy of all the failed green jobs programs in Atlanta", many of them funded by the 2009's federal stimulus bill. For Luke, "a root of the failure" lay in public subsidies that "just planned to create jobs", with little concern for their durability after subsidies ceased, or their qualities for workers themselves.[23] Unions, let alone a focus on building power for workers and movements to lead climate transitions on their terms, were simply out of mind in state practice.

California and its San Joaquin Valley could easily have followed this national trend of green jobs disappointments. Instead, a union jobs boom was wrought following the state's clean energy requirements since 2002 and its 2008 public investment in high-speed rail. In 2017, UC Berkeley Labor Center researchers reported that "(i)n California, the construction of renewable energy power plants has primarily been carried out under collective bargaining agreements," or in plainer terms, a union contract. For new apprentices in the unions of "electricians, iron-workers, and operators that have built most of the renewable energy power plants", the researchers found that the share of apprentices of color,

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[19] Foster, 2020.
[20] The unionization figure for renewable energy is from Foster, 2020; the general US rate from US Bureau of Labor Statistics, 2021.
[21] US BLS, 2021.
[22] Lara Skinner, Nov. 6, 2020.
[23] Nikki Luke, Sept. 17, 2020.

including Latinx workers, had reached higher than the state's workforce in general. [24] High-speed rail has been even more fully union-made. As a longtime leader for the Fresno-area Carpenters told me succinctly: "High-speed rail work means Carpenters, Pile Drivers, Ironworkers, Operators, Laborers, Electrical Workers, and basically 100% union."[25]

The San Joaquin Valley solar and rail boom calls for deeper study not only as a unionized outlier, but because existing research on these standout jobs has seldom asked construction workers' own perspectives on their conditions and power. The best labor scholarship on California's standout clean energy sector has documented or estimated the outcomes of state policy for job creation, along with wages and racial diversity in some of those jobs, but without ethnography or analysis of workers' power.[26]

Assessing the California boom through construction site perspectives and power is especially urgent because other states are preparing to follow its model. At the behest of campaigns funded by the national AFL-CIO union federation in Connecticut, Illinois, New York, and Rhode Island, from 2019 through 2021, state legislatures passed mandates for union labor or union-level wages on commercial wind and solar power plants.[27] In multiple cases, these states will publicly require the arrangement that was privately developed on many California projects: a "project labor agreement", or PLA, which guarantees certain working conditions and use of union or union-trained labor, but prohibits unions to strike for the duration of a project. If California's green jobs model is already a template for four other states and counting, then its outcomes for workers and their power have transcontinental stakes.

A story of power on California's green jobs should begin with how these sites were unionized in the first place. California's renewable energy and high-speed rail projects were not slated to be union-made from their inception, in the plans of state and capital. In fact, labor standards–and even words like "job", "wage", or "training"–are entirely absent in the formative state legislation for these projects.[28] Instead, this green construction wave was unionized, more than any other factor, owing to a decade of construction unions' initiative, leveraging their capacity to reproduce the labor that could transform the landscape.

[24] Luke *et al.*, 2017.
[25] Art Lopez, Oct. 29, 2019.
[26] Jones *et al.*, 2017; Luke *et al.*, 2017; Zabin *et al.*, 2020.
[27] An overview of these state laws is provided by Alvarez & Devaney, 2021. A review of their legislative text, such as Noble (2021), shows a consistent commitment to the project labor agreement model for commercial wind and solar construction.
[28] I found labor language absent in a full legislative text search of the first and latest California statutes for the Renewable Portfolio Standard, Sher (2002) and De León (2018), as well as the founding statute for high-speed rail, Proposition 1A (2008).

B. Sowing a solar turn

Private capital, drawn by public mandates and tax breaks, has transformed the San Joaquin Valley into one of the world's leading zones of solar power. For two decades, state laws called renewable portfolio standards have required California's largely private electric utility companies to buy a certain minimum share of renewable power. These "RPS" laws began with the state legislature's 2002 mandate for 20% renewable electricity by 2010, ratcheted up in 2008 and 2015, until a 2018 mandate for 60% renewable electricity by 2030–and 100% carbon-free by 2045.[29] As of 2020, California's utilities were meeting their state targets, providing a hair's breadth above the mandated 33% renewable resources –with solar the largest component (13.2%), followed by wind (11.1%), and geothermal well behind in third.[30]

Despite their direct mandates on utility company portfolios, none of these state renewable energy laws dared to mandate any labor standards for the workers who would build the clean power plants required. Yet San Joaquin construction union leaders and activists generally shared a sense that state RPS laws, more than any other single factor, had driven the solar boom. At the Fresno-area Electrical Workers training center, over demonstration electrical boards and solar panels, a union instructor told me, "The RPS, that's actually what's driving the industry. Once utilities saw the state of California was serious, they weren't going to fall behind."[31]

Tax breaks, too, greased the wheels of solar investors scouting the Valley floor. Since 2005, federal legislation allowed investors to write off taxes with an investment in solar power, whether on residential roof-top panels or a 50-acre solar power plant. By 2020, the credit allowed investors to write off taxes equal to 30% of the cost of the solar power they paid to bring online. That year, California legislators exempted commercial solar installations from state & local property tax assessments, no matter their size, at least until the property sold to a new buyer.[32] San Joaquin union leaders were well aware of these tax breaks helping the solar boom, like Francisco, a young Ironworkers leader–recently building solar fields himself–who keenly understood the credits as public funding. "These solar jobs have public money, right? Because they get tax incentives, state and federal."

Since the tax credits were national or statewide, what explains why a boom landed specifically in the San Joaquin Valley? A crucial factor was a near-decade of drought, which dried out vast agribusiness holdings in the Valley, especially on its irrigation-dependent westside. Dim prospects for crops drew landowners to lease land to solar. A climate disaster, in other words, set the ground for clean energy. For most of the 2010s, a statewide

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[29] Sher, 2002; De León, 2018.
[30] California Energy Commission, 2021.
[31] Bill Ramirez, Dec. 11, 2019.
[32] Mitchell, 2020.

drought led to agricultural irrigation districts in the San Joaquin Valley receiving 20% or less of their contracted water from the state's Central Valley Project pipeline; reaching a grim 0% in 2021.[33]

The Westlands Water District, along the Valley's westside about fifty miles from Fresno, had its band of enormous farmholdings particularly hard hit. For decades, Westlands' heavy irrigation in soils with poor drainage had built up selenium and other toxic salts, right in the reach of crop roots. Environmental regulation and lawsuits dogged the district's thirst for water, and its toxic outflow.[34] With profits in peril, Westlands leaders began to actively woo solar developers as early as 2010, well before the decade's epic drought came to roost.[35]

Solar offered a profitable fix for farmland run dry and salty. According to one longtime farmer in the Westlands area, leasing their land for solar in 2019 "pays $1,000 an acre, or ten times what the family takes in from wheat".[36] The notoriously huge scale of San Joaquin farms in one sense simplified the transition: solar developers eagerly leased thousand-acre contiguous plots from a single landowner at once, rather than haggle over a yeoman patchwork.

For solar developers, San Joaquin ex-farmlands offered another huge advantage: far easier environmental permitting than southern California's undeveloped deserts. While environmental nonprofits fiercely fought solar permits in the scorching Mojave Desert, these same groups cheered the prospect of San Joaquin boom.[37] Carl Zichella, a doyen of California energy policy at the National Resources Defense Council, spelled out this San Joaquin advantage with his hearty endorsement for the Westlands Solar Park:

> "It's about as perfect a place as you're going to find in the state of California for a solar project like this. There's virtually zero wildlife impact here because the land has been farmed continuously for such a long time and you have proximity to transmission, infrastructure and markets."[38]

Past transformations of the ecosystem into an agroindustrial machine, in other words, greased the political case for its transformation into a solar hotspot.

Solar also offered a chance at truce for local environmentalists and landowners in the San Joaquin. Local environmental and labor organizer Daniel O'Connell told me how, in the 1990s and 2000s, "the Sierra Club and other conservation groups waged a Stalingrad-like fight against developers to save farmland" from sprawl housing construction. With 25-year leases, solar projects promised to take rural land out of both housing development and pesticide-intensive agriculture, while keeping landowners flush.

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[33] Westlands Water District, 2021a and b.
[34] Hiltzik, 2015.
[35] Dearen & Cone, 2009.
[36] Kasler, 2019.
[37] Power Technology, 2020.
[38] Woody, 2010.

A global influx of private investors put up capital for the San Joaquin solar boom. Two gigawatts of solar power plants were installed in the central San Joaquin Valley region by the end of 2020; at average national costs that year, amounting to roughly $1 billion in capital invested.[39] Transnational solar firms developed many of the largest plants, like First Solar's 2,900 acre California Flats project, or the 1,900 acre Tranquility plant, built by a Canadian Solar subsidiary.[40] Both firms were public on NASDAQ, raising capital from stock investors globally. First Solar claims finance titans BlackRock, Vanguard, and a Walmart heir as its largest shareholders, together holding over a quarter of the company as of late 2021.[41]

The lure of San Joaquin solar profits has also drawn new contenders into solar development altogether. The mammoth Westlands Solar Park is being developed via ownership and investment by the CIM Group, a commercial real estate giant that presides over the Miami World Center and a 52-story skyscraper alongside Los Angeles' Museum of Contemporary Art.[42] From drought, public mandates, and tax breaks, San Joaquin solar drew capital from far corners to its lucrative transformation of land.

The resulting solar boom, in terms of power generated, is shown in Figure 3, which shows San Joaquin solar growing rapidly to become over a fifth of all California solar power plant generation by decade's end. The center of the Valley, from the Westlands to Fresno and Madera, came to produce nearly three fifths of all San Joaquin solar.

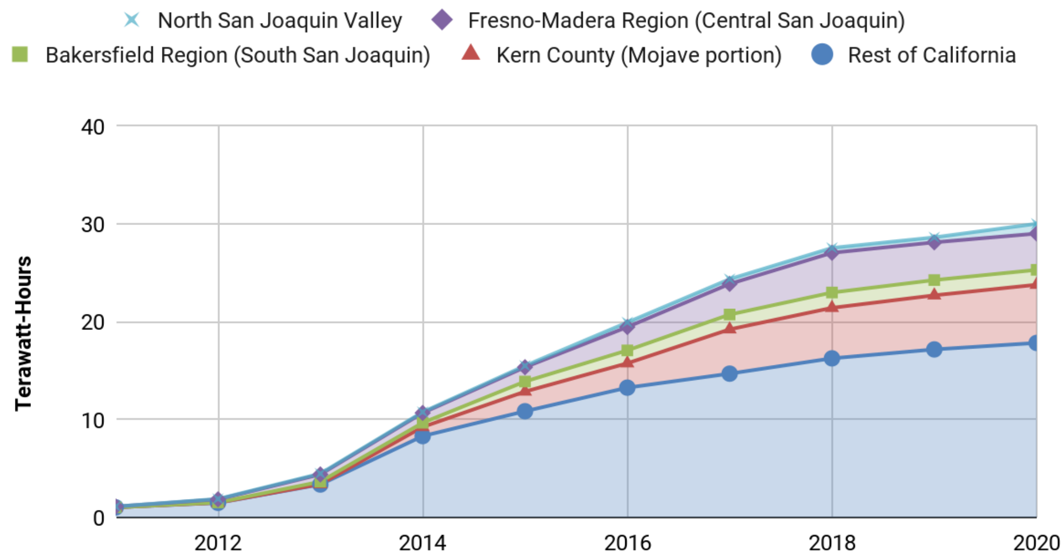

Figure 3: The San Joaquin and California solar power boom. (CEC, 2021)

[39] Capital estimate based on Cox, 2020. Capacity data (and Figure 3) based on author analysis of CEC (2021), with plant geolocation by company sites or Google Maps.
[40] First Solar, 2021; and Recurrent Energy, 2016.
[41] US Securities & Exchange Commission, 2021
[42] CIM Group, 2021.

The flood of finance, environmentalists' encouragement, and relatively easy access to existing major transmission lines led the state to declare the Westlands area as a target zone for new solar. Fresno region labor leaders were well aware of this geographic advantage, and how it offered a shot at leverage. As told by the local Labor Council chief, "You can't have solar anywhere better than the Valley."[43] A prime location meant solar construction jobs were harder to send elsewhere, giving local unions environmental leverage, or at least a chance to flex and build it in this constrained zone.

With transnational profit-seekers fronting the funds, and state labor standards absent, how did the San Joaquin solar boom become unionized? For a decade before the boom picked up in earnest, leaders of California's building trade unions used two fronts of pressure–and one fraught compromise–to draw solar developers and state regulators towards union contracts. Backing union pressure was a more fundamental kind of environmental leverage: their capacity to reproduce the workforce for the massive landscape transformations capital and state demanded.

First, California construction union leaders lobbied state legislators to require largely in-state renewable construction. Their active support for the state's clean energy mandates, from the initial 2002 law on, helped swing recalcitrant state legislators (often right-wing Democrats) with the prospects of new union jobs in their districts. That union influence helped ensure the in-state construction clause was included, which raised demand for their local members or their reproductive capacity to grow a larger workforce. According to Victor Uno, a leader for an Electrical Workers local covering part of the San Joaquin, "The building trades worked really hard to shape how renewables were going to go. It was a big fight: a lot of resources were put into legislative and lobbying efforts."[44]

Second, unions applied direct pressure on solar developers with a "permit intervention" approach. In a strategy first used versus gas power plant developers during a 2000s boom, unions systematically pressured renewable energy developers to commit to unionized contractors, or else face stiff union opposition to environmental permits for their solar plants. At times, particularly in battles with gas plants, building trade unions forged brief alliances with environmental justice groups to stymie permits and win joint concessions. According to a union lobbyist closely involved, solar developers facing a "very competitive" market found that the "trivial cost increment from non-union to union labor" was a mere few percent of overall costs.[45] Developers seeking to lock in a construction timeline, with dependable labor, generally worth paying the union premium compared to the costlier prospect of project delays from permit or labor battles.

Third, construction union leaders agreed to a major initial concession to solar developers: two-tier contracts for key trades. At the start of the 2010s, Electrical Worker

[43] Dillon Savory, Oct. 29, 2020.
[44] Victor Uno, Sep. 24, 2021.
[45] Ken Fontana, Nov. 18, 2021.

and Ironworker leaders consented that a major share of solar installation roles would be done by temporary workers under a union-negotiated contract, but with less benefits, pay, training, and far less job security than "full" union members. These "helpers" were set to take the most repetitive work requiring the least training, like fastening racks or "lifting glass"–setting photovoltaic panels into place. Helpers were generally free of apprentices' set pathway to "journey" worker membership, or their entitlement to be hired from a union list after being laid off.

A Fresno-area Labor Council leader made a cautious case for the compromise, but acknowledged the decision wasn't unanimously beloved in the house of labor:

> "The solar industry is used to paying way below prevailing wage. Those jobs are not going to be $45/hr and full union membership. It's a new lower classification, but we keep our hands on them rather than a bunch of random companies. That was very controversial at first. In the labor movement, dropping your wages is always going to be controversial."[46]

Beyond solar developers' pressure for lower wages, the "helper" compromise helped assuage building trade union leader anxiety about bringing in more members than they could sustain. With no guarantee the solar and rail boom would endure for decades, union leaders accepted the tiered compromise as a means to not overextend their workforce reproduction beyond what future employment would demand. As put by a labor researcher active with California construction unions, "In the Central Valley, the unions aren't as strong as SoCal, so they may not think they'll have the work for all those apprentices to go up to."[47] By agreeing that many solar workers would be helpers, leaders were assured they would not compete with existing members, or turn against leaders if union jobs ran dry. But the concession also made a lower class of union membership, insecure on the job and often divisive within the union.

The San Joaquin solar helper compromise echoes a national trend, and backlash, in labor. Helpers are construction's parallel to the "two-tier" labor hierarchies that, since the 1990s, many US firms pushed across sectors to divide union workforces.[48] Two-tier contracts prevent newer or temporary workers from ever achieving the benefits, pay, or job security of earlier "legacy" workers. In practice, lower-tier workers' lesser incentive or protections to keep their jobs long-term meant less reason to participate or build their union. Such divisive provisions have become the target of major rank & file revolts, since 2018, in sectors as diverse as auto manufacturing, logistics, healthcare, and food processing.[49] That context gives the fate of California's solar helpers a significance beyond the clean energy industry. As of early 2021, helpers frequently covered half of the jobs for

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[46] Randy Hield, Feb. 5, 2021.
[47] Peter Philips, Oct. 26, 2020.
[48] Bradbury, 2021.
[49] *ibid.*

Electrical Workers on major San Joaquin solar plants.[50] Ironworkers, as explained later in greater detail, were able to replace helpers with full apprentices in their 2018 contract, in a key sign of their growing power within the solar & rail boom.

Underpinning these pressure campaigns, building trade unions held an even more fundamental leverage: their ability to train and coordinate the workforce needed for the solar boom, in the right places. As developers sought to build increasingly large solar plants in remote areas of the San Joaquin, they required hundreds of skilled construction workers to be there, trained and ready on a tight schedule. Driving together around the Westlands Solar construction site, Francisco, the Ironworkers local leader in the San Joaquin Valley, succinctly explained what the union offered contractors: "We provide skilled labor. It's what we do."[51]

Building trade unions, nationally and locally, had long developed capacity in workforce reproduction, often by winning control away from contractors.[52] Apprentices train in union-taught classes, although typically in training centers administered and funded in a joint arrangement with union contracts. In a hiring hall system akin to only a few historically militant unions in other sectors, most US construction union apprentices and fully-trained "journey" workers are hired out by union dispatchers, based on union-kept "books" of members' skills and who has been laid off longest. Finally, union construction workers coordinate the day-to-day decisions of implementing blueprints on the jobsite, under guidance from union foremen and more experienced members.

Unions could offer a reproductive fix to make landscape reconstruction possible for the solar boom, and it became the backbone of their leverage. As told to me by a Fresno-area Carpenters' leader, the terms of California's renewable energy mandate unintentionally strengthened the leverage of building trade unions: "The state requires utilities to get a shovel-ready PPA (Power Purchase Agreement), which pushes developers towards getting a PLA (Project Labor Agreement) years in advance." Unions' reproductive fix, within a constrained terrain where construction was needed, provided a specific form of environmental leverage for unions. With solar developers seeking hundreds of skilled hands on demand, San Joaquin Valley building trade unions offered the best engine available to furnish hundreds with the right skills of landscape transformation in the right place and time.

With this leverage over workforce reproduction and from their pressure campaigns on solar contractors, construction unions worked to standardize their turf. In the early 2010s, during a grim recession for unionized construction overall, Carpenters, Electrical Workers, Ironworkers, Laborers, and Operating Engineers unions developed a "five craft" agreement setting out their jurisdictions on solar work to come. Since 2014, according to a

[50] Miguel Higuera, May 16, 2021.
[51] Francisco Esquivel, Mar. 18, 2021.
[52] Palladino, 2005.

union lawyer involved in the deliberations, that agreement has been the model labor contract for 90% or more of California's utility-scale solar projects, covering all but one developer in the state.[53] Like almost nowhere else in the country, San Joaquin and California construction unions hitched a huge solar energy transition under contract.

C. Unionizing the electric rails

With a massive supply of public funding, high-speed rail has been a cornerstone of California's state ambitions for most of this century. The aim is a line running from the twin economic capitols of San Francisco to Los Angeles in under three hours, and eventually beyond. At top speeds over 200mph, the planned train would be by far the fastest in the US.

Figure 4: California's high speed rail plan. (By the end of 2020, a segment from Madera to just south of Kings/Tulare had been built.) (CA HSRA, 2021)

[53] Ken Fontana, Nov. 18, 2021. The non-union developer outlier, NextEra Energy, is a Florida-based energy developer, which according to Fontana, has "an ideological commitment to never make a labor agreement. They're immune to pressure. It's an uneconomical decision, but they're rich enough and big enough to get away with it."

Motivating the project, officially, is climate concern. SF-LA was the nation's second most highly trafficked flight route in 2008, and had become its busiest by 2015.[54] In a buildup to a statewide referendum in 2008, California's Democratic leadership and major environmental NGOs argued a public investment in high-speed rail would replace busy flights with clean transit, powered by the state's steadily more renewable electricity. Yet in their closing pitch to statewide voters, the rail campaign chose a less noble call, trotting out three Chambers of Commerce magnates and the head of the state's construction union council to argue the train would lessen highway traffic and create jobs “without raising taxes”–the last point fully capitalized for effect.[55]

A narrow 52% majority carried the popular vote for Proposition 1A in 2008, approving nearly $10B in public bonds to kick off the project. This commitment of public debt was followed by harder federal dollars, with $2.5B in grants in the 2009 stimulus bill, then a chaser of $929M in 2010. In 2014, the California legislature tied the future of high speed rail to its cap-and-trade policy, committing 25% of annual revenues from its greenhouse gas market to the project until at least 2030.[56] As of 2021, about $22B in public funding was slated for the decade–but engineers projected the total cost of the Los Angeles to San Francisco line to run practically four to five times that amount.

The first running segment of high speed rail in the works was to be entirely in the San Joaquin Valley, running from Merced, south through Fresno, and at last to Bakersfield. By the end of 2020, the tracks had been built from Madera's Amtrak station, past the Fresno westside, down to an expanding edge in an almond orchard above the Kern County line to the south.

As the track stretched steadily along, construction worker leaders in the region were firmly aware of its dependence on continued public largesse. On a cool morning in December 2020, Francisco, a local Ironworkers union leader, drove me out to one edge of the rail construction, near the county seat of Hanford. We stood beneath a crew tying together rebar 40ft in the air, setting the iron bones of a concrete tower that would someday hold the track platform aloft. As he put it, "This work all depends on high-speed rail: if they keep getting funding. I feel good, I haven't heard of any problems with that happening. With Biden in, I hear he's pledging $900M in federal funding for this."[57]

Before Ironworkers tied together the bones of the railway, it's unionized Pile Drivers who rooted its spine deep in the earth. Using powerful engines, they hand-rigged and drove steel beams down into the Valley's hardpan soil, setting the foundation of towers and tracks fit for a packed bullet train to hurtle across. A retired Pile Driver leader, still active in

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[54] The rising traffic of SFO-LAX flights is documented in McCartney (2009) and O'Brien (2016).
[55] State of California, 2008. This passage describes the arguments of pro-rail advocates in the brief guide mailed by the Secretary of State to all voters.
[56] California High Speed Rail Authority, 2021b.
[57] Francisco Esquivel, Dec. 10, 2021.

internal union debates, was unperturbed that public criticism–particularly from right-wing pundits across the state–would stop the project. "Some people might talk crap about it. But they said the same thing about BART (Bay Area Rapid Transit) when it was built--who's going to ride that thing? Now it goes almost around the Bay, and almost into the Valley." The key reason for the high speed rail's secure hold on public funding, in his eyes, was its ability to juice private prospects on the Valley's terrain. "The reason they put that high-speed rail in there is to build towns, and move industry out there because it's cheaper. It's always about money."[58]

Whatever its virtues for private speculation, the public investment in high-speed rail became a source of leverage for San Joaquin Valley building trades. Meeting by the Fresno union hall, a longtime local Carpenters leader told me, "High-speed rail, because it gets federal money, gets prevailing wage under Davis-Bacon," referring to New Deal-era legislation requiring federally-funded construction projects to pay at union-level wages for their area.[59] He explained how even without an explicit requirement for union labor, this gave unions even footing for their pitch to private high-speed rail contractors. "In the end they're paying the same. Why not pay for the better worker?" The quote demonstrates how construction union leaders sought to win over contractors not through confrontation, but through marketing their members as the most trained and skilled force available for the job. That strategy, staked on unions' reproductive fix, was set to be widely repeated with the wave of solar power developers soon to come.

After the bursts of 2009-10 federal funding for high-speed rail ran dry amid a Republican takeover of Congress, California elected officials moved to base the project on state funding. Although perhaps more reliable, state funding meant high-speed rail would not be bound by the same federal prevailing wage laws that had first given a foothold to unions on the project. The chief of the Fresno regional Labor Council, son of an Ironworker, told me from his truck how California building trades took initiative to win state requirements for union labor on the mammoth rail line. "High-speed rail took a full court press. We beat that to death for 7-8 years before we got any traction on that."[60] Unions' difficult sell came despite a labor-backed Democratic supermajority in state office across this whole period.

When building trade unions finally succeeded in winning a state requirement for union labor on California high-speed rail, in December 2012, it came with a requirement to bring state-identified "disadvantaged workers" into their ranks. Under this Community Benefits Agreement, unions would ensure 30% of all work hours on the project were done by workers living in Census tracts where the median income was $40K per year or less.[61]

[58] Don Villareal, Apr. 26, 2021.
[59] Joe Rosillo, Jun. 11, 2019.
[60] Dillon Savory, Feb. 2, 2021.
[61] California High Speed Rail Authority, 2012.

Akin to the state's grid view of environmental injustice, the economic midpoint of a worker's home neighborhood was the decisive token of personal disadvantage. For the rail agreement, a third of the disadvantaged category, representing 10% of the total workforce, would be required to meet an extra kind of disadvantage: among other markers, including those with criminal records, veterans, single parents, unhoused people, or union apprentices with less than 15% of their needed hours to graduate to full "journey" level membership.

Unions' deal with the state was a flipside of their reproductive fix to private contractors. To the state, they offered to be an engine for training the "disadvantaged" towards well-paid, skilled, and stable careers. To the contractors, they offered training that would turn raw human material, no matter how raw, into the best labor money could buy. To both parties, unions' capacity in reproducing a workforce–specifically, in training and coordinating workers to build the whims of state and capital–was the key. This reproductive fix was environmental leverage in the future tense. Union leverage hinged on the location, relationships and skills of workers for transforming land into solar where state and capital demanded it.

Last but not least, the high-speed rail Community Benefits Agreement came with a union commitment not to strike on the project during its entire construction, like nearly all project labor agreements. For high-speed rail, that would likely mean decades of preemptive truce. The agreement did not mince words in its aim: "to provide close cooperation between management and labor."[62] Even if construction unions went on strike at other workplaces across the whole region for a new master agreement with contractors, union leaders were now legally obliged to keep high-speed rail workers on the job.

Despite this compromise, union leaders and sympathizers in government circles widely described the high-speed rail deal as a landmark win. As a longtime staff advisor to Fresno Mayor Ashley Swearingin told me, "The PLA on high-speed rail felt like a really big watershed moment," opening the door to future state and local agreements in its mold.[63] For the retired leader from the Pile Drivers, a branch of the Carpenters, the agreement helped cement northern and central California as the most friendly terrain nationally for construction unions and their members. "This is the strongest region in the country for Carpenters: most progressive, best relationships with politicians, best wages, best conditions."[64]

Unions' high-speed rail deal with the state and contractors, based on the kind of workforce they could provide, had not come without compromises. Yet they made sure, with their "full court press", that union labor would build California's most ambitious public infrastructure project for a generation.

[62] *ibid.*
[63] Kim Costa, June 5, 2019.
[64] Don Villareal, Apr. 26, 2021.

In California's solar and rail growth spurt, public mandates, bond funding, and private capital were all turned by construction unions to lock down union jobs. Where the rest of the country had largely shut unions out of clean energy, here, unions instead won themselves a dominant role in building the state's climate transition. Building trades' capacity for workforce reproduction to transform landscapes offered a fix to the urgent demands of public rail and private solar developers, offering unions leverage to buck the national trend. Given that outlier, what were workers' own perspectives on these unionized green jobs?

D. The character of work

As hundreds of construction workers did morning stretches on the torn dirt of the Westlands Solar loading yard, Francisco told me this was my chance. A pair of Ironworker brothers stood off to the side, both around forty, their hardhats brimming with faded stickers from past jobs. I introduced myself as a researcher here with Francisco, trying to get workers' perspectives on these solar jobs. The brothers, Alex and Mario, had never been interviewed before, but were more than willing.

> *Alex*: Solar work is easy. Oh yeah, it's repetitive. The best part is it's steady.
> *Mario*: You get forty hours every week, scheduled out for months. With this contractor, we work four tens, which is great for more time with family. Plus overtime if we want it. On other jobs, you maybe get a few days, a few weeks, before it's done and you're looking for the next job.
> *Alex*: When we're doing strut, structural, ironworkers work ourselves out of a job.[65]

The vast scale of solar and high-speed rail projects, plus their solid contracts with stable intra-union turf, translated to a kind of dependable work previously rare for San Joaquin construction workers.

The problem of "working yourself out of a job", on typical building projects, came up in multiple interviews; construction workers were used to a week or two crafting their stage of a new hospital or highway overpass, only to finish and be laid off immediately, possibly waiting a month until the next gig. Other projects could also be suddenly delayed by investors pulling out. The solar and rail projects, in contrast, were solidly funded and huge enough that hundreds of workers from a single trade might spend months–or years–continuously assembling their part of the project in roving crews.

[65] Alex & Mario Capini, Mar. 9, 2021.

Figure 5: Lifting glass at Westlands Solar Park, Aquamarine branch. (SOLV Energy, 2021)

The Ironworkers' foreman at Westlands, Jason, said that "out of 300 workers total", "110 Ironworkers are on site today, getting 4,400 hrs a week."[66] On acres where Laborers and Operating Engineers had leveled earth and driven steel beams vertically down, Ironworkers would now unload and fasten metal racks to carry future solar panels. Each day, crews of 22 Ironworkers, using their hands, legs, and compressed-air power wrenches, would each set up 700 25 feet-long solar rack sections, centered on cores informally called "torque tubes". Within a few weeks after, Millwrights (a division of the Carpenters) would set up motors to turn those racks towards the sun, and Electrical Workers–mostly helpers–would set the panels and their wiring.

With satisfaction, Jason noted, "We've got work here on Westlands out to 2024. And more phases could still be added to that." A project superintendent, Brian, still a dues-paying Ironworker himself, put down a cigarette to mention that the general contractor, Swinerton, had an even longer local docket. "We've got solar jobs out to 2030. We're not taking on more, we're so full."[67]

High-speed rail offered a similar welcome steadiness, in the perspective of construction workers. On the rail construction site near the Kings County seat of Hanford, I interviewed workers during their downtime, standing beside piles of rebar or eating lunch at their cars, the horns of banda music trilling out from one. One Ironworker praised the steadiness of the rail work in terms of paperwork: "I had a year with 11 W-2s to fill out, from

[66] Jason Benson, Mar. 9, 2021.
[67] Brian Cartwright, Mar. 9, 2021.

working for a bunch of different contractors. Now I have one."[68] Echoing that thought, a Piledriver foreman shared: "A lot of bridgebuilders want to get on high-speed rail because of the length of the job. Where I'm at, we could be on this for the next few years. That's a long time for building a bridge. For one bridge over the 99, that could be just 6-9 months. I've got a hundred other people that would want on this project."[69]

Figure 6: Raising high speed rail platform towers, near Hanford, CA. (Author, 2020)

Like on solar, high-speed rail was steady in part because different construction trades had long settled consistent roles on the job. Pile Drivers rammed steel beams, typically 127' long and 4' wide, down vertically to set a foundation. Laborers and Operating Engineers prepared the ground around the railway, grading and scoring a channel over one hundred feet wide and ten deep, with steep diagonal walls. To make the rail platform and the towers to hold it up, Ironworkers built rebar cages, filled with concrete by Carpenters, in mostly-outdoor pre-fabrication factories which moved every few years to follow the construction frontiers. Trucked on site by Teamsters, these pieces were then lifted aloft by Operating Engineers running cranes, and Ironworkers cinched to high platforms would finally guide, tie, and weld the parts into place. Electrical Workers to come would set the wiring. Eventually, this platform was designed to carry two trains racing past each other at 220 miles per hour, each weighing about a thousand tons with a full load of a thousand passengers aboard.

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[68] Francisco Esquivel, Dec. 10, 2020.
[69] Sam Lopes, Nov. 17, 2020.

The steady work, and its long prospects, meant most to the workers in terms of boons to their families. Jason, the Ironworkers foreman said, "We like [solar] because it's $40 an hour, and insurance for our whole family. That's a big deal for members who have 5-6 kids; they're all covered. You got a family, kids, dogs, everybody on the payroll!" Miguel, who became an Electrical Workers helper on solar after 18 years in prison, had family dreams that motivated his plan to use his hours on solar to become a full union apprentice: "That's how I can get the career I want not just for me, but to have a family, support a family."[70] After he drove up to a local election canvass in a crisp new Kia Stinger, fourth-year Ironworker apprentice Pedro told me proudly how it was the job that had made not only buying this car, but owning a house, getting married, and supporting kids seem personally possible for the first time.[71]

Francisco, the Ironworkers leader, stressed how San Joaquin high-speed rail and solar jobs helped workers avoid long commutes, and thus care for their families or simply enjoy time off. "If you're working out of town, that puts the kids all on the mom and family. If they're working here, they spend time together every day. Or, for some guys, it's that they get to drink beer earlier. That's how it is!"[72] Although the Ironworkers, Piledrivers, and some other building trade locals had jurisdiction to work across most of northern and central California, union members and leaders told me the Fresno area was overwhelmingly where they lived. The high-speed rail foreman told me, of his trade, "A majority of Pile Drivers are local to Fresno. It's much more affordable to live here. Money goes a lot farther down here." At Westlands Solar, I was present on payday; the Ironworkers foreman told me, "Ninety percent of our checks today were Fresno addresses. Three in Bakersfield."[73] That divide helped shape the contrasting union politics in Fresno and Madera versus Bakersfield.

Some construction workers saw another upside for their families in the clean air they expected would come from the solar and rail transition. As we looked down a row of rail platform towers that disappeared into winter smog at the horizon, Francisco told me, "Some of us appreciate high-speed rail because their kids have asthma. My wife has light asthma. She's happy we're doing solar, because it'll clean the air." Joe, the Carpenters leader, told me how his union took pride in building a San Joaquin Valley with healthier air for their kids. "More renewable energy would help. There are still gas plants that are here… More public transportation, high speed rail, light rail, will help by pulling cars off the road. Highway 99 [the Valley's key intercity corridor] has tons of truck traffic."[74] Although not exactly a commitment to change the construction agenda itself, these union activist sentiments showed a pride in "cleaning the air" that might support ambition down the line to steer what landscape would be built.

[70] Miguel Higuera, May 16, 2021.
[71] Pedro Garzo, Oct. 24, 2020.
[72] Francisco Esquivel, Dec. 10, 2020.
[73] Jason Benson, Mar. 9, 2021.
[74] Joe Rosillo, Jun. 11, 2019.

Construction workers were intimately familiar with the San Joaquin's extreme air pollution, both from their families and their work. The Piledrivers foreman on the rail project, soon after the record 2020 wildfire season, shared how company discretion and unpaid leave pushed many construction workers to work through dangerous air days.

> "I wouldn't let my kids play outside in this weather. Our company has a program where at a specific level, the job shuts down. We had just a few days where we had to shut down completely. But you're holding [workers] hostage to a paycheck… you get paid for the hours you work."

In the middle of the 2021 fire season, I caught up with Felipe, an Ironworkers apprentice, at a Labor Council BBQ that kept going despite a severe air hazard day. "Work's been good, with lots of highway projects. But the smoke is bad this year. It's been hard on guys with asthma." Over giant speakers, "I can feel it coming in the air tonight" sang out. A child of about five got a nosebleed with no obvious cause–some speculated from the air–and soon was taken home.

Though it was family-supporting work for cleaner air they appreciated, construction workers often disliked the repetition of high-speed rail and, especially, solar construction. As opposed to buildings that might require more improvisational, specialized craft skills–like a hospital or water treatment plant–solar and rail work was generally closer to an assembly line, with workers responsible for the same task for weeks on end.

Nonetheless, many workers admitted that steadiness came with upsides for the youngest and oldest among them. On a quick break at the Hanford rail site, Ironworkers nodded their heads as José told me, "High-speed rail is steady. Repetitive. It's bigger rebar, so it's harder on the body."[75] Andy jumped in, "Solar is easier on the body. It's lighter. Good money. It's good for older guys to get hours."

That spoke to a problem in construction work in general left out by most accounts of "good infrastructure jobs": their frequent bodily toll. Construction workers nationally bear high rates of injury and chronic pain, which can become a major impediment to work that depends on hand tools and bodily.[76] Ironworkers faced the fifth highest rate of workplace deaths of any occupation nationally, worse than underground miners. Most workers I asked had stories of witnessing or narrowly escaping a worksite calamity.

This backdrop made solar's relatively light, assembly-line construction a welcome means for older and injury-constrained workers to earn their final hours to retirement. Between rows of solar racks going up at Westlands, I met a longtime Ironworker who everyone called Cowboy, a Black man with a trim gray beard, who grinned as he talked about retiring with just another year or two of steady solar hours. "You know what I signed up for–pension! I did my time, paid in for guys before me, now it's my time."[77]

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[75] José Estrada, Dec. 10, 2019.
[76] Jacobsen *et al.*, 2013.
[77] "Cowboy", March 9, 2021.

For newer construction workers, the ample hours on solar and high-speed rail often seemed like a windfall, although with limits. To advance to a full "journey"-level union member, most trades required apprentices to reach a certain number of hours worked on union jobs each year.

Electrical Worker apprentices I spoke to at their Fresno training hall all described solar as the main industry with growing demand, where they could count on getting the hours they needed. Ronaldo had made it into the apprenticeship after nearly a decade working as a solar helper and in non-union electrical repair for food packing plants around the Valley. Though grateful for the safer and steadier work he expected as a union solar worker, he was salty about the caveats: "For us solar babies, we use simple, repetitive skills for months. It makes you rusty on other skills."[78] The class trainer, on staff for the union, emphasized that apprentices needed these classes to learn precisely the more complex electrical skills they would not on solar, which would be needed to qualify for more jobs in the future. "There's going to be a lot of work turning farms to solar. But it's repetitive, dumbed down electrical work."[79] Instead of the basic solar installation tasks, solar Ironworkers and Electrical Workers I interviewed spoke about preferring "remediation" roles: the more varied, creative work of checking and troubleshooting after installation, generally available to just a few of the most experienced workers at a time.

On the solar and rail construction, scant supervision from managers meant that union workers often enjoyed a relatively unrestrained space for learning, bonding, and joking together. In union construction in much of the US, day-to-day supervision is mostly from fellow union members, including foremen, while managers, contractors, and inspectors make rare visits to confirm progress and work quality. The repetition and vast scale of solar and rail projects seemed to spread management even more thin: at Westlands Solar, only one manager from the contractor was reportedly present, largely in his trailer, on a day when 330 union workers went out to build acres of the power plant. Over lunch breaks, workers sometimes brought portable grills to dish out carne asada, or homemade ceviche to share. Graffiti in porta-potties made for a forum varying between lewd jokes, satire of management’s “work faster!” directives, or mocked architects' cluelessness to design plans that worked in the field. The latter implied a nascent worker confidence that they knew better than developers' blueprints how to make iron fit in clay.

The long, steady work on solar and rail projects gave space for workers to build closer relationships, which often became foundations for mutual learning, hijinks, or union politicking. High speed rail even involved its own version of “factories in the field”–pre-fabrication plants to build major railway components before hoisting them into place–which offered construction workers a uniquely fixed-in-place worksite for a year or two before a plant would pick up to move down the line.

[78] Ronaldo Diaz, Mar. 11, 2021.
[79] Bill Ramirez, Mar. 11, 2021.

Figure 7: A pre-fabrication plant for high speed rail platforms and towers, near Hanford, CA. (Author, 2020)

Between his gregarious humor and years of steady work on solar projects and high-speed rail pre-fab plants, Francisco had befriended seemingly hundreds of other Ironworkers, helping lay ground for his run for local union office. At one rail plant, as we drove up in his truck to a line of Ironworkers tying rebar bones for a train platform section the length of a soccer pitch, Francisco shouted out salaciously, "Hey, where the *men* at?!" Four workers turned their heads, and one shouted back, laughing, "Oh, we know all about you, Cisco!" The merry innuendo defied my expectations that construction union culture would be a total tough-guy act. Driving further up the line, a young Ironworker saw us coming and shouted, "Hey Francisco! Where's the music? What's a truck full of Mexicans doing with no music?" (Shortly, coming up to the cab, he saw me closer and said, "Wait, you're not Mexican!" to friendly laughs all around.) These moments, minutes apart, gave a glimpse of jovial social life on the job brooked by steady solar & rail work and its routine freedom from bosses' eyes.

Even if their work was not watched every moment, construction workers knew that their employers had stiff expectations for their output. As Francisco told me matter-of-fact, driving around hundreds of rows of panels at Westlands Solar, "There's always pressure from the contractors to speed up, do work faster. They're in this to make money." Union leaders and foremen could gently push back on this speed-up from contractors, on work safety or quality grounds, but ultimately felt responsible to keep a quick pace based on their union pitch to "provide skilled labor" better than any alternative.

Although there might be some freedom in the moment to finish the work on workers' own social terms, they held no doubt it must be finished fast.

For Fresno-region building trades on the whole, the long, steady prospects of solar and rail work propped up a climb in union membership from 2014 on. Local leaders told me parallel stories of growth in their dues-paying members working on union jobs, following the post-2008 downturn where members stayed on union books while taking the non-union work they could find. On the low end, a local Operating Engineers organizer estimated, "We've probably had 20% growth in the last decade."[80] On the high end, an Ironworkers leader told me, "In the last ten years, Local 155 went from about 250 active members to about 800. Solar, high-speed rail, PLAs, highway work has been a ton of that." In impact on union dues and associational power, these gains in active membership outstripped the more modest gains in paper membership alone.

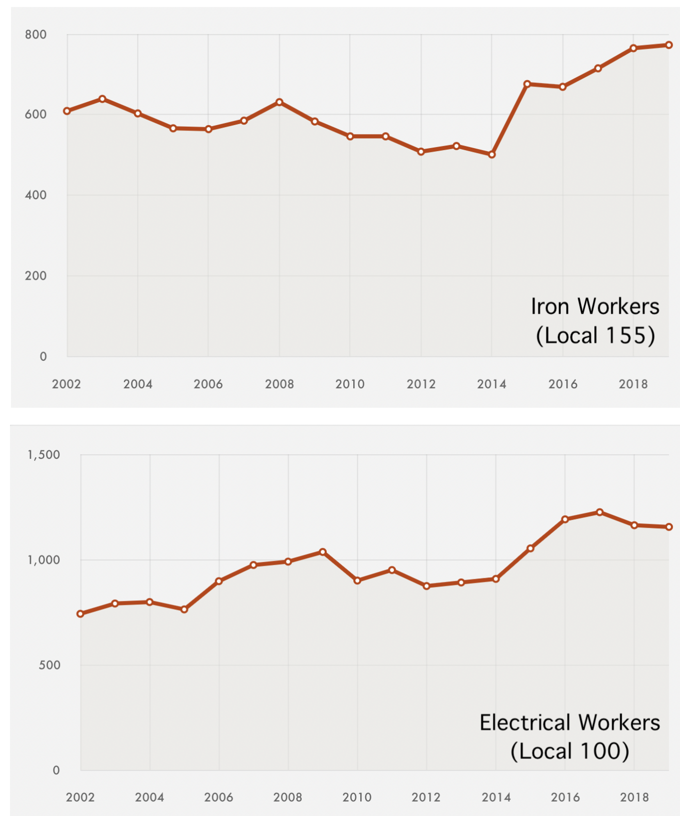

Figure 8: Membership for two key Fresno-region building trades, 2002-2020.[81]
(UnionFacts, 2022; based on US Dept. of Labor data)

[80] Ken Ricci, Feb. 17, 2021.
[81] Ironworkers 155, the local tracked in this graph, includes members across a central California region that includes Kern County. However, its headquarters, organizing focus, and a majority of its active membership is in the Fresno-Madera area, according to leaders and stewards. UnionFacts, the site providing this visualization of local membership, is a notorious anti-union effort, yet is used here because their graphs provide a uniquely accessible read on data otherwise strewn across scores of federal filings.

After building trades unionized the San Joaquin solar & rail boom based on their strengths at workforce reproduction, the boom tested those capacities, at times nearly to their limit. Even before COVID and 2021's tight labor market hit nationwide, a local Labor Council leader told me building trades had been already "busting at the seams. Every [union leader] I know is struggling to keep up, looking for people. They'll expedite people with experience right into the union."[82] A Carpenters' foreman believed his local's recent growth on rail was crucial for renewing the lifecycle of the union itself: "The more work, the more apprentices that can come on. Without an apprentice, our union dies--who do you pass the torch to?"[83]

This passing of the union torch, in most San Joaquin building trades, was from majority white older members to majority Mexican-American apprentices. That meant working past a longstanding racial hierarchy in construction. According to a local Labor Council leader, "The building trades didn't have this natural connection with Latino community. There was tension about conflict between them based on the idea that undocumented guys were the competition for construction jobs." Despite that tension, with a decade of new solar and rail jobs combining with shifts in leadership approach, he said, "The construction unions went from old white guys, kind of a country club, to a bunch of young Latino guys. They came from Mexico, or Grandpa did. I'd be shocked if we weren't coming up on the high forty percents of Latino membership, and the Valley as a whole is majority Latino."[84] From the scores of construction workers I interviewed at job sites or union halls, a majority were Latino, and largely second-generation Mexican-American. As of early 2021, apprentices in state-registered programs–overwhelmingly for construction unions–were 62% Latinx in the central San Joaquin, compared to a 57% Latinx population.[85]

The growing inclusion of Mexican-American workers in the San Joaquin construction unions supported them to reach a stronger position in workplace and union politics alike. A Latina Painters' apprentice, Marcia, reported she was finding more work opportunities because "it helps that I'm bilingual. A lot of these guys are Mexican. I can help translate for the foremen. I also help translate the safety meetings."[86] Ricky, a Electrical Workers apprentice whose parents immigrated from Nayarit state in Mexico, told me he had never been further south than San Diego, but had brushed off the Spanish he learned as a child to become "the only means of communication" for the "more than eight to ten percent of the employees who speak Spanish in the field."[87] At one high-speed rail site

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[82] Randy Hield, Feb. 5, 2021.
[83] Sam Lopes, Nov. 17, 2020.
[84] Randy Hield, Oct. 16, 2020.
[85] California Division of Apprenticeship Standards, 2021; US Census, 2019.
[86] Marcia Fuentes, May 18, 2021.
[87] Ricky Gallegos, May 18, 2021.

where I had a few hours to observe, two-thirds of conversations I heard were in English, with the remaining third split evenly between all-Spanish and a fluid mix of both languages.

In that environment, Francisco, the Ironworkers leader, found his bilinguality not only helped translate on the job, but also earned him notice from a former union president, who mentored him for years in an effort to develop more Latino leaders in the union local. Far from the exclusive "country clubs" they had once edged towards, San Joaquin building trade unions became a powerful engine for including and developing Latinx leadership. By the end of the boom decade for solar and rail, leaders from the largest building trade locals reported they had become majority Latinx in both their members *and* top leaders. Chuck Riojas, an Electrical Workers leader and head of the local Building Trades Council, took pride in how these union shifts had earned notice in a very noticeable way: "Our applicant base has changed. It reflects the community much better."[88]

Inclusion for women grew as well, albeit at a much slower pace. Nationally, as of 2020, only 4% of construction workers were women.[89] In the San Joaquin Valley, as of 2021, women made up about 9% of state-registered apprentices, showing a gradual shift. Women considering entering construction were overwhelmingly wary they would face misogyny on the job, but increased work experience generally led women to believe prejudice was a minor, manageable issue, if still widespread.[90] Marcia, the apprentice Painter, described how support from union brothers had been key on her first extended job, on a major casino. "I'm the only girl on the site. I have found some negative comments, like 'You're a girl, you can't do this.' But I always get support from my crew, they say, 'No, she can!' They're always willing to show me something."[91] A Pile Driver foreman on high-speed rail shared, "Ten years ago, I'd never worked with a woman. Now you do see a lot more. Women in the trades are coming in hot."[92] He attributed those gains to recruitment and support programs for women in the trades. My interviews with Marcia and other tradeswomen found that state-funded pre-apprentice training had often helped with connections and encouragement to enter these unfamiliar, male-dominated construction worlds.

Formerly incarcerated people were also increasingly included in the building trades, providing them a welcome career option in a Valley infamous as a hub for California's mass prisons. Building trade unions seldom screen out applicants based on criminal

[88] Chuck Riojas, Jun. 17, 2020.
[89] US Bureau of Labor Statistics, 2020.
[90] In Brown et al. 2021, we found over 70% of women yet to apply to construction training in the Fresno area expected "major discrimination against women" in the field. Of women who had completed their training (who had generally worked on jobsites), less than 20% perceived "major discrimination"--though nearly 70% still found "minor" discrimination. This might show worksite experience either showed misogyny to be a more modest issue or helped it become more manageable, but indicates it remains a widespread issue.
[91] Marcia Fuentes, May 18, 2021.
[92] Sam Lopes, Nov. 17, 2020.

backgrounds, or even ask. As Ricky, the electrical apprentice told me, "I know out there at the solar project, there's some guys I know who've been in trouble with the law. They figured they'd never get a job like that, but they're actually earning their money now, they're respecting the work and being able to provide for their family. You look at them, they're all tattooed up, and you'd think people would judge them, not give them a job." At a high-speed rail pre-fab plant, I met Doc; with long white hair falling around his neck tattoos, he spoke effusively about being "reborn" by becoming an Operating Engineer after a long stint in prison. A Fresno-area Labor Council leader told me, with a dash of exaggeration, how there were mutual advantages for the unions in this inclusion: "Half these guys have been in prison… That's where we find the toughest people who don't complain, keep their head down, always show up to work on time."[93]

Building a solar and rail boom on rarely unionized terms, San Joaquin Valley construction workers met working conditions that they largely celebrated. A bumper crop of steady hours, less grinding labor, short commutes, inclusion of more diverse members, prospects for cleaner air, and relatively strong wages and benefits were perceived by solar and rail workers as boons for their families and unions. By leveraging their in-house hiring and training powers as a reproductive fix for both developers' labor needs and state demands for inclusive employment, building trades transformed into larger, stabler, and more Latino organizations than ever before. Did these working conditions alter the *power* of San Joaquin construction workers in their unions, and versus their employers?

E. Solar empowerment

What do I mean by workers' power? At the simplest level, I mean their ability to get what they want, and to change their world to get it. A helpful guide comes from scholars and activists who have looked at the roots and obstacles to workers' power. Sociologists Erik Olin Wright and Beverly Silver, based on studies of labor struggles at national and global scales, argued that workers could have power in two basic forms: first, *structural* power, workers' leverage based on their position to stop work in tight labor markets or at chokepoints in a production process; and second, *associational* power, based on the strength of workers' institutions to express their shared aims, like unions or political parties.[94]

I propose four revisions to this scheme of worker power. First, since these scholars were focused on union actions at large, institutional scales, I find it crucial to add more fine-grained lessons from the Labor Notes union activist network. In their experience, workers' structural leverage and associational power ultimately rests on rank-and-file militancy and democracy. Union leadership does not automatically represent member

[93] Randy Hield, Feb. 5, 2021.
[94] Wright, 2000; Silver, 2003.

interests, nor can it substitute for their power.[95] To that end, I sought rank-and-file construction worker perspectives on their work and power at San Joaquin union halls, jobsites, and in national reform networks, along with the more readily available views of leaders and staff representatives.

Second, as we learn from activists and historians of workers' fights against racism, like Robin D.G. Kelley and Justin Akers Chacón, workers do not work and connect on economic terms alone, shorn of culture, gender, race, or sexuality.[96] Although common experiences and relationships often make the workplace a uniquely fruitful ground to overcome divides and prejudices, workers' associational power depends on how much they can overcome racism, sexism, and other oppressive divides in their ranks. For many workers, those particular injustices are often the first inspiration to take part in collective action, rather than wages or other shared economic demands.

Third, following that insight, workers' power depends on their political formation: how they come to conceive collective interests, adversaries, and strategies to win. As Silver pointed out, workers' structural and associational leverage, to become real, first had to be recognized in workers' "idea of power". In Gramsci's reckoning, working and oppressed people expressed their potential power–or even became conscious of it–in the failures of employers and other elites' powers of popular control.[97] Gramsci stressed that any "hegemony" of coercion, consent, and resignation was never complete; in their cracks, both the idea and practice of powerful resistance could flourish. In practical terms, workers and oppressed people had to seek where popular dissent was brewing with the dominant order and its ideas, helping broader layers organize around their own rebellious interests for an alternative order. How this political formation takes shape is, as Stuart Hall put it, "without guarantees".[98] That made it all the more crucial to ask open-ended questions of construction unionists, not only about what they explicitly conceived as politics or power, but also their backgrounds, social lives, and aspirations for their families and the region

Finally, there is environmental leverage. As I fleshed out last chapter, the potential power of working and oppressed people is shaped by their relationship with landscape. Construction workers found leverage in the San Joaquin from their familiarity with how to drive piles through hardpan clay, their capacity to prepare hundreds of others to do that work, their proximity to the drought-struck fields with solar demand, and their hard-won spaces of training and political formation in union halls and community institutions.

Combining these approaches, I find it best to assess how the solar and rail jobs boom shifted construction workers' power by looking at their own perspectives. Instead of looking at structural leverage and associational strength in the abstract, the views and

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[95] Parker & Gruelle, 1999; Bradbury *et al.*, 2016.
[96] Kelley, 2015; Chacón. 2018.
[97] Gramsci, 1971.
[98] Hall, 1986.

actions of union leaders and rank-and-file members are strong evidence of how much they have overcome coercion, consent, and resignation to practice their own power. While this chapter focuses on Fresno-area construction worker power in relation to their employers, it's just as crucial to assess their power in relation to the state and broader community, which I save for the next chapter. In parts B and C of this chapter, I shared activist perspectives on the union power–particularly over workforce reproduction–that organized San Joaquin solar and rail jobs under contract. Next, I turn to workers' experiences of power once on these jobs, in terms of their control at work, racial solidarity, contract shifts, unionizing new work, and union democracy.

A starting point for workers' perceived power on San Joaquin solar and rail construction lay in their union's hold on training and hiring, which meant even if fired, they would have support and a spot in line to a next job. Their training and local union membership meant they could usually count on a place in the reproduction of the workforce. While an individual reputation as a hard worker and specific skills might put them in higher demand from contractors, the union was a collective intermediary that helped find work for the older and injured, the newer and less trained. Union apprenticeship training was taught by union members, but usually jointly administered with affiliated contractors; curricula were aimed at craft, not organizing for power. But the experience of training together with a cohort for two to five years, often in the union hall, tended to form a collective center for working life and its politics.

Construction workers' relatively unsupervised, jocular experience on the jobsite was another prominent feature of their power. Infrequent management supervision is common on union construction, but even lower on the vast, repetitive solar and high-speed rail projects. That opened space that union workers appreciated to joke, teach, occasionally talk politics, barbecue at lunch, and carry out the work more how they pleased–including potentially calling a day off. On a high-speed rail site, I asked Ironworkers and Operating Engineer foremen how they were impacted by rain or other extreme weather; laughing, they said they could declare a rain day and send workers home, after drawing a foot-wide circle in the dirt and waiting for three drops to fall inside. However, since stopped work meant stopped pay and frustrated contractors, this power was seldom used except when union foremen felt a stoppage was needed for safety of people or equipment on site. On San Joaquin solar and rail projects, I never heard of this capacity to stop or slow work used explicitly to make demands on the employer; their nearly unsupervised control over how work proceeded was a largely latent power.

Nonetheless, the steady demand for construction workers strengthened their hand to express themselves freely to managers. As put by Miguel, the formerly incarcerated Electrical Workers helper at Westlands Solar, "They're trying to bring back journeymen on travel right now, there's so much work. We can say to the foreman, 'Go ahead and fire me,

I'll get another job!' Everybody's cracking around like that."[99] Solar and rail workers were aware that a tight construction labor market gave them leverage, making coercive firing less likely. Through the lightly-supervised culture of union socializing and mutual learning on the job, they developed a collective sense they need not be resigned to every whim or disrespect from management.

A more fundamental shift came in union inclusion for Latino workers, and to a lesser extent, women. Only one to two decades before, workers and union leaders said, nearly all the area's building trades had been predominantly white, at every level. Coveted apprenticeships were often landed by well-advised sons and nephews of existing members, while many Mexican-American construction workers never considered it possible to join. Older members generally said that open racism had been extremely rare in prior decades within the union. Nonetheless, many building trades' *de facto* tendency towards racial exclusion had reproduced the hierarchy of the broader area, with a well-organized white minority versus a disorganized majority of color. This exclusion and hierarchy undermined workers' power in glaring ways. Union workers I interviewed shared the perception that non-union contractors, by hiring largely Latino undocumented workers, had undercut and routed unions from the majority of construction, particularly in the residential sector.

New solar and rail jobs, contract mandates for inclusion, and dedicated efforts within unions helped break down this racial line in construction. Once a critical mass of Latino workers was included, bilinguality became a major advantage on the job. A Mexican-American Ironworker leader shared how recently retired local leaders had sought out and mentored prospective Latino leaders from the ranks, including him, during the 2010s. Union apprenticeship classes overall became just as Latino as the Fresno region, and often slightly more, while union efforts to recruit and support women made more modest progress. As the next chapter shows, becoming unionized together across racial divides helped unions form organization and political alliances that overcame Mexican-American exclusion from local politics. Union leaders thought these political coalition gains would help unionize future public and private construction across the San Joaquin, for a virtuous cycle of building worker power.

Despite this inclusion, informal social divides remained, often based on generation as much as race. A local Labor Council leader told me, "If I go to the Ironworkers' meeting, in the parking lot before, you can see the cliques getting ready for the meeting. There's the old white guys who know each other, there's the young Latinos. There's not a prejudice or a tension, just a difference of who people hang out with."[100] An active Ironworker told me how local union elections were often defined by a contest between structural and rigging workers; the former, who set beams for large buildings and bridges, were generally older and whiter; the latter, working with rebar and racks for solar and rail projects, were

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[99] Miguel Higuera, May 16, 2021.
[100] Randy Hield, Feb. 5, 2021.

younger and more Latinx on the whole. In just a decade, Fresno-area construction unions had dramatically expanded their membership and leadership across racial lines, but a more collective political formation might take more time and shared work.

In the eyes of most solar and rail construction workers, the clearest benchmark of their power was their contract. Every three to five years, a local or regional bargaining team from each trade bargained their "master agreement" with representatives of local contractors, setting a floor for wages and benefits for the whole area. Details like work schedules, ratios of apprentices, helpers, and journey-level workers were generally worked out in a project-specific agreement, which was seldom shared beyond its signatories. As one labor researcher told me, "These are private contracts: tough luck seeing one. It's like asking, 'I'd like to see what you promised when you got married.'"[101]

Behind that caution, Fresno and Madera solar and rail workers and leaders frequently told me they were proud of their contract gains from the boom so far, and hopeful for more. A Pile Driver foreman on high-speed rail beamed when sharing the raises of the last decade. "Ten years ago I made $15 an hour, now they're making $36. The best part about it is it continues to go up. Every year we get a raise, and a portion goes to wages, a portion to retirement or health, welfare, vacation. We have a new contract every 5 years. Our wages never go down, they only go up."[102]

Ironworkers' most profound contract win came in ending their two-tier system on San Joaquin solar projects. In an initial compromise they believed necessary to win solar jobs, regional Ironworker leaders had agreed to hire "probationary" workers–with little training, pay, or job security–for about a third of their solar jobs. Less than five years later, they successfully pressed their employer to turn those roles into work for full union apprentices. As Jason, the Westlands Solar foreman told me, "Ironworkers started out in 2015 in a deal with the contractor where a lot of workers were probies, probationary workers. That was an opportunity to show our skilled labor, get in with the contractor. Thank god it's over. Those poor kids, getting minimum wage. Only a few ended up getting sponsored [to become a full apprentice]."[103] Recent solar laborer Francisco said the divided, less secure workforce had created problems for his union's customary teamwork and craft: "There was a different mentality–'You're here to just work'–versus a respect for Ironworker tradition."[104]

As solar projects stacked up in the San Joaquin Valley, Ironworker leaders pushed contractors to end the "probie" caste altogether. In 2018, they won, turning the lower tier roles into work for full apprentices on future projects. Speaking of the largest solar contractor in the Valley, Francisco said proudly, "Now, there's a 1:1 apprentice to

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[101] Peter Philips, Oct. 26, 2020.
[102] Sam Lopes, Nov. 17, 2020.
[103] Jason Benson, Mar. 9, 2021.
[104] Francisco Esquivel, Mar. 9, 2021.

journeyman ratio on Swinerton." In the context of labor revolts across the US against two-tier contracts since 2019, which have made only a few gains in manufacturing and logistics sectors so far, the San Joaquin Ironworkers' reunification of their workforce is a striking achievement.[105] Electrical Worker leaders in the area, meanwhile, did not push to replace the solar helper system for their trade, seeing it as a necessity to have any union grasp on the less training-intensive installer labor that often made up over half the electrician roles on solar power plants.

With sustained solar & rail demand for their landscape-transforming labor, and bolstered internally by ending two-tier, Fresno-area Ironworker leaders and members in 2021 widely believed they had enough leverage to hold out for their largest contract gains in local memory. During one visit to Westlands Solar early that year, Ironworkers were weighing a new "master agreement" offer from a board of their regional employers, which would set a floor for compensation and basic work terms across the local's turf. The past agreement had expired and then was extended by leaders for nearly a year, while negotiations moved slowly during the COVID pandemic. Despite that initial delay, workers and leaders had sufficient confidence in their power to reject the contractors' initial offer. As Francisco told me, "The last offer from the contractors, leadership opposed it. Members voted it down. We got a new offer now, with a $6.60 an hour top rate increase. Pension goes from $70 to $105 payment per month per credit year. That's a huge deal. It helps that we have all this work coming in, that helps us ask for more."[106]

Although less strident, Fresno-area Electrical Worker, Carpenters, and Operating Engineer leaders also boasted of contract gains on wages and benefits at the end of this boom decade. At the Electrical Workers' training hall, a trainer made the case that meant gains even beyond union ranks. "We fight to make things better for all workers, non-union workers too. When our wages go up, they [non-union contractors] have to keep up, just a few notches down."[107]

Construction unions were able to win a greater share of new work across the San Joaquin after expanding their ranks and reputation in the solar and rail boom. In 2020, Swinerton, a major contractor, committed to employ only unionized Ironworkers on all of its California solar projects, chosen via "direct hire", where the local union would decide which of its members to dispatch to a given project. Dillon Savory, director of the Fresno-area Labor Council, said that expanded membership from the solar and rail boom had bolstered union's organizing resources, public support, and reputation as a quality workforce for local construction, all of which helped win new private contracts like a major casino outside Fresno. As Savory put it, "Private projects can be difficult to secure with

[105] Bradbury, 2021.
[106] Francisco Esquivel, Mar. 18, 2021. A "credit year" is counted for each year an Ironworker met a minimum number of hours worked on union jobsites. Pensions were in effect based on the number of dues-paying years worked.
[107] Bill Ramirez, Mar. 11, 2021.

union labor, but our contractors have the best trained workers with the highest building standards in our region. If a business plans to own their building for a long time and want to avoid delays and construction mistakes, they use union labor."[108]

At the close of the decade, Fresno-area building trades also won hundreds of new jobs each year on municipal public sector work, as the next chapter explains in depth. With new solar and rail jobs building up union membership and training capacity, leaders turned that leverage to unionize more private and public work, setting the stage for a cycle of growth to come.

Union democracy and rank-and-file involvement made uneven advances during the solar and rail boom, starting from a modest point. Major building trade unions nationally have been known for leaderships fortified by scant or repressed member involvement. In the Laborers, top leaders were federally convicted in the 1990s for corruption and Mafia ties; soon after, the union's first open elections for top positions, levied by court order, were swept by the uncontested incumbents, in a show of member disinterest or disorganization.[109] In the Carpenters, a longtime steward in the region told me how the union's current international leadership had "consolidated power" for decades, forcing dissidents to resign or retire, while replacing formerly elected local and regional organizers with representatives appointed from afar.[110]

Whatever those difficult dynamics at the top, Fresno-area building trades often had a greater degree of democracy in local practice. As a Labor Council leader told me, "Ironworkers are different. They elect all their officials. They have people go in a day from banging on concrete to running big business operations. You've got to organize, beat the pavement, talk to people. It's very volatile. Electricians run and kick out their officials every few years too."[111]

The more glaring challenge, nearly all agreed, was the low level of member involvement in internal union affairs. A Carpenter told me, of his Northern California local, "They've got 3,000 members in the union. Usually 20 come to the meeting."[112] From Francisco, leader of an Ironworkers local with about 900 members, I heard the highest rate of participation: "We have a meeting every month, on Friday nights. About 100 attend on average, more for big meetings." An Electrical Workers representative reported a slightly lower mark. "On a good night, 10% of membership are there." Official union meetings are not the only measure of rank-and-file activity, but in no trade did I hear of ongoing local rank-and-file caucuses, other than informal groups based on worksites and shared crafts. Without sensing much at stake, or much power to change leaders' direction, members said they generally opted to skip meetings after a long work day.

[108] Dillon Savory, Feb. 3, 2021.
[109] Teamsters for a Democratic Union, 2020.
[110] Don Villareal, Apr. 26, 2021.
[111] Randy Hield, Feb. 5, 2021.
[112] Sam Lopes, Nov. 17, 2020.

Yet limited rank-and-file participation was not an inevitable fact, but shaped by a structure cast by leaders. Ricky, an apprentice on solar projects, told me a Electrical Workers local general meeting had recently voted to allow the union to dispatch workers based on employers' requests for specific names, rather than dispatch the qualified member who had been out of work longest. This was a landmark change to past policy, and had been heavily pushed by contractors until ultimately supported by local leaders. The decision became controversial precisely because it seemed its vote had been scheduled to limit member participation. "I know when they did that vote, they did it right at 6 o'clock. A lot of people were upset, were still at work, or just getting out. A little over 20 people come to the meetings. A lot of people don't show up. They get so distracted with life."[113] That claimed attendance compared with over 1,100 eligible members. With such practical obstacles to leading their locals, I often heard San Joaquin construction workers speak of their unions as "representation", a third-party staff working on their behalf. That seemed to show a resignation about their own rank-and-file capacities to lead, for the moment.

Limited rank-and-file organization posed a challenge to transparency in internal union affairs, and vice versa. An Ironworkers foreman, at the Aquamarine solar site, bemoaned his estimate that "90% of these members don't know what a PLA is!" Since he had taken office, the Ironworker leader Francisco said, "We've been doing more transparency, sharing reports, details that didn't used to be shared. It's because members pushed for it. Most guys don't know a lot of the [contract]. We're trying to change that. We're looking into sending texts [for updates]." As I observed on the solar site, a spirit of democracy showed in his conversation with a seasoned Ironworker, who asked, "What's up with this new offer? Do you want us to vote for it?" Francisco replied, "We're not pushing for a no like last time. If you feel it's a good deal, vote for it. It's up to you."

Other local construction unions had more limited draws for members to take charge. Lower tier workers in the Electrical Workers generally had the right to attend and vote as members, but little of the job security or benefits that would give them stakes in the meeting decisions. The few "helpers" who participated were usually those most deadset to making it into the full apprenticeship, due to their lack of other decent options, like formerly-incarcerated helper Miguel, who told me: "It's good to learn about, because that's my future." While some trades smiled on their members talking to non-union construction workers to encourage unionizing, a local Electrical Workers leader told me plainly, "That's really for organizers. We don't train apprentices on organizing. I don't want to cast a shadow with all that." That approach reinforced a divide between non-union workers, union members, and the staff paid to represent them from a distant station.

How did these shifts in construction workers' experience and power on solar & rail shape their politics on clean energy transitions? Despite limits on member's power in their unions, recent local union leadership changes showed shifts towards deeper support for

[113] Ricky Gallegos, May 18, 2021.

clean energy transitions. A Fresno regional Labor Council representative told me that older leaders were extremely resistant "to force trades to merge to move into green energy. You can't make a plan that keeps the plumbers, every trade." Nonetheless, he said,

> "The jobs showing up has caused a shift in trades leaders. The younger generation still don't have enough power to challenge their state or regional presidents. The baby boomers still have 5 years of direct power left. They feel the pressure. The amount of young people who believe in climate change means as soon as those leaders shift over, it's going to happen quick."[114]

Fortifying many construction union leaders' hesitation to take active stands about clean energy was their general reluctance to challenge their employers. Each Fresno-area union leader I spoke to, both from the solar and pre-solar generations, expressed a creed of collaboration rather than conflict with the boss. At the Electrical Workers union hall, a longtime training rep encouraged me to grab a sticker from their pile for members, but was irked to see one that read "Will strike if provoked" around a bare-fanged cartoon cobra. In the rep's perspective, referencing an infamous Teamsters leader, "Strikes were part of the Hoffa, mobbed-up style of unions. Now in progressive, PC California, it's better to use sugar and honey than a crowbar."[115]

While we drove around Westlands Solar, Francisco, the young Ironworkers leader, shared a similar take. "I'm a positive guy. I don't want to make everything a fight, a strike. That's not how we get what we want." Those stances reflected leaders' perceived vulnerability to lose future union jobs–lowering their dues revenue and angering their members–without maintaining the goodwill of contractors towards "dependable" labor. Although San Joaquin rank-and-file workers I met did not express any greater hunger than their leaders for conflict with employers, it was based on similar fears of job poaching, but might not indicate a deep, lasting consensus. When I spoke to more militant building trade activists from other regions, many described member passivity as the product of union leaders' commitments towards resignation and consent to employers.

That collaborative attitude meant a strong union deference to contractors and developers on what projects would be built, whether clean or dirty. As one veteran Pile Driver leader told me, "We don't fight inventions, we insert ourselves into it. The work belongs to the employer."[116] Deference to their current employers, in the case of Fresno-area construction unions booming with solar and high-speed rail work, translated to very different union political action than for Bakersfield-area unions, committed to the oil companies who often wrote their paychecks. But both shared an underlying resignation, at the jobsite, to amicably let financiers decide what world would be built.

[114] Randy Hield, Feb. 5, 2021.
[115] Bill Ramirez, Mar. 11, 2021.
[116] Don Villareal, Apr. 26, 2021.

At the state leadership level, however, perceived boons of the solar boom helped move California building trades towards supporting a sweeping shift to cleaner energy, although not a complete one. As recounted in section B of this chapter, state construction union leaders had provided potent support for the initial 2002 state mandate for utilities to reach 20% renewable energy, after guaranteeing the lion's share of work would be in-state.

In 2018, buoyed by over a decade of booming work on solar projects in particular, building trade leaders lobbied in favor of a bill expanding state mandates to 60% renewable sources by and 100% "carbon-free" sources by 2045. Exerting influence through campaign donation and volunteering pledges in districts where they had grown in the San Joaquin, a leading lobbyist claimed the trades had to be a decisive part of winning legislator votes and successfully passing the renewable mandate, overpowering opposition from all three giant private electric utilities in the state.[117] Yet just a few years later, these same state building trade leaders also opposed limits on oil wells near homes, allying with drilling companies to unsuccessfully fight a perceived risk to future job counts.[118] Union chiefs' commitment to "all-of-the-above" energy meant they could provide little direction for an energy transition, leaving initiative to employers and their investors.

Collaboration with employers on climate and energy transitions was reinforced by perceived weakness elsewhere, as San Joaquin union leaders spoke of a pressing need to unionize the mammoth, union-hostile residential construction sector. While unions had once held a huge share of residential work, since the 1950s they had been routed from housing construction nationally and in the Valley, in what a Latino Pile Driver leader described to me as "an economic genocide. I don't know another word to use."[119] Shifting to piecework pay, housing contractors won control of hiring, and shifted to hiring non-union, frequently undocumented workers at grim wages and nonexistent job security.[120]

With over four-tenths of construction employment nationally in residential construction, and only one in eight construction workers in a union, prospects for this sector weighed heavily on union leaders' hopes and fears.[121] A Fresno-area Labor Council leader told me that construction unions' climate politics, unexpectedly, hinged here.

> "The silver bullet is us having a significant change in the residential construction market. We have 0% capacity there for unions. There's zero unions that want to go from $47 an hour to $27 an hour to work on houses. But if you could get residential unionized, you'd see an absolute explosion in union members and pension health. If unions saw their pensions aren't hanging into the red, they'd be more open to new sectors and turning off some jobs."[122]

[117] Ken Fontana, Nov. 18, 2021.
[118] Cantu, 2022; Meredith, 2022.
[119] Don Villareal, Apr. 26, 2021.
[120] Palladino, 2005.
[121] Associated Builders & Contractors, 2021; US Bureau of Labor Statistics, 2021.
[122] Randy Hield, Feb. 5, 2021.

While construction union leaders believed a friendly approach to their existing contractors had helped them hang onto public and commercial construction jobs, unionizing the vast and hostile housing sector seemed to demand more militant risks towards employers. The fate of not only housing, but broader energy and transit transitions, could credibly rest on whether construction unions turned their newfound strength towards their white whale.

F. The contrast in Kern

At the southern end of the San Joaquin, Bakersfield's Kern County followed a linked but divergent path on green jobs and worker power this decade. Although high-speed rail had brought over 7,000 jobs to the counties surrounding Fresno in the 2010s, its construction had yet to start in Kern. With oil drilling providing a major source of employment around Bakersfield, construction work was often dependent on volatile crude prices that drove new investment or repair on the wells and pipelines.

In the 2015-2020 period, Kern's oil sector lost roughly a quarter of its share of overall local employment, landing at roughly three percent of the county's workers, with four thousand direct jobs in extraction and a similar number in support roles evaporating.[123] Decline in the oil industry meant building trades lost lucrative jobs constructing or maintaining pumps and pipelines. As shown in Figure 9, construction work steadily grew to nearly double in the Fresno-Madera metro area, while the Bakersfield area saw booms and busts, ending with employment at about the same level the decade began.[124]

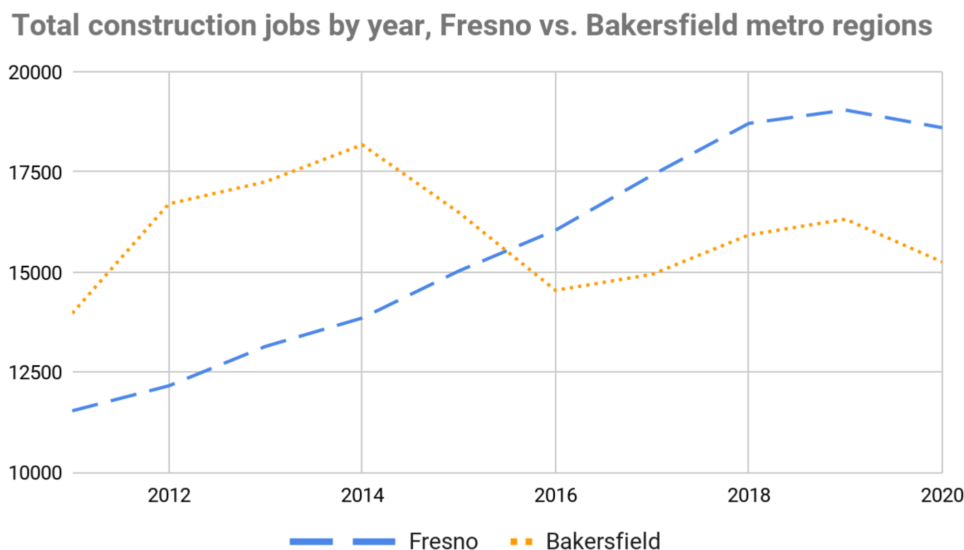

Figure 9: Fresno's steady construction boom versus Bakersfield's rocky stasis.
(US Bureau of Labor Statistics, 2021)

[123] Kern Economic Development Foundation, 2019; US Bureau of Labor Statistics, 2021.
[124] US Bureau of Labor Statistics, 2021b.

According to a union leader, oil losses drew some laid-off skilled workers from that sector to join construction unions for the first time, seeking help gaining work in new sectors like solar. However, that influx boosted internal union competition to get a contracting number of jobs. The unstable construction outlook tended to leave union leaders cautious about bringing in too many new apprentices, let alone advertise their capacity to train hundreds of diverse new workers, as in Fresno.

A solar boom that surpassed Fresno's buffered against that faltering demand. Companies as varied as Chevron, Goldman Sachs, and a French majority-state owned energy conglomerate invested in building new solar power plants on Kern County's dried-up San Joaquin farmland and, over a mountain pass, its stretch of the Mojave Desert. From 2012-2017, over three thousand union jobs helped build twenty-seven solar plants; by 2020, Kern's power plants had become the largest producer of solar electricity in all of California, making nearly double what the four counties around Fresno generated. However, the lion's share of Kern's solar construction was in the Mojave, at least an hour or two driving from Bakersfield, and their workers often lived in desert or foothill exurbs rather than the distant city. The solar plants in the Valley near Bakersfield were just half the scale of those around Fresno.

As union paychecks and members testified, a major share of these Kern solar jobs were done by workers living in the Fresno area. According to local labor researchers, construction job losses in Kern's declining oil drilling sector balanced out the solar job gains.[125] As one Ironworker foreman described the tougher context, "In Kern, we got work on an Amazon building. Nice little job for Bakersfield. There's not much oilfield work. There's a little solar there, not as much."[126]

Without an overall boom in demand for construction labor, Bakersfield-area unions were hard pressed to leverage their reproductive capacity to make demands on employers. More than any other local trade in the decade, the Electrical Workers membership grew overall around Bakersfield, but with its fastest growth by far among solar "helpers" who required little training, paid minimal dues from their slender wages, and had less stake to participate or build the union. A local Electrical Workers leader told me, with a glum note, that their recent master contract was "not as favorable as I personally would like."[127] His trade's limited bargaining power versus contractors ultimately came down, in his assessment, to their overall gains in jobs, not just in solar. "Everything [in bargaining] is based on market share, hours worked."

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[125] Edward Flores, Nov. 20, 2020.
[126] Jason Benson, Mar. 11, 2021.
[127] Devin Ryans, Nov. 18, 2021.

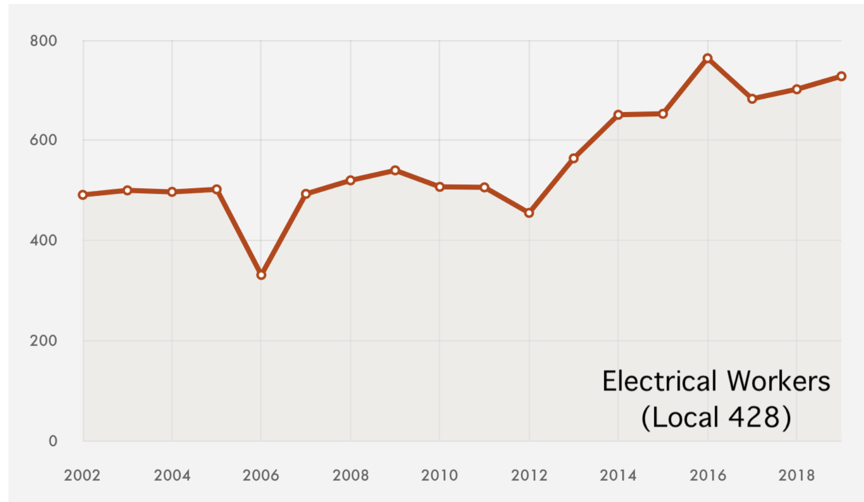

Figure 10: The Kern electricians' union grows, on the books. (UnionFacts, 2022)

In contrast to Fresno-based Ironworkers who had been able to remove the helper tier from solar projects across the whole Valley, Electrical Worker leaders in Kern stood firmly by the helper system, despite grumbling from their ranks, as a necessity. A journalist who had attended one of the union's solar hiring events in 2017 told me how, "A lot of folks who showed up were in a tense situation because they had oilfield experience, and were hoping to get a more formal apprenticeship on some projects. But Electrical Workers had negotiated to be in charge of all hiring, and had two tiers of workers, maybe three."[128] As a result of the diminished class of work, she said, "Some of the electricians and ironworkers who'd come up working in the oilfields were really skeptical of solar".

Just south of the Fresno-area boom, Kern County's less stable overall construction demand constrained the power of union construction workers, reinforcing skepticism about solar transitions from the ranks of those needed to build them. Both places gained green jobs, but not in a vacuum; the cross-sector demand for construction work shaped the resignation or ambition of union members and leaders. A county south, this shows the Fresno-area advances will not always be easily replicated in different landscapes. Time sets another horizon, as solar jobs on a given project rarely last half a year for any single worker. It took solar driving a regional boom in union construction at large, for five straight years and a promising decade ahead, for Fresno union leverage over workforce reproduction to find confident heft.

The San Joaquin shows how the promise of green jobs as welcome work is anything but automatic. It took years of union initiative to turn public investment, policy mandates, and private capital shifts towards the ironworker's ends. From their leverage over the reproduction of the workforce urgently needed to transform the land for a solar & rail boom, Fresno-area building trades won major gains in their membership, contracts, and

[128] Bridget Huber, Oct. 24, 2020.

inclusion, especially for Mexican-American workers. Workers largely welcomed these unionized green jobs in terms of steady boons to their families, lower-strain if repetitive work, and a freewheeling culture on the job, with "cleaning the air" a noted plus. Yet growing worker power met limits, in the uneven endurance of a tiered workforce, bounded union democracy, and deference to let employers "own" the direction of construction itself.

Surging overall demand for landscape transformation allowed Fresno-area building trades to offer a reproductive fix with two sides: to employers' localized demand, and to potential allies' seeking union careers for their long-excluded constituents. Where overall construction demand was unsteady, in Kern, unions lacked that potential power despite a parallel solar boom. Sector-wide growth provided more than simply the "structural" leverage of labor demand in the abstract, but gave purchase for building trades' environmental leverage to transform landscapes in the places and ways capital demanded, by recruiting, training, and coordinating construction workers by the hundreds.

This has broad ramifications for strategies for unions and state action in climate transitions. Like in construction, unions might seek to seize the means of workforce reproduction to build their leverage in other sectors where employers' demand outpaces current training and recruitment. For example, healthcare labor, and nursing in particular, is a sector where researchers and employers commonly claim a labor shortfall in many nations, but where organized workers generally have little control of training or recruitment.[129] Winning greater control of hiring, training, and coordination on the job could build their power, including their environmental leverage to reproduce workforces in the places demanded, with the local knowledge and relationships needed.

As for the state, these findings show how climate strategies that hope to deeply boost worker leverage demand the ambition to swell demand for union labor on a sector-wide scale. This is not to say vast growth of clean energy or transit construction are always, indefinitely necessary. For example, public investments or direct hires could boost demand for construction workers to turn to social housing, parks, or even environmental remediation. Advance guarantees on public projects to use union labor can provide a beginning, but not an end to building worker leverage. Especially when public union deals for climate projects legally handcuff strikes, tier the workforce, or are levied with limited member initiative or charge to lead, then further rank-and-file organizing is needed for leverage with depth.

The San Joaquin solar and rail boom did not guarantee unions would apply their leverage, let alone *how*. As the next chapter shows, construction union strategies diverged even further in their approach to change the state, showing how their relationships beyond the workplace were decisive in drawing their political horizons.

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[129] Drennan & Ross, 2019.

Chapter 4

Welding Breakthroughs

Figure 1: Fresno's allied student organizers & construction trainees, fists up.
(Valley Forward, 2020; ValleyBuild, 2019)

Southwest Fresno had seen the worst. For decades, its largely Black and Mexican-American neighbors had lived in homes between industrial sites, truck-thick highways, capped landfills, and sprayed orchards. Scattered by repression of their unions and migrant families, many had organized anyway to shut polluters, or to fund crumbling schools, sidewalks, and parks as well as the richer side of town. Success had been rare and fleeting. But in the latter half of the 2010s, new allies joined the fray; local construction unions booming in members and ambition, young immigrant activists, and newly flush environmental justice nonprofits. In just a few years, this rare coalition shut a noxious meat rendering plant, blocked a planned trucking hub, swept city council challenges, and passed measures boosting union labor and bringing parks money here at last.

Why did Fresno's construction unions develop these politics, allowing for moments of alliance with environmental justice and immigrant movements? This question has pressing, global stakes, as a climate spiraling into chaos has made environmental

movements increasingly hungry for forceful alliances with construction and industrial unions. How can the workers who build our world make common cause to fight for it?

In this chapter, I trace how San Joaquin construction union and immigrant environmental politics developed, based on the words of activists and participants, on the heels of the 2010s solar and rail boom. In Fresno and Madera, construction unions became an engine of immigrant and environmental justice coalitions at key junctures, winning landmark electoral and policy breakthroughs against the long-dominant, rightwing landowner elite. In Bakersfield, in contrast, construction unions grew with solar jobs, but did not build similar alliances; labor, immigrant, and environmental movements stayed largely divided and repressed.

What explains the gap between these politics? A gap in unions' environmental leverage in the workplace, owing to weaker overall construction employment in Bakersfield, provides just a partial answer. I begin to show the additional formative role of household social reproduction struggles and a reproductive bond they made possible. The San Joaquin's working majorities struggled to make a decent life against extreme pollution, hostile workplaces, cruel policing, and segregated austerity, which could overwhelm the labor of making healthy selves, family members, or sustaining the capacity to work.

This breakdown was what construction unions' workforce reproduction *fix*, discussed last chapter, could help address for solar developers, public officials, and prospective laborers alike. But beyond that path into work, shared experience of grim household struggles opened a reproductive *bond* for politics: allowing a shared agenda to make sense for immigrant activists and recently unionized construction workers. In Fresno and Madera's Mexican-American districts, through elections and local planning battles, the coalition agenda sought collective answers to household struggles by redistributing infrastructure, growing unions, and cleaning the air.

Shared political exclusion helped this alliance form with political independence. Against their agenda lay a largely white landowner and developer elite long dominant at every level of San Joaquin municipal government, seeking to turn landscapes to profit and power, while shutting out the San Joaquin's working and oppressed majorities. That exclusion drove unions and immigrant activists to seek a new majority bloc, in a distinctly independent revolt to turn the municipal state to their ends.

In Bakersfield, despite a similar political lockout of a working class majority of color, shaky overall construction employment and oil industry hegemony sapped those potential bonds, and activist initiative had largely yet to try. But like scores of counties at the potential crux of clean energy transitions and growing with immigrants across the United States, Bakersfield's latent working class majority harbored the promise of its own breakthrough.

A. Prior looks at alliances

My research built on a slender line of geographies of union ties with environmental justice and social movements. A swath of geographers studied so-called "community unionism" to find how labor groups, largely in the public or service sectors, built alliances and leverage for racially-oppressed working classes from California to Cape Town–but without assessing their environmental politics.[1] An exception was Juan De Lara, who researched a short logistics labor alliance with an environmental justice movement in southern California, which led him to call for "bringing labor back in" to activist studies of environmental politics, to avoid "sustainability without justice".[2]

Only rarely have geographers studied the role of construction workers in politics, and largely in cases of their hostility to environmental movements or oppressed activists. Radical geographers charged building trades with upholding racism and self-interest from Los Angeles to Canada's far north.[3] In the few geographies of construction alliances with social movements, the focus was on unions' narrow roles in immigrant electoral turnout in LA, articulating a political idea of "the people" in Sydney, or lobbying for workplace safety in Austin.[4] The few brief economic geographies of construction labor, like sociologists, have focused on its precarity and disorganization under neoliberal regimes, rather than workers' politics beyond the workplace.[5] A potent outlier was Jonathan Pattenden's agrarian Marxist study with migrant construction workers in India, which agreed their organization had been fragmented by employer strategies, but theorized their collective action was likely to emerge both in worksites and struggles over household reproduction and state support.[6]

Addressing some of geography's gap, "environmental labor studies" developed over the last decade as an interdisciplinary social science field, in the words of its doyens, "largely concerned with the environmental policies and practices of trade unions across the globe".[7] The field has a defining interest in labor's alignments in the politics of pollution, climate, and other environmental conflicts.[8] In a rare engagement from geography, Mills usefully sorted environmental labor studies by scholars who see labor politics driven either by economic self-*interest*; or by the terms of *organization* of union leaders and, sometimes, members.[9]

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[1] Davis, 2000; Pastor, 2001; Lier & Stokke, 2006.
[2] De Lara, 2017.
[3] Davis, 2000; Tufts, 2004; Mills, 2019.
[4] Varsanyi, 2005; Iveson, 2013; Torres *et al.*, 2013.
[5] Gourzis *et al.*, 2019; Vetta & Palomera, 2020.
[6] Pattenden, 2018.
[7] Räthzel *et al.*, 2021.
[8] Räthzel *et al.*, 2011.
[9] Mills, 2019.

By situating labor in a regional political context, some environmental-labor scholars reached past explanations based largely on raw class interest or organizational effort. One US-wide study found union-environmental coalitions were more common under relatively labor-friendly Democratic state governments, while less common in Republican-controlled states, where "union leaders may give up on any hopes of securing broadly progressive policies that would satisfy both unionists and the environmental community".[10] Two later municipal-level studies found the opposite, as local economic duress and political marginalization nudged union leaders towards novel efforts at alliances.[11]

The most comprehensive scheme yet of conditions for labor's climate politics arrived with a study of German and South African unions.[12] Through interviews with union officials, Kalt argued "sectoral interests, organisational identities, internal structures and coalition partners" are key factors, with unions driven by an "imperative to maintain or expand their power" rather than simply wages or jobs. Key external conditions, in Kalt's scheme, were the "political- and socio-economic environment, governance context and public discourse". These terms were useful steps forward, but still vague, deserving clarification and development.

For all its advances, the environmental labor studies literature has room to grow in three crucial dimensions. First, there is a gap on the *practice* of labor's environmental politics in the workplace, state, and elsewhere; instead, this work has largely assessed union politics based on texts like official policy statements, campaign names, or at most, interviews with leaders and staff.[13] This chapter attempts to address practical actions, as understood by rank-and-file workers, union leaders, and outside activists alike.

Second, the literature has focused on union politics for coal and other "sunset" industries, with little on workers in nascent transitions into "green" jobs. That includes a particular gap on construction work, foundational to transforming landscapes and their infrastructure for energy transitions. By studying San Joaquin workers already transitioning or working in industries driven by climate action, this chapter charts the politics formed in growing sectors, which could open routes for workers departing "sunset" sectors.

A third gap for environmental labor studies, most challenging of all, is to give a fuller picture of political formation. Interests, collectives, and politics do not spring up automatically. As put sharply by geographer Camilla Houeland: "What remains underdeveloped in this literature is a convincing explanatory approach to the social construction of interests that undergird labour's claims-making strategies on issues of climate change."[14] That includes a lack of ethnography on how workers and their unions

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[10] Obach, 2002.
[11] Obach, 2004; Estabrook *et al.*, 2005.
[12] Kalt, 2022.
[13] Exceptions include Barca 2012, on legal suits and citizen science in union-environmental alliances.
[14] Houeland, 2020.

understood their own social and environmental politics, in particular around the immigrant, racialized, and gendered dimensions of their lives outside the jobsite.[15]

B. New methods to trace bonds

To understand the construction of worker politics and alliances beyond the workplace, I draw on three conceptual approaches: social reproduction, hegemony, and rank-and-file unionism.

First, I use a particular read of social reproduction theory. Social reproduction has two dominant meanings for scholars: a classical Marxist definition, and a Marxist-feminist definition. My definition focuses on a particular intersection between the two.

On one hand, classic Marxist works define reproduction as the whole set of social relations that sustains capitalist production. As Marx lays out in *Capital*, Vol. I, production means the labor-capital relationship: the realm where capitalists exploit labor to make surplus value, and workers must sell their labor to make wages to survive. In contrast, social reproduction includes the whole set of relations that "reproduces the capitalist relation; on the one side the capitalist, on the other the wage labourer".[16] If production means the factory floor, for Marx, reproduction could seemingly include everything–from education to family care, policing to politics–that makes the factory possible, day after day, generation after generation.

If practically anything can count as social reproduction, the concept does little to focus strategy. Marx briefly mentions potential focal points: how the "reproduction of the working class carries with it the accumulation of skill… handed down from one generation to another", and requires a workers' "maintenance of himself and family". But for Marx and many followers, social reproduction ultimately sits as a broad, basically passive backdrop to the vital site of struggle in production.

On the other hand, the Marxist-feminist tradition has tended to focus on a specific level of social reproduction: the reproductive labor that makes living people, often done in households, paid care, and social services. This analysis of "life's work" frequently begins from a sympathetic criticism of Marx's theory of social reproduction.[17] In this vein, Federici and Vogel argued that Marx took for granted that workers naturally attend to their own daily "self-preservation", obscuring gendered reproductive labor into the "hidden abode" of the household.[18]

Reproductive labor, in Evelyn Nakano Glenn and Mignon Duffy's definitions, includes the work of care for personal needs, relationship building, and tending to "physical

[15] This lack is also noted by Mills, 2018.
[16] Marx, 1977 (1867), Ch. 23.
[17] The quoted term is from Katz *et al.*, 2004.
[18] Federici, 2012; Vogel 1983.

surroundings" that helps people be healthy, educated, and ready to work.[19] Observing that an overwhelming share of reproductive labor has been women's unwaged work in capitalist societies, Marxist-feminist scholars and activists found that system of reproductive work to be a profound root of gender oppression, and in turn, gender domination propped up capitalism itself. Scholars like Ferguson, McNally, Fraser, and Cooper focus on how the gendered terms of unwaged reproductive labor are based on the family form and state social support, which are made in battles between racialized working classes and ruling classes.[20] Feminist geographers in this tradition focused on understanding spaces of reproductive labor, and its spatial connections with other kinds of labor.

The Marxist-feminist focus on reproductive labor steps forward from Marx's broad definition of social reproduction as nearly everything underpinning the workplace. But a focus on any kind of reproductive labor is still too wide to narrow down strategic choices. Reproductive labor is extremely widespread. Which moments of social reproduction and its labor are most important for building movements of working and oppressed people?

I argue an intersection of these two definitions is where social reproduction theory is most useful for strategy. This intersection is where reproductive labor is under such distress that it threatens the reproduction of the whole social order. That's what I call a social reproduction *crisis*.

Such a crisis can sometimes shift leverage towards working and oppressed people, in two ways. First, collective breakdowns for reproductive labor can foster shortfalls of "productive" labor compared to employer demand in specific landscapes. That can build the structural and environmental leverage of remaining workers, both productive and reproductive, to demand more. As last chapter argued, Fresno region construction unions could leverage their capacities for workforce reproduction in a context of shortfall.

Second, widely felt hardships for reproductive labor can spark outrage, helping political rebellion get organized. As Salar Mohandesi and Asad Haider argued:

> "(A)ctivities of social reproduction remain the field of powerful class antagonisms. Many of today's lines of political contestation are thus being drawn squarely through the terrain of social reproduction – soaring rents, crumbling buildings, underfunded schools, high food prices, crippling debt, police violence, and insufficient access to basic social services like water, transportation, and health care."[21]

Shared dissent against those hardships can foster what I call a reproductive *bond* between disparate working and oppressed people. Household and individual grievances about these reproductive problems, interpreted through social connections and organizing, can become a common fury at the officials, landlords, bosses, and service-cutters behind the breakdown. Moreover, that reproductive bond can allow a shared agenda to resonate, helping form a collective political project.

[19] Glenn, 2010; Duffy, 2011.
[20] Ferguson & McNally, 2017; Fraser, 2016; Cooper, 2017.
[21] Mohandesi & Haider, 2015.

In these ways, social reproduction shortfalls and dissent can crack breaks in the economic engines and hegemony of ruling groups. This happens in specific space, where workers' connection and location in the landscape gives these shortfalls and rebellions specific kinds of environmental leverage against regional elites who need their labor or political consent. Taken together, this is how a social reproduction crisis can help unite a political breakthrough.

For union alliances beyond the workplace, Juan de Lara and Stefania Barca found social reproduction bonds–around pollution and family health, especially–were driving factors for California truckers and Italian factory workers that joined environmental justice campaigns.[22] As David Jordhus-Lier observed about South African public sector union alliances, when "social reproduction is pushed further onto social networks... so is (worker) politics: shared identities and political alliances are forged with family members, communities, neighbourhoods and associational life."[23] These scholars found reproductive bonds were key for union alliances, but none yet looked at notoriously hesitant construction labor.

Following this theory for this chapter, I looked to where San Joaquin activists saw challenges to making healthy, working people in their families, organizations, and social circles. I found many perceived extreme challenges due to pollution, austerity, and repression. I asked how these reproductive challenges shaped their politics, in terms of what they saw as the causes, possible solutions, and ways to win them. In short, I looked for how breaking down reproductive labor might create breaks in hegemony, opening new opportunities for alliance and revolt.

For a second intervention on methods for labor alliances beyond the workplace, I take up a Gramscian geography of hegemony. Given the focus of environmental labor studies on alliances, it's striking that this literature has yet to mention the last half-century's defining theorist of political alliances across radical geography and sociology.[24] Developing from activist experience and his read of Marxist traditions alike, Gramsci's method looked closely both at conditions of political economy, and how activists and movements understood and chose to relate to them.

For Gramsci, political alliances did not arise in a vacuum, but in relation to a "hegemonic" bloc; an existing alliance of groups with a shaky social rule through coercion, consent, and resignation, seeking the "passivity of the majority".[25] Gramsci saw these blocs

[22] De Lara, 2018; Barca, 2012.
[23] Jordhus-Lier, 2013.
[24] Beyond geography and environmental labor studies, a narrow line of "neo-Gramscian" political scientists looked to "material, organizational, and discursive formations" to explain the tenacity of fossil-fuel industries' "resistance against low-carbon transitions", but have yet to study the practice or potential of labor alliances. Principal works include Levy & Newell, 2002 (quoted); Geels, 2014.
[25] Gramsci, 1973, p. 183.

often rooted on a regional scale, like Southern Italy's large landowners and clergy. This idea of hegemony, as Stuart Hall and Peter Thomas pointed out, was that it was far from an inevitable or invincible feature of capitalist society, but instead always partial and resisted.[26] The task of liberatory strategy was to see the breaks in hegemony, and how they could be torn wider by movements of the oppressed, potentially forging blocs with their own tenuous hegemony.

Clyde Woods developed elements of Gramsci's approach to alliances, in my read, as an incisive method of Black and working-class geography. Whether studying the brutal, fractious hegemony of the Mississippi Delta region's "plantation bloc", or the "global significance of the working-class, multiethnic alliance created on the streets of New Orleans", Woods added to Gramsci a keen eye to how racial formation and liberatory cultural traditions like the blues helped construct politics.[27] Woods also showed how Delta hegemony was built in part through ecological reengineering, a foundation of the environmental leverage theory I use throughout this dissertation. A fight over hegemony often involves a fight to transform the fulcrum of power entrenched in the landscape.

Alliance building by labor with environmental and social movements has to be understood, then, in relationship with a regional hegemonic bloc and its leverage with the land. This is a promising approach for California's San Joaquin Valley: both the "largest human alteration of Earth's surface" in geological records, and for canonical geographies, a region defined by white landowner hegemony over a migrant working class.[28]

My third intervention on methods is to evaluate labor politics in terms of the perspectives and power of rank-and-file workers, not only of union leaders or staff. This addresses gaps in environmental labor studies for attention to union democracy and distinctions between leadership & member politics. Though a few scholars have identified this need, it is largely yet to be fulfilled, despite journalism showing sharp divides on climate between some members and union brass.[29] This follows Kim Moody's criticism of mainstream labor geography, two decades largely unanswered, for treating each union as a largely unified social actor on the terms of its leadership or staff, as neglecting to "probe the shifting social-political depths of unions and other working class organizations". This is

[26] Hall, 2016; Thomas, 2013.
[27] Woods, 1997 & 2017.
[28] The geological quote comes from Galloway, 1999; canonical geographies of the San Joaquin were reviewed in Chapter 2.
[29] Calls for this attention to rank-and-file democracy as a factor for labor-environmental alliances were made, briefly, by Kalt (2022) and Thomas & Doerflinger (2020). In historical fact, Aronoff (2016) documented a gap between some construction union members and leaders in LiUNA on the Keystone XL pipeline, while Burgmann & Burgmann (2017) evidenced national leaders' hostility to Sydney, Australia's construction laborers' "green bans".

why I interviewed both rank-and-file workers and leaders, often on their breaks at construction sites, union halls, or community events.

A closely related, influential concept of "class struggle unionism", recently popularized by Joe Burns, should also be brought to bear on environmental labor studies.[30] Burns argues "the main ideological trend for the last two decades" among US union leaders has been a "labor liberalism" strategy, which built relationships with liberal politicians or nonprofits, often through socially progressive public statements, while making mounting concessions towards employers in the workplace. Instead of defining "transformative" climate politics or "social movement union" strategies by official statements, a clearer standard of worker ambition is found in Burns' "class struggle unionism", where the proof is practice: workers' use of shopfloor leverage against employers, like in slowdowns or strikes, coupled with union organizing that builds working people (across divides like racism) into leading their own fights to break the power of capital, and transform states and employers. This standard helps understand union strategy in terms of actions and ambitions at multiple levels, even for cases–like in this study–that are far from reaching it entirely.

For the practice of research itself, I drew on two particular guides. The comparative case structure of this study–looking at the construction of political alliances or faults in Fresno, Madera, and Bakersfield from 2015 to 2020–followed what Gillian Hart termed the "relational-comparative" method of geography. In her comparison of two cities' political constructions in post-apartheid South Africa, Hart defined the approach: “Instead of comparing pre-existing objects, events, places, or identities, the focus is on how they are constituted in relation to one another through power-laden practices in the multiple, interconnected arenas of everyday life”.[31] Places on the municipal scale are traced in connection with global, national, and regional forces, shaped by history.

In that comparative structure, my research used ethnography for its principal evidence, with the approach Leslie Salzinger and Teresa Gowan termed "macro analysis".[32] This kind of research seeks "a ringside perch on the processes through which subjects act and are made in the asymmetrical interactions of daily life", which clarifies the social "structures that constrain, impel, and impress themselves" on subjects, or the people in focus. This is a development of Michael Burawoy's extended case method for Gramscian sociology, meaning ethnography should have a "a primary focus on questions of power and domination, and on the possibilities of instability and critique." By questioning people's perspectives, observing their practices, and grasping for common threads and context, the "macro" ethnographer assesses how meanings and solidarities are made in action. If people make history, but not under conditions we choose, this is a method to understand how both people and our constraining circumstances are made.

[30] Burns, 2022.
[31] Hart, 2006.
[32] Salzinger & Gowan, 2018.

My ethnography was based on fieldwork in the Fresno, Madera, and Bakersfield regions of the San Joaquin Valley from April 2017 to November 2021, along with frequent phone interviews after. Observation and socializing, by invitation, at construction worksites, union halls, organizing spaces, and municipal meetings fostered my contacts for about two hundred semi-structured interviews with regional activists, union officials. construction workers, and their family members. I led a collaborative research project for a cross-union policy campaign in Fresno, which expanded contacts, trust, and practical context.[33] Key perspective on household and workforce reproduction challenges came from a public study I helped lead on women's reasons, barriers, and support to complete construction training in the Fresno area, based on over one hundred in-depth interviews or surveys.[34] Archives of public workforce, health, environmental, infrastructure, and demographic data showed conditions to situate what I learned with ethnography.

While the last chapter focused on how the San Joaquin solar & rail boom changed workers' power on the job and in their unions, the crucial questions for this chapter lie in their politics beyond the workplace. How and why did Fresno and Madera's construction worker unions ally with working-class immigrant and environmental justice fights? Why did division reign in Bakersfield?

C. Fresno & Madera's breakdown bond

> The kids manage to blow up despite
> The fact I had to grow up
> In the home of the three strikes
> Where no one succeeds
> -from Fashawn, "Letter F"[35]

In late October 2020, California was a quiet sideline from a national presidential election in its furious last weeks. But in a drought-browned park in the San Joaquin city of Madera, between single-floor houses ringed in chain fences, I witnessed a storm brewing against a long reign of undemocratic rule. Picnic tables had been turned into the day's home base of a citywide canvassing operation for Santos Garcia's mayoral run, along with a slate for local offices that included Brian Ramirez, a young rank-and-file Ironworker. Under shade in ninety-degree heat, two campaign staffers briefed paid student organizers and union construction workers, swinging in for shifts on their day off. Every single person organizing was Latinx; going between English and a smattering of Spanish, they spoke frankly of the political opportunity they planned to seize.

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[33] Brown, 2021.
[34] Brown *et al.*, 2023.
[35] Fashawn, *The Ecology*, Mass Appeal Records, 2015. The lyrics take place in Fresno.

For three decades, Madera and many Valley towns had been majority Mexican-American, yet elected offices continued to be almost entirely held by right-wing, largely white allies of agribusiness and land developers. For a century and a half, a heavily Mexican-Californian working class had built and staffed the region's landed industries. Both Mexican settlers predating US conquest and newer immigrants had faced repression by seizures of their land, deportation raids that even took the locally born, and union-busting hired guns. Famous upsurges, like the massive 1930s cotton strike or 1960s United Farm Workers pickets in the fields between Fresno and Bakersfield, had united fieldhands of Mexican, Filipino, and European descent, among others.[36] But after vicious landowner repression of those movements, by the start of the 2010s, the UFW had just 6,000 members statewide, and disorganization in the workplace and state largely reigned for the San Joaquin working class.[37]

Fresno, California's fifth largest city with its half-million-plus population in 2020, had boomed for a century first as an agroindustrial hub, then as the sandbox of sprawl housing developers. An unbroken string of Republican mayors ruled with harsh policing, anti-union laws, and gutted infrastructure for barrios of the heavily Mexican-American, Black, and southeast Asian immigrant working class. When rebellion seethed, it was often among youth–in Fresno State's Chicano student movement of the 60s, or a rarely multiracial punk scene since–but rarely sustained or organized. By 1990, Fresno had reached a majority of color in the census; Madera, a city one quarter the size of Fresno and forty minutes north by car, shares much of its agribusiness and housing developer domination, mostly without its university or professional class, and with an even larger Mexican-American majority (80%, as of 2020) long held quiet in politics.[38]

As booming construction unions backed insurgent Mexican-American candidates and environmental justice campaigns, they sparked breakthroughs against that resignation and disorganization. From Spring 2018 to the close of 2020 in Madera, Fresno, and other central San Joaquin cities, labor-backed electoral challengers–largely from immigrant activist backgrounds–swept out 16 rightwing incumbents, nearly three quarters of those they took on. Certain building trades, in key moments, became powerful supporters and funders of environmental justice policy wins for new public infrastructure, closure of a noxious meat rendering plant, and blockage of a massive proposed logistics hub in working class, heavily Mexican-American neighborhoods. Held together by union funding and organization, an alliance of the politically excluded came together for insurgent challenges to an entrenched elite bloc, and shook hard earth loose.

A key to this alliance was how expanding membership ranks connected unions to the region's working class, Mexican-American struggles for a decent life. In the central San

[36] McWilliams, 1939; Chacón, 2018.
[37] Bardacke, 2011.
[38] US Census, 2021.

Joaquin surrounding Fresno and Madera, a decade of booming solar and rail construction had boosted construction jobs overall, in contrast with Bakersfield's lack of growth on the whole. This translated into more than just raw growth in numbers. As last chapter detailed, many building trades opened up dramatically to younger Latinx workers, particularly second-generation Mexican American men, as well as a growing degree of women and formerly incarcerated men. Key locals, like the Ironworkers, became majority Latino in both members and leadership.

Compared to majority-white prior generations in their trades, the new generation of construction union members were more connected to the Valley's social reproduction crisis via household experience of racialized poverty, policing, pollution, and austerity. Older building trades workers had earned lower absolute wages in prior decades, but before the extreme surge in Fresno housing costs in the late 2010s, pay had been enough to buy houses in more securely middle-class neighborhoods of the city or its foothill suburbs. A decent handful of recently retired construction workers I met had earned enough to support spouses to stay out of full-time paid work for years at a time; no current construction workers I asked felt they could offer that choice.

When I met newer union construction workers at electoral canvasses, or on solar and rail worksites, they were quick to describe the boons of the job in terms of the harder lives they'd left behind. After I asked an Ironworker volunteering at a Madera canvass how he got into the trade, he told me plainly, "I grew up in a bad neighborhood. Bad schools. 85% of people I grew up with are in jail or a gang. I'm just proud and happy to have this life."[39] Union members widely spoke of having scarce prior support or clear options to gain a livable income, except for jobs that ran afoul of the notorious local police. At the giant Aquamarine solar site, an Ironworker foreman told me, "A bunch of guys here say 4-5 years ago, they were selling dope on the corner. They say, 'I like this work, I don't have to look over my shoulder, watch out for the law.'"[40] Frequently, workers told me of coming of age in the San Joaquin Valley and feeling hopelessly adrift, without clear aid or opportunities in any direction, until union construction lit a path.

These were cruel symptoms, personally felt, of a larger breakdown in social reproduction. In the San Joaquin Valley, public support for health, education, and housing evaporated since the 1980s, while the region became nationally infamous for aggressively racist policing and incarceration.[41] A majority of new construction workers I met had grown up in Fresno or nearby towns during this period, and still lived in Fresno or Madera's working class quarters. A plurality had parents who had immigrated from Mexico, often from western states like Nayarit and Jalisco. The possible persecution of their immigrant

[39] Francisco Esquivel, Oct. 24, 2020.
[40] Jason Benson, Mar. 18, 2021.
[41] Gilmore, 2007; Zuk, 2013 Thebault & Fuller, 2018.

family had given workers a sense of threatened home lives and constrained job prospects, as they sought to keep afloat in economic tumult.

Household breakdowns steered many members into the trade and the union. Multiple apprentices told me they had entered construction after losing prior jobs in service work during the COVID pandemic. Others had jumped into the field to provide for family members in costly health crises, or had fled the nearby San Francisco Bay Area, where they were raised or had worked for years, as rents exploded.As an apprenticeship trainer for the Electricians told me, "The average age of applicants is 27-30. They understand what it's like to struggle for a living for a decade."[42] Construction apprentices sometimes pointed to how a lack of living wages and power on the job had constrained their lives before. Marcia, a Latina, union construction worker, told me, "My parents worked the fields. I worked at a taco truck for 5 years. For me, coming out of a minority, and working in the fields, it was always work for nothing, no benefits."[43]

Most construction apprentices I asked had previously only worked near minimum wage. They had worked in big box retail, restaurants, Amazon warehouses, non-union construction, or farm fields. Moreover, they had often despaired they had no pathway to better options, prior to finding union construction. Crumbling public schools and policed lives, among other breakdowns of reproductive support, had not prepared them to be a worker employers would pay above $15 an hour, let alone find a career with leverage. This breakdown is where building trades' reproductive fix opened a path.

Even compared to California's spiraling costs of living and public austerity at large, Fresno and Madera's heavily Mexican-American working class faced particularly steep hardships for their reproductive labor at home. Southeast Fresno and east Madera's working class neighborhoods, where many construction workers were born and still lived, were ranked by the state in the worst 5% of all California census tracts for combined health, education, pollution, and poverty metrics.[44] Those numbers, as researcher Miriam Zuk showed in Fresno, owed to how recent decades of austerity in social programs capped a century of racially segregated "government neglect", pushed by "aggressive developers".[45]

Given these grim figures, for years during my study period, it was startling that Fresno had the largest rent increases of any large city in the nation. This was the profit of the environmental leverage of the barely regulated developer and landlord bloc, wielded to cash in on fugitives from increasingly unaffordable Bay Area and Southern California housing.[46] A jump in Fresno's median rents by 39%, in just four years, had pushed many of those I asked to share cramped quarters with extended families.

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[42] Mike Gonzales, Mar. 17, 2021.
[43] Marcia Fuentes, May 18, 2021.
[44] Cal EPA, 2022.
[45] Zuk, 2013.
[46] Dillon, 2021.

Many newer construction workers sought a union role to address hard living for their families, not only themselves. Two pre-apprentice graduates who I interviewed together, both Black women, agreed passionately on this theme. Kendra spoke to her eagerness to "give back to the people who supported me", like the extended family who had given her gas money and a couch to sleep on after her release from a short prison stint and during her initial, unpaid construction training. Dominique told me her hope of fighting pollution and climate change through green construction, because "I'm worried about my son. I want to make sure the world isn't crazy for him."[47]

However, construction workers knew that union wages and benefits meant a partial salve, not a total cure, for their household reproductive struggles. No workers I spoke to believed they could be a sole income for their household, given steep costs of living. As Francisco, an Ironworker told me, "There's no way you can live off $16 an hour out here, between a house, car, credit card payments. With this job, all that is possible. But even with this job, my wife works too, we need to do that."[48] The extreme surge in housing costs around Fresno meant delayed aspirations for moving to parts of town with better-funded schools and parks, even for many construction workers who had reached top wage rates.

Childcare struggles were a key challenge, especially for women in construction, shared with a broader regional hardship. Construction unions, compared to their 96% male membership nationally, had rarely bargained for extensive childcare benefits in their contracts; but even where they existed, partial benefits could do little to overcome availability and timing issues.[49] In the wake of California's pandemic downturn in licensed childcare providers statewide, Fresno and Madera counties were 20% worse off in availability than the rest of the state.[50] Even prior to the pandemic, less than one quarter of parents seeking childcare could find a spot in the area, and only at prohibitive costs averaging about ten thousand dollars a year.[51] For women considering construction, over a third described childcare or family care as an area where more support would help them finish training. Over a quarter of women who'd completed training said child or family care challenges had posed a major, nearly make-or-break barrier to finishing.[52]

With 6:30am calls on outlying solar construction sites were typically well before daycares opened, construction worker parents I asked nearly all relied on spouses or extended family members to help with childcare. Relying on extended family for childcare built bonds of shared reproductive labor and conversations about kids and schools across households, but at times with a cost of lost mobility, deferred incomes for caretakers, and

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[47] Dominique Jones & Kendra Okafor, Aug. 21, 2021.
[48] Francisco Esquivel, Dec. 10, 2020.
[49] US BLS, 2021.
[50] Boyd-Barett, 2022..
[51] *ibid.*
[52] Brown *et al.*, 2023.

tensions about balancing the work between family members. This intergenerational reliance also seemed to raise the stakes of deportation threats.

Among construction workers I interviewed, a majority were second-generation Mexican-American, and most guessed that generation was the largest set of Latinos in their unions by far. Although no construction workers told me they had struggled with immigration persecution themselves, a few shared stories of family members or neighbors who'd faced deportation or agonizing hearings to stay. It was a difficult topic to open up.

A cruel regime of policing immigrants had metastasized in recent memory. Between 2008 and 2016, under President Obama, the number of people across the Central Valley snatched into federal deportation proceedings grew from just over one thousand to *five* thousand a year.[53] Under President Trump, by 2019, federal and local police pushed that number higher to nearly eight thousand attempted deportations.[54] In 2017, a Fresno State poll found nearly a majority of all San Joaquin residents–and 68% of Latinx residents–were afraid they or someone they knew could face deportation.[55] Latino construction workers I spoke to rarely raised this persecution unless directly asked, nor mentioned it as a principal grievance with the local elite, seemingly perceiving it driven by national factors beyond immediate control. But the migrant policing regime loomed as a calamity waiting to happen to friends and relatives they depended on for childcare, community, and more.

Figure 2: Madera, fields around and smog above. (Formulanone, 2015)

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[53] Romani, 2022.

[54] Based on US Census figures from 2020, these 8,000 people annually brought into deportation hearings were equivalent to one in every nine hundred Valley residents at large, or one in every four hundred Latinx residents.

[55] Schock, 2017.

San Joaquin air pollution, typically ranked as the country's most hazardous region for particulate smog, was a widely shared point of connection for these largely outdoor workers with a Valley-wide crisis.[56] Many workers mentioned family members with asthma, or attested to their own cases turning hard to bear when wildfire smoke became trapped in the Valley for weeks at a time. A Carpenters leader told me, "We're used to breathing not so great air just due to construction hazards. Now we've been losing days due to AQI,"[57] referring to how contractors shut down work once pollutants reached "very unhealthy" levels by federal standards. Multiple workers told me they appreciated working on rail or solar as means to "clean the air", and hoped to push that further. Climate chaos was driving massive wildfires in the Sierra foothills above Fresno and Madera, including a 2020 blaze became the largest single fire in California history. As smoke from across the state piled in the San Joaquin Valley for months, it brought construction workers and their families painfully in touch with a regional plight.

Airborne toxins from agribusiness had also affected construction workers up close, like for an infamous environmental injustice for the migrant farmhands who often lived alongside industrial fields and orchards.[58] Solar worksites in between orchards were nearly as exposed. As an Ironworker told me, "On a solar job in 2015, a bunch of us got sprayed with pesticide from a plane. Some of us got sick from it right away. We had to get naked, shower in a tent the firefighters set up."[59] At a neighboring solar panel, another worker chimed in to tell me, with a note of fury, "We're getting money together for the wife of an Ironworker who got sprayed, then died of cancer. Because she didn't get sprayed herself, she doesn't get the payment."[60] Support for the sick and the widowed was no longer a lonely household fight, but a shared task among a union network–in this case, one furious at agribusiness disregard for their lives.

This was just one example of how Fresno region construction unions forged novel experiences of collective action in spite of regional repression and disorganization. As one Sheet Metal Worker apprentice, a younger woman, put it poignantly; "We're not just surviving anymore. The union introduced me to solidarity, took care of me when I needed it."[61] Many workers spoke of the local union itself as "another part of a family", like one Electrician apprentice termed it.[62] An Ironworker described a social life among members

[56] American Lung Association, 2022.
[57] Joe Rosillo, Oct. 29, 2019.
[58] San Joaquin Valley environmental justice fights with pesticide drift are extensively documented in Harrison, 2011.
[59] Francisco Esquivel, Mar. 18, 2021.
[60] Jason Benson, Mar. 18, 2021.
[61] Sandra Dolores, Nov. 17, 2021.
[62] Ricky Gallegos, May 5, 2021.

that knit their families together, but began on the jobsite: "We work together a long time! We come to each other's places for birthdays, baby showers, housewarmings, barbecues."[63]

Construction unions offered an alternative solidarity to family support systems, sometimes providing a welcome degree of independence. Marcia, the Painter's apprentice, told me she had personally been able to stick with the job due to union support, "I've got 32 guys in my crew and I feel I can count on every one of them."[64] Marcia's former instructor told me, "She's the one I'm most proud of. She's got three kids, and her family was trying to discourage her (from construction work). But (a leader from) the Painters gave her a lot of support."[65] The network she found in the union backed her ability to chart a course beyond her family's gendered expectations.

For members who had struggled to build a decent life in the landowners' Valley, the union had become a rare space of camaraderie and aid beyond the last resort of family. From shared challenges of housing, childcare, pollution, and deportation, a common program with the region's Mexican-American majority seemed to make sense to construction workers as their own agenda. Even more, the union became a collective foothold from which to fight back.

D. *Charging into politics*

"We got involved in the war, and we're winning the war now."
- Randy Hield, Fresno-Madera-Tulare-Kings Labor Council leader

Through their unions, Fresno and Madera construction workers built courage to confront the ruling bloc at the heart of their hardship. Averse to bruising battles with their employers in the workplace, union leaders led a charge against the region's powerful non-union developers and landowners through elections and policy fights, especially at the municipal level. Swelling membership meant more volunteer organizers, potential candidates, expanded dues money for campaigns, and broader connections from which to organize the region. From a shared bond over reproductive hardships, political exclusion, and new resources to fight back, union construction workers and leaders grew their political ambition and made startling alliances with immigrant and environmental justice activists on the region's political Left.

Whether for massive farms or housing projects, San Joaquin land developers had long pushed construction unions onto the political margins. In tow to real estate developers and their anti-union contractors, in 2002 Fresno's city government was the first

[63] Francisco Esquivel, Mar. 18, 2021.
[64] Marcia Fuentes, May 18, 2021.
[65] Mike Gonzales, Mar. 17, 2021.

in the nation to ban project labor agreements (PLAs), which guarantee union or union-trained labor, on *all* municipal public construction.[66]

This had been a bipartisan shut-out. A local labor and environmental activist told me, of this period, "I was shocked to find out that a major Democratic leader in Fresno had said we're not even going to talk about PLAs, they're off the table. So we had both parties unwilling to even discuss PLAs."[67] This resulted in drastically less unionized construction than cities just a three hour drive away: "I saw the Carpenters have 90% market share in San Francisco, and down here, it was nothing! I mean nothing!"[68]

Union leaders' resigned strategy in the 2000s reinforced that political isolation. According to a young leader on the regional cross-union council:

> "The Labor Council used to be a reactive political player. 15 years ago, it was old white men in labor, on the council, who were the consultants, running all the campaigns. They had this "spirit of bipartisanship" bullshit. White guys nudging each other on the shoulder, saying we can figure out an agreement, even if it screws over the poor people. Labor would get peeled off by the softer Republicans. Would never support progressives."[69]

When San Joaquin building trades made a strategic shift in the 2010s, in this insider perspective, it was due to both their shift towards a majority Mexican-American rank & file, and pressure from other unions–particularly those in public education and care work:

> "The construction unions went from old white guys, a country club, to a bunch of young Latino guys. They came from Mexico, or Grandpa did. They didn't have a lot of opportunity, and they get in the union and take it really seriously, want to build it. A bunch of younger progressives came along, started pushing labor. A lot of push from progressive unions, the SEIUs, the women in the public sector. That gave the push to drive the Labor Council forward, it took a lot of years, a generational shift."[70]

Public sector care workers were face-to-face with state austerity and household breakdowns in the San Joaquin. For moments, they organized their outrage into growing militancy. At a rally in 2017, over a thousand Fresno teachers voted by 98% to approve their first strike in four decades, predating the national teachers' strike wave the following year. Although that strike was headed off by teacher union leaders keen on going "from conflict to collaboration", care workers' mounting activism across multiple unions put pressure on the state and labor council to draw a firmer line against austerity and poverty wages.[71]

Construction unions, growing like few others in the region, put in crucial dues money and canvassing hours to help labor council campaigns to oust pro-austerity school

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[66] Wang, 2012.
[67] Samuel Forbes, Oct. 12, 2020.
[68] Samuel Forbes, Oct. 5, 2020.
[69] Randy Hield, Oct. 5, 2021.
[70] Samuel Forbes, Oct. 5, 2020.
[71] Bonilla, 2018.

board incumbents, among other municipal politicians targeted by care unions. The changed regional labor strategy showed up in earlier, deeper electoral organizing, with efforts to develop an organizer core from workers and young, paid, majority Mexican-American field staff. As a teachers' union staffer told me before a canvass in Fresno, "There's been a change in how unions work in politics here. The old school way was, unions would show up the last 2 months of the election. Since 2014, we've been getting involved in campaigns from February, or the year before."[72]

The Labor Council built two offshoot institutions to bring this strategy to life. First was a bridge-building nonprofit, the Central Valley Partnership, founded in 2012 with Council funds; its monthly meetings, often convening over fifty at the Fresno Carpenters' hall, aimed to convene activists and leaders from unions and nonprofits towards a common regional agenda. Its executive director, an activist scholar with a long interest in Gramsci, said the initial goals had been to "bring labor and environment together in a blue-green alliance".[73] Although that had initially meant a focus on conservationist groups like the local Sierra Club chapters, in the latter 2010s the institution had shifted to focus on developing links with environmental justice, immigrant, and Black-led nonprofits.

Second, for organizing the unorganized into action, Valley Forward was an unique engine. Again funded by the Labor Council and its partner unions, it often hired over twenty local students at a time into paid canvassing roles, especially seeking those who spoke multiple languages and knew the working-class neighborhoods they'd be canvassing. As a Council leader said "Training the next generation of Valley organizers is our real goal."[74]

Figure 3: Immigrant student organizers in training. (Valley Forward, 2019)

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[72] Jesús Peña, Oct. 24, 2020.
[73] Daniel O'Connell, Feb. 11, 2021.
[74] Randy Hield, Oct. 16, 2020.

Sandra, a field coordinator in her early twenties, had risen up from an entry-level trainee in the program, and spoke frankly about its stakes. "I'm undocumented, I can't vote. A large majority at Valley Forward are undocumented, and this is their way to contribute."[75] This was a path to inclusion in paid organizing work for young immigrants with few other options. Of the nearly dozen Valley Forward organizers I interviewed in 2020, few had prior activist experience before this job–although some had volunteered in undocumented and student organizations. Most said they hoped to keep organizing down the line, especially after their doorknocking had shown them air pollution, housing costs, scarce living wages, and a void of public infrastructure were shared problems, not just their own.

During a canvassing day in Madera with air quality hovering just below the "unhealthy" mark, Miguel, a lead Valley Forward organizer, told me he had started as an undocumented Dreamer activist at Fresno State, then found a steady career and greater leverage through electoral and labor organizer roles. A few years in Los Angeles campaigns had offered lessons he'd brought back home. Miguel spoke to how climate action and immigration had become common ground for both union members and Mexican-American voters at large: "Immigration's become a big catalyst for us. And here, because fires and smoke are getting so bad, I think people are starting to realize we've got to take care of the earth a little better."[76] Here was the reproductive bond: shared, tangible household hardships to making a decent life as "catalysts" for an insurgent political bloc of organized care workers, construction unionists, and immigrant activists.

Figure 4: Union activist & soon-to-be Mayor Santos Garcia, drilling into Madera hardpan, rallying with Fresno teachers. (Author, 2020; Garcia campaign, 2020)

[75] Natalia Cisneros, Oct. 24, 2020.
[76] Miguel Villareal, Oct. 24, 2020.

Construction workers themselves stepped into political action, although usually on terms guided by union leaders or the Labor Council. When I joined at the organizing base of Ironworkers canvassing in Madera in 2020, they came and headed out swiftly in ones and twos, already familiar with campaign doorknocking. Diego, working just the day before on the high speed rail site, said, "I like coming out here: we get to work for our community."[77] Jesús, a staff organizer with the Fresno teachers' union, said members' swing into politics had won notice: "In the past, you wouldn't see an ironworker leaving the job except to go home. Now they're out on the weekends to canvass, phonebank, textbank, being involved. It's causing a shift in the Valley because everybody's getting more involved."[78]

In at least one case, a rank & file construction worker ran for office: Ironworker Brian Ramirez, who ran with encouragement from union leaders for a Madera County Board of Education seat in 2020, and won with spirited organizing from fellow members and Valley Forward. As Miguel, the Valley Forward organizer, summed up the shift:

> "Most candidates in 2018 and now are labor, or have labor connections. Very few don't. Ironworkers for sure encouraged their people to run, and they're our most consistent union canvassing. Their leader says if it works, they'll run more next time. If they do well, UDW [United Domestic Workers] and Carpenters could be next."[79]

Three major construction union locals built alliances with immigrant and environmental movements to shift the municipal state in Fresno and Madera, but with distinct strategies. Ironworkers and Carpenters took what I call a "confrontational" approach to the region's ruling bloc; Electrical Workers leaders chose a "diplomatic" route.

Ironworkers opted for frontal confrontation with incumbent developer allies in electoral campaigns. Their strategy stood out for a focus on rank-and-file field organizing for immigrant candidates, often with strikingly social-democratic agendas. This drew in part on Ironworkers' relatively strong internal democracy, with divisive tiers removed from their contracts and local leaders directly elected by members. During the 2010s boom of solar, high-speed rail, and Mexican-American inclusion in the union, a younger Latino leadership had emerged, with mentorship from outgoing leaders. A regional Labor Council organizer spoke to why he'd seen Ironworkers turn out to canvass in extraordinary force:

> "Getting somebody out of poverty, making them into a union ironworker, they have an incredible sense of pride. A lot of guys might have been in jail otherwise… These members are building something, putting your hands on something, they have a real pride in their craft. That shows in how they show up politically. [Their leader] has got a group of 25 guys he can get to show up."[80]

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[77] Diego Estrada, Oct. 24, 2020.
[78] Jesús Peña, May 21, 2021.
[79] Miguel Villareal, Oct. 24, 2020.
[80] Randy Hield, Feb. 11, 2021.

Young, Mexican-American Ironworkers had lived experience of political exclusion and migrant struggles for a decent life in the Valley. That bond gave a will to support outsider candidates, typically union members or immigrant activists remarkably independent of the state Democratic Party establishment. Often these had been local champions for Bernie Sanders' presidential runs, like Madera mayoral challenger Santos Garcia. While Ironworkers matched the regional Building Trades Council endorsements on paper, in practice, excitement from the ranks keyed into a few choice elections. In Madera, in October 2020, Ironworker members fired up for Garcia and Ramirez canvassed alongside Valley Forward student organizers across the working class eastside. Both campaigns won.

The local Carpenters stood out for confrontations with the developer bloc in municipal policy and planning battles, often in explicit alliances with local environmental justice and immigrant nonprofits. Fresno Carpenter leaders said that the dominance of developer elites in workplace and politics had led them to shun both workplace confrontation and quiet political lobbying on its own, to instead join community campaigns with the breadth to win on labor, health, and environmental issues alike. Current leaders credited one local field organizer, retired in 2019, as the figure who'd read regional conditions, developed an alliance strategy, and built relationships to pursue it. As a younger Carpenters staff organizer told me, in an interview at their union hall:

> "The political environment in the Valley can be really tough to us… We figured out that we needed to work not just for ourselves, but for all. That was how we were going to break through. If we wanted to win for better jobs, for worker power, it meant we had to fight for everyone… We've taken up two strategies to take that on. One, in politics. We help elect people, pressure them on the inside. Two, in the community. We build relationships with the community, especially through the CBOs [community benefit organizations], Leadership Counsel and BHC [Building Healthy Communities] especially."[81]

For Carpenters' leaders, the largely Latina and Black staff at these environmental justice and health nonprofits stood as the clearest available representatives and organizers of a diverse, disorganized working class. Not without reason, either, given the growing influence of these nonprofits' in policy across this period, which led to victories billed plainly by the major daily newspaper as "Social Justice Groups Are Changing Fresno".[82] A few of these NGOs had memberships and occasional volunteers that reached into the hundreds, along with key contacts throughout churches and neighborhood networks.

The city's NGOs had limits, of which their staff were often all too aware. In general, community members were sporadically involved at most, while the crucial decisions of organizing and planning were made by paid staff. Major funding for BHC, along with other regional environmental health & justice nonprofits, depended on satisfying outside donors

[81] Austin Desoto, Nov. 16, 2021.
[82] Kumamoto & Zamora, 2019.

like the California Endowment.[83] Perhaps most crucially, nonprofits were barred from direct electoral campaigning, making their alliances all the more crucial with unions, which had no such handcuffs on their money, staff, and political formation.

Focused on allying with these nonprofits and their networks, Carpenter leaders and some members joined rallies, donated regularly, and lobbied officials for environmental justice advances. Together, they won landmarks in Fresno politics:

- A 2018 ballot measure for a sales tax to expand public parks funding citywide, against a long austerity and funding bias towards wealthier, whiter districts;
- City negotiations which shut the Darling meat rendering plant in southwest Fresno, long fought by Black and Mexican-American neighbors;
- Blockage of a powerful local developer's massive logistics hub to be built with non-union workers, originally fast-tracked by city government, opposed by working class neighbors for its threatened fumes of thousands of new diesel trucks a day;
- Public comments for a development plan that limited new industrial polluters initially planned in poorer, less white residential areas.

In the context of infamous building trade opposition to environmental measures nationwide, this is an extraordinary list of concrete Carpenter actions in alliance on archetypal environmental justice campaigns.

Figure 5: A rally against a planned trucking hub in South Fresno; organized by nonprofits, backed by Carpenters: "No to bad neighbors". (Leadership Counsel, 2019)

[83] These nonprofit funding records were obtained through the Guidestar database. Their history, including of the California Endowment's healthcare profiteer origins, is offered with more detail in Chapter 2.

These experiences helped expand Carpenter leaders' ambitions. They hoped to win Community Benefits Agreements on major incoming developments; contracts through which municipal governments would enforce a coalition agenda: guaranteed union labor, new limits on pollution, and developer payouts to community organizations or social services. Carpenters expected these could readily win support from nonprofit allies, especially if local hiring and environmental justice provisions were included. Most ambitious of all was Carpenter leaders' strategy for a second Amazon distribution hub, expected to be planned for Fresno. They believed their alliance could win a CBA guaranteeing higher wages for both construction *and* long-term jobs in the hub, along with limits on truck traffic and pollution. The strategy points to how building trades elsewhere might use the environmental leverage of construction labor to win gains for warehouse workers at Amazon, a white whale of the global union movement.

Fresno's Electrical Workers charted a more traditional, diplomatic path of political action: leaders focused on private negotiations with city officials, along with electoral campaign funding, to apply a gentler pressure. As the union grew especially quickly with solar work in the 2010s, its leaders won a dominant role in the regional Building Trades Council, which carried decisive influence on a wide range of electoral campaign donations, endorsements, and lobbying.

This sway was turned to quiet persuasion, rather than public conflict, with the local developer bloc in office. An Electrical Worker leader told me of his strong relationships with Fresno's Republican city councilmembers, and his conviction he could win their votes on key labor priorities through direct phone calls, rather than organized public conflict. As for his union members' political involvement, the leader stood by a distinctly hands-off approach: "The biggest ask is to vote. I don't care how they vote. I haven't recruited somebody (from the union) to run specifically. I believe it comes from the person themselves."[84]

Despite this more cautious political strategy, the Electrical Workers and Building Trades Council had often contributed their influence to the broader breakthrough. As trades like the Ironworkers and the Labor Council, which included care sector unions, shifted towards confrontation, they increasingly drew this core of the trades into backing challengers to the Fresno region's old guard. The IBEW leader was proud of construction unions' growing unity: "There's more coordination, getting on the same page. Sometimes trades would split and support different candidates. In the last 15 yrs, there's been an effort to create a union, solidarity."[85]

In the late 2010s, the political strategies of Fresno's three largest building trades marked distinct positions in a messy terrain between labor liberalism, business unionism, and class struggle unionism. At first glance, these trades practiced business unionism with

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[84] Ken Pérez, Oct. 23, 2020.
[85] Ken Pérez, Apr. 21, 2021.

their employers–avoiding conflict with unionized contractors, while collaborating to expand their prospects–comfortably forged with varied modes of a labor liberalism focused on "building left-liberal influence in the political arena", but which "situates union efforts far from the worksites involved".[86]

Yet in confronting Fresno and Madera's developer hegemony with a challenge in municipal politics, construction unions helped build a broader working class and Latinx movement with power in the municipal state. If not class struggle unionism to the letter, they were at least a few major steps in that direction, powering the heart of an insurgent worker and immigrant struggle across the region. The Carpenters, although focused on alliances mediated through nonprofit staff, made nationally-rare bonds with environmental justice campaigns to win policy and planning upheavals for a broader movement agenda. The Ironworkers in particular stepped beyond labor liberalism's limits, with Mexican-American rank & filers becoming volunteer organizers, and even candidates, for forceful left electoral challenges to incumbent developer allies. Combined with public and care sector unions through the region's Labor Council, construction unions funded a paid organizer pipeline that helped scores of young, largely undocumented organizers into electoral and community activism for the first time.

Isolation from both rightwing Republican elites and the state's neoliberal Democratic establishment opened space for a more confrontational, class and immigrant-based political strategy from construction unions. The long domination of real estate and agribusiness developers in the Valley came with their ferocious hostility to unions, especially repressing farm and construction workers pivotal to turning a profit from land. That fierce opposition, translated into hegemony over both party establishments in regional government, had marginalized building trades with little room for compromise.

On the other side, the absence of a functional Democratic machine in the region meant relative independence and more strident class politics for this uprising. As put by the campaign manager for Bertha Pérez, a union activist, Democratic Socialists of America member, and successful city council candidate in a nearby county, "There's no Democratic Party presence here. They do a Facebook post every 4 years. There's no campaign operatives here, no team."[87] That void left campaign activists more ready, in his words, to challenge "corporate Dem" incumbents who were "mostly funded by Republicans" from ag and real estate.

While almost entirely running on Democratic ballot lines, the Fresno region's insurgent candidates and activists were full of self-proclaimed "Berniecrats", often outspoken organizers or delegates for Senator Sanders' presidential primary runs. One Bernie activist and successful municipal challenger–a favorite of Ironworkers–told me plainly, "Feinstein, Pelosi, all those neanderthals need to go. The Bernie people are

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[86] Burns, 2022.
[87] Matt Benson, Apr. 5, 2021.

enthusiastic, knowledgeable. The Dem elite tries to co-opt people."[88] A local Labor Council leader said, of regional politics, "I'm sure Bernie helped a lot in terms of uniting people. A lot of the problem on the Left has been divides between old white progressives and younger, more diverse people who care about LGBT issues and racial justice. Labor is potentially that great joiner. Bernie was a joiner--he made all these people realize they're on the same team."[89] Though co-optation and pressured moderation remained serious risks in the constraints of electoral politics, this kind of frank appraisal from key figures showed an appetite for continuing to lead on their movement's terms.

Labor's political isolation drove it towards building these unusual alliances. As a Fresno Carpenter leader explained, by way of contrast, "In the Bay Area, the trades have the electeds on lock, and don't need alliances with advocacy groups." Marginalized against a harshly opposed regional elite, construction unions seeking their own job gains came to see a material need to ally with broader immigrant, environmental and social-democratic activists, in hopes of rallying the latent working class majority to crack open municipal power. Beyond a simple ability to turn out votes or lobby electeds, construction workers and union leaders sought these movement allies as pipelines of potential organizers, policies, and candidates with roots and appeal beyond labor's alone. As a Labor Council organizer put it, "There's young people who have family on the brink of deportation who have been starting to run for office and win too. They all agree with improving workers' conditions. We can bring them in, and help them have a connection with labor."[90]

From the other side of the potential alliance, environmental justice and immigrant activists saw that construction unions had resources that were just as crucial. As one broker of these alliances at a union-funded nonprofit told me, "There's a historic but healing schism. Over the last three years between labor and environmental groups, we've begun to address historic mistrust, tensions, acrimony. Labor had capacities that other environmental and community groups did not have. That's their history of organizing deeply, and they have real money too. That's who has boots on the ground."[91] Fresno region activists and nonprofits often saw construction labor as a unique potential partner, able to provide deep ranks of potential member organizers, community connections, and warchests from dues, independent of wealthy donors or the limits against non-profits' electoral involvement. Elected officials noted this leverage coming into play, like labor ally Miguel Arias on the Fresno City Council, who told me, "Now they've realized their power. They had it before, just weren't using it."[92]

Outside of their electoral work, construction unions' reinforced the alliance with their fix for workforce reproduction. With the region's working class, majority

[88] Arturo Sandoval, Oct. 29, 2020.
[89] Randy Hield, Feb. 5, 2021.
[90] Randy Hield, Feb. 3, 2021.
[91] Samuel Forbes, Oct. 5, 2020.
[92] Miguel Arias, Aug. 27, 2021.

Mexican-American youth facing dim paths to decent work, unions sought allies by presenting their apprenticeships as an uniquely inclusive and direct launchpad into well-paid careers. By placing municipal support for union hiring agreements at the top of their wishlist, construction unions found an issue that could resonate with local immigrant activists and nonprofit staff acutely aware of the local need for jobs with better pay and power. At a banquet of public and labor officials to mark "Apprenticeship Week", Building Trades Council leaders translated their training programs into the terms of state and activist goals: "Apprenticeship is how we break the cycle of generational poverty." In the words of another key trades leader, as he told me from his office:

> "We have that last piece, that pipeline into apprenticeships from high schools. Nobody else can do that… That helps bring the community in. We can't do it alone in Fresno as just the trades. Maybe they can in SF or LA. But not here. We've got to work together. If we get targeted candidates into apprenticeships, that's when they start handing us PLAs like in LA, like in SF."

With a fix to a gap in workforce reproduction–from deprived high schools into skilled trades–construction unions built political alliances they needed for their own prospects to expand.

That said, tensions sometimes persisted about how to prioritize new "local hires" versus existing union members on new projects. In one small town neighboring the mammoth Westlands Solar site, an immigrant mayor with a long background in nonprofit organizing shared his outrage at the nearby jobs overwhelmingly going to prior union members who largely lived in Fresno and Madera: "It's like a diamond mine near an African village, but nobody from the village is benefiting from the mine."[93] The success of the Fresno and Madera alliances, hitched on unions' reproductive fix, wasn't without the shadow of those missing out.

These moments of labor and immigrant movement alliance led a seismic change in elected offices. The Labor Council's candidates racked up victories in 21 out of 29 Fresno and Madera electoral campaigns in 2018 and 2020.[94] Strikingly, across the Council's region, their challengers to incumbents did even better overall (16 of 22), while challengers of color (including Latinx candidates) did best of all, winning 15 of 18 campaigns against largely white, conservative incumbents.

New officials made moves to redistribute city and school infrastructure budgets towards the long-neglected, working class quarters of town, with bolsters for the building trades. Under developer bloc rule, Fresno had been the first city in the nation to ban project labor agreements for any municipal construction; in 2021, the revamped City

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[93] Rey León, Feb. 21, 2021.

[94] These election result figures are based on my analysis of official county & state election records, compared to public endorsements by the Fresno-Madera-Tulare-Kings Labor Council for 2018 to 2020.

Council not only reversed the ban, but voted 6-1 to require these agreements on public works citywide.

Activists were confident they could wield this model of construction labor-powered electoral upheavals elsewhere, like the Valley Forward organizer who told me, "We start here, and want to do everywhere in the Valley. Madera is our testing ground."[95] Leaders in the Carpenters were also bullish on taking the model of movement alliances on the road, like one who told me, "We're talking about spreading this model up the (Highway) 99 corridor. Redding is like a mini-Fresno."[96]

For all the optimism, questions remained about limits of the Fresno and Madera alliances as a model. One apparent limit was the depth of rank & file construction workers' role in initially choosing or steering these alliances, except by voting with their feet, in helping the campaigns where they volunteered. Even in the Ironworkers, with their visibly active rank-and-file, those I asked said that the largest union meetings focused heavily on internal contract debates, while substantial decisions about political campaigns were largely made in small committees and leadership groups.

Limited debate, training, or planning for political action from the ranks constrained members' roles as tribunes or organizers of these labor-environment-immigrant alliances. In my interviews, workers most often described their political tasks in more narrow terms as helping win elections for "people on labor's side", or simply "good for our jobs".[97] I heard of only a few examples of workers organizing family members or other connections outside their unions to take part in political actions with them.

A reproductive bond–shared experiences of pollution, austerity, and other household hardships–made the agenda of insurgent candidates and allies make sense to construction workers, but I rarely found it to be the explicit reason for members to canvass. Further interviews–especially with members at home, and with their family members–would help grasp how deep this reproductive bond was as a driver of political formation, rather than just an enabling condition for these union shifts. Moreover, an approach based on top-down initiative meant union politics were vulnerable to shift again, if leaders' interests might diverge from members, or with a turn of capital.

Another apparent limit to these alliances lay in a conciliatory strategy to follow private investment to employment, rather than guide it.[98] Whereas leaders sought to oppose anti-union developers at the ballot box, in city law, and with coalition rallies, labor peace was their policy to hold onto their existing and prospective employers, describing strikes as the tool of a bygone era. Construction union heads pushed for unionization of public work through project labor agreements with no-strike clauses, or, in some cases,

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[95] Miguel Villareal, Oct. 24, 2020.
[96] Austin Desoto, Nov. 16, 2021.
[97] Diego Estrada, Oct. 24, 2020; Jose Hernández, Dec. 9, 2020.
[98] This commitment to labor peace is detailed in Chapter 3, focused on solar and rail workplaces, and their union politics.

accepted new private sector solar work at a lower tier of wages, benefits, and job security than for most other members. To take workplace conflict with employers off the table, as a rule, was to deprive Fresno's alliances of labor's most direct leverage.

Most importantly for labor's climate politics, this deference to employers meant building trade leaders kept to an "all-of-the-above" agenda for jobs. The same Carpenter leader who had been pivotal in building relationships with environmental justice NGOs also told me, in 2019, that his union would welcome more work on gas power plants. A broker of the alliances, at a labor-backed nonprofit, told me that if capital rolled in for fossil fuel or dam construction, it would likely divide the fledgling relationships–though not entirely. "If a big infrastructure project landed in my lap, that would be a nightmare… I don't think the trades are ready to have the transition from oil conversation."[99] Without a willingness to challenge potential employers, shun certain jobs, or advance an independent vision of what would be built, construction union alliances with environmental and immigrant movements might be fleeting. Nonetheless, it seemed possible that the relationships and material successes made from these new alliances could build a practical interdependence and more deeply shared politics down the line.

Parallel limits of ambition were apparent for the elected offices won in Fresno and Madera. During campaigns, like Santos Garcia's mayoral run in Madera, some of these alliance candidates advanced elements of so-called "class struggle elections".[100] These campaigns were based in (largely immigrant) working class movement action; they agitated against developer elites, for expanded public infrastructure for all; and they developed shreds of independent organization from the state's Democratic establishment. While at the time of my study's conclusion it was too soon to finally define how candidates elected in 2018 and 2020 would use their offices, to date their focus was on managing the municipal state and leading amiable community events (like fêtes for veterans or charity giveaways), rather than principally using their offices as engines of movement building and disruption against the developer bloc.

Last but not least, the Fresno and Madera alliances had intense limits of scale. The building trades found common cause with immigrant & environmental justice organizing on municipal and county-level politics; at the same time, their leaders did not challenge state & national levels of their unions, as they continued to back fossil fuel projects and neoliberal incumbents. In the Bakersfield region, just south of Fresno and Madera, sometimes the same building trade locals flared in conflict with environmental justice activists, in defense of oil.

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[99] Samuel Forbes, Oct. 5, 2020.
[100] McShane, 2019.

E. ***Renewing divides in Bakersfield***

In the fields of the Valley
The sweat and toil one with the land
No cup of gold, no candy mountain
What better place to make a stand?
-from Son Volt, "Bakersfield"[101]

A ninety minute drive south from Fresno, at the southern end of the San Joaquin Valley, the city of Bakersfield was home to an enduring political tension between construction labor and environmental justice movements. Bakersfield has been nationally known as an oil drilling hub, home base of recent Republican Speaker of the House Kevin McCarthy, and perhaps most of all, as the "alternate capital of country music", where the children of white "Okie" settlers like Merle Haggard became famous, in part, for turning "working man blues" into support for conservative officials and cultural revanchism.[102] Despite these apparently disparate politics, the city is strikingly similar to Fresno demographically; slightly smaller in population, with the same narrow Latinx majority. What drives the political gap?

Explanations for Bakersfield's politics usually begin at the oil well. Its county, Kern, was the seventh largest oil production county in the US as of 2019; Fresno and Madera's part of the Valley had barely a drop. Kern's largest oil field runs right up to Bakersfield.

Figure 6: The Kern River Oil Field (center), at Bakersfield's edge below. (Uncle Kick-Kick, 2012)

[101] Son Volt, *Honky Tonk*, Rounder Records, 2013.
[102] Haslam, 2005.

Most oil jobs were not unionized, especially on well operations, but segments of the industry typically hired from building trades for construction and maintenance work. In the words of a Kern Labor Council staffer, "these are some of the best jobs anywhere in the Valley." On the other hand, this building trades' work on oil was volatile, mostly picking up when crude prices rose high enough for new investment to build new wells and pipes altogether, or repair creaky ones back into service. Nonetheless, as industry boosters and building trade leaders were often quick to point out, oil remained the highest paid sector on the whole in Bakersfield, with mean incomes edging into six figures.

But in the 2015-2020 period, Kern's oil sector lost four thousand jobs, roughly a quarter of its share of local employment overall.[103] With that loss pulling down new development across the board, Bakersfield did not share Fresno and Madera's general boom in construction jobs. On the whole, building trade unions in Kern were fighting for work in a slightly contracting sector.[104] Not helping was that high speed rail had yet to reach Kern County by 2020, and faced more hostile local governments than anywhere else in the San Joaquin.

Yet Bakersfield's county still had a solar boom comparable, if not greater than around Fresno and Madera. That contributed to membership gains and greater Latino inclusion for the Electrical Workers union in particular, whose ranks grew about half again over the decade, albeit with the bulk of growth in the low-paid, insecure "helper" tier. Otherwise, jobs for major trades largely did not land to Bakersfield residents. Key solar unions, like Ironworkers and Operating Engineers, had turf allowing members to work in Bakersfield, Fresno, and Madera alike, while nearly all trades allowed members to "journey out" to take jobs in neighboring areas, if demand was high enough. By all reports I heard, a majority of the union members building Kern solar plants actually lived in Fresno, which strengthened their commitments, connections, and availability for political action near home. Meanwhile, the main regional offices for key construction unions were in Fresno, which tended to focus their staff and leaders' relationship-building and ambitions on campaigns in close reach.

In this tough context, Bakersfield building trades leaders and some members frequently took the side of oil companies in battles with environmental justice advocates over drilling and pollution regulation. At public hearings, leaders of some building trades organized scores of members to speak, sometimes furiously, in support of company positions to fast-track new drilling with less environmental red tape, and to oppose proposed constraints on wells near residential areas. As a local university researcher active in these meetings told me, amid 2020's oil price crash, "Even now, when the oil companies are taking away jobs, unions' perception is that the state takes them away."[105]

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[103] Kern Economic Development Foundation, 2019; US Bureau of Labor Statistics, 2021.
[104] *ibid.* This comparison of construction employment is graphed in Chapter 4, Figure 9.
[105] Manuel Silva, Nov. 20, 2020.

The push for stronger limits on oil drilling was a primary focus of Kern County's largely Mexican-American-led environmental justice nonprofits. In particular, the Center for Race, Poverty & the Environment sometimes mobilized over a hundred activists and neighbors to its largest protests and public hearings. After years of conflict with state and Bakersfield-area building trades, CRPE organizers openly opposed adding a union representative to a state environmental justice committee, claiming committee seats should be for "representing their communities rather than, in this case, it would be their union".[106] Unions, in that view, were nearly guaranteed foes, incapable of representing a "community", only themselves.

These conflicts spoke to an underlying tension in Bakersfield around fossil fuel's prospects, emblematic of a friction over fossil jobs which environmental-labor researchers have observed the world over.[107] Bakersfield building trade leaders were committed to keep their work options open, especially in a relatively lucrative, ongoing, fixed-in-place industry like oil. Yet they also saw mounting state pressure towards clean energy, and sought to define a transition on their terms, tempered by global context and a faith in insatiable oil demand. Kern's Electrical Workers had grown most of any local union with solar jobs, yet one of their leaders told me they defended a specific kind of future with oil companies:

> We've got members that rely on oil and gas. I think there needs to be a just transition. Oil & gas isn't going to go away tomorrow. our demand isn't going to go any lower tomorrow. So stopping drilling tomorrow isn't the answer; then we'll just bring it in from Saudi Arabia. What we're drilling here is cleanest in the world. Carbon capture is another thing that frustrates me. Environmental groups oppose it, but it gives oil companies a place to go. I think it is a big part of the solution.

A Kern Labor Council organizer told me union leader goodwill for a shift from oil was hedged by concerns about job prospects, saying, "I think most of us agree we should get off fossil fuels, but we need to do it in a way where you have the job ready for them to transition into." So far, those new jobs were hard to count on, while overall construction employment contracted or plateaued around Bakersfield. For all the talk of transitions, Bakersfield's building trades and their state representatives were known nationally for relationships with regulators and environmental justice movements that were "reactionary" and "ripe for conflict", in the words of a prominent researcher.[108]

Construction unionists' hesitation to shift from the oil industry alliance was also based on their grim read of Bakersfield's political landscape. Alex, a longtime building trade leader in the area, told me construction unions faced intense hostility in the municipal state: "We had a (Bakersfield) city council member for years who basically runs (the

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[106] Kahn & Mays, 2021.
[107] Kalt, 2022.
[108] Lara Skinner, Nov. 6, 2020.

non-union contractors association), who got a lot of traction with others in the area. He poisoned the well for PLAs all over."[109]

Worse yet, in Alex's assessment, Bakersfield's building trades had dim prospects to expand the ranks of allied elected officials: "We have two city council members friendly to labor, one county supervisor. The districts are friendly to them. I just think those districts, those are the ones (Republicans) gave up. I think it has more to do with that than what we did on the ground." With chagrin, he noted, "Those district lines got sued by the Dolores Huerta Foundation." This major nonprofit, founded by a star leader of the United Farm Workers, had been an ally in the environmental justice groups' push to constrain oil. Leaders of this nonprofit saw those "friendly" districts as rigged to concentrate Latinx votes, instead of more districts with slimmer Latinx majorities; labor leaders saw these districts as the only defense for their few allies in office.

Activists hoping to build a left electoral breakthrough in Bakersfield were frustrated by the flimsiness of most elected officials nominally on labor's side. In the words of one organizer at a labor-funded nonprofit: "Melissa Hurtado used to say she supported labor and the environment, but now she doesn't talk with us anymore." A longtime local Democratic Socialists organizer saw a slick industrial influence at play: "The Democratic establishment has a stranglehold on the local primaries. Given how prevalent oil money is here, all the Democratic Party clubs, the Women's Dem club, tend to meet at the Petroleum Club," the retreat of local oil magnates.[110] Despite a Democratic brass close with oil, local labor leaders sometimes reached for even more rightwing prospects. In this organizer's account:

> "The Carpenters ran a member for city council who's a registered Republican. Things here are so bad that Our Revolution members even canvassed for him. At an event, I asked if he was a Republican, there was an SEIU guy who got pissed and said 'We don't have the luxury to pick our own candidate!' It's tough down here. The unions make insane compromises, to get the tiniest concessions."[111]

That Carpenter candidate, Ryan Nance, ended up losing by a 2 to 1 margin against a local real estate developer, in 2017's special election for Bakersfield's open council seat.

Not only a steep electoral terrain, but pessimism about the city's modest social movements came from many corners, limiting unionists' hope for transformative allies. The Kern Labor Council was often without its own staff, underequipped for the ongoing alliance- and movement-building roles of the Fresno area council just north. While for city meetings on oil development or redistricting, a few scores or even a hundred working class, largely Mexican-American residents of Bakersfield might turn out, each of the local activists I asked told me they knew of scant grassroots organization focused on politics,

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[109] Alex Bowman, Nov. 18, 2021.
[110] Patrick Arvizu, 3/15/21.
[111] *ibid.*

only charitable aid efforts, church groups, and the staff operations of local non-profits like CRPE or the Huerta Foundation. Those staff forged strategy, by and large, and mobilized their contacts for their focus on public hearings and legal battles.

A local record of fleeting victories turned into losses was discouraging for Kern's working-class non-professionals who had stepped into activism. In late 2019 through early 2020, immigrant activists successfully pressured the City Council in nearby MacFarland to block a new ICE detention facility, aided by local Democratic Socialists activists who canvassed thousands of houses for "No ICE" and "Tío Bernie" at once. Just months later, during COVID lockdown and under developer pressure, the council reversed its decision and approved the project, a move a leading activist told me was "really demoralizing" for the recently born, newly locked-down immigrant and left movement.[112] Without morale or union resources behind steady political organization, Bakersfield's working class majority of color remained relatively inactive at challenging the dominant developer-oil bloc.

No stasis is permanent; potential seemed to only be growing for a future labor and immigrant breakthrough in Bakersfield. By 2022, high speed rail construction was approaching just a forty minute drive from city limits, hammered together by at least 30% local hires for unionized jobs for local trades. That same year, over a billion federal and state dollars budgeted for Kern County public water infrastructure, oil site cleanup, energy efficiency, and affordable housing held promise to further boost union construction. Meanwhile, according to the 2020 Census, Bakersfield's majority of color rose from 63% to 71% of city residents in the prior decade. This emboldened the Huerta Foundation to campaign for a third majority-Latino council district, and showed potential for more ambitious challenges to Bakersfield's rightwing officials who relied on white voters. Though divides and resignation had reigned between repressed immigrant organizing, environmental nonprofits, and construction unions defensive of a declining oil industry, the materials to build a bridge might already be arriving.

F. *Sealing the welds*

Comparing why construction unions forged breakthrough alliances in Fresno and Madera, but not in Bakersfield, helps reveal what has fallen short in widespread strategies on green jobs and climate transitions. Vast landscape transformations for solar & rail did offer a fulcrum for construction unions' environmental leverage, based on their capacity to train and coordinate thousands to rework the earth. But whether they used this leverage, and to what end, hinged on how they understood their long political exclusion, the strengths of potential allies, and their shared household hardships as collective regional fights that could transform their power.

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[112] Patrick Arvizu, Mar. 15, 2021.

A surge of green jobs alone was not sufficient to build a labor-environmental alliance, even when unionized. Construction workers around Bakersfield built more solar power than around Fresno, but most union members lived near the latter, rooting their household bonds and political commitments there. Near Bakersfield, union leaders and many workers perceived an overall construction industry decline, a continued allure in oil jobs, and dim prospects for challenges to the regional elite.

Simply including unions "at the table" of energy and climate policymaking also fell short. For Fresno, Madera, and Bakersfield building trades alike, state-level union representatives had been influential in California legislation and regulation on clean energy and transit for decades, and both had been shut out at the municipal and county level by a developer bloc. There was little difference in the "table". Instead, the relevant difference lay in union leaders' perceived opportunity for an alliance to win power in the municipal state, secure better work, and redistribute infrastructure. In Fresno and Madera, unions did not have dramatically better access than Bakersfield's in the policymaking that seeded a solar and rail building boom. But with that boom expanding their ranks and warchests, Fresno and Madera's construction unions and immigrant activists alike found potential to sweep out the developer bloc that had long controlled municipal offices and repressed them both.

Political exclusion, rather than inclusion, was crucial to Fresno and Madera unions making their rare allies. With a long regional history of harsh anti-union rule in the workplace and local governments, building trade unions shifted towards making allies by necessity with fellow outcasts, including supporting immigrant, social-democratic activists for office who were openly independent from both Republican and Democratic Party establishments. On the other hand, immigrant activists and environmental justice organizers at nonprofits, despite past tensions, increasingly saw construction unions as the "real political muscle" with dues money, members, and agenda that could break the developers' lock on power.[113] That contrasted with the divisions that reigned in the nearby Democratic strongholds of the Bay Area, where "trades have the electeds on lock, and don't need alliances with advocacy groups," as a Fresno union leader said.[114]

How political exclusion fostered union independence and daring is support, in new detail, for conflicted past findings that political vulnerability for unions correlated to them joining environmental alliances in some US cities.[115] This also parallels sociologist Barry Eidlin's finding that union marginalization in 20th century Canadian politics drove their development of an independent, leftwing party – which won gains like national single-payer health insurance – compared to US unions, brought peaceably into the Democratic fold.[116] Like a Gramscian approach to political alliances might expect, in Fresno

[113] Samuel Forbes, Feb. 9, 2021.
[114] Joe Rosillo, Jun. 11, 2019.
[115] Obach, 2004; Estabrook *et al.*, 2005
[116] Eidlin, 2018.

and Madera, allies came together by developing a shared consciousness of collective interests, complementary strengths, and common ordeals at the whims of the dominant developer bloc.

These insurgent politics were based on a close connection of racism and class in the San Joaquin Valley. The landowner and developer bloc, and their elected officials, were overwhelmingly white. Notoriously racist policing, incarceration, immigration raids, and segregated austerity had been among their favored tools for over a century to repress the regions' working class: long majority Mexican-American, and significantly Black or south and east Asian in parts of Fresno and Bakersfield. Those living experiences of racism helped unite working class Mexican-Americans and people of color in a common formation behind the insurgent electoral and policy challenges of Latinx candidates and activists in Fresno and Madera, with stirrings in Bakersfield. As Clyde Woods bolstered a Gramscian geography to show, in the United States, it is often where racism and class domination have fused most tightly that dissent arises most broadly.

The politics of social reproduction served as a bond for the Fresno and Madera alliances. With what I termed their reproductive fix, building trades' capacity to recruit training, dispatch, and jobsite coordination was crucial leverage to unionize the regional solar & high-speed rail building boom. That expanded workforce reproduction bonded building trades, especially through their majority Mexican-American new members, in a regional social reproduction crisis they knew too well. Severe pollution and public deprivation for the barrio were no longer outside issues for unions, but a lived and present struggle for members and their families; a potential reproductive bond with broader movements fighting those hardships. Understanding how family care roles formed politics and connections for these alliances remains a key area for future research. Coming full circle, Fresno and Madera construction unions found their apprenticeships could be expanded as part of a solution to the broadly felt reproductive crisis, forming a unifying agenda with their immigrant & environmental justice allies. In contrast, the lesser inclusion of Bakersfield residents in construction unions meant less bonds were built, and union politics shifted little.

Conscious strategies by Fresno and Madera activists seized on their common ground. Alliances were not automatic. Union leaders and member volunteers built institutions for political action like a muscular Labor Council, and its young organizer training and canvassing engine. From the other side of the alliance, organizers at key nonprofits sought out building trades' participation in public planning debates and rallies. Immigrant and union-member candidates, like Santos Garcia or Brian Ramirez, depended on union backing, and stepped into the fray with an open commitment to labor and the Mexican-American working class. In contrast, although Bakersfield shared key conditions of a Chicano majority and unionized solar job growth, union leadership and the Democratic establishment opted to defend the oil industry, while nonprofits focused on frontal attacks against oil, and division reigned.

As found at other sites of fossil fuel extraction globally, an economic conflict of interest became a wedge against labor-environmental alliances in Bakersfield.[117] Construction union leaders and members, in a stalled labor market for their sector, often chose to defend their prospects at well-paid oil jobs. But the emergence of alliances in Fresno and Madera, despite latent differences over gas plants or dams, shows that potential economic conflicts can be patched over by other conditions and choices by possible allies. A key condition in Fresno was how state pressure and union leverage had succeeded in creating an overall construction boom for building trades focused on clean energy, rail, and public infrastructure.

This shows how state power can be used to set up a shared interest between labor and environmental movements: not with a token amount of green jobs, as in Bakersfield, but with a scale that tips the overall construction labor market into sustained growth for building trades. Like many versions of a Green New Deal propose, a public program that shifts massive capital into unionized construction of clean energy, transit, and other infrastructure can help unite labor and social movements–but context is crucial.

For all their promise, Fresno and Madera's momentary alliances were vulnerable because of limited roles so far for rank & file union members and non-professional activists. Alliances on electoral and policy fronts were forged largely by initiative from nonprofit staff and union leaders, mobilizing workers and volunteers to their plans without much collective political debate or development. As scholars in South Africa found, when labor-environment alliances are largely tied together by state and union leaders alone, they can drift readily towards a mild reformism rather than a transformative or confrontational agenda.[118] Yet in a region where labor, immigrant and environmental movements had all been long repressed, their alliance still took on shades of "class struggle" unionism and elections, organizing Fresno and Madera's largely-Latinx working class majority to seize state power from the dominant landowner bloc, redistribute infrastructure, and lay new foundations for union power.

Combined with state programs that dramatically expand workers' leverage and green employment, similar regional working class campaigns for state power could lay a basis for building trade alliances that lead on climate transitions. That could build virtuous cycles of labor-environmental power, on a planet in urgent need of them. Deeper research on parallel regions of repressed, racialized working class majorities is needed to judge this potential more fairly. Neither crude economics nor demographics guarantee anything about how politics get made. More than green jobs in a vacuum, it is common struggle over racial capitalism and social reproduction crises that can weld together labor and environmental movements like rarely before.

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[117] Kalt, 2022.
[118] Chandrashekeran *et al.*, 2017.

This model may prove useful far from the San Joaquin Valley. By the 2020 Census, 101 US counties were majority Latinx, tripling in just two decades, while making up a quarter or more of the residents in 311 counties. Spread from Minnesota dairies to Texas wind farm country, from the Disney World suburbs to Washington orchards, these counties often have their government offices still ruled by rightwing, largely white developers and major employers. This gap between a working class majority and an exploitative minority political class, marked by racial divides, sets up possible grounds for a similar labor-powered, immigrant movement strategy for democratic rule.

The majority role of Latinx workers in construction, nationally, makes these counties potent for construction unions to unite in movement alliances. State pushes for sustained, unionized green construction booms could strengthen these coalitions, and open room for shared support of environmental action. But where this labor leverage turns will depend on whether allies find a common reckoning of their hardships, oppressors, and openings, as they did for moments in Fresno and Madera. These were places far from fame, but their breakthroughs in hegemony lit a path where immigrant, working class power and climate action were built hand in hand.

Chapter 5
Conclusion

> Do a figure eight, let the tire screech
> In the 559 tryin' to find a beach
> -Fashawn, "Golden State of Mind"[1]

What world is going to be made? That's a choice that San Joaquin construction workers and immigrant movements began to leverage, in the late 2010s, from the flux of a solar and rail boom. In a landscape of fiercely entrenched repression, their remaking began with modest but immediate ambitions–a park on the corner, a union for those making it, a shuttered meat rendering smokestack, a new logistics hub forced to pay more and smog less. Remaking each place with collective action began, for moments, to open activists' imagination for the next one, and how it might be remade for their power and needs, including care and leisure.

Inspiration might be found very close. While the vast reengineering of the San Joaquin Valley for agribusiness earned its infamy, this has also been a place of eccentric reconstructions that made landscapes of fantasy come to life. What follows are vignettes of two of these landscapes, illustrating horizons. These were terrains remade for more than profit or simply a good cut for labor, but for opening up kinds of collective learning, pleasure, and refuge with the land. From there, new imagination and causes in common might be made.

Then, this conclusion returns to strategy, to reach those horizons of power and beyond. I draw out the lessons of San Joaquin environmental leverage, reproductive bonds, and allied breakthroughs for working and oppressed majorities to remake earth and sky. In a climate being torn apart for profit, facing the harder work of alliance building and planned transitions to come, the question is not *whether* life on earth will be transformed, but *who* will choose *how*.

A. The diaspora underground

Eight feet beneath the hard clay surface on the outskirts of Fresno, the highest leaves of olive trees are reaching up. For ten acres, tunnels of stone and dirt are the bed of an underground garden, its ceilings cut with open air skylights, and cool air circulating through fruit tree roots on shady floors. The garden was the vision and forty-year labor of

[1] 559 is the Fresno-Madera area code. Fashawn, *The Ecology*, Mass Appeal Records, 2015.

love for a Sicilian immigrant farmhand, Baldassare Forestiere, who learned subterranean arts in prior years as a construction worker at the digging edge of the Boston subways.[2]

Dreaming of growing the citrus of his native island on the San Joaquin plot he'd long saved to buy, Forestiere found the hard topsoil and searing summer heat in his way. Perhaps recalling the limestone caves dug in Sicily for refuge, or the temperate depths beneath Boston, in 1906 he decided to carve down, and found loamy earth beneath the hard-pan top. After his day shifts toiling on farms nearby, he recruited friends and coworkers–largely southern Italian and Japanese immigrants–as hired hands to help scrape out and buttress the underground maze.

Figure 1: An underground garden montage: Sicilian orange, a Fresno scraper, a welcoming entry, a skylit alcove. (Clockwise from top left: Yale Quan, Pomax [twice], David Prasad)

These were earthworks of spiritual devotion and making community, not just climate adaptation for a lonely nostalgia. Forestiere carved Catholic shrines in alcoves, a chapel with a skylit bell, and expressed the holy trinity and the seven sacraments in the

[2] This account of Forestiere's gardens draws on Scambray's unparalleled history, in Sciorra *et al.* (eds.), 2011, as well as my notes from a 2017 site visit and interview with a resident historian, who preferred not to be named.

number of tunnels branching from intersections, the number of stones in an arch. When local press viciously mocked the "human mole", it emboldened his effort to build communal gathering spaces in the cool refuge, carving a grand dining room–under an aquarium skylight with San Joaquin River fish–and started on a ballroom for dances. Beyond the lemons, fish, and people which Forestiere drew in by design, the tunnel garden became a more rich, unplanned web of life, with kit foxes, rabbits, blue-bellied lizards, hummingbirds, feral cats, and indefatigable rodents weaving an ecosystem in the cool shade.

Today, the garden continues as a part-wild refuge and collective wonder, run as a living museum by a family trust. After his death, Forestiere's children finished his ballroom, often bookable for weddings. Hemming in its plot are chain motels, scrappy industrial yards, and immigrant bastions of a Sikh temple, a *mariscos* kitchen, and a Punjabi market. In the opening years of another ambitious transformation, ironworkers and carpenters built the platforms of the high speed rail line running just a block away.

Fresno's underground garden is testament to the imaginative potential of remaking landscape: the repurposing of laborers' arts for immigrant refuge, collective celebration, creative faith, and kindling a richer web of life, never fully planned. If the garden is a fantastic rarity, it begs the question why: why more landscapes could not be made by workers' passion, by imaginations in diaspora, by refugees across species gathered in temperate wonder.

B. Irrigation surfing

The banks of disappeared Tulare Lake may be long dry, ringed with state prisons, vast solar fields, and farmworker towns, but they also hold a world marvel of hydraulic leisure. A century after Forestiere began his garden, the brightest star of world surfing arrived just outside the basin town of Lemoore to begin an experimental transformation in secret. Under the ruse of starting a tilapia farm, Floridan phenom Kelly Slater purchased a half-mile long, five-hundred feet wide pool, originally dug for water-skiing or wakeboarding. Next, Slater quietly recruited a small cadre of aerospace & mechanical engineers from the University of Southern California to manufacture the perfect wave.

A decade later, the Surf Ranch debuted in a cryptic 2015 video of Slater on its wave, barreling with eerie precision, powerfully shaped as the "the best California point break on the best day in history… that happens to be the color of French roast", in the words of a mesmerized surfer journalist.[3] The original dust-hued water was soon purified to blue-greens with an on-site treatment plant. Slater's Ranch wooed an ownership bid by the World Surf League, and soon displaced a legendary San Diego beach as California's

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[3] This quote is from Finnegan, 2018. Since access to the wave or its craftspeople were (tragically) out of reach, my account draws heavily on Finnegan, along with Wilson, 2018.

championship stop. In action, the machine churned out practically the same fabulous wave every four to five minutes, but for a select few. As of 2022, the Ranch was still open only by private invitation or VIP arrangement to pay its rumored fee, ten thousand dollars for a weekend package.

Figure 2: Surfing the re-engineered Tulare shore. (Kris Wilson, 2019)

This elite surf club belied what its founder claimed were democratic hopes. In his memoir, published a few years before the Ranch effort began, Slated argued his whimsy was a collective one, a step towards heightened mass leisure: "Surfers have dreamed of creating the ultimate wave machine. The perfect setup would take surfing to every town in America and make the sport as mainstream as soccer."[4] Claiming this particular pool could be a prototype for a new suburban fixture, however, would have to skip over the rare landscape it found to re-form in Lemoore: a pre-dug pool of fifteen million gallons of water, fed by the city water company, in a region especially gripped by developers and their risky experiments.

Surfer conservationists and their leading nonprofit seized on Slater's Ranch and fellow wave pools as an emblem of human hubris. In Surfrider Foundation's words, these wave parks were "land artificialization", inherently hostile to biodiversity and wild nature, not least because of the electricity and water demanded.[5] The Ranch closely guarded the watts and gallons used, but made sure to claim wind powered the whole. But the problems here, for environmentalist pundits, were more fundamental. For one wary writer, the Ranch was "the antithesis of my understanding of 'surfing'... because I have a healthy suspicion of

[4] Slater, 2003.

[5] Surfrider Europe, 2020.

human structure and endeavor."[6] The Ranch was simply on the wrong side of a sacred divide.

But here, in a premade pool on the old Tulare lakeshore, it rang hollow to claim the wave was artifice in an untouched Eden. Even riding the tumult of the ocean no longer could be called an escape to raw nature, in a decade where anecdotes swirled of climate-driven changes in popular waves around the world. As Surfrider grimly summarized, "surfing will bear the brunt of rising seas… just three-feet of sea level rise will render most breaks unsurfable."[7] That doomsday mark, by NOAA's modeling, was due by this century's end with only "intermediate" growth in greenhouse emissions, and potentially sooner.[8] In that context, every wave worldwide was already part man-made, and wave machines might be a last-ditch lifeboat for the sport itself.

This is not to say nothing was lost in translation from sea to San Joaquin pool. As a more measured critic wrote after riding the Ranch: "It wasn't as if I had gone surfing. That happened in a big, endlessly complicated world—the ocean."[9] In the machined, chlorinated single-track, surfers found a "theme park ride", an austere repetition that narrowed their sport to perfecting their own movements, rather than their balance in the momentary, mysterious surges of a reef break. But even in the pool, water still had powers that defied engineers, with compounding backwash forcing intermittent pauses to the scheduled surf.

If not a simple tale of "the natural world versus the artifices of mankind", as one conservationist surfer put it, then the draw of Surf Ranch was still defined by its exclusions; largely free of unknown swells; wholly void of unforeseen kelp or seals alongside in the wave, and of all those who couldn't pay small fortunes or compete at extreme heights.[10] For whatever its founder's popular hopes, the barreling wave by dry Lemoore was a space transformed for a scarce few, a waterscape of wildest dreams turned to rote and lonely thrills.

C. Transformative intent

The underground garden and the surf ranch are landmarks of horizons–and horizons are never final–far different than the more notorious, ubiquitous transformations of the Valley for landowner hegemony and lucre. Instead, these two places reached for landscapes of collective pleasure and learning, but with very different terms: as communal refuge versus exclusive club, diasporic habitat versus sterilized gym. These landscapes were more readily reworked in this valley not just because of its long free rein for landowners' whims, but also its construction workers' well-honed transformative crafts,

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[6] Wilson, 2018.
[7] Sekich, 2021.
[8] NOAA, 2022.
[9] Finnegan, 2018.
[10] The quote is from Wilson, 2018.

and the compounding effects of past reengineering that left some land dry, cheap, or water-logged.

These places show the immense creative potential of transformative labor with the land, even one with limited means. What can be created, with remade relationships in the landscape, are new collectives and newly opened political questions. The underground gardeners and their guests had to decide whether to harbor the owl nests and stowaway foxes, or chase them out. The ranch surfers debated conservation of shrinking beaches versus willful transformation. These were not the most obvious dilemmas of global climate crisis, to be sure, but that all the better shows how sensuous experiences within a remade landscape can remake collectives and their outlook on their political choices.

Here is why this dissertation includes stanzas of song lyrics, poetry, and photos about the changing San Joaquin landscape, from those right there. These were more than intermissions; they were vivid insights about "becoming the Valley" through toil, or longing "to find a beach" under the asphalt.[11] Even the site of labor is full of creativity and relationships that go beyond work; solar jobsites were full of careful horseplay, sandlot barbecues, and sensitivity to the air quality and dirt. People are a part of landscapes not just as labor power or profiteers, but as creative beings making sense of our sensuous place and its potential, from our labor, play, care and much else.[12] A sense of landscape is not just made alone, naively, but given words and meaning through collective ideas, like Forestiere's mysticism, or Montoya and Ondaatje's immigrant histories and utopian hopes.[13]

There's no easy way to generalize where these creative, sensuous dimensions of relationships to landscape lead politically. But their open ends are the whole point. Marx was right to encourage radicals to avoid "writing recipes... for the cook-shops of the future", both to avoid abstract idealism, and from belief that democratic movements can cook up far better from future grounds they've won.[14] That is another virtuous cycle to seek for climate transitions: transforming landscapes to expand the grounds for more ambitious movements to learn, grow power, and build a future beyond what can be foreseen from our current, crumbling ledge.

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[11] This refers back to the passage cited in Chapter 2 from Soto's "Elements of San Joaquin", and, at the opening of this chapter, Fashawn's "Golden State of Mind".
[12] My argument here is indebted to a line of political theory running from Haraway's *Cyborg Manifesto* (1985), especially through interpretations by Kathi Weeks (2013) and Alyssa Battistoni (2017, p. 22): calling for a politics of labor consciously seeking "a collective subject that is still coming into being... one capacious enough to include humans and nonhumans alike" in a solidarity of "co-laborers". My suggestion, consciously too undercooked to put in the main text, is that some kinds of transformed landscapes can make this kind of solidarity more tangible and winnable.
[13] This refers back to the passages cited in Chapter 2, from Montoya's "in search of aztlán" and Ondaatje's *Divisadero*.
[14] Marx, 1977 (1867), p. 99.

Greater transformations beckon. When scientists and state officials visualize climate "pathways" to avoid total calamity, it is typically as lines on a graph: emissions cut by so many tons, in so many years, from such and such sectors. The unspoken substrate, for any climate transition worth the name, involves massive remakings of land, sea, air, and life. The essential political question of climate is how working and oppressed people could decide those massive transformations democratically, for a common good defined by themselves.

Figure 3: A shore imagined restored; Merced National Wildlife Refuge, 40 miles from Madera. (Author, 2021)

Constructing a politics of "conscious environment making", in Christian Parenti's words, is the order of the era.[15] Three decades of climate crisis have further shredded the web of life since William Cronon's call for a less pious environmentalism:

> "the solution to our environmental dilemmas... will only happen, however, if we abandon the dualism that sees the tree in the garden as artificial—completely fallen and unnatural—and the tree in the wilderness as natural... both in a practical sense now depend on our management and care. We are responsible for both, even though we can claim credit for neither... Instead, we need to embrace the full continuum of a natural landscape that is also cultural..."[16]

There are no returns to Eden; only a harder, confusing job of conscious transformation and care for our earthly mess. That responsibility might be most readily taken up in starkly transformed landscapes, and especially by those who have done the transformative work so far, but know how little they've been served by it.

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[15] Parenti, in Sapinski *et al.* (eds.), 2020.
[16] Cronon, 1996.

To ask how these transformative choices will land is largely to ask *who* will make them. Over any transformation with stakes to change a region, let alone the globe, conflict is guaranteed. There is little ground in strategy for the royal "we". For all his insight in troubling wilderness, Cronon's help for strategy was held back by writing his subject, his agent of history, with that genial "we": at places meaning his peer "environmentalists", mostly meaning "human selves" as a whole, who he exhorted to become careful stewards together.

From who and how a transformative collective can be made are the primal questions of political strategy. As Raymond Williams precisely put it, presaging Cronon's argument, "We have mixed our labour with the earth, our forces with its forces too deeply to be able to draw back and separate either out", but this made very different kinds of potential political agents: "for the miner and the writer the mixing is different, though in both cases real; and that for the labourer and the man who manages his labour, the producer and the dealer in his products, the difference is wider again."[17]

Few mix themselves with the earth quite like the construction laborer: the pile driver who sinks beams below, the mason who turns ground rock slurries to structure, the welder who turns mineral flux to rippling metal bonds. Even more distinctly, few laborers see their products taken from them in quite the same way. Construction workers' craft, once done, is largely hidden behind drywall or finish. Almost always, their access, income, and say in the use of a space they built is cut off as soon as their work is done.

The way construction workers labor with the earth means more than just possibilities of environmental leverage through making spaces or striking to stop them, though those are mighty kinds of leverage. Construction is dirty work, which means tactile possibilities for consciousness–for knowing the dirt, so as to work with it better. In the San Joaquin, the job could involve learning where and how to set a solar panel rack, a park playground, a runoff channel, or a wildlife tunnel under a road; possibilities these workers could make elsewhere for common designs, rather than investors' whims.

As they remade the landscape, construction labor could remake parts of their perspective on what lies beneath and what could be done with it. That makes construction workers a potential agent of transformative stewardship–or beams in a broader movement of the working and oppressed–like few others.

D. Shifting construction

How could construction workers come to fight more often for transforming landscapes for a common good? That's a pressing question of strategy that animated my research. Like in Bakersfield, building trade leaders in much of the nation have staunchly

[17] Williams, 1980.

defended fossil fuel developers as part of a frank "all-of-the-above" strategy to maximize union employment, alongside increasingly lobbying for unionized clean energy work.

Combining lessons from Fresno and Madera's alliances with ideas from construction rank & file activists from elsewhere in the US, I propose three approaches with promise to help building trades break from allying with development capital, towards climate action led from working & oppressed movements. First, an "inside transition": union and state action can empower workers in "dirty" industries to clean up the work process directly, at increasingly prohibitive costs. Second, state and movement action to reinforce zero-sum choices for unions between building for fossil capital or a green commons, to gain construction jobs and political allies. Third, crucial for all else, a process of construction worker political formation is needed, likely to be helped by reproductive bonds, influence from allies, and rank & file initiative.

Workers in dirty industries can help lead climate transitions when they have the power to make their jobs less polluting, better paid, and increasingly expensive for fossil capital. This goes beyond the concept of "just transition" as originally conceived by US oil and chemical industry unionists in the early 1990s, with state funds as "a helping hand to make a new start" for those laid off from closing dirty industries.[18] Decades later, as that phrase has become often a toothless cliche for center-left politicians, union activists have recently proposed to use their control on the job to push transitions themselves.

This emerging strategy might most simply be called an "inside transition".[19] The clearest example in practice comes from the main US oil worker union, which demanded, for their 2022 nationwide contract, to lower greenhouse and toxic gas emissions at refineries as a matter of workplace safety, common good, and avoiding state shutdowns that could jeopardize their jobs.[20] Instead of outside action forcing the transition, here were workers using their power on the job to bargain climate demands directly with the boss. A leading California refinery unionist in this push told me that although refinery executives fiercely objected and ultimately avoided any concession on this front, many oil workers hoped to keep pushing this strategy to make a future for work on their own, greener terms, with help from mounting federal funds for cleaning up the oil industry.[21]

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[18] Mazzochi, 1993.
[19] This proposed name is mine, given a lack of a existing name so far. "Inside transition" may not be the most vivid, but it recalls what this strategy shares with the "inside strategies" of work-to-rule slowdowns and other on-site tactics to constrain production and affect the boss, which became popular among manufacturing workers fighting plant closures and concessions in the 1980s; Botz, 1991.
[20] DiMaggio, 2021. The oil worker union referenced is the United Steel Workers, in which the Oil, Chemical, and Atomic Workers–the original union advocates of "just transition"–folded into at the national level in 2005. Since details of the contract demand were never shared publicly, this interpretation of the strategy is based on the interview in the following note.
[21] BK White, Jan. 6, 2023.

For the building trades, this "inside transition" approach could have plenty of heft. Australian construction workers took up a highly ambitious version with their 1970s slowdowns and "green bans" to win concessions from–or outright stop–the construction projects they deemed environmentally or socially destructive.[22] More recently, in a massive southern California electrician union, with officials known for defending oil projects, a rank and file organizer told me she and a few fellow members were beginning to promote their own inside transition for oil projects: "Make the jobs as expensive as possible."[23] Workers would raise wages, vigorously challenge "every health & safety issue" at work–possibly using walkouts or slowdowns–and otherwise push work process cleanup "to make it the best anywhere" for climate and local pollution. State rules would likely be needed to reinforce union power, setting high standards and preventing management workarounds. But by making dirty jobs expensive, clean as possible, and with a work process increasingly under their control, electricians could help lead a phaseout from inside.

Instead of a jobs versus environment dilemma driven by a state-led shutdown, the inside transition calls for workers to make their jobs *for* the environment as much as they can, while building control to shift their work into a new, cleaner industry. In practice, this would need to be a lever balanced in a broader movement strategy. Powerful, highly-paid workers in a dirty industry could have ample reason to drag out a shutdown. That likely makes necessary a degree of guidance and decisive pressure from off-site allies and state power to ensure transitions meet broader democratic needs. But this approach would no longer place workers in dirty sectors as an obstacle in need of subduing, but instead a force in need of power to help lead.

The second approach this research suggests is to use state and movement action to foster *zero-sum choices* for construction unions on their potential jobs and potential allies. Building trade leaders, facing immense pressure to sustain their membership between short-term jobs, have tended to push forcefully for "all-of-the-above" development, or backing any construction with promise to be unionized. In practice, siding with dirty industry might come with immense, direct trade-offs. For Fresno and Madera building trades, choosing to fight for new gas plants or dam jobs would have created a "nightmare" straining their alliances with immigrant and environmental justice activists, as put by a local intermediary.[24] Without those allies, these trades would have had far dimmer chances to win elections and unionize municipal construction jobs by the hundreds. Not only key allies, but an even greater degree of jobs might be lost by building trades taking the side of fossil profiteers.

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[22] Burgmann & Burgmann, 2017.
[23] Celina Barron, Mar. 11, 2023.
[24] Local labor-environment broker Samuel Forbes, Oct. 5, 2020; from a quote included more fully in Chapter 4, section D.

That demonstrates a crucial task for activists, union members, and state action will be to reinforce that "all-of-the-above" jobs aren't possible at once–and that much more can be gained for building trades by constructing a growing green commons, than for a volatile, largely hostile fossil capital. If fossil profiteers continue to plan the bulk of what is built, too often with building trade support, the construction work will not only help unravel life on earth, but it would miss out on better jobs that might be made building a green commons: clean energy, transit, parks, land remediation, and social housing, for a start. The hardest work of activists and state advocates of the latter projects may be to prove they are potent and necessary allies, capable of winning that more bountiful green path together. In Fresno and Madera, a political lockout by hostile developers helped make the case to unions and immigrant activists for their alliance, as did the growing strengths of both groups. State action helped by proving the solar and rail-led boom it initiated could boost union strength, a taste of the possible gains from an alliance. However, that example alone wasn't enough to shift construction unions–as in Bakersfield–without movement allies able to convince that a breakthrough path was possible, and hinged on their help.

This leads, finally, to how a third element is needed for any shift in construction unions: their own political formation. As this dissertation has worked to show, how construction workers developed their collective politics depended on not just prospects for jobs, pay, or powerful allies, but also on a complex process of developing strategy and solidarity, through relationships within and beyond the union. Key factors for Fresno and Madera building trades' political formation were growing inclusion across race, the hardships they knew at home, the systems they made to reproduce the workforce, their culture on the jobsites, the mediated influence of care worker and nonprofit allies, and their process of internal democracy through limits.

In that mix, union members themselves had unique relationships and credibility from which to talk politics and build support for new directions. That's why a "rank-and-file strategy for the building trades", as a Texas electrician proposed in 2019, could have an irreplaceable role for politician formation in these unions.[25] This strategy, as spelled out across sectors in the 1970s by socialist union activists in the US, encourages left activists to become long-term, respected union members themselves. More importantly, whether started by those activists or longstanding members, the strategy calls for rank-and-file reform movements to move their unions towards democracy, powerful fights with management, and deeper ties with class-wide, left, and anti-oppression movements.[26]

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[25] Pollock, 2019. In a sector adjacent to clean energy construction, Huber (2022) makes a detailed case for a rank-and-file strategy for electric utility workers to lead for working-class climate politics, and frequently with membership in separate locals of the International Brotherhood of Electrical Workers union.

[26] Moody, 2000.

Beyond theory, this strategy has held up for union reform breakthroughs and new political directions from logistics to teaching to manufacturing unions in the US, and in Brazil.[27]

Whether from trusted members inside, or close allies alongside, these sparks of politics could be organized into major shifts in construction union strategy. Whether they caught on depended on how union members and leaders perceived their prospects at work, in the state, and at home. This dissertation argues that a shared agenda for Fresno and Madera building trade alliances came to make sense from a reproductive bond: how construction workers and the region's working class, Latinx majority increasingly shared household hardships of making decent lives against extreme pollution, rising rents, migrant persecution, and segregated austerity. Rank-and-filers or prospective allies would not make those conditions of their choosing, but they could use them as grounds from which to unite and fight a developer elite at the root of the problems. Those conditions of household hardship for making healthy people and decent lives are awfully widespread, which means alliances based on transforming them might have wide potential to shift union politics well beyond care worker unions alone.

A principal question for building trades' politics begins at the blueprints. "We don't fight inventions… the work belongs to the employer," even a relatively militant Pile Driver told me plainly, just minutes after he recalled gleefully throwing eggs at non-union contractor suits for a 1980s direct action in San Francisco.[28] If construction workers came to challenge the plans of construction as not simply "belonging" to the financier, but instead to their labor and a greater commons that made them, a world might be turned.

Building trades are already closer than it might seem at first glance to working for a public good, and in standout ways, on their own terms. In large swaths of the US, union construction work is overwhelmingly on publicly-funded or mandated projects, just run by private contractors, like on San Joaquin high speed rail. Union tradespeople typically own all their own hand tools, run their own training, coordinate their work largely unsupervised, and carry with them the crafts and relationships that remake landscapes. If not a total grip on the means of production, that's many steps closer than many ever come. More direct public employment–or even union-run firms, as California building trades did over a century ago–could help laborers' nascent strengths take ownership of the blueprints.[29]

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[27] The US gains of this strategy have been richly covered in *Labor Notes*, as across sectors in Bradbury, 2021. For Brazil: Brown, 2022.

[28] Don Villareal, Apr. 26, 2021. Full quote in Chapter 3, section E.

[29] As Kazin (1987) wrote, around 1900, San Francisco's powerful building trade unions opted to make, own, and run their own construction materials factories. This ambitious worker ownership principally sought to replace private factories, which had not only been fiercely anti-union in their shops, but had even charged steeper prices or withheld sales to unionized private contractors in efforts to bust unions. Due to both strategy shifts and increasing competition, these union-run factories were generally retired within about a decade.

Construction workers hold potential leverage over what is built or not; over what terrains are made. That essential environmental leverage could prove pivotal to hopes of working and oppressed people writ large to make climate transitions in our own interest. For long besieged building trades, those were the politics which empowering transitions, potent allies, and resolute members could give ground to form.

E. Upward spiral

On the long altered floor of the San Joaquin, the start of a massive climate transition took form in a single decade. But far harder choices remain.

The bullet train line and the world's largest solar power plant, if ever done, may take another decade or more of sweat, capital, and politicking. The renewable energy already supplying a third of California's demand looks like low-hanging fruit, compared to the costly lithium, compressed air caverns, geothermal wells, or other transformations likely needed to reach state goals for a complete reliance on clean power by mid-century. The oil fields and rusted pipes outside Bakersfield loom for battle between visions for renewed drilling, or for phaseouts, cleanups, and conversions, perhaps to solar plants. Marathon droughts, groundwater sucked low, and imminent cataclysms for linked watersheds across the Southwest all demand either bitter decisions, or the rule of ruin.[30]

The prospects of these climate transformations, parallel to those the world over, hinged on what political formations would bring them into being. Yet those formations are the opposite of ready-made. The climate crisis arrived in public view just in time with neoliberal rule across most of the globe. For four decades since, employers and their boosters in government have relentlessly pushed privatization, austerity, and repression to disorganize the possible collective leadership of working and oppressed people.

The San Joaquin breakthroughs show how in transforming landscapes, construction unions can become an engine of collective action for working people. Here, ironworkers and carpenters built a more steady, immigrant, and emboldened membership through a sweeping solar and rail building boom. Especially crucial was how they leveraged their means to reproduce the transformative workforce those booms demanded fast.

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[30] The San Joaquin Valley water and agribusiness machine depends on massive deliveries from wetter northern California, drawing a whole quarter of the take from the State Water Project (Islam et al. [2022]). Nearly all the remaining northern water is carried to massive southern California cities and irrigation districts, which pull massive shares from the Colorado River and Owens Valley watersheds, among others. The Colorado River water system, as of the writing of this chapter, was on the precipice of unprecedented collapse due to drought and obstinate overdrafts, particularly from California (Flavelle [2023]). In this fraying Western web of thirst and greed, the San Joaquin agroindustry and housing developers most dependent on water imports stood both deeply threatened, and as a dangerous wild card.

Construction unions turned that leverage, and its collective proceeds, into the material fuel for heavily immigrant, working class coalitions to confront developer hegemony, especially its power in the municipal state. When they won startling supermajorities of their challenges to elite incumbents, they began to steer the transformation of landscapes by their collective hands.

It's striking that construction unions could become this engine of movement power in a notoriously anti-union landscape. The San Joaquin municipal levels of government and land development, longstanding pioneers in union repression and immigrant policing, are exactly where construction workers and their allies made their greatest gains in the late 2010s. Although the relative influence of building trades over California's state government helped unionize solar and rail jobs at the start, that lobbying was never the only factor or the deepest fulcrum of their leverage. This case can't be dismissed simply as the luxury of a blue state.

Climate crisis and past irrigation gone awry pulled California's solar boom to a Valley shore long hostile to labor, but where construction unions' reproductive fix and environmental leverage could still gain advantage. The San Joaquin's developer bloc built their hegemony through the landscape, and that made them all the more vulnerable to the workers needed for transforming it back to profitability. Many contemporary geographers argue that such "capital switching" from dirty to cleaner industries is increasingly widespread across the globe, as investors seek an "ecological fix" to their diminishing returns under climate chaos and state pressure.[31] That capital switching is likely to create widespread opportunities for construction workers and others to wield leverage over the terms of transformation.

This sums up *how* San Joaquin construction workers and immigrant allies wielded leverage. But *why* they took this allied path is an equally needed guide for strategy. As opposed to a friendly state, it was political marginalization in the San Joaquin that helped construction unions foster their independence and confrontational courage. Exclusion from land developers' "knitting circle", in the words of a Carpenter organizer, sowed the fury to challenge them directly.

Moreover, fellow outcasts found common cause. In Fresno and Madera, construction unions, Latina social democrats, and environmental justice activists came to see that shared adversaries meant shared reasons to make an insurgent alliance. Intermediary institutions, forged by unions from care work as much as construction, made space for parley and for developing new immigrant organizers, which helped make an alliance tangible. Each of the outcast groups brought tools the others needed: the unions had committed member organizers and warchests of dues, while the others provided candidate pipelines, policy chops, and activist links well beyond labor's. In park meetings and elections, worksites and laws, the alliance cracked apart the developers' long grip.

[31] Castree & Christophers, 2015; Ekers & Prudham, 2017.

This points to a finding of broad consequence. If political exclusion can help unions build courageous independence, then the long neoliberal onslaught against unions has definitely not ended labor's relevance. Instead, exclusion has created opportunities for organized workers to lead and unite from the margins they've been forced into.

Marginalization alone doesn't explain the specific politics and alliances which construction unions developed. After all, there were many others on the margins. Shared experiences of household social reproduction challenges were key in forging compatible goals for building trades and immigrant insurgents. With key unions becoming majority Latino in their membership and leadership, many lived in the long-repressed sides of Fresno and Madera, familiar from their past and present with segregated austerity in education and infrastructure; persecution in the workplace and policed streets; pollution in the water and lungs. The state's "grid" measures of environmental justice captured parts of these problems at home, but missed the powers that made them–and the solidarities that might remake them. The classic Marxist geography "well" model of the San Joaquin vividly grasped its transformations for exploitation and profit, but often missed how life beyond the "factories in the field" made grounds for entrenching or breaking hegemony.

Even in a landscape practically designed for atomization, labors of social reproduction tended to build ties. Survival, anguish, and the search for joy drew moments of interdependence. Facing raw edges of austerity and despair, Fresno and Madera's care worker unions took a formative role in moving regional institutions of labor towards more a confrontational tack to the local state. At a broader level, from shared hardships at home, construction workers, environmental justice and immigrant activists found shared agendas for their neighborhoods to win parks and walkable streets, public union jobs and classrooms, less pollution and poverty wages. Future ethnographies in homes, schools, inter-family networks and more could clarify how reproductive struggles more actively form insurgent politics, advancing strategies in the San Joaquin and beyond.

The San Joaquin shows no guarantees these factors will always weld alliances of construction unions and movements of the working and oppressed. Bakersfield had relatively close shifts to resident majorities of color and growth in unionized green jobs, on paper, but alliances and political insurgencies were fleeting if at all. In Madera and Fresno, three factors were distinct. First, the lion's share of solar & rail workers from key unions lived there, even if they worked across the San Joaquin. Second, the direction of work was different: high speed rail work was well underway, with little oil in sight to form the wedge it did further south. Third, these cities had a greater strength of immigrant movements, environmental justice campaigners, and mediators intent on building this alliance. These helped tip construction unionists and immigrant activists towards taking risks, making bonds, and building institutions.

These gains, of course, were not final. Even at their most confrontational with elite developers in the state, Fresno and Madera construction union leaders sought peaceful collaboration with almost any employers they could sign up. While in the state,

construction unions supported redistributing public infrastructure to long-deprived immigrant and working class neighborhoods, with private employers they deferred to investors' blueprints. In one exceptional challenge, Ironworkers used their growing environmental leverage in the solar boom to successfully push an end to the underclass tier of their contracts, building for solidarity to come. But whether through the gradual influence of their new allies, a leg up from the state, or their members' tenacity, it would be a longer task for construction unions to fight without fear for the landscapes they wanted for a common good.

The toughest tests of these alliances and their wins lay ahead. It remained to be seen how Fresno and Madera's movements would sustain their elected champions' political independence, or push them towards continued movement-building from their new offices. Modest promise was shown in how some insurgent electeds moved quickly to unionize the sidewalk, park, and water construction they launched for the barrios. That was a plum to their union backers, certainly, but also a landmark advance for worker organization going forward, tied to expanding common infrastructure rather than private whims. This pointed to what state programs for climate transitions could hope to achieve; not simply jobs or emissions cuts by the number, but sparking a virtuous cycle for working and oppressed people to grow their power each phase of a transition, the better to steer it.

A downward spiral is the ready figure for the climate crisis. It can be felt in the unraveling chaos of drought, fire, and extinctions, or in the quieter creep of weather on nearly every landscape to something for which its life was not woven. The same sick sense is there in the plummeting of politics, amid that upheaval, into desperate isolation and violent competitions, of nations and banks and lone figures in the smoke, for last gasps of private gain. These are not illusions. This chaos will be a part of any climate transition, as much as lithium or silicon lattice.

But if much is in motion, nothing is inexorable. Movement is the only guarantee, and its restlessness can spring startling power at long dry shores. From the salted clay where Tulare Lake stood, five years of a solar flux made means for a historic turn for working people, immigrant life, and the making of more. It's a vision, grounded as it must be, of an upward spiral: building solar, leverage, and alliances into a new majority bloc. This was not a path without conflict of its own–a landed hegemony had to be confronted and curbed. Both the choice of allies and of rivals made the uphill climb possible. This flux was lit by the sun, but wasn't chosen by it. The architects were those who bent rebar, who cared for children, who dreamt from the fields, and did all of the above.

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