Across the Pond:

A Comparative Analysis of US and UK Community Solar Regulations[1]

[1] Acknowledgement: This paper did not receive any financial support, nor do any conflicts of interest exist.

Abstract

The literature on policy related to community energy—defined as generation projects with a high degree of local ownership and control—largely focuses on European governance. North American community energy policy, conversely, receives considerably less attention. In this paper, I pursue a partial comparative analysis of European and North American community energy capacity and regulation. I imposed three primary restrictions on my analysis. First, I focused exclusively on community solar installations. Second, I limited my international analysis to the UK—excluding Northern Ireland—and the US. Third, I only surveyed regulations relevant to community solar grid interconnection. My research on community solar capacity reveals that the US possesses greater absolute and relative volumes of community solar than the UK. Interestingly, subsequent regulatory analysis indicated that the UK's interconnection procedures are better suited to community solar developments than are regulations in the US. This discovery indicates that interconnection regulation cannot explain the US's volumetric advantages in community solar capacity over the UK. The novel insights provided in this paper contextualize current regional focuses in community energy scholarship while highlighting the need for further policy research in the US.

Introduction

The threat of climate change challenges a foundational assumption of energy law: that centralized energy generation and regulation "can most effectively and efficiently"[1] support our electricity needs. National action on energy regulation encounters corporate opposition and partisan gridlock, delaying necessary measures that aim to shift our energy supply.[2] Local communities have increasingly turned to alternative generation options—including community energy—to compensate for federal and state failings.

Consensus regarding a precise definition of community energy does not presently exist. Scholars and practitioners "infer varying degrees of community involvement"[3] in such projects, complicating any attempt to determine a clear meaning of the phrase. Rather than deriving my own definition of community energy, I have elected to contextualize my paper with a definition provided by Seyfang et al. (2013). These scholars define community energy as "those projects where communities…exhibit a high degree of local ownership and control."[4] Projects can include community-scale "wind turbines and solar farms…mini-hydroelectricity schemes…[and] locally-owned energy distribution networks."[5]

Leonhardt et al. (2022) conducted a literature review focusing on papers that highlighted a range of government instruments and policies dedicated to promoting community energy. Around 80% of these papers focus on a European context, while only 9% of the selected papers focus on North America.[6] The authors attribute this finding to Europe's leadership in community energy, with countries like Germany, Denmark, and the UK pioneering developments within the sector.[7]

This fact, however, offers only a partial explanation for the considerable difference in the amount of attention bestowed upon European versus North American community energy policy. I wanted to understand the quantitative and qualitative differences between the sectors in each region, so as to offer context for the comparative lack of scholarly research on North American community energy governance. Accordingly, I decided to pursue a partial comparison of community energy prevalence and policy in the two regions, subject to three primary constraints. First, I focused exclusively on community solar due to the prevalence of this form of community energy and the availability of relevant data. Second, I limited the scope of my international analysis to the United States and the United Kingdom—excluding Northern Ireland—for the sake of brevity. Thus, my findings do not represent a comprehensive review European or North American regulation. However, the information that I consider still reveals novel insights into community solar in the US and the UK that may prove useful to other researchers looking to understand the sector. Third, I concentrated my discussions of specific community solar regulations on grid interconnection policies rather than land use regulations.

I begin by presenting the data I collected on the amount of community solar in the US and the UK. Then, I detail electricity regulations within the UK and highlight community solar-specific policies. I provide the same information for community solar in the US. My analysis of the data and relevant regulations reveals that while the US has a greater volume of community solar, the UK's regulatory structures are better suited to community solar interconnection, as such structures possess national uniformity.

Data

Before detailing UK and US community solar regulations, I wanted to offer a comparison of physical capacity in Table 1. I used data from the National Renewable Energy Laboratory

(NREL) in the US and Community Energy England (CEE) in the UK to determine the number of megawatts (MW) of community solar each country possesses. I then employed the most recently released population data from the US Census Bureau and the UK Office for National Statistics to highlight MW per capita. The figures that reveal community solar's share of each country's generating capacity employ 2023 generation data from the US Energy Information Administration (EIA) and the UK Department for Energy Security and Net Zero.

Table 1: The US surpasses the UK in community solar capacity in both absolute and relative terms. Data from NREL (2024); CEE (2024); US Census Bureau (2024); EIA (2024); Office of National Statistics (2024); Department for Energy Security and Net Zero (2024).

Comparing Community Solar in the US and UK		
	US	**UK**
Installed MW Capacity	7,870	228
MW per capita	0.000023	0.0000034
% Total Generation Capacity	0.7%	0.3%
% Total Renewable Generation Capacity	2.4%	0.9%

According to NREL, the US possesses 7,870 megawatts (MW) of community solar.[8] Great Britain, on the other hand, possesses approximately 228 MW.[9] In absolute terms, the difference in community solar capacity between the two countries is quite large. The same description may also be applied to relative comparisons. The US possesses more MW per capita than the UK. Additionally, community solar compromises a larger portion of the US's total generation capacity and renewable generation capacity than it does in the UK. Given the UK's recognized status as a leader in community energy,[10] this data appears initially surprising and seems to suggest a need for further research on community solar projects in the US. The remainder of this paper addresses the regulatory underpinnings of community solar in both the US and the UK, thereby providing a portion of the "further research" required.

UK Policies

Electricity systems within the UK consist of intangible and tangible components. Intangible elements include the wholesale and retail electricity markets. Wholesale transactions occur between electricity generators and suppliers in a competitive market.[11] Retail transactions, on the other hand, involve the sale of electricity between end-use customers and suppliers in a competitive marketplace.[12] These transactions manifest physically in the transmission and distribution networks, respectively. This section describes basic electricity market and infrastructure regulations in the UK, with additional focus given to community solar interconnection procedures.

I. General Regulation

The Electricity Act of 1989 privatized generation and transmission services within the UK.[13] Notably, this act also required energy firms to receive licenses for providing such services to consumers, which entailed the establishment of independent regulatory bodies. Today, the Office of Gas and Electricity Markets (Ofgem) issues licenses to electricity companies and regulates electricity markets in Great Britain.[14] Ofgem's control over licensing procedures allows the office to exercise influence over generation, transmission, and retail supply operations throughout the UK.[15]

Ofgem's responsibilities over electricity markets extend to price and industry code regulations. Ofgem sets the energy price cap for retail supply, defined as "the maximum price that energy firms are allowed to charge households on their default tariffs."[16] The price cap restricts the unit price of energy measured in kilowatt-hours (kWh).[17] Ofgem also determines price controls for transmission networks through RIIO-T2.[18] Additionally, distribution and

transmission operating codes are overseen at the highest level by Ofgem. Each code has its own Code Administrator that acts as the point of contact for the code.[19]

Evidently, Ofgem exercises a high degree of authority over the UK's electricity markets. This authority extends to the physical infrastructure underlying such markets. Ofgem provides the license to operate for the National Electric Systems Operator (NESO) in Great Britain.[20] NESO balances supply and demand for electricity across the entire system through the Electricity National Control Centre.[21] NESO also operates the national high-voltage transmission infrastructure, owned by three different network providers: National Grid in England and Wales, SP Energy Networks in central and southern Scotland, and Scottish and Southern Electricity (SSE) Networks Transmission in north Scotland.[22]

NESO utilizes the transmission infrastructure owned by National Grid, SP Energy and SSE to "pass high voltage electricity onto Distribution Network Operators (DNOs)."[23] DNOs—like the distribution businesses owned by SP Energy and SSE—then use their own infrastructure to deliver electricity to end-use consumers. These network operators do not sell electricity; rather, energy suppliers pay these companies for use of their infrastructure.[24] DNOs, like NESO and the transmission owners, require licenses from Ofgem to conduct their operations.[25]

II. Community Solar Interconnection Procedures

NESO identifies community solar infrastructure as a type of embedded generation. Embedded generation is connected to local distribution networks rather than the national transmission network.[26] Accordingly, NESO does not manage community solar generation and must account for this type of generation in its nationwide demand forecasts.[27]

Connecting a community solar project to its local distribution network requires referring to the Distribution Code, an industry code regulated by Ofgem and administered by the Energy Networks Association (ENA).[28] The code contains procedures for actual interconnection and other relevant engineering guidelines. Parties interested in installing a community solar project will generally follow one of two engineering codes outlined by ENA: G98 or G99.[29] G98 projects connect 3.68 kilowatts (kW) or less of nameplate capacity to each phase of an installation, while G99 projects connect over 3.68 kW to each phase.[30]

Connecting a small micro-generator to a single phase of an installation—as compliant with G98—will have a minimal impact on the overall distribution system.[31] Accordingly, the process for connecting such projects is relatively simple. Customers interested in installing a small solar project (at or under 3.98 kW of nameplate capacity) on a single premise must find a competent installer to install and commission the project. After the completion of these two steps, customers need to inform their DNO of the micro-generator within 28 days of commissioning the unit.[32] If the G98 project is installed on multiple dwellings at the same time, discussions with the local DNO must begin before starting work on the project. Provided that the DNO responds favorably in informal discussions of the project, a formal G98 application will need to be submitted to the DNO in advance of the installation.[33] The remainder of the steps in the interconnection process parallel the requirements of a single-premise G98 project.[34]

For projects requiring over 3.98 kW of nameplate capacity, the installation must comply with G99 procedures.[35] The DNO must be contacted prior to beginning work on the project.[36] Once the project has been planned and the DNO has been contacted, the selected installer must submit a G99 application form to the DNO on behalf of the customer.[37] If the DNO accepts the project, they will "produce a connection offer"[38] that the customer must then agree to. The customer will

also enter into a series of other agreements with the DNO prior to the installation and commissioning of the project.[39] Customers and installers will generally remain in close contact with the DNO throughout project construction and may even have the DNO witness the commissioning testing.[40]

While each of the 14 DNOs undoubtedly varies in their response to community solar projects, the general procedure for installing these generators remains nationally consistent. This effect stems from the high degree of centralization over interconnection procedures in the UK. At the highest level, Ofgem monitors and alters the Distribution Code, with ENA communicating such alterations. The Distribution Code, like all other energy industry codes, is considered a "living"[41] document; accordingly, these codes are granted a flexibility that can assist in promoting community energy installations as the UK's government increasingly prioritizes distributed generation options.[42]

US Policies

On the surface, US electricity systems seem to closely parallel those of the UK. Both countries operate wholesale and retail markets with similar underlying infrastructure. Upon closer inspection, however, the realities of each system appear quite different. While the UK exhibits a high degree of national uniformity in its market structures and interconnection procedures, the US possesses substantial regional variation in these areas. This section covers the differences between "regulated" and "deregulated" markets, while also providing a high-level overview of the variance in community solar interconnection policies.

I. General Regulation

Investor-owned utilities service most electricity customers within the US. These utilities are classified as either traditionally regulated or deregulated. Regulated utilities typically operate as vertically-integrated monopolies that own generation and transmission infrastructure in a particular region. These utilities receive oversight from regulators on the state's public utilities commission (PUC).[43] State regulators monitor the retail electricity prices that utilities charge to end-use customers and must approve a utility's power plant investments. Utilities in deregulated markets often do not own generation assets—which are instead owned by independent power suppliers—but still possess transmission and distribution infrastructure.[44] In order to acquire power from generation facilities, deregulated utilities must participate in wholesale power markets.

Seven regional transmission organizations (RTOs) operate wholesale power markets in the US. Most of these RTOs are regulated by the Federal Energy Regulatory Commission (FERC).[45] FERC acts as the "economic regulator…[for] wholesale electricity transactions that cross state lines."[46] This role requires FERC to approve the ratemaking process in wholesale markets, so that rates are considered "just and reasonable."[47] Deregulated retail electric utilities "purchase electricity at market-determined wholesale prices [regulated by FERC] and then sell that electricity to customers at market-determined retail prices."[48]

II. Community Solar Interconnection Procedures

Community solar interconnection policies vary considerably by state. State PUCs often determine the interconnection procedures for distributed energy resources (DERs) like community solar that seek to connect to distribution systems retained by investor-owned utilities.[49] Thirty-six states currently possess statewide mandatory interconnection standards for DERs; thirteen others maintain a form of optional interconnection guidelines.[50] Individual

investor-owned utilities may add their own interconnection policies to statewide baselines. Municipal and cooperative utilities also implement interconnection standards for DERs, although these standards may differ from statewide regulations as such utilities are often exempt from PUC oversight.[51]

Two primary factors determine the extent of federal authority over a community solar installation's interconnection process: its market engagement and its physical interconnection. If a community solar project engages in interstate wholesale power transactions, the installation must comply with FERC's Small Generator Interconnection Procedures (SGIP) and the Small Generator Interconnection Agreement (SGIA).[52] SGIP and SGIA apply to projects with under 20 MW of nameplate capacity.[53] FERC also exercises authority over community solar projects with physical interconnection to the transmission system.[54] If a community solar installation connects to an intrastate distribution system and is engaged in retail sales exclusively, the project will not be subject to FERC jurisdiction.[55] However, elements of SGIP and SGIA may appear in state interconnection procedures, extending FERC's overall influence in the community solar sector.

Analysis

In attempting to understand the differences between a sample of European and North American community energy sectors, I uncovered surprising data findings. The US surpassed the UK—traditionally recognized as a community energy leader—across four different measures of community solar capacity. This data, however, does not necessarily conflict with the UK's status as a leader in community energy as a whole; after all, I exclusively considered community solar capacity, which compromises only 63% of the UK's total community energy sector.[56]

This qualification to my data findings enhances the necessity of exploring underlying policy structures within both countries, as regulatory regimes possess considerable influence on the proliferation of community solar. The degree of centralization over electricity regulation varies by country, as evidenced by the amount of authority granted to national regulators. In the UK, Ofgem possesses authority over the entirety of the UK's electricity system, although the degree of such authority varies by component. Ofgem licenses all electricity generators, energy suppliers, distribution and transmission network owners, and the national transmission operator, NESO. Authority over licensing procedures allows Ofgem considerable influence in industry operations. FERC's licensing authority, on the other hand, is considerably limited. FERC only possesses the authority to license hydroelectric projects.[57]

Ofgem also regulates both retail and wholesale electricity markets at the national level. The office sets a "price cap" for retail customers and establishes price controls for wholesale transactions. Conversely, FERC possesses minimal regulatory authority in both wholesale and retail power markets. FERC's authority over wholesale transactions extends only to interstate power markets; intrastate wholesale markets—such as Texas's market—fall outside of FERC jurisdiction. FERC does not regulate retail electricity rates; instead, state PUCs act as the principal retail rate regulator.

These observations provide important context for understanding the specifics of community solar regulation within each country. Ofgem's regulatory purview extends to energy industry codes, including the national Distribution Code. This code, administered by ENA, articulates both the interconnection procedures and relevant engineering recommendations applicable to community solar projects. The possession of a uniform national interconnection code streamlines the community energy installation process. In the US, on the other hand,

interconnection procedures vary greatly by state. Most projects will need to follow state and utility-specific requirements, although some installations may also face mandatory FERC oversight.

The fragmentation of interconnection regulation in the US can prevent the creation of comprehensive guidance documents for communities looking to invest in solar projects. Additionally, communities can encounter significant opposition to proposed solar projects from their local electric utility, which typically owns the local distribution infrastructure. These utilities often receive strong support from state PUCs. Accordingly, communities may not be able to seek impartial arbitration from state regulators, thereby stalling or preventing the creation of a community solar project. Communities in the UK can face similar challenges with DNOs, although Ofgem's high-level oversight of interconnection procedures helps to prevent such conflict from occurring. After all, Ofgem's strategic priorities reflect a nationwide interest in transitioning to an increasingly-decentralized energy system, as do the priorities of ENA.[58]

The UK's interconnection regulation appears better suited to community solar deployment than the US's regulatory regime based on its relative national uniformity. This finding suggests that additional research is needed to evaluate alternative explanations for the US community solar sector's volumetric advantages over that of the UK. The amount of government financing available to community solar projects within each respective country should be investigated when considering alternative theories for this phenomenon.

Although this study may not have revealed an explanation for why the US surpasses the UK in community solar, it does offer novel data and regulatory insights that help to contextualize the relative lack of attention placed on North American community energy governance. My research suggests that community solar developments within the US deserve greater scholarly

attention, as the sector is larger across multiple metrics in the US than in the UK—a nation that currently receives greater attention in the field.[59] I hope that the analysis I provided serves as a foundation for further research on community energy in the US and inspires critical discourse on regulatory solutions that can accelerate domestic community energy deployment.

[1] Shelley Welton, “Public Energy,” N.Y.U. L. Rev. 92 (2017): 270.
[2] Jonathan Rutheford and Olivier Coutard, “Urban Energy Transitions: Places, Processes and Politics of Socio-Technical Change,” *Urban Studies* 51, no. 7 (2014): 1369.
[3] Gill Seyfang et al., “A thousand flowers blooming? An examination of community energy in the UK,” *Energy Policy* 61 (2013): 978.
[4] Ibid.
[5] Richard J. Hewitt et al., “Social Innovation in Community Energy in Europe: A Review of the Evidence,” *Frontiers in Energy Research* 7 (2019).
[6] Renata Leonhardt et al., “Advancing local energy transitions: A global review of government instruments supporting community energy,” *Energy Research & Social Science* 83 (2022).
[7] Ibid; Hewitt et al., “Social Innovation in Community Energy in Europe,” 2019; Annalisa Savaresi, “The Rise of Community Energy from Grassroots to Mainstream: The Role of Law and Policy,” *Oxford Journal of Environmental Law* 31 (2019): 493-494.
[8] Kaifeng Xu et al., "Sharing the Sun Community Solar Project Data (June 2024)," NREL Data Catalog, Golden, CO: National Renewable Energy Laboratory (NREL), last modified September 25, 2024.
[9] This figure is likely an underestimate, as several data points were missing from my calculations. I added up all available community solar capacity counts as provided by Community Energy England’s (CEE) National Community Energy Map. (Source: “Community Energy in England (map),” CEE, last modified July 2024).
[10] Leonhardt et al., “Advancing local energy transitions,” 2022; Hewitt et al., “Social Innovation in Community Energy in Europe,” 2019; Savaresi, “The Rise of Community Energy,” 2019.
[11] Suzanna Hinson, “Electricity Grids,” House of Commons Library, Briefing Paper Number 8472, January 8, 2019: 12.
[12] Ibid.
[13] Ibid, 9.
[14] Nathaniel Amos, “Ofgem,” Institute for Government, December 21, 2022; “Energy Policy and Regulation,” Ofgem, https://www.ofgem.gov.uk/energy-policy-and-regulation.
[15] Amos, “Ofgem,” 2022.
[16] Olly Bartrum, “Energy price cap,” Institute for Government, November 24, 2022; “Energy price cap (default tariff) policy,” Ofgem, https://www.ofgem.gov.uk/energy-policy-and-regulation/policy-and-regulatory-programmes/energy-price-cap-default-tariff-policy.
[17] Bartrum, “Energy price cap,” 2022.
[18] “Network price controls 2021-2028 (RIIO-2),” Ofgem, https://www.ofgem.gov.uk/energy-policy-and-regulation/policy-and-regulatory-programmes/network-price-controls-2021-2028-riio-2.
[19] “Industry codes and standards,” Ofgem, https://www.ofgem.gov.uk/energy-policy-and-regulation/industry-codes-and-standards.
[20] “What does the Electricity National Control Centre do?” National Energy System Operator (NESO), https://www.neso.energy/what-we-do/systems-operations/what-does-electricity-national-control-centre-do.
[21] Ibid.
[22] “What we do,” National Grid, https://www.nationalgrid.com/about-us/what-we-do; “Our Transmission Network,” SP Energy Networks, https://www.spenergynetworks.co.uk/pages/our_transmission_network.aspx; “Our business units,” Scottish and Southern Electricity (SSE), https://www.sse.com/about-us/our-businesses/.
[23] “How does electricity move around?” NESO, https://www.neso.energy/energy-101/electricity-explained/how-does-electricity-move-around.
[24] Hinson, “Electricity Grids,” 8.
[25] Ibid, 9.
[26] “What is embedded generation?” NESO, https://www.neso.energy/energy-101/electricity-explained/how-electricity-generated/what-embedded-generation.
[27] “What does the Electricity National Control Centre do?” NESO.
[28] “Industry codes and standards,” Ofgem.
[29] “Distributed Generation Connection Guide: G98 & G99,” Energy Networks Association (ENA), March 2024.
[30] Lorraine Haskell and Jessica Duning, “Guide: Solar PV,” Community Energy London, last modified January 2023: 13.
[31] “Distributed Generation Connection Guide,” 2024: 43.
[32] Ibid, 44.
[33] Ibid, 47.

[34] Ibid, 48.
[35] Haskell and Duning, "Guide: Solar PV," 2023: 13.
[36] "Distributed Generation Connection Guide," 2024: 57.
[37] Ibid, 58.
[38] Ibid.
[39] Ibid.
[40] Ibid, 59.
[41] "Industry codes and standards," Ofgem.
[42] "Distributed Generation Connection Guide," 2024: 30.
[43] Kathryne Cleary and Karen Palmer, "US Electricity Markets 101," Resources for the Future, last modified March 17, 2022.
[44] Ibid.
[45] Texas's RTO, the Electric Reliability Council of Texas (ERCOT), is exempt from FERC regulation, as the RTO operates exclusively within Texas's borders. (Source: Cleary and Palmer, "US Electricity Markets 101," 2022).
[46] Kathryne Cleary et al., "FERC 101: Electricity Regulation and the Federal Energy Regulatory Commission," Resources for the Future, last modified August 21, 2021.
[47] Ibid.
[48] Cleary and Palmer, "US Electricity Markets 101," 2022.
[49] Michael Ingram et al., "A Guide to Updating Interconnection Rules and Incorporating IEEE Standard 1547," Golden, CO: NREL, 2021: 1.
[50] Ibid, 2.
[51] Ibid, 1.
[52] Ibid; Steve Pincus and Steve Shparber, "Legal Considerations Related to Distributed Energy Resources (presentation)," PJM Interconnection, April 18, 2016.
[53] "Generator Interconnection," Federal Energy Regulatory Commission (FERC), last modified May 16, 2024, https://www.ferc.gov/electric-transmission/generator-interconnection.
[54] Pincus and Shparber, "Legal Considerations Related to Distributed Energy Resources, 2016.
[55] Ibid.
[56] "Community Energy State of the Sector 2024," CEE, July 2024.
[57] "What FERC Does," FERC, last modified October 23, 2024.
[58] "Protect, Build, Change, Deliver: Ofgem's Multiyear Strategy," Ofgem, 2024: 62; "How we're improving grid connections," Energy Networks Association (ENA), https://www.energynetworks.org/industry/connecting-to-the-networks/reforms.
[59] Leonhardt et al., "Advancing local energy transitions," 2022.

Bibliography

Amos, Nathaniel. “Ofgem.” Institute for Government. December 21, 2022. https://www.instituteforgovernment.org.uk/explainer/ofgem.

Bartrum, Olly. “Energy price cap.” Institute for Government. November 24, 2022. https://www.instituteforgovernment.org.uk/explainer/energy-price-cap.

Cleary, Kathryne and Karen Palmer. “US Electricity Markets 101.” Resources for the Future. Last modified March 17, 2022. https://www.rff.org/publications/explainers/us-electricity-markets-101/.

Cleary, Kathryne, Karen Palmer, and Todd Aagaard. “FERC 101: Electricity Regulation and the Federal Energy Regulatory Commission.” Resources for the Future. Last modified August 21, 2021. https://www.rff.org/publications/explainers/ferc-101-electricity-regulation-and-the-federal-energy-regulatory-commission/.

“Community Energy in England (map).” Community Energy England (CEE). Last modified July 2024. https://www.google.com/maps/d/u/0/viewer?mid=1zGQXlC3lM3uEkZeML5iFQx6fCoJpJUgP&ll=53.27687315628658%2C-2.387098553535104&z=6.

“Community Energy State of the Sector 2024.” CEE. July 2024. https://communityenergyengland.org/files/document/960/1720710752_CommunityEnergyStateoftheSector2024UKOverview.pdf.

“Digest of UK Energy Statistics: Annual data for UK, 2023.” Department for Energy Security and Net Zero. July 30, 2024. https://assets.publishing.service.gov.uk/media/66a7e14da3c2a28abb50d922/DUKES_2024_Chapters_1-7.pdf.

“Distributed Generation Connection Guide: G98 & G99.” Energy Networks Association (ENA). March 2024. https://www.spenergynetworks.co.uk/userfiles/file/2024_DG_Guides_Combined_Document.pdf.

“Electricity explained.” US Energy Information Administration (EIA). Last modified July 16, 2024. https://www.eia.gov/energyexplained/electricity/electricity-in-the-us-generation-capacity-and-sales.php.

“Energy Policy and Regulation.” Ofgem. https://www.ofgem.gov.uk/energy-policy-and-regulation.

“Energy price cap (default tariff) policy.” Ofgem. https://www.ofgem.gov.uk/energy-policy-and-regulation/policy-and-regulatory-programmes/energy-price-cap-default-tariff-policy.

“Generator Interconnection.” Federal Energy Regulatory Commission (FERC). Last modified May 16, 2024. https://www.ferc.gov/electric-transmission/generator-interconnection.

Haskell, Lorraine and Jessica Duning. “Guide: Solar PV.” Community Energy London. Last modified January 2023. https://www.communityenergy.london/wp-content/uploads/2023/01/Solar-PV-Guidance-V2.pdf.

Hewitt, Richard J., Nicholas Bradley, Andrea Baggio Compagnucci, Carla Barlagne, Andrzej Ceglarz, Roger Cremades, Margaret McKeen, Ilona M. Otto, and Bill Slee. "Social Innovation in Community Energy in Europe: A Review of the Evidence." *Frontiers in Energy Research* 7 (2019). https://doi.org/10.3389/fenrg.2019.00031.

Hinson, Suzanna. "Electricity Grids." House of Commons Library. Briefing Paper Number 8472. January 8, 2019. https://researchbriefings.files.parliament.uk/documents/CBP-8472/CBP-8472.pdf.

"How does electricity move around?" National Energy System Operator (NESO). https://www.neso.energy/energy-101/electricity-explained/how-does-electricity-move-around.

"How we're improving grid connections." Energy Networks Association (ENA). https://www.energynetworks.org/industry/connecting-to-the-networks/reforms.

"Industry codes and standards." Ofgem. https://www.ofgem.gov.uk/energy-policy-and-regulation/industry-codes-and-standards.

Ingram, Michael, Akanksha Bhat, and David Narang. "A Guide to Updating Interconnection Rules and Incorporating IEEE Standard 1547." Golden, CO: National Renewable Energy Laboratory (NREL). NREL/TP-5D00-75290. https://www.nrel.gov/docs/fy22osti/75290.pdf.

Leonhardt, Renata, Bram Noble, Greg Poelzer, Patricia Fitzpatrick, Ken Belcher, and Gwen Holdmann. "Advancing local energy transitions: A global review of government instruments supporting community energy." *Energy Research & Social Science* 83 (2022). https://doi.org/10.1016/j.erss.2021.102350.

"Network price controls 2021-2028 (RIIO-2)." Ofgem. https://www.ofgem.gov.uk/energy-policy-and-regulation/policy-and-regulatory-programmes/network-price-controls-2021-2028-riio-2.

"Our business units." Scottish and Southern Electricity (SSE). https://www.sse.com/about-us/our-businesses/.

"Our Transmission Network." SP Energy Networks. https://www.spenergynetworks.co.uk/pages/our_transmission_network.aspx.

Pincus, Steve, and Steve Shparber. "Legal Considerations Related to Distributed Energy Resources (presentation)." PJM Interconnection. April 18, 2016. https://www.pjm.com/-/media/committees-groups/committees/mrc/20160418-special/20160418-item-03a-state-and-federal-jurisdictional-rules-and-regulations-related-to-der.ashx.

"Population estimates." Office for National Statistics. Last modified October 8, 2024. https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates.

"Protect, Build, Change, Deliver: Ofgem's Multiyear Strategy." Ofgem. 2024. https://www.ofgem.gov.uk/sites/default/files/2024-03/20240328%20Ofgem%20Multiyear%20Strategy%20%28FINAL%20v2%29_0.pdf.

Rutherford, Jonathan, and Olivier Coutard. “Urban Energy Transitions: Places, Processes and Politics of Socio-Technical Change.” *Urban Studies* 51, no. 7 (2014): 1353–77. http://www.jstor.org/stable/26145800.

Savaresi, Annalisa. “The Rise of Community Energy from Grassroots to Mainstream: The Role of Law and Policy.” *Oxford Journal of Environmental Law* 31 (2019): 487-510.

Seyfang, Gill, Jung Jin Park, and Adrian Smith. “A thousand flowers blooming? An examination of community energy in the UK.” *Energy Policy* 61 (2013): 977-89. https://doi.org/10.1016/j.enpol.2013.06.030.

“US and World Population Clock.” US Census Bureau. Last modified November 12, 2024. https://www.census.gov/popclock/.

Welton, Shelley. “Public Energy.” N.Y.U. L. Rev. 92 (2017): 267-349.

“What does the Electricity National Control Centre do?” NESO. https://www.neso.energy/what-we-do/systems-operations/what-does-electricity-national-control-centre-do.

“What FERC Does.” FERC. Last modified October 23, 2024. https://ferc.gov/what-ferc-does.

“What is embedded generation?” NESO. https://www.neso.energy/energy-101/electricity-explained/how-electricity-generated/what-embedded-generation.

“What we do.” National Grid. https://www.nationalgrid.com/about-us/what-we-do.

Xu, Kaifeng, Gabriel Chan, and Sudha Kannan. "Sharing the Sun Community Solar Project Data (June 2024)." NREL Data Catalog. Golden, CO: NREL. Last modified September 25, 2024. DOI: 10.7799/2438583.