INTRODUCTION

ELECTRIFICATION AS NEW ZEALAND'S COLONIAL IMAGINARY

In a press release for the Labour Party in 2019, Aotearoa New Zealand Prime Minister Jacinda Ardern said, "We are committed to taking the next steps to get to 100 percent renewable with support for projects like pumped hydro at Lake Onslow, removing the barriers to development of new renewable electricity projects, advancing green hydrogen and other green technologies and supporting businesses to decarbonise. Our plan for clean energy and lower carbon emissions will help us seize the economic opportunities of being the clean, green country that New Zealanders see ourselves as being and that we can market ourselves as."[1] As suggested by some of Ardern's claims, electric power issues occupy people's attention in New Zealand, including grid security after Cyclone Gabrielle in 2023 and concerns about the fate of New Zealand's Zero Carbon Act 2019. The company Emrod, founded in 2019, plans to kickstart a global shift toward wireless electric power technology.[2] Beyond the work of firms like Emrod, New Zealand's electric power initiatives and projects feature in electrification programs around the world. For example, Māori-led geothermal power initiatives in Kenya and the United States have initiated global conversations about how Indigenous peoples might use geothermal

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sources to provide electricity and foster socioeconomic relief.[3] In short, New Zealand's electric power infrastructure looks poised to deliver exciting systems and outcomes inside and outside the country in the coming decades.

New electric power technologies inspire interest as technological quick fixes toward a solution to systemic energy inequity. Partly this is because they offer to expand a particular vision in which electricity allows for the production and consumption of more. Such contemporary plans build on a long history of electric power schemes in New Zealand, all of which have promised more—more production and more consumption for *some* people. Beginning in the 1880s, settler New Zealanders developed hydroelectric systems to light towns, drive extractive industries, communicate, and integrate technologies the British Empire deemed modern into the colony. Throughout the twentieth century, the state diversified the energy sources used to generate electric power by adding fossil fuels and geothermal energy into its electric infrastructure. The development of these systems mirrors electrification stories from around the world. What distinguishes New Zealand's story is how the people that designed and used electric power systems saw them as the best vehicles for achieving settler visions for the country. Electrification in New Zealand is a form of settler-colonial logic espoused by boosters and public works authorities in New Zealand and worldwide. New Zealand's electrification story demonstrates how the global history of these initiatives is rooted in, and profits from, extractive and inequitable practices engrained in colonial politics and ideologies. Building on significant additions to energy history from environmental, cultural, technology, and political historians, I argue that electrification must be understood as settler-colonialism within the larger transition to state control of energy resources, use of fossil fuels, and massive industrial production models.

Framing electrification as part of the settler-colonial project in Aotearoa New Zealand clarifies how and why electrification unfolded there. The availability of technology alone did not guarantee its adoption. So, when we consider things like Emrod's plans for wireless electric power—seen as innovative in 2023, even though such ideas circulated among engineers over a century earlier—historians are better positioned to explain how certain electric systems came to dominate. Many in the engineering and scientific community are quick to

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argue that technological, scientific, and material limits to electrification exist; therefore, electric power systems *had to* develop in a specific way. Furthermore, historians of electric power technology note that there are limits to sociocultural acceptance. The claims from both groups are, at most, partially true. There are indeed material limits to producing and harnessing electric power, just as people embed some technologies into their worldview while finding others incompatible. This book is about how such ideas developed in New Zealand, and why people choose or believe in certain energy systems.

From its earliest electrified mines to Ardern's speeches about energy futures, New Zealand's power production and consumption have been closely associated with labels like *self-sufficient*, *sustainable*, and *green*. Following how the country electrified provides a way to explore how these labels and understandings of energy use took shape. If indeed Aotearoa New Zealanders—indeed, much of the world—see the country's electrification as a model energy identity, then the country's energy infrastructure must be clearly linked to the sociopolitical systems that created those labels. While terms like *self-sufficiency*, *sustainable*, or *green* might typically be seen as aspirational goals linked to contemporary environmental movements, energy efficiency prerogatives, or broad initiatives to combat anthropogenic climate change, in New Zealand they are rooted in the settler-colonial practices that used electrification as a tool to effect the goals of the British Empire, the colonial government, and settlers.

As historians like Fredrik Meiton (*Electrical Palestine*) or Andrew Needham (*Power Lines*) argue, one of the issues at stake when asking about how people electrified is, why did people begin to use specific energy resources—hydro, mining, geothermal—for electrification?[4] The question remains worth asking, whether during the earliest days of speculation about the wonders of electric currents, or today, when countries worldwide grapple with how the continued production of electric power can either help destroy or save our planet. In New Zealand, since at least 1886, electric power systems facilitated settler-colonial imaginaries and realities that settlers and Māori built into New Zealand's electric power infrastructures. They continue to inform how people think about energy. The history of New Zealand's electrification reveals how electric power technologies dramatically developed, thrived, and transformed around settler-colonial ideas about the purpose of the islands' resources and peoples.

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In recent years, discussion of electric power systems' sociopolitical impact has flourished in mainstream and scholarly literature, stimulated by such energy-related concerns as global warming, overpopulation, and increasing energy inequality. Histories of electrical science and technology have been popular for decades. Recently, historians, sociologists, political scientists, and anthropologists have felt the need to respond to energy crises in their work—a conversation I aim to influence here.[5] Writing about the history of electricity while plugging in our nearest devices—or reading such histories on them—we are complicit and intertwined with those infrastructures. It can be difficult to imagine escaping them or even wanting to do so. However, accepting electric power as inevitable is to comply with settler-colonial logic. I choose not to treat electrification as inevitable, and I encourage other historians and users of electricity to be critical of the choice to use electricity—in the past and present. Interrogating our electrical past is the only way to appreciate how electrical systems shape our world and might be altered to better navigate climate change and inequality.

ENFORCING ELECTRIFICATION AND EXPLOITATION

In many histories of electrification, particularly the majority written about New Zealand, the complexity and scale of electrical systems have eclipsed the salience of their ideological and cultural influence. As much as New Zealand's transition to electric power reflects the actions for and against the formation of a state, it is also about the cultural significance of electricity to British politicians, European settlers, and the Māori, as well as the use of technology to enforce, ignore, and resist colonialism. Electrification is part of a seamless web of connections among people, machines, and the environment. Electric systems must account for the input of politicians, scientists, administrators, legal operatives, engineers, entrepreneurs, and businesspeople, because all of these perspectives respond to technical problems and are involved in developing electrification. Yet the resistance to electric power or its associated infrastructure is just as noteworthy in shaping electricity usage as the networks that build and regulate it. And perhaps more importantly, electricity itself is not a neutral energy source waiting to be used at the right time. It was an active and politically charged element of British society that made it attractive to certain classes and unattractive to others for reasons that had little to

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do with its users' actual capabilities. For many colonial spaces in the British Empire, technocrats used electric power to delineate between "white" and "dark," reinforcing racial hegemony. Electric power and electrical technologies in this book demonstrate that energy shifts must be dealt with not only at the labs, drafting tables, or boardrooms but also at the propagandist fundraisers, town council meetings, and protests. Further, the relevant people and places involved may not easily be thought of as coexisting under the auspices of the state.

Understanding the sociopolitical impact of transitions to electricity is not an unprecedented move in the history of technology or electricity, of course.[6] Since the 1980s and, more formally, from the 1990s on, historians of electricity have offered narratives of electrification that treat electrical systems as massive social and technical networks. What is new is that they highlight how New Zealand's electrification within larger energy transitions positions researchers to challenge the assumption that electrification was inevitable throughout the world during the late nineteenth century and into the present.[7] The success of electrification did not hinge solely upon the successful mastery of electromagnetic theory or refinement of conductive materials. It is both a product and cause of a broader reconceptualization of energy that took place across the world throughout the nineteenth and twentieth centuries. Understanding electrification, in the British Empire, New Zealand, and beyond as a foreordained outcome of industrialization ignores the role colonials' assumptions played in the change of energy systems. The process of electrification in New Zealand, therefore, cannot be understood without unpacking the colonial machinations embedded in the grid that settlers and Māori navigated. The connection of New Zealand and its electrification to settler-colonialism will expand both how historians see those networks and how historians of New Zealand specifically understand settler-colonialism.

To appreciate why colonialism played a formative role in New Zealand's electrification and to avoid deterministic assumptions about electrification, I approach the country's electrification as part of a much longer energy transition. An *energy transition* refers to a structural change in energy systems, including a shift in energy resources, distribution, and use. These transitions take place over prolonged periods in which people, governments, and companies seek more satisfactory means of using energy for power, light, and transportation.[8] Situating New Zealand, and indeed many other states' electrification

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narratives in the 1880s, within these transitions is necessary for helping us better trace the sociopolitical forces that governed the course of electric power technologies. The scale of the transition expands the timeline, geographic scope, and number of power sources involved in electrification. While mines, cities, and companies built electric power systems at the local level, the shift represents global transitions in how people harvest, store, produce, and consume energy. Even though this study focuses on New Zealand, I treat its electrification as part of a global energy transition.

Energy systems are complex sociotechnological arrays that involve the technologies associated with production and the humans that design and make the technologies, manage energy distribution, and use and consume energy. Therefore, efforts to change energy systems must account for the broader social and economic assemblages built around energy production and consumption. Framing shifts in energy systems as part of a more extended transition disrupts ideas about the stability or predetermination of power sources by locating the sociocultural influences that motivated the search for new energy systems. The consequences of an energy transition go beyond the economic costs or the exciting implications of new energy technologies, and so must our historical investigations. New energy systems have immediate and far-reaching sociopolitical consequences that redefine how people live, work, and govern.[9] Recognizing these consequences shows how energy resources and systems have benefited oppressive political regimes and how those same systems can be used to challenge oppression.[10] Environmental and energy historians have done much to show how resources—particularly energy resources—are bound to the violent dispossession wrought by colonialism.[11] Andrew Curley argues that the word *resources* is just a synonym for colonialism.[12] The extraction of resources and the expansion of state-run infrastructure cannot be disentangled from the settler-colonial prerogative. Because electric power technology served as a tool for extracting, controlling, and organizing energy, mineral, agricultural, and transportation resources, it was colonial from the start.

Electrical systems grew rapidly at the turn of the twentieth century, and a broad literature depicts how their infrastructures expanded, consolidated, and at times stagnated.[13] These power networks flourished through an amalgamation of governmental, private, and corporate funding; collective innovation; and the birth of electrical

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engineering. Furthermore, these systems spanned massive geographic spaces. New Zealand's stories of remote lighting of towns and mines are connected to the simultaneous construction of large electrical systems elsewhere, especially throughout the British Empire. This book expands the timeline typically associated with the implementation of electric power systems in New Zealand and gives more attention to the global scope of electrification. Allowing for a longer timespan better accounts for the sociopolitical motivations behind a transition that predates dreams of centralized power production or grids. For instance, I tie early-nineteenth-century colonial patterns of resource usage to the rhetoric of electrification boosters during the late nineteenth century. New Zealand's electrification relied on settler and Māori use of water and geothermal resources, which had profound implications for New Zealand's history, such as the massive growth on the North Island, the expansion of agriculture around Christchurch, and the growth of the mining industry in Otago.

As David Nye argues in *Electrifying America*, and more recently in *American Illuminations*, electrification was not a "'natural' or 'neutral' process; everywhere, it was shaped by complex political, technical, ideological interaction."[14] Appreciating the British "culture of energy" is crucial for understanding the ready reception of, and at times skepticism toward, electric power systems in Britain and its colonies.[15] Locating excitement and anxiety about energy in literary, political, educational, and scientific texts demonstrates the cultural depth of electric power in the British world. Energy physics and popular interpretations of the theories that developed therein "had an undeniable appeal for those who sought one rule to rule them all."[16] This was especially true of natural philosophers and scientists like Herbert Spencer and William Thomson (later Lord Kelvin). For many, an all-guiding principle of the conservation of energy represented God, and for others promoted British liberalism and colonialism. That is not to say that every colonial politician or public intellectual wielded energy physics as a justification for the British Empire; rather, it resonated with British colonialism's ideas of uniformity, universal rules of law, and the domination of Nature.[17] Electrification gained adherents because it aligned so well with British colonial aspirations for New Zealand and empowered political authorities to argue for increased central governance, while granting Māori new ways to fight legislation and regain land.

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