8

Revamping Public Energy

Shelley Welton[*]

As unusually strong Santa Ana winds whipped through California in fall 2019, the state's utilities faced a bind: cut power for millions, or risk their transmission infrastructure sparking another devastating and deadly fire? In the end, both occurred, and California was alternately ablaze and in the dark throughout the fall. This impossible predicament was, many said, a harbinger of things to come: climate change exposing the precarity of seemingly advanced economies, as centuries of fossil fuel emissions reveal their bite.[1]

The California fires also prompted renewed debate over control of utilities under changing climate conditions – particularly as evidence mounts that deferred grid maintenance in favor of shareholder payments was a contributing cause of the wildfires.[2] San Jose launched calls for a public takeover of California's largest utility, Pacific Gas & Electric (PG&E).[3] San Francisco had already put in a bid to buy its portion of PG&E's grid.[4] These proposals are the latest iteration of a growing conversation about whether private control of electric

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[1] *See, e.g.*, Reis Thebault et al., *High-Voltage PG&E Power Line Broke Near Origin of Massive Fire in California Wine Country*, Wash. Post (October 25, 2019), www.washingtonpost.com/nation/2019/10/24/fast-moving-wildfire-ignites-northern-california-wine-country-prompting-evacuations/.

[2] Dale Kasler, *PG&E Gets Blamed for Another Deadly 2017 Wildfire, This Time from "Sagging Power Lines."* Sacramento Bee (October 9, 2018), www.sacbee.com/news/california/fires/article219731815.html; David Roberts, *California's Deliberate Blackouts Were Outrageous and Harmful. They're Going to Happen Again.*, Vox (October 24, 2019), www.vox.com/energy-and-environment/2019/10/16/20910947/climate-change-wildfires-california-2019-blackouts.

[3] John Woolfolk, *San Jose Leads Cities, Counties Calling for Ratepayer Takeover of PG&E*, Mercury News (November 5, 2019), www.mercurynews.com/2019/11/05/san-jose-leads-cities-counties-calling-for-ratepayer-takeover-of-pge/.

[4] Shanti S. Nair, *PG&E Turns Down San Francisco's $2.5 Billion Offer to Buy Assets*, Reuters (October 11, 2019), www.reuters.com/article/us-pg-e-us-sanfrancisco-assets/pge-turns-down-san-franciscos-2–5-billion-offer-to-buy-assets-idUSKBN1WQ2SO.

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utilities is compatible with the scale of the energy transition demanded by climate change.

The aim of this chapter is to clarify the debate between public and private energy options in the context of climate change – and to mount a case for why public energy's longstanding theory and praxis suggest several promising roles for public options in the clean energy transition. Many are familiar with the role that public energy played in bringing electricity to rural America during the New Deal, when investor-owned utilities refused to expand service to rural areas because they were insufficiently profitable. To fill the gap, Congress created the Tennessee Valley Authority (TVA) and other federal public power entities to produce cheap power, and simultaneously provided low-cost loans to local communities to form rural electric cooperatives or municipal utilities to build lines to deliver this power.[5] The long-term result of these public investments has been widespread (though lamentably still imperfect) access to reliable, affordable power across the United States.[6]

However, the fact that public options proved critical in electrifying America has limited bearing on their potential to help with the central challenge facing the US power sector today: the need to decarbonize energy supply to respond to climate change. Recent scientific alarm bells have suggested that the United States has a limited window – perhaps a couple of decades – to transform its energy system to 100 percent clean energy before the planet overheats to catastrophic levels.[7] In response, young activists have sparked a vibrant movement for a "Green New Deal" to jointly tackle climate change and inequality, while several US states have adopted their own 100 percent clean energy targets.[8]

[5] *See* Tennessee Valley Authority Act of 1933, ch. 32, 48 STAT. 58 (1933) (codified as amended at 16 U.S. C. § 831 (2012)); Rural Electrification Act of 1936, ch. 432, 49 STAT. 1363 (May 20, 1936) (codified at 7 U.S.C. § 901).

[6] On the imperfect realization of access, see Laurel Morales, *For Many Navajos, Getting Hooked Up to the Power Grid Can be Life-Changing*, NPR SHOTS (May 29, 2019), www.npr.org/sections/health-shots/2019/05/29/726615238/for-many-navajos-getting-hooked-up-to-the-power-grid-can-be-life-changing (reporting that 10 percent of Navajos living in the Navajo Nation, "the largest Native American reservation in the U.S.," are without electricity). On ongoing affordability challenges, see Diana Hernández & Stephen Bird, *Energy Burden and the Need for Integrated Low-Income Housing and Energy Policy*, 2 POVERTY & PUB. POL'Y 5, 6 (2010) (discussing the difficult choices that many American families must make between paying for food or electricity each month).

[7] *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, SUMMARY FOR POLICYMAKERS, *in* GLOBAL WARMING OF 1.5°C: AN IPCC SPECIAL REPORT ON THE IMPACTS OF GLOBAL WARMING OF 1.5°C ABOVE PRE-INDUSTRIAL LEVELS AND RELATED GLOBAL GREENHOUSE GAS EMISSION PATHWAYS, IN THE CONTEXT OF STRENGTHENING THE GLOBAL RESPONSE TO THE THREAT OF CLIMATE CHANGE, SUSTAINABLE DEVELOPMENT, AND EFFORTS TO ERADICATE POVERTY (2018).

[8] *See* H.R. Res. 109, 116th Cong. (1st Sess. 2019); Julia Pyper, *Tracking Progress on 100% Clean Energy Targets*, GTM (November 12, 2019), www.greentechmedia.com/articles/read/tracking-progress-on-100-clean-energy-targets (reporting that "[s]even states, as well as Puerto Rico and the District of Columbia, have passed 100 percent clean energy transition laws," and several others have executive orders to the same effect).

Some have suggested that public options could play an important role in this new effort at infrastructure transformation; others have doubted their suitability to this suite of challenges.[9]

To bring the terms of this debate into focus, this chapter first traces the roles that public options play across the energy system today. It then parses the ways in which public options might enhance the transformation of energy supply, transmission, and delivery, highlighting where in the system public options are most likely to achieve their theoretical potential to remediate climate change, and where risks may outweigh potential rewards.

8.1 THE PUBLIC ENERGY LANDSCAPE TODAY

Any conversation about public options in energy must begin from an understanding of how significant they already are in the US energy system. The key components of the electricity system are supply (generation), transmission and distribution (the poles and wires), and procurement and delivery (sales to end-use customers). Nearly a century after the New Deal, and even as the energy sector has increasingly embraced competition,[10] public options continue to perform all three of these functions (see Figure 8.1). On the supply side, federally owned power projects, such as the TVA, supply generation and transmission services to many publicly owned utilities and cooperatives, some of whom also own their own generation facilities. On the distribution and sales side, these publicly owned utilities (typically owned by a municipality, but sometimes by a rural power district) serve 14.4 percent of Americans, while cooperatives serve another 13 percent.[11]

When theorists and policymakers speak of public "options," they generally mean public alternatives that can coexist alongside private ones: for example,

[9] *Compare The Green New Deal*, BERNIESANDERS.COM [hereinafter *The Green New Deal*], https://berniesanders.com/en/issues/green-new-deal/ (last visited December 13, 2019) (championing a robust public ownership role), *with* Mark Paul, *Can Public Ownership of Utilities be Part of the Climate Solution?*, FORBES (September 13, 2019), www.forbes.com/sites/washingtonbytes/2019/09/13/can-public-ownership-of-utilities-be-part-of-the-climate-solution/#5fb7b1232296 (quoting Elizabeth Warren as disagreeing with public ownership of utilities as a climate change solution).

[10] See William Boyd, *Public Utility and the Low-Carbon Future*, 61 UCLA L. REV. 1614 (2014), on the evolution of the sector over the twentieth century.

[11] AM. PUB. POWER ASS'N, 2019 STATISTICAL REPORT 16 (2019) [hereinafter APPA], www.publicpower.org/system/files/documents/2019-Public-Power-Statistical-Report.pdf. Technically cooperatives are not "public," because they are member-owned, whereas municipal utilities and public utility districts are owned by the local government itself. But they similarly aspire to democratic management.

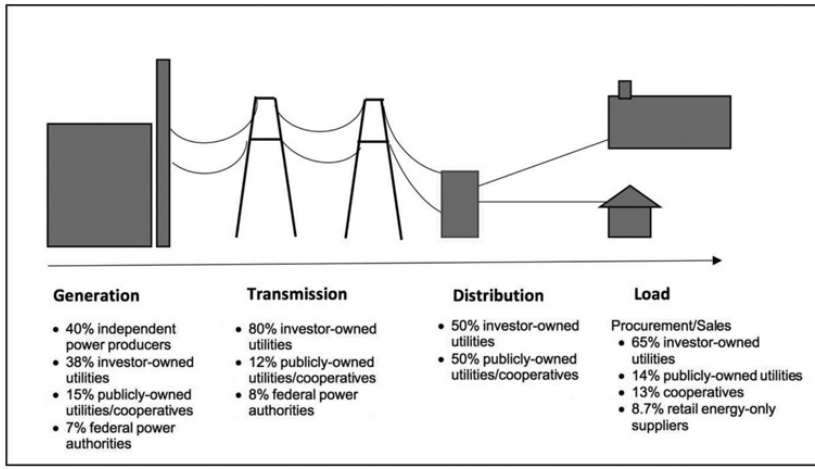

FIGURE 8.1 Schematic of US Electricity System, with relevant ownership shares[12]

a public community pool in the same town as several private, membership-based pool clubs; or public libraries that might share the same block with bookstores.[13] This genre of public options maximally preserves individual choice: join the country club or swim for free; borrow the book or buy the book – up to you.

Public options in energy function differently. The transmission and distribution networks are presumed to be natural monopolies, because it would be duplicative and ugly to build two sets of poles and wires in the same place. Accordingly, only a single entity – public or private[14] – serves a given locale. That means that the choice of whether to have a publicly or privately owned grid must be made at the collective, community level (except in rural places that private companies refuse to serve, in which case there is no choice). Public ownership of these energy assets is thus a democratic but clunky form of a public option, because it requires majority vote (or, in some places, city council approval) plus protracted negotiations to

[12] Picture adapted from Analytical Study Methods for Reducing Power Losses in Mesh Power Grids Using Optimization Techniques for Sizing and Location of Decentralized Generators, www.researchgate.net /figure/Traditional-power-system-structure-1_fig22_320626855 (last visited December 13, 2019). Data from *Electricity 101*, ENERGY.GOV, www.energy.gov/oe/information-center/educational-resources/electricity-101 (last visited December 13, 2019); APPA, *supra* note 11, at 23 (cooperatives and publicly owned power sales); U.S. ENERGY INFO. ADMIN., ELECTRIC POWER ANNUAL 2018 tbl.2.1 (October 2019), www.eia.gov /electricity/annual/html/epa_02_01.html (retail energy-only providers).

[13] *See* GANESH SITARAMAN & ANNE L. ALSTOTT, THE PUBLIC OPTION: HOW TO EXPAND FREEDOM, INCREASE OPPORTUNITY, AND PROMOTE EQUALITY 2 (2019).

[14] When I say "private," I mean the term as shorthand for investor-owned. Many of these corporations are publicly traded.

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switch between public and private options.[15] In contrast, on the generation side, most of the country now has electricity markets where generators compete to sell power[16] – such that public options in electricity generation can coexist more closely with private ones, since they can compete side-by-side in these markets in many states.

8.2 CLIMATE CHANGE AND THE ENERGY SYSTEM

For the last seventy years, the ownership patterns described earlier have remained relatively stable.[17] Limited switching between public and private systems has occurred, mostly via small municipal systems selling their assets to private utilities – but flip-flopping between the two ownership structures is rare.[18] Recently, however, the wisdom of this mottled system has been thrown into question by theorists, politicians, and community activists. The central reason for this renewed interest in questions of utility ownership is climate change – which challenges every component of the electricity system.

8.2.1 *Supply*

To decarbonize the electricity system – a task often called the "linchpin" of responding to climate change[19] – will require a radical shift in the sources of electricity. The generation mix today is approximately 62 percent fossil fuels (27 percent coal and 35 percent natural gas); 19 percent nuclear power, and 16 percent renewable.[20] In the next decade, or two, or three (depending on which expert's discounting practices and relative degree of technological optimism you favor), 100 percent of that electricity will need to be produced by clean sources – as the sector also doubles in size to electrify transportation.[21]

[15] *See, e.g.*, Synapse Energy Econ., An Analysis of Municipalization and Related Utility Practices 12 (September 30, 2017), https://doee.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/An%20Analysis%20of%20Municipalization%20and%20Related%20Utility%20Practices.pdf.

[16] *See* William Boyd & Ann E. Carlson, *Accidents of Federalism: Ratemaking and Policy Innovation in Public Utility Law*, 63 UCLA L. Rev. 810, 837–38 (2016).

[17] *See* Synapse Energy Econ., *supra* note 15, at 8 (finding that of the 900 "munis" in existence, only 2 percent municipalized since 1990).

[18] *See* Shelley Welton, *Public Energy*, 92 N.Y.U. L. Rev. 267, 90 (2017)(charting the rise and fall of municipal utilities over the twentieth century).

[19] Jesse D. Jenkins et al., *Getting to Zero Carbon Emissions in the Electric Power Sector*, 2 Joule 2498 (2018).

[20] Hydropower and wind each produce around 7 percent; solar energy makes up only 1.6 percent. *See What is U.S. Electricity Generation by Energy Source?*, U.S. Energy Info. Admin., www.eia.gov/tools/faqs/faq.php?id=427&t=3 (last visited December 13, 2019).

[21] *See* Alexandra B. Klass, *Expanding the U.S. Electric Transmission and Distribution Grid to Meet Deep Decarbonization Goals*, 47 Envtl. L. Inst. 10,749, 10,751 (2017).

8.2.2 Transmission and Distribution

Transmission infrastructure does not need to transform as radically as generation to respond to climate change. Existing transmission can carry electrons produced from clean energy sources as easily as electrons from dirty sources. However, the sector faces two key challenges of its own. First, considerably more transmission infrastructure must be built to connect new renewable resources to population centers.[22] Second, as revealed by tragedies like California's wildfire crisis or Puerto Rico's destruction under Hurricane Maria, the electricity grid – with its reliance on physical interconnectedness of delicate wires – is uniquely susceptible to damage from the kinds of disasters that climate change is rendering worse and more frequent.[23] In response, the grid must either be hardened to become less susceptible to such damage, or become more "distributed" or localized – so that it can function without long-distance interconnectedness, at least for periods of time.[24]

8.2.3 Procurement and Sales

The energy sector under climate change must also grow more adept at managing not just supply, but also demand. No longer passive recipients of central-station power, consumers must increasingly participate in the electricity system. Through rooftop solar panels, energy storage, electric vehicles, and electricity management technologies, households and businesses can play an important role in creating a cleaner, leaner, and more resilient system.[25] But investor-owned utilities often resist the policy and pricing changes that would be required to achieve this more interactive grid, since they typically earn profits from investing in precisely the infrastructure that these reforms are designed to reduce.[26]

8.3 PUBLIC OWNERSHIP VERSUS PUBLIC UTILITY: CONFRONTING HISTORICAL EVIDENCE

When public energy options are broached as climate change solutions, a common first reaction is to inquire how the public options already in

[22] *See* Alexandra B. Klass & Elizabeth J. Wilson, *Interstate Transmission Challenges for Renewable Energy: A Federalism Mismatch*, 65 Vand. L. Rev. 1801 (2012).

[23] *See* Alyson Kenward & Urooj Raja, Climate Central, Blackout: Extreme Weather Climate Change and Power Outages 3–4 (2014), http://assets.climatecentral.org/pdfs/PowerOutages.pdf.

[24] Kate Anderson et al., *Increasing Resiliency through Renewable Energy Microgrids*, 2 J. Energy Mgmt., no. 2, at 24 (August 2017), www.nrel.gov/docs/fy17osti/69034.pdf.

[25] *See* Sharon B. Jacobs, *The Energy Prosumer*, 43 Ecology L.Q. 519 (2017).

[26] *See* Michael P. Vandenbergh & Jim Rossi, *Good for You, Bad for Us: The Financial Disincentive for Net Demand Reduction*, 65 Vand. L. Rev. 1527, 1530 (2012).

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existence are responding to climate change. This part tackles the comparative question between public and private utilities today, before explaining why this inquiry is of limited relevance to an exploration of public options' potential future role.

The contrast painted above between public and private options in electricity in some ways splits the sector too dramatically: investor-owned utilities are some of the most heavily regulated companies in the United States, where the law treats them as "public utilities" to be managed in the public interest. States and the federal government carefully scrutinize the rates that private utilities charge to ensure that they are just, reasonable, and nondiscriminatory.[27] In contrast, most states – and the federal government – exempt publicly owned utilities from these requirements on the theory that democratic control will provide similar checks on access and affordability.[28]

Over time, theories of both public utility regulation and democratic accountability have worked reasonably well: Private and public powers are competitive on price and complaints of discriminatory service are rare in both.[29] The comparability of public and private options in energy might be taken as affirmation of the "yardsticking" theory that led President Franklin D. Roosevelt to champion public energy in the 1930s, whereby private utility performance could be measured against public options to keep prices and service quality in check.[30]

But even as yardsticking has worked well to impose price discipline, it has failed to drive sectoral transformation. At a snapshot level, public power's comparative record on climate change is unimpressive. Despite resistance, a majority of states have placed clean energy requirements on private utilities through mandates that dictate an ever-cleaner private energy sector – in some cases, demanding 100 percent clean energy within the next few decades.[31]

[27] *See* 1 Alfred E. Kahn, The Economics Of Regulation: Principles And Institutions 3 (1988) (describing the four principal components of public utility regulation: control of entry, price-fixing, prescription of quality and conditions of service, and an obligation to serve all applicants under reasonable conditions).

[28] *See* Jim Cooper, *Electric Cooperatives: From New Deal to Bad Deal?*, 45 Harv. J. on Legis. 335, 345 (2008).

[29] The American Public Power Association (APPA) reports that in 2018, publicly owned utilities charged an average of 11.8 cents/kilowatt-hour for residential customers, whereas investor-owned utilities averaged 13.5 cents/kilowatt-hour. APPA, *supra* note 11, at 20; *see also* John D. Donahue, The Privatization Decision: Public Ends, Private Means 76 (1989) (collecting comparative studies and noting that "[n]o study even hints at superior private efficiency"); Welton, *supra* note 18, at 330 n.10 (collecting studies).

[30] Franklin D. Roosevelt, *Campaign Address in Portland, Oregon on Public Utilities and Development of Hydro-Electric Power*, Am. Presidency Project (September 21, 1932), www.presidency.ucsb.edu/ws/?pid=88390.

[31] *See* Pyper, *supra* note 8.

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Many of these policies exempt public power and cooperatives.[32] Relatedly, publicly owned utilities remain more reliant on coal – the dirtiest fossil fuel – than investor-owned utilities, and have taken more limited steps to develop new renewable energy generation.[33] At the federal level, the TVA has long since lost its progressive luster, as it has worked to block renewable energy and teamed up with private utilities to lobby against federal climate change regulation.[34]

There are several reasons that publicly owned utilities have proven even more sclerotic than their private counterparts on clean energy. Many are locked into long-term purchase agreements for fossil fuel-based electricity, or own long-lived fossil assets that they are loath to retire before the end of their useful life.[35] If they retire assets or end these contracts early, there are no shareholders to help bear the costs, which instead fall entirely on community members.[36] Other publicly owned utilities are simply responding to local priorities. In communities where climate change is not high on the agenda, one can hardly be surprised under a theory of democratic control that the publicly owned utility (or cooperative) mirrors this deprioritization.[37]

However, in places where climate change *is* a political priority, publicly owned power entities have responded impressively. Many city-run utilities in communities with ambitious climate change goals are decarbonization pioneers, including Austin Energy, San Antonio's CPS Energy, the Sacramento Municipal Utility District, Seattle City Light, the Burlington Electric Department, and the City of Aspen Utilities.[38] These examples suggest that public energy has the potential to play the same kind of transformative role in a Green New Deal that it did in the New Deal, by performing a new

[32] *See State Renewable Portfolio Standards and Goals*, Nat'l Conference of State Legislatures (November 1, 2019), www.ncsl.org/research/energy/renewable-portfolio-standards.aspx.

[33] *See* APPA, *supra* note 11, at 4 (showing, percentagewise, more coal and less wind and solar generation by publicly owned utilities).

[34] *See, e.g.*, Daniel Tait & Joe Smyth, *TVA Attempts to Chain Local Power Companies to Longer Contracts in Effort to Prevent Defection Risk*, Energy & Pol'y Inst. (September 22, 2019), www.energyandpolicy.org/tva-local-power-companies-defection/ (describing barriers that TVA has erected to local communities' efforts to adopt renewables); Stephen Smith & Maggie Shober, *TVA Deceives the Public and the Press with Misleading Claim of Solar Commitment*, cleanenergy.org (September 19, 2019), https://cleanenergy.org/blog/tva-deceives-the-public-and-the-press-with-misleading-claim-of-solar-commitment/.

[35] See Nat'l Rural Elec. Cooperative Ass'n, Comments on Standards of Performance for Greenhouse Gas Emissions from Existing Sources: Electric Utility Generating Units, Docket No. EPA-HQ-OAR-2013-0602, at 66–67 (December 1, 2014) (on file with author).

[36] *Id.*

[37] *See, e.g.*, Wilmon H. Droze, *The TVA, 1945-80: The Power Company*, *in* TVA: Fifty Years of Grass-roots Bureaucracy 66, 81 (Erwin C. Hargrove & Paul K. Conkin eds., 1981) (describing the TVA's investments in coal and nuclear generation as driven by its "mission to provide low-cost electricity").

[38] *See* Welton, *supra* note 29, at 332–38.

yardsticking function that measures not only affordability, but carbon content. But public energy can only play this role more broadly if tasked to do so – as it has been in the communities described earlier.

The more interesting question going forward, then, is this: If charged with a clean energy mission, can public power deliver? Can it deliver better than investor-owned, commission-regulated utilities, and in what ways and on what terms?

8.4 WHAT SHOULD BE PUBLIC? WEIGHING BENEFITS AND RISKS

The fact that climate change drives new calls for public options in energy makes this sector different from many others in which public options are proposed as gap-fillers, focused on expanding coverage to those currently underserved by the private market (as in health care, banking, and early childhood education – and as public power and rural electric cooperatives did in the electricity sector in the first half of the twentieth century). The central challenge to be solved in electricity today is not coverage, but sectoral transformation. Moreover, many of the calls for public options in energy are concerned with more than just bare decarbonization: public provisioning is often proposed as a way of accomplishing multifaceted goals that relate broadly to making the economy more equitable as it shifts to run on new sources of energy. A new theory is required to explain how public energy options might aid in accomplishing these new objectives – a theory capable of explaining how public options can function as agents of change.

To construct such a theory, it is important to disaggregate the roles that public options might play in electricity generation, transmission and distribution, and procurement. To this end, this part analyzes the rationales animating the most prominent proposals for public energy ownership. It also explores the pragmatic benefits and risks of each. It concludes there is a rank order of the potential gains from public options that is inverse to their costs and risks. Local public procurement options offer both the greatest potential upside and the least potential risk. In contrast, expanded federal power administrations carry the most political and economic risk – at least without design modifications – for reasons explained earlier.

8.5 CLEAN ENERGY-FOCUSED FEDERAL POWER ADMINISTRATIONS

One proposed public option is expanding the network of federal power administrations to drive clean energy construction across the country. Most notably, presidential hopeful Bernie Sanders called for the expansion of federal power marketing administrations to every state, which along with a refocused TVA would buildout

$1.52 trillion in renewable energy generation and $852 billion in energy storage capacity.[39] Because such proposals would require Congressional buy-in, the critical point of comparison is how these federal authorities stack up next to their chief private sector alternative: a federal mandate on private companies to achieve 100 percent clean energy.

The most appealing element of federal power administrations is their not-for-profit structure, which is well-suited to the nature of renewable energy production. Unlike fossil fuels, which require considerable expenditures to unearth, wind and sun are there for the taking. For this reason, renewable energy's variable costs – the costs of producing it once infrastructure is in place – are close to zero.[40] Renewable energy operators thus do not necessarily need to generate substantial long-term revenue – unless managed by a private corporation that must demonstrate such returns to attract investors.[41]

To date, US renewable energy policy has focused on providing private renewables' developers extra revenue streams outside the market to make renewable energy "financeable" by guaranteeing a healthy long-term rate of return.[42] But instead of funneling money to the private sector to build renewables, in-house production by a government authority, backed by low-cost government financing, might prove cheaper and faster. These savings could then be passed on to municipal and cooperative utilities – or investor-owned utilities – in the form of low-cost power supply contracts. Alternatively, revenue derived from market-rate sales of publicly owned renewables might be spent on other public energy projects – including transmission buildout, public building retrofits, mass transit, electric vehicle infrastructure, and other pressing decarbonization initiatives.[43] Federally owned projects could also help transform the nature of energy work – for example, by providing high-wage, unionized jobs – a mission that private renewables companies appear none too eager to embrace.[44]

[39] *The Green New Deal*, *supra* note 9; *see also* Kate Aronoff et al., A Planet to Win: Why We Need A Green New Deal 53 (2019). Britain's Labour Party has made similar proposals. *A Green Industrial Revolution*, Labour, https://labour.org.uk/manifesto/a-green-industrial-revolution/ (last visited December 13, 2019).

[40] *See* Joshua C. Macey & Jackson Salovaana, *Rate Regulation Redux*, 168 U. Pa. L. Rev. [manuscript 3–4] (forthcoming 2020).

[41] *See* Andreas Malm, Fossil Capital: The Rise of Steam Power and the Roots of Global Warming 369–70 (2016) (quoting BP and Shell executives regarding the difficulty of making money on the sun).

[42] *See* U.S. Dep't of Energy, Pub. No. DOE/EE-1509, Leveraging Federal Renewable Energy Tax Credits (2016), www.energy.gov/sites/prod/files/2016/12/f34/Leveraging_Federal_Renewable_Energy-Tax_Credits_Final.pdf; Edward Holt et al., Nat'l Renewable Energy Lab., Technical Report No. NREL/TP-6A20-51904, The Role of Renewable Energy Certificates in Developing New Renewable Energy Projects (June 2011).

[43] *See* Aronoff et al., *supra* note 39, at 59.

[44] *See*, *e.g.*, Lauren Kaori Gurley, *This Solar Energy Company Fired Its Construction Crew After They Unionized*, Vice (November 21, 2019), www.vice.com/en_us/article/evjenn/this-solar-energy-company-fired-its-construction-crew-after-they-unionized.

Can the climate-change-denying, solar-power-blocking TVA really be remade in this mold? Critics question the political feasibility and practicality of such efforts, as compared to simply continuing to spur private investment in clean energy.[45] These concerns are reasonable – although more market-based climate proposals have to date equally confronted political feasibility challenges.[46] My predominant concern is less with this duel over which strategy might ultimately prove more politically feasible, and more with the scale of operations proposed. Although sympathetic to the idea of more publicly owned generation, I nevertheless find myself asking: Why *federal*? Why must public clean energy options be of the nature and size of the TVA?

Our track record on federal mega-projects suggests some reason to doubt their efficacy in achieving the kind of multifaceted social goals that proponents of these new authorities advance. As historians have documented, the TVA's size contributed to the least appealing elements of its history. The architects of the TVA emphasized "grassroots administration" and "democratic planning" as guiding principles for development in the Tennessee Valley.[47] But especially in the building of power projects, the TVA came to prioritize project completion as the measure of success, abandoning much of its initial commitment to the agency's democratic ideals.[48] The losers of this strategy were, as one researcher describes it, "the most vulnerable: poor farm tenants, African and Native Americans, and farmers forcibly removed from their lands."[49]

Those advocating for new TVA-like clean energy entities are well aware of the limitations of the original form.[50] To avoid repeating these mistakes, Green New Deal proponents have called for new infrastructure development to occur through "democratic and participatory processes that are inclusive of and led by frontline

[45] Lisa Friedman, *Sanders's Climate Ambitions Thrill Supporters. Experts Aren't Impressed*, N.Y. Times (November 14, 2019), www.nytimes.com/2019/11/14/climate/bernie-sanders-climate-change.html; *see also* Richard Lowitt, *The TVA: 1933-45*, *in* TVA: Fifty Years of Grass-roots Bureaucracy, *supra* note 37, at 35, 46 (describing the "heavy price in expensive litigation" that the TVA had to endure during its first several years).

[46] *See, e.g.*, Ryan Lizza, *As the World Burns*, New Yorker (October 3, 2010) (describing the failure of federal cap-and-trade legislation); Theda Skocpol, Naming the Problem What It Will Take to Counter Extremism and Engage Americans in the Fight Against Global Warming 11 (2013) (similar).

[47] *See* Atif Ansar, *The Fate of Ideals in the Real World: A Long View on Philip Selznick's Classic on the Tennessee Valley Authority (TVA)*, 36 Int'l J. Project Mgmt. 385, 389 (2017); David E. Lilienthal, TVA: Democracy on the March 19 (1944) (prioritizing "democratic methods" and "active daily participation of the people themselves" in "the TVA experience").

[48] Ansar, *supra* note 47, at 392; *see also* Philip Selznick, TVA and the Grassroots: A Study in the Sociology of Formal Organization 7 (1966) (discussing how ends overpowered means in the TVA's orchestration); Gail Radford, The Rise of The Public Authority: Statebuilding and Economic Development in Twentieth-Century America 111–12 (2013).

[49] Ansar, *supra* note 47, at 392; *see also* Richard Lowitt, *The TVA: 1933-45*, *in* TVA: Fifty Years of Grass-roots Bureaucracy 35, 52, 58–59 (Erwin C. Hargrove & Paul K. Conkin eds., 1981) (on discrimination in the TVA).

[50] *See, e.g.*, H.R. Res. 109, 116th Cong., at 5 (1st Sess. 2019).

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and vulnerable communities and workers."[51] These are commendable promises – but they have been made and broken before. How to design federal clean energy authorities to resist these tendencies is thus a critical institutional puzzle that needs solving.

One possibility for mitigating the risks of these federal programs might be to decentralize them. Renewable energy development does not require projects on the scale of the TVA's Muscle Shoals or Tellico Dam – it is considerably more modular.[52] For this reason, it may not be necessary to recreate TVA-like behemoths to drive renewable energy infrastructure development across the country. Why not instead design a scheme with more inherent democratic potential?

For example, taking a cue from the Rural Electrification Act, a federal program could offer low-cost loans to municipal, state, and not-for-profit renewable energy projects that communities develop from the bottom up. This more flexible approach to public generation options would accomplish many of the same yardsticking objectives as massive federally owned projects, with fewer humanitarian risks. And to capture a wider range of goals, such a program could include priority loans or favorable terms for low-income communities and communities of color, as well as stipulating worker protections.

To be sure, a more chaotic, bottom-up process might make planning and orchestration of the clean energy buildout more complex. However, more localized projects come with a substantial upside: they might expedite siting and infrastructure approval processes. Absent substantial reform of current state-centered energy siting regimes, local opposition to TVA-style renewable energy projects might prove a substantial wrench in the works of such an organization.[53] On the flip side, research shows that community involvement and bottom-up planning substantially enhance public acceptance of renewable energy infrastructure and the transmission needed to support it.[54] Decentralization thus might ultimately speed up construction of renewable energy projects, while offering a buffer against federal agency tunnel vision.

[51] H.R. Res. 109, 116th Cong., at 10, 12 (1st Sess. 2019).

[52] For example, utility-scale solar is often defined as any project greater than 5 megawatts – whereas Wilson Dam at Muscle Shoals has a capacity of 653 megawatts. *Compare* Mark Bolinger & Joachim Seel, Lawrence Berkeley Nat'l Lab., Empirical Trends in Project Technology, Cost, Performance, and PPA Pricing in the United States ii (2018), https://emp.lbl.gov/sites/default/files/lbnl_utility_scale_solar_2018_edition_report.pdf, *with Wilson*, Tenn. Valley Auth., www.tva.gov/Energy/Our-Power-System/Hydroelectric/Wilson-Reservoir (last visited December 13, 2019).

[53] See Michael B. Gerrard, *Legal Pathways for a Massive Increase in Utility-Scale Renewable Generation Capacity*, 47 Envtl. L. Inst. 10,591 (2017); J. B. Ruhl, *What Happens When the Green New Deal Meets the Old Green Law?* (March 27, 2019), www.acoel.org/post/2019/03/27/What-Happens-When-the-Green-New-Deal-Meets-the-Old-Green-Laws.aspx.

[54] See Richard Cowell et al., Acceptance, Acceptability and Environmental Justice: The Role of Community Benefits in Wind Energy Development, 54 J. Envtl. Plan. & Mgmt. 539 (2011); Alastor M. Colby et al., *Public Attitudes and Participation in Wind Turbine Development*, 11 J. Envtl. Assessment Pol'y & Mgmt 69 (2009); Chad Walker & Jamie Baxter, *Procedural Justice in Canadian Wind Energy Development: A Comparison of Community-Based and Technocratic Siting Processes*, 29 Energy Res. & Soc. Sci. 160 (2017).

8.6 PUBLIC OWNERSHIP OF THE GRID

A second public option floated by many communities is takeover of the grid itself – the poles and wires that deliver power from generators to customers. This could be done at various scales, but is most often discussed at the city or state level. When done by a city, such takeovers are referred to as grid "municipalization." Boulder, San Francisco, and Chicago are among the cities to recently consider municipalizing.[55] At the state level, in addition to California's recent threats, state representatives in Maine have introduced legislation that would replace the state's two largest investor-owned utilities with a "Maine Power Delivery Authority."[56]

There are three key theories advanced in favor of public grid ownership. First, many hope for better service at lower cost. Costs may be reduced through a combination of lower borrowing rates (via low-interest bonds, rather than commercial interest rates) and the elimination of the need to pay shareholder dividends.[57] These savings might be funneled into necessary grid maintenance and upgrades to prepare for the effects of climate change (the same maintenance that PG&E deferred for decades, in favor of shareholder payouts).[58] They might also help pay for the buildout in transmission infrastructure necessary to integrate adequate renewable energy.

Second, publicly owned transmission and distribution companies allow cities or states to more easily accomplish climate-related goals. Many cities pursue public control over the grid as a means of obtaining control over procurement – that is, the decisions about where the community's energy comes from. Utilities often thwart city-level renewable procurement goals by refusing to arrange special clean energy supplies, and fight against city- or state-led initiatives to install rooftop solar panels and pursue aggressive energy efficiency improvements.[59] Municipal (or state) grid ownership eliminates this resistance, thus giving governments a key tool for making good on decarbonization objectives.

[55] Catherine Morehouse, *Chicago Considers Municipalizing ComEd*, UtilityDive (July 25, 2019), www.utilitydive.com/news/chicago-considers-municipalizing-comed/559505/

[56] H.P. 1181, 129th Leg., 1st Reg. Sess. (Me. 2019).

[57] *See, e.g.*, Robert Wasserstrom, Opinion, *The Promise of Public Power, and What it Means for Maine*, Bangor Daily News (May 1, 2019), https://bangordailynews.com/2019/05/01/opinion/contributors/the-promise-of-public-power-and-what-it-means-for-maine/; Letter from Mayor Sam Liccardo, City of San José et al., to The Honorable Marybel Batjer et al., President, California Public Utilities Commission (November 4, 2019) [hereinafter California PUC Letter], https://rtoinsider.com/wp-content/uploads/Mayor-CPUC-Letter-final-11.5.19.pdf.

[58] *See supra* note @.

[59] *See* Hiroko Tabuchi, *Rooftop Solar Dims Under Pressure from Utility Lobbyists*, N.Y. Times (July 8, 2017), www.nytimes.com/2017/07/08/climate/rooftop-solar-panels-tax-credits-utility-companies-lobbying.html; Vandenbergh & Rossi, *supra* note 26; Max T. Brozynski, *Decarbonizing Power and Transportation at the Urban Scale: An Analysis of the Austin, Texas Community Climate Plan*, 43 Sustainable Cities & Soc'y 41, 42 (2018) (describing how Austin avoided these challenges by controlling its own utility).

Third, given the hard questions that grid management will increasingly raise about who to black out and when for the sake of safety and fire prevention, some argue that a public grid takeover would "allow[]the public to have greater role in determining decisions that increasingly have come to define matters of life and death."[60]

Some of these theoretical benefits could prove vulnerable under real-world pressures. Will cities and states be able to resist the desire to funnel grid earnings into other government projects (the equivalent of shareholder dividends)? Will publicly owned grid operators really slash their own earnings through strategic investments in energy efficiency and other demand reduction strategies? Will political pressures to keep costs low overwhelm the pressing need for transmission and renewable energy investments? Do politicians actually want to own the "life and death" decisions around blackouts and wildfire prevention? These are fair questions – the answers to which depend upon local political winds.

At the same time, the price of grid ownership is dear. Boulder, Colorado is in year nine of its struggle to purchase its grid from the private utility Xcel Energy. Along the way, it has waged several court battles, endured five years of adjudication at the Colorado Public Service Commission, and spent millions on studies and referenda.[61] In November 2019, the city offered Xcel $94 million to purchase the company's electric utility assets, which the city reports "is nearly double the original cost of the company's assets, less depreciation."[62] Under a best-case scenario, city representatives estimate that the final referendum required to authorize the terms of the agreement might take place in 2021[63] – making municipalization an expensive ten-year-process before operations even get up and running.

Whether city ownership will be worth the price and delay is difficult to weigh ex ante – but the money and time spent on these efforts obviously has substantial opportunity costs. Moreover, for cities like Boulder where municipalization is driven by climate change goals, full grid takeover may not be necessary. As the final part of this chapter explains, there are easier ways for a community to gain control over its energy supply.

Before turning to this final public option, however, a few words connecting federal power authorities and grid ownership are warranted. Although less discussed, a federal role might prove most transformative in ownership of the transmission grid. Experts

[60] California PUC Letter, *supra* note 57.

[61] Alex Burness, *Boulder's Long Road to its Elusive Right to a Municipal Electric Utility*, Daily Camera (April 22, 2017), www.dailycamera.com/2017/04/22/boulders-long-road-to-its-elusive-right-to-a-municipal-electric-utility/.

[62] Sam Lounsberry, *Boulder Offers Xcel $94 Million for Assets Necessary to Form Municipal Utility*, Denver Post (November 22, 2019), www.denverpost.com/2019/11/22/boulder-offers-xcel-94m-for-assets-necessary-to-form-municipal-utility/.

[63] Sam Lounsberry, *Boulder Gains State Approval to Transfer Some Xcel Assets in Municipal Utility Effort*, Daily Camera (October 10, 2019), www.dailycamera.com/2019/10/10/boulder-gains-state-approval-to-transfer-some-xcel-assets-in-municipal-utility-effort/.

have calculated that the costs of a renewable energy transition will be dramatically lowered –and its physical accomplishment substantially eased – by a more interconnected grid, which can balance the inherent intermittency of renewable resources across the country.[64] If a new TVA-like entity could be charged with only one mission, it should be this: construct a federally funded backbone of high-speed transmission lines to facilitate the nationwide integration of renewable energy projects. To successfully accomplish this mission, Congress would also have to override state and local project approvals and siting processes – one of the main roadblocks to such a network.[65] Such an override would be contentious, but this is one infrastructure project where it is worth stepping on some federalist toes for the greater collective good.

8.7 PUBLIC OPTIONS IN ELECTRICITY PROCUREMENT

There is a final component of the energy system that can be made public with considerably less effort: electricity procurement and sales to end-use customers. Procurement decisions determine whether a community's electrons will come from renewable energy or coal, and where such energy generation is located. Therefore, public control over procurement functionally translates into public control over generation – at least in terms of controlling the resource mix, although not the profit motive.

Historically, procurement was a task bundled together with grid ownership and all accomplished by a single utility, be it public or private. Utilities would either self-supply by building and running their own generation plants, or would enter into contracts to purchase the electricity they needed from other utilities.[66] But with the advent of competitive electricity markets has come the possibility for a new form of public procurement, called Community Choice Aggregation (CCA). Where permitted by state statute, CCA arrangements allow a community to vote to "break up" with their private monopoly utility and make their own electricity purchases instead. At the same time, CCAs leave operation of the poles and wires to the incumbent private utility. That means that CCAs can turn to competitive energy markets to select particular types of energy they want to purchase – or particular locales for such energy – without having to orchestrate the full grid takeover required to municipalize electricity service. For this reason, they are often referred to as "public power lite."[67] CCAs are currently allowed in nine states: California, Massachusetts, Illinois, New Jersey,

[64] *See* Lori Bird & Michael Milligan, *Lessons from Large-Scale Renewable Energy Integration Studies* (Nat'l Renewable Energy Lab., Conference Paper, NREL/CP-6A20-54666, June 2012), www.nrel.gov/docs/fy12osti/54666.pdf (reviewing studies reaching this conclusion).

[65] *See* Ashira Pelman Ostrow, *Grid Governance: The Role of a National Network Coordinator*, 35 Cardozo L. Rev. 1993 (2014); Klass & Wilson, *supra* note 22.

[66] *See* Paul L. Joskow, *Lessons Learned from Electricity Market Liberalization*, ENERGY J. (special issue) 9, 10–11 (2008).

[67] Herman K. Trabish, *As CCAs Take Over Utility Customers, Local Renewable Generation Emerges as the Next Big Growth Driver*, UTILITYDIVE (October 8, 2019), www.utilitydive.com/news/as-ccas-take-over-utility-customers-local-generation-emerges-as-the-next-b/564422/.

New York, Ohio, Rhode Island, New Hampshire, and Virginia.[68] Communities in these states can elect to create a CCA either by referendum or city council vote.[69] Residents are then automatically enrolled in the CCA, but can elect to Opt out and receive service from their traditional utility if dissatisfied with the CCA.[70] In this way, CCAs are a more classic "public option" than municipalization, because they provide individual choice regarding participation.[71]

Some cities turn to CCAs for the simple reason of managing costs, and they have often been able to deliver power at lower rates than the incumbent utility.[72] But increasingly, cities are turning to CCAs as an explicit climate change strategy, particularly as the price of renewable energy has plummeted.[73] For example, the city of Newton, Massachusetts recently entered into a CCA arrangement that decreased electricity rates by around 2 cents per kilowatt hour, while providing customers with 60 percent renewable energy content – as compared to the state-mandated 14 percent required of investor-owned utilities.[74]

One advantage of CCAs, then, is their climate-oriented yardsticking function. Utilities often resist renewable energy mandates by decrying their cost or technological infeasibility. CCAs put the lie to overblown protests, illustrating that more rapid progress on decarbonization is possible and affordable. In total, US CCAs in 2017 procured around 8.9 million megawatt-hours of renewable energy above and beyond state-mandated purchases – amounting to 9 percent of US voluntary renewable energy purchases.[75]

But the case for local control over energy procurement goes beyond yardsticking. Responding to climate change necessitates reimagining the ways in which humans might live together, in modern comfort, without using the atmosphere as a giant dumping ground. Cities prove a key physical and political space for testing and contesting various low-carbon ways of living, through their authority over housing and land use, transportation, local economic development, and public spaces.[76]

[68] Six other states are considering CCAs: Colorado, Connecticut, New Mexico, Nevada, Oregon, and Utah. *See* Eric O'Shaughnessy et al., Nat'l Renewable Energy Lab., Technical Report No. NREL/TP-6A20-72195, Community Choice Aggregation: Challenges, Opportunities, and Impacts on Renewable Energy Markets (February 2019) [hereinafter "NREL CCAs"]; Shawn Marshall & Peter Millman, Community Choice Aggregation, Presentation on behalf of Lean Energy (May 2019) (on file with author).

[69] *See* Local Gov't Comm'n, Community Choice Aggregation Fact Sheet 1 (May 2015), www.lgc.org/resources/community-design/lpu/may2015/.

[70] Researchers estimate that 85 percent to 95 percent of consumers choose to remain with their CCA. *See* NREL CCAs, *supra* note 68, at 8.

[71] *Cf.* Sitaraman & Alstott, *supra* note 13.

[72] Advocates assert 3–10 percent average bill savings from CCAs, as compared to incumbent utilities. *See* Marshall & Millman, *supra* note 68.

[73] *See* NREL CCAs, *supra* note 68, at 15.

[74] *See* Marshall & Millman, *supra* note 68.

[75] NREL CCAs, *supra* note 68, at v, 4, 12.

[76] *See* Jedediah Purdy, This Land is Our Land: The Struggle for a New Commonwealth 82 (2019) ("We are creatures of our built environment, an infrastructure species"); Katherine A. Trisolini, *All*

Assuming control over energy procurement as well allows a city to weave together many of these issues in potentially transformative ways.

For example, political control over energy supply allows communities to address jointly the related challenges of decarbonizing electricity and transportation – the two biggest sectoral contributors to climate change in the United States.[77] Most experts believe the best way to decarbonize transportation is to electrify it.[78] But getting people to adopt electric vehicles has proven structurally challenging because they require new charging infrastructure and provoke "range anxiety." At the same time, some question whether a future of private electric vehicles – with the materials they require to produce, and the traffic snarls they still create – is even the right goal.[79] A city that has control over its energy, zoning, and housing policy can build an urban infrastructure that empowers its population to transition to more sustainable, high-quality forms of transportation. Already, several CCAs in California are pursuing electric vehicle and electric bus projects as a way of uniting their approaches to decarbonizing electricity and transportation.[80]

More broadly, cities that control energy procurement can integrate decarbonization and social justice in ways that prove challenging within the bounds of public utility law. A city might use revenue from its energy sales to fund a retrofitting and renewable energy initiative on public housing – thus jointly reducing electricity demand and energy poverty. Or a city might prioritize the siting of community-scale solar energy at local brownfield locations because of the jobs and community revitalization benefits such projects provide, even if buying utility-scale solar from the next state over would be cheaper.[81] Such programs would parallel rural electrification efforts during the New Deal, while also potentially tackling the structural racism that the New Deal largely failed to remediate.

CCAs thus have broad potential to help communities build new models of how life post-climate crisis might be lived – a potential that inheres in their public nature and could not be replicated by a private utility of the same size. At the same time, CCAs' political and economic costs are lower than those of federal power authorities or public grid ownership. Utilities of course still resist CCA efforts, since they allow a city to control decisions that cut into utilities' bottom line,

Hands on Deck: Local Governments and the Potential for Bidirectional Climate Change Regulation, 62 Stan. L. Rev. 669 (2010) (tracing the many controls cities have over climate change).

77 *Sources of Greenhouse Gas Emissions*, U.S. EPA, www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions (last visited December 13, 2019).

78 *See* Brozynski, *supra* note 59, at 43.

79 *See* Aronoff et al., *supra* note 39, at 129–32.

80 NREL CCAs, *supra* note 68, at 15–16; Cal. Pub. Utility Comm'n, Cal. Community Choice Ass'n, Comments on the California Consumer Choice Project Workshop 7, www.cpuc.ca.gov/uploadedFiles/CPUC-Public_Website/Content/Utilities_and_Industries/Energy_-_Electricity_and_Natural_Gas/CA%20Community%20Choice%20Aggregators.pdf (last visited December 13, 2019).

81 *See* NREL CCAs, *supra* note 68, at 15 (gathering examples of communities that have prioritized local energy in their CCAs).

including energy efficiency and incentives for on-site generation and storage.[82] But because the incumbent utility retains its position as the grid operator, billing manager, and opt-out service provider, it has less at stake – as evidenced by the fact that 750 communities have managed to adopt CCA arrangements in the past several decades.[83] Of course, CCAs only work where authorized by state legislation. Perhaps, though, municipal resources are better spent winning one battle at the state legislature to authorize CCAs, rather than individualized, piecemeal battles to municipalize the grid city-by-city.

There are, to be sure, risks to CCAs as well. First, they may be poorly run and fail. But here the cost of failure is relatively low – residents simply revert back to their utility. Two other concerns are more substantial: CCAs may balkanize energy decision-making, and they may flourish best in wealthier communities, leaving others stuck behind with the retrograde utility.[84] These are real risks, and they become more acute in places where CCAs come to dominate the energy landscape, as in California, where regulators now project that by 2025 an astounding 85 percent of load will no longer be supplied by investor-owned utilities.[85] For this reason, I would not necessarily champion a move to a 100 percent CCA-controlled model of energy procurement, at least not without policies in place to coordinate decarbonization efforts and share system costs and benefits equitably across localities. But most of the country is far from encountering these risks and can safely focus on CCA authorization and promotion.

Ultimately, CCA experiments produce potentially far-ranging benefits – especially under political conditions that do not yet favor federal climate action. These local projects can serve as proof positive of ways to weather the coming climate storms, thereby propelling popular acceptance of greater action at the state, national, and international levels. At least, that is the promise that makes these public options particularly worth the risk.

8.8 CONCLUSION

The robust range of public options in our current energy system has worked remarkably well to produce reliable, affordable power for tens of millions of Americans underserved by private utilities. The next generation of public options

[82] *See* Herman K. Trabish, *Join or Die: How Utilities Are Coping with 100% Renewable Energy Goals*, UtilityDive (December 13, 2017), www.utilitydive.com/news/join-or-die-how-utilities-are-coping-with-100-renewable-energy-goals/512664/.

[83] *See* NREL CCAs, *supra* note 68, at iv.

[84] *See* Cal. Pub. Util. Comm'n, California Customer Choice: An Evaluation of Regulatory Framework Options for an Evolving Electricity Market 8, 20–21 (May 2018) (showing CCAs clustered on the coast and "nearly absent from the Central Valley").

[85] Cal. Pub. Utility Comm'n, Consumer and Retail Choice, the Role of the Utility, and an Evolving Regulatory Framework 3 (2017). This figure includes CCAs and large companies choosing to self-supply. *Id.*

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in energy must respond to a new charge: transformation of the system away from fossil fuels, toward clean technologies that power new low-carbon ways of living together. Community control over energy procurement provides a potent tool for effectuating this transformation in communities that already have adequate political will. As more states and eventually the federal government join course, either private utilities must rapidly transform themselves into partners, or else a broader range of public options across the energy system should be seriously considered as a way to inject both discipline and creativity into the clean energy transition.