

CHAPTER FOUR

Peripheral Infrastructure

The Electrification of Indonesia's Borderlands

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On January 23, 2009, electricity from Malaysia finally reached Kaliau, an Indonesian border village in the Sajingan Besar subdistrict in West Kalimantan. The Indonesian government had agreed to purchase electricity from Sarawak Energy Berhad, a nearby utility company in Malaysia, for about 930 rupiah per kilowatt-hour (about nine US cents). This was considerably cheaper than if the Indonesian state-owned PT Perusahaan Listrik Negara (Persero), known as PLN, had supplied electricity, which would have cost 3,000 rupiah per kilowatt-hour (about thirty-two US cents). Representatives of both the Malaysian and Indonesian utility companies and the governor of West Kalimantan attended the cross-border electricity delivery inauguration ceremony on March 15, 2009 (*Fokus* 2009a). Previously, electricity had been available for only twelve hours in the evening and night, but it was now available around the clock. Maria, a Kaliau resident, was ecstatic: “We feel happy now. Electricity can now be enjoyed day and night like in a city” (quoted in Haryo and Syaifullah 2009).

PLN was also pleased with the arrangement. Electricity demands in the West Kalimantan–Sarawak border regions had increased, and PLN could not meet them all. By purchasing electricity from a neighboring country, PLN could reduce the cost of operating two diesel power plants that supplied electricity to Sajingan Besar and to another subdistrict called Badau (Haryo and Syaifullah 2009). In other words, buying Malaysian electricity relieved PLN of its increasingly burdensome obligations to electrify the border villages.

Illuminating a border region using cross-border electricity marked a shift in Indonesia's electrification strategies. For decades the focus had been on electrifying urban and rural areas far from the borderlands, using electricity generated within the country. Following the electrification of Kaliau, the Indonesian government launched several initiatives through PLN to increase the territorial scale of the country's electricity coverage. After decades of neglect, many isolated areas and remote islands—including border regions—began receiving PLN electricity in the second decade of the twenty-first century. In 2014 these endeavors gained extra support from the newly elected president, Joko Widodo, who had

successfully run on a platform that promised to develop Indonesia from the periphery inward.

After the fall of the 1966–1998 New Order regime under President Soeharto, successive Indonesian governments began paying more attention to Indonesia's borderlands.¹ Territorial forfeiture and the perceived threat of further geographical loss animated a change in perspective. One incident that sparked a renewed commitment to Indonesia's periphery was the loss of the long-disputed Sipadan and Ligitan Islands to Malaysia at the International Court of Justice in 2002. Malaysia's claim of effective administration over the islands defeated Indonesia's historical claim, which had been based on an 1891 colonial agreement between the Netherlands and Great Britain (International Court of Justice 2002).

A second pivotal event, also in 2002, was the wide coverage in the Indonesian media of the dire condition of Nipa, a tiny island on the Indonesia-Singapore border that almost disappeared after extensive sand mining had significantly reduced its size (Mendrofa 2015, 46). Singapore had been reclaiming land by importing sand from Nipa and other places for decades. The concern brought about by the Indonesian media coverage had less to do with the loss of Nipa, which was uninhabited, than it did with the loss of a natural marker from which to draw a median line delineating the maritime boundary between the two countries.

Calls continued to be made by the Indonesian media and citizens to stop treating Indonesia's borderlands as the country's *teras belakang* (backyards). A civilian expedition to survey frontier islands in 2008, and its broad media coverage, further raised public awareness. The Indonesian government passed a law in late 2008 regulating how the country should protect and manage its vast territory and borders. In 2010, it created an interagency organization to develop border regions and improve the socioeconomic well-being of the people who live there. The new agency's 2011 Grand Design specified four approaches to reposition the borderlands as Indonesia's *teras depan* (front yards). One of these was to provide electricity to support the construction of other infrastructures—water, telecommunication, markets, and border posts (BNPP 2011, 38). To achieve this objective, the Indonesian government instructed PLN to prioritize the electrification of border regions.

This chapter examines the post–New Order electrification of Indonesia's periphery. It discusses the sociopolitical and legal contexts that facilitated PLN's new electrification strategies. It also argues that the Indonesian government did not just want to light up the country's frontiers; it also used electricity to protect its borders and create a more unified nation. Electrifying Indonesia's borderlands illuminated these regions, facilitated economic growth, and brought the country's periphery into the fold. The arrival of electricity and other supporting infrastructure

helped instill a sense of national belonging among Indonesia's marginal populations. It transformed border spaces and produced what the introduction to this volume refers to as "new hierarchies, levels of interaction, and imaginations of the world." Regions that were once considered remote became a matter of national interest to be protected, developed, and made more explicitly part of the country. Increased news coverage allowed people of the borderlands to showcase their languages and customs to the rest of the country. Other Indonesians, more informed about these people in far-flung places, started to embrace their fellow citizens and made them feel part of the nation. In this sense, electricity helps illuminate, so to speak, the existence of Indonesia's border regions and the people who inhabit them. However, although electrification has brought benefits for many border populations, some citizens still receive insufficient electricity or none at all.

In his reflection on the mutual shaping of infrastructure and modernity, Paul Edwards (2003, 188) makes an instructive observation: the idea of infrastructure as an invisible and smoothly operating sociotechnical system is a "western bias." Akhil Gupta (2015, 564) supports this statement when he writes, "It is a fact that the grid still does not reach many people in the Global South, and that many areas of the world are not connected to a central system of electric power." A decade and a half ago, one could find similar conditions in many parts of Indonesia, especially its frontier regions. The Indonesian government erected electrical infrastructure in the cities first, then slowly expanded it to the countryside. This center bias—spreading electrical infrastructure from the center to the periphery—is understandable. The initial focus of many governments has been to first electrify areas with higher population densities before moving to light up sparsely populated areas. But in Indonesia, the center bias persisted, not just because of the government's priorities and asymmetrical population distribution, but also because of the perception that borderlands were remote and thus unimportant.

Borderlands as a research topic have received much attention from scholars in various disciplines.² As one scholar notes, studies of these regions worldwide are instructive since "borders have histories, as peoples do" (Tagliacozzo 2016, 2). Conceptualizing and historicizing borders helps us understand what they mean to state actors and to the people who live there, and how the idea of borders has been changing throughout history. As Eric Tagliacozzo (2016, 17) asserts, "mapping a border means mapping it in its totality—culturally, politically, and especially historically—and not just mapping the number of hilltops and the demographics of contemporary poverty, work, and migration." Drawing on literature in the field of science and technology studies, I would add that we need to map a border technoscientifically as well—in other words, to make legible the science

and technology employed to imagine, delineate, protect, develop, and police borders.

States survey and map territory, install border markings, and hold talks with neighboring countries to establish borders. They construct walls, barbed-wire fences, boundary markers, and roads to delineate boundaries. They fund the military and create other armed organizations such as border patrols and coast guards to protect and police borders. Countries erect border checkpoints and security posts to regulate the flow of people and goods across borders, although illegally trafficked items still manage to slip through.³ Nations use cross-border technologies such as pipelines, bridges, and power grids to negotiate the buying and selling of commodities across borders. In short, states build peripheral infrastructures in their state-making projects.

In Indonesia's case, building this peripheral infrastructure has been particularly challenging because of the country's archipelagic character. One important feature of electrical infrastructure is that it is a wired system. Unlike a telecommunication system that can harness electromagnetic waves wirelessly, power grids need wires. Whatever technology is used to generate electricity, it needs to be built on site and it requires cables to distribute the current. As a result, extending a power grid from the mainland to nearby islands, installing a power generation and distribution system on remote islands, or stitching local grids on a cluster of islands into a larger grid can be very expensive.

In his seminal work on the history of the electrical infrastructure of three Western cities, Thomas Hughes (1983) introduced the term "reverse salient" to describe any critical problems that hamper the growth of power systems. For Indonesia, a constant reverse salient to developing a countrywide electrical infrastructure has been Indonesia's archipelagic character. However, Hughes explains that a reverse salient provides an opportunity to solve problems and innovate. And since it is helpful to think of infrastructure as "*sociotechnical* in nature" (Edwards 2003, 188), solving a reverse salient requires more than just technical fixes. Changing a social perception, rethinking a social arrangement, coming up with a new strategy, or enacting a law can fix a reverse salient.

As I explain below, some of these nontechnical solutions were implemented to solve the reverse salient of Indonesia's power system in the periphery. But the paradoxical nature of infrastructure is that "even as infrastructure is generative, it degenerates" (Howe et al. 2016, 548). Even though infrastructural solutions can deliver purported benefits, "they are also ultimately incapable of forever satisfying the tasks they are meant to carry out" (Howe et al. 2016, 553)—that is, infrastructure can break down or become unusable due to lack of maintenance. Despite

attempts to increase the geographical scope of Indonesia's electrical infrastructure, the remoteness of the country's peripheral infrastructure means that it is challenging to maintain. In this sense, the geography of an archipelago poses a constant reverse salient to nationwide electricity coverage. But the country's archipelagic character is not merely a disadvantage: it also provides Indonesia with an unexpected opportunity.

Becoming an Archipelagic State

Situated along the equator, Indonesia consists of a chain of big and small islands that collectively span a distance roughly equal to the width of the contiguous United States, making Indonesia the largest archipelagic country in the world. The islands are so numerous that within Indonesia, several smaller archipelagos form regional or provincial administrative units such as the Aru Islands Regency and the Riau Islands Province. Indonesia shares land and maritime borders with ten countries in the Pacific and Indian Oceans. Ninety-two islands encircling the archipelago mark Indonesia's outermost maritime boundaries.⁴ Only thirty-one of those ninety-two islands are populated (Subandono 2013). Imaginary straight lines connecting the outermost points of those islands create the baselines that Indonesia uses to draw its Exclusive Economic Zone (figure 4.1⁵).

When Indonesia declared independence in August 1945, it did not emerge as an archipelagic state as the concept is understood today. At the time, not all the waters within the Indonesian archipelago were considered the country's sovereign territory. The Java Sea and the Makassar Strait, for example, were regarded as international waters by most foreign nations. It took a unilateral declaration, followed by long and arduous diplomacy, for Indonesia to become a recognized archipelagic state.

In December 1957 Prime Minister Djuanda Kartawidjaja declared that all waters within Indonesia's outermost perimeter would become part of its sovereign territory and control. The so-called Djuanda Declaration turned what had been deemed international waters into lawful Indonesian regions by fiat. This announcement angered many nations, and Indonesia's claim initially met with strong resistance. But Indonesia's persistence, together with the efforts of a few other island nations, paid off seven years later. After a breakthrough at the 1975 Geneva Law of the Sea conference, the United Nations finally acknowledged and adopted the concept of an archipelagic doctrine, which is the idea that an archipelagic nation should be treated as a single sovereign unit. In 1982, the international body passed the United Nations Convention on the Law of the Sea, which

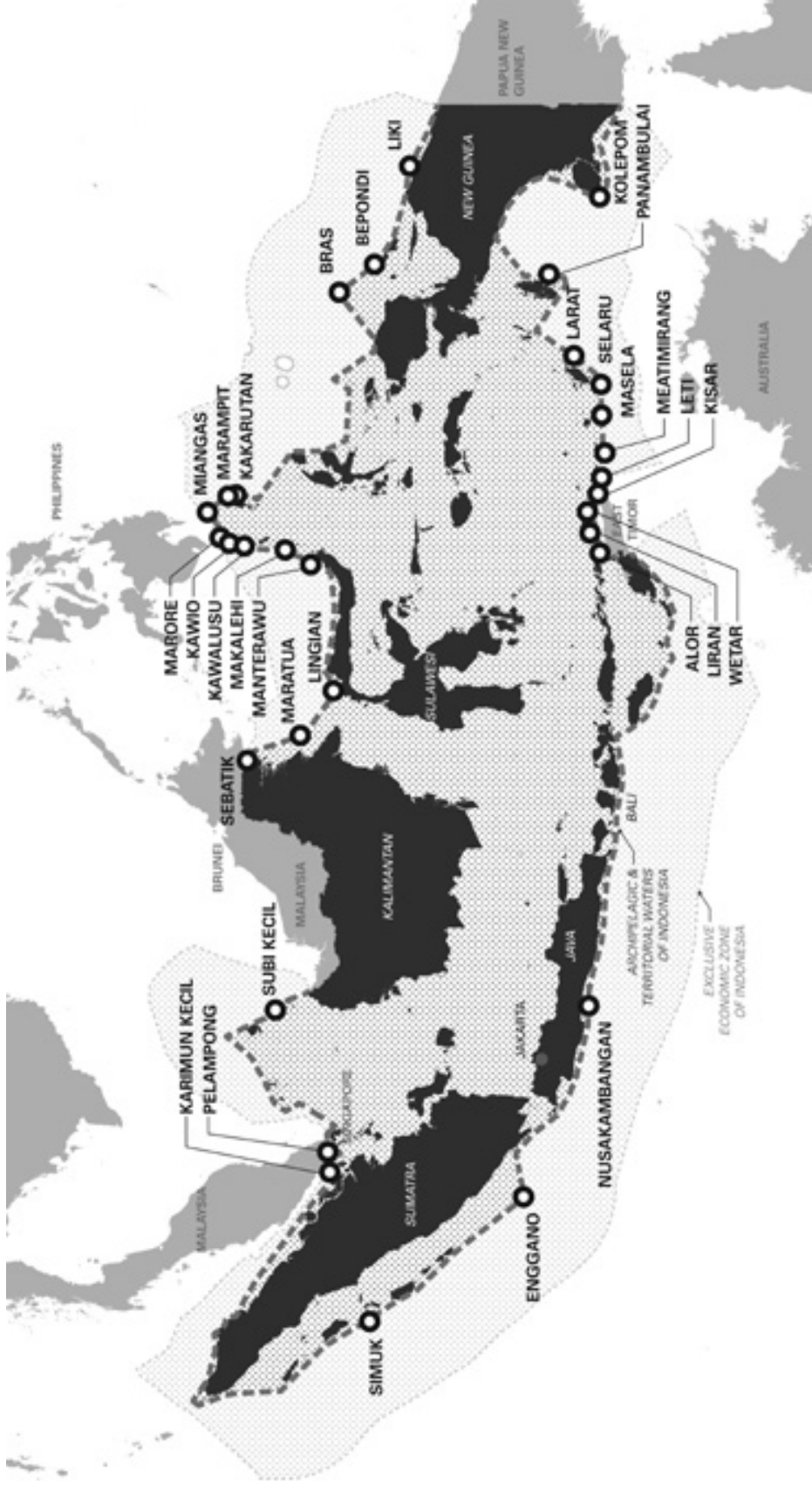


Figure 4.1. Indonesia's thirty-one inhabited frontier islands. (Map by Dorothy Tang.)

endowed a new type of nation called an archipelagic state with full sovereignty over its interior waters. Indonesia ratified the agreement in 1985 (Butcher and Elson 2017).

Even before the ratification, the New Order regime had enacted Law No. 5 of 1983 on the Indonesian Exclusive Economic Zone to exploit the country's marine resources, especially natural gas and oil. The export of these fossil fuels would add to the regime's coffers. The government subsequently allocated bigger portions of the state budget to fund many infrastructure projects across the country. However, most of them were built in Java or in a few other urban centers. Infrastructure projects in the periphery were very few and far between. Nationally, the border regions did not count much in domestic politics because of the small number of people living there. Internationally, they also mattered little, as the regime did not think that these areas played an essential role in regional geopolitics.⁶

Instead, the New Order government was inclined to build infrastructure on other islands, such as Bali and Batam. The Soeharto government developed Bali as a tourist destination and a setting for regional and international meetings—showcasing the results of various projects, including electrical infrastructure (Mohsin 2017a). Batam, an island near Singapore, was specifically developed to rival the neighboring city-state. It is therefore no coincidence that the electrical infrastructure on these two islands is some of the most developed in Indonesia.

A New Perspective on Border Islands

When the New Order regime collapsed in 1998, following the 1997 Asian financial crisis and subsequent student-led protests, the succeeding Indonesian government took a different approach to governing the country. The fall of Soeharto ushered in a new period called the Reformation Era. During this time Indonesia amended its 1945 Constitution, decentralized power by giving more autonomy to districts and provinces, held regular elections for public offices, permitted multiple parties to participate in the elections, increased freedom of the press, and changed the presidential electoral process from having members of the legislature select the president to allowing every citizen to vote directly for president. It was during the Reformation Era that national awareness about Indonesia's border regions gained traction.

For example, the abovementioned critical coverage in the Indonesian media about the island of Nipa jolted the government into action. In 2004 it banned the mining and exporting of sand, began reclaiming Nipa's coastal areas, planted protective vegetation there, and eventually built tetrapod breakwaters to prevent the erosion of the island's coast. President Megawati Sukarnoputri visited the island

and signed her name on a stone monument affirming that Nipa was part of Indonesia. She even left her footprint to be added as part of the monument (Mendrofa 2015, 41). After the government had sufficiently reclaimed the island, it installed two rainwater catchment tanks and a combination solar and wind power plant to supply water and electricity to a newly constructed navy security post (Mendrofa 2015, 42–43).

Several citizens also continued to raise public awareness and shape public perception of Indonesia's frontier islands. Susanto Zuhdi, a noted maritime scholar, had suggested changing the term for them from “outermost islands” (*pulau-pulau terluar*) to “frontier islands” (*pulau-pulau terdepan*) in a speech in 2006 at the Faculty of Humanities of the University of Indonesia. His idea gained support from Benny H. Hoed, then chair of the Association of Indonesian Translators. Hoed contended that the suggested new term—or the similar term “border islands” (*pulau-pulau perbatasan*)—would signal to the people on those islands that they were an essential part of the nation (Iskandar 2015).

Then came a civilian maritime expedition that helped raise public awareness of the frontier islands even more. In May 2008 members of Wanadri (an association of Indonesian explorers) and Rumah Nusantara (a cultural organization) set out on a journey to survey all of Indonesia's frontier islands. Dividing their expedition into three stages, which they completed in a little over two years, the team documented the geophysical dimensions of the islands and the sociocultural aspects of their inhabitants.⁷ Significantly, in naming their voyage the Nusantara Frontiers Expedition (*Ekspedisi Garis Depan Nusantara*), the team used part of Zuhdi's term. This indirectly criticized the government, which had been using the older phrase “outermost islands,” connoting remoteness and neglect.⁸ The expedition called attention to border islands and their populations as significant components of the geo-body of the nation (Winichakul 1994).⁹

Around the same time that national discourse about the country's frontier islands was increasing, the government passed two laws asserting its authority over those areas. The first was Law No. 27 of 2007, regarding the management of coastal regions and small islands. This law's purpose was to manage Indonesia's small islands (those smaller than two thousand square kilometers) and their coasts to preserve them from environmental degradation and the negative impact of human activities. This law was less about developing these islands than about conserving their ecosystems. The second law was Law No. 43 of 2008, concerning the so-called Indonesian Territory, which provided the legal basis for comprehensive management of this territory—especially its border regions. The law stipulates that tampering with the country's boundary marks in any way is a criminal act and any person found guilty of such tampering will be punished. This law elevated

what had previously been considered mundane objects to the status of national importance.

In addition, the government passed Government Regulation No. 62 of 2010 on the uses of small islands in the outlying regions. The regulation explicitly classifies these small islands as part of the so-called Specific National Strategic Areas (*Kawasan Strategis Nasional Tertentu*)—that is, areas of national significance—thus underscoring the rising national desire to treat Indonesia’s border islands as front-and-center regions. Also in 2010, the government solidified its commitment to managing its frontier islands and other border regions by creating the National Agency for Border Management (*Badan Nasional Pengelola Perbatasan, BNPP*) in order to coordinate border development activities of the central and provincial governments. The agency’s board is chaired by the interior minister and includes the heads of eighteen other government ministries and cabinet-level bodies, as well as thirteen provincial governors whose jurisdictions border neighboring countries.¹⁰ The agency’s 2011 Grand Design aimed to create border regions that are safe, orderly, and developed, combining security, prosperity, and environmental approaches (BNPP 2011). PLN carried out its new electrification strategies within these broader sociopolitical and legal contexts.

Reformation Era Electrification Strategies

Indonesia’s approach to electrification before the Reformation Era had been mainly to construct a combination of centralized and distributed power generation systems across the country. The centralized system consisted of large-scale power plants, substations, and power lines, built mainly on islands with high population densities. Small- to medium-scale diesel power plants with limited distribution lines made up the distributed systems, typically constructed in remote areas. One example of this is the Kutampi Diesel Power Station (*Pembangkit Listrik Tenaga Diesel* or *PLTD Kutampi*), built to serve the population of Nusa Penida, off the southeastern coast of Bali (figure 4.2).

Although several private companies and a few cooperatives participated in these electrification processes, PLN dominated Indonesia’s electricity business. The main reason for this was the mandate of the country’s 1945 Constitution for the state to control vital means of production, for the benefit of the people and to achieve social justice for all Indonesians. To the Indonesian government, electricity is a necessary commodity that must be reliably and affordably provided to all citizens, no matter where they live. Since the government did not wholly trust private companies to electrify unprofitable areas such as the countryside, it created a state-owned power company and instructed it to electrify Indonesia’s territory.



Figure 4.2. Kutampi Diesel Power Station, in Nusa Penida. (Photograph by Anto Mohsin.)

Private companies could get a license to generate electricity for their own needs. However, all electricity surpluses that these companies wanted to sell to the public must be sold through PLN. This scheme provided little incentive for companies to join the electricity sector, and consequently there were not many independent power producers in the New Order period.

PLN's monopoly and its status as a state-owned enterprise have both advantages and disadvantages. With the government's support, it has evolved into one of the largest utility companies in the region, with tens of millions of customers and billions of US dollars of assets. PLN employees are civil servants, and they enjoy the benefits of that status—including job security and, for people in the higher echelons, a political connection to the ruling elites. But at the same time, the government controls how PLN conducts its electricity business. For example, the government appoints PLN's executives and sets electricity prices. These prices are complex and structured to differentiate among various customers (e.g., households, businesses, government offices, large industries, and street lighting). But they are set to ensure that many customers, particularly households in the countryside, can afford electricity. Fixing electricity prices artificially low (i.e., below the average cost of producing electricity)

has been a good political move for the ruling elites, so they have been reluctant to increase prices. Consequently, PLN does not earn any profits from sales to some of its customers.

Following the collapse of the New Order, PLN struggled to stay afloat. The value of Indonesia's currency took a nosedive and was significantly reduced against the US dollar because of the Asian financial crisis. PLN's finances were in trouble because, among other things, it needed to service its debt obligations and buy oil at the world market's prices. Consequently, no investments were made in new power plants between 1998 and 2001, and since no new power plants were constructed while demands for electricity kept rising, Indonesia experienced a power deficit in the 2000s. PLN had to implement rolling blackouts in many areas. At its peak, the power deficit affected more than two hundred cities across the country (*Fokus* 2010a). During these perilous times, PLN launched a nationwide energy conservation campaign to reduce electricity consumption. The government then initiated the first fast-track program to generate an additional ten thousand megawatts in 2006. This was followed by a second such program in 2010, which emphasized using renewable energy.

PLN finally managed to resolve the electricity crisis, in part because of the appointment of a new executive team at the end of 2009. Dahlan Iskan, a media tycoon, was put in charge of the power company. He and nine new deputies were sworn in on December 24, 2009 (*Fokus* 2009b). Although he was relatively new to the electricity business, Iskan proved to be an adept leader. He quickly won the hearts of many PLN employees, including those who had initially opposed his appointment, with his no-nonsense and down-to-earth leadership style. As a former reporter, he understood the importance of communication, which he conducted almost daily through events called Coffee Mornings. He also introduced a less hierarchical corporate culture and new ways of doing things.

Iskan cultivated a can-do attitude among PLN employees. Under his leadership, the company ended the rolling blackouts in mid-2010 by implementing an electricity emergency program (*Fokus* 2010a).¹¹ In another instance, he successfully led PLN to connect a million new customers to the electricity grid in a single day. That was less than half of the 2.5 million prospective subscribers on the waiting list, but what Iskan wanted to show was that it could be done. He also clearly understood the importance of symbolism and nationalism. He rolled out his "one million in one day" program on October 27, 2010, the day the country celebrated National Electricity Day (*Fokus* 2010b).¹² PLN achieved its goal, and this accomplishment helped boost the organization's confidence.

Assured of his accomplishments in 2010, Iskan set new goals in 2011. Aware of the national discourse surrounding borderlands and the inequality of existing

electricity access, he sought to electrify a hundred islands using solar energy (figure 4.3¹³). The majority of these islands, including several frontier islands, were located in eastern Indonesia.

PLN used two types of off-grid solar power plants. The first type was a 200-volt-ampere photovoltaic (PV) power plant that PLN called “communal PV” (*PLTS komunal*) because it could supply an entire community. The second type, known as “independent PV” (*PLTS mandiri*), would be installed independently at each house.¹⁴ The independent PV is really a solar home system, consisting of a 12-watt-peak solar panel, 3-watt LED lightbulbs (highly energy-efficient SEHEN lamps), and a battery (Sambodo 2015, 113).¹⁵

Each independent PV subscriber made a deposit of 500,000 rupiah (about USD 55) at a local bank to get electricity access and paid a monthly fee of 35,000 rupiah (about USD 4) (Tjandring 2011). For most subscribers, the monthly fee was less than what they would have spent on kerosene. Even so, some electricity subscribers were unwilling or unable to pay—because their equipment broke down, or they lacked sufficient income, or the distance to the local bank was prohibitive. PLN also struggled to collect payments because it lacked accurate data on its independent PV subscribers (Sambodo 2015, 117).

The decision about which type of solar power plant to install depended on several factors, including a village’s distance from the nearest PLN grid and its population density (Sambodo 2015, 113). For example, in the frontier islands of Miangas, Marampit, Makalehi, and Bunaken, the power company installed communal PVs (Kompas 2012). Miangas, the northernmost inhabited island of the archipelago, became the first island in Indonesia to have hybrid power generation, combining biomass, solar, and diesel. The Indonesian Museum of Records (MURI) acknowledged this as an important achievement and presented PLN with an award in May 2013 (Hidayat 2013).¹⁶ Nine islands in the province of Maluku (Kelang, Pulau Tiga, Banda, Pulau Panjang, Manawoka, Tioor, Kur, Kisar, and Wetar) also received communal PVs, with capacity totaling 900 kilowatt-peak in 2013 (*Fokus* 2013).

Independent PVs turned out to be a good investment for PLN. The cost for installing them in remote areas was much less than that for extending its power grid, and the power company used these solar home system kits to illuminate hundreds of thousands of households. In July 2013, MURI bestowed another award to PLN for installing a hundred thousand SEHEN lamps in East Nusa Tenggara Timur Province within one year, and in September 2013, yet another award was given to Vickner Sinaga, a PLN executive in charge of East Indonesia operations and an innovator of SEHEN lamps (Hidayat 2013). Sinaga said that the MURI

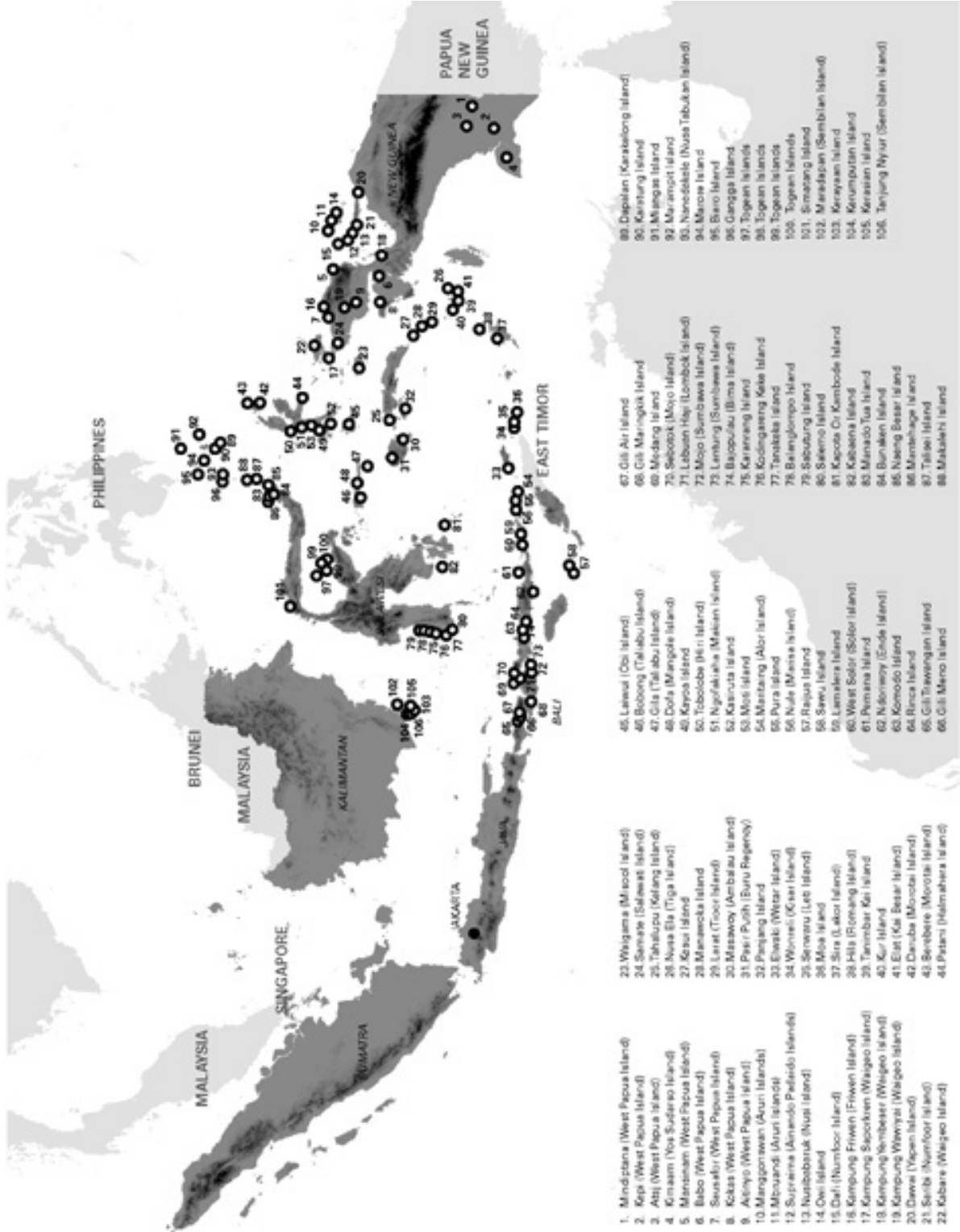


Figure 4.3. Locations of the hundred islands in PLN's solar energy program. (Map by Dorothy Tang.)

awards acknowledged PLN's efforts in lighting up remote regions and that the SEHEN lamps had been used in at least forty-five frontier islands (Hidayat 2013).

The SEHEN lamps were widely distributed, becoming very popular among thousands of residents in very isolated villages. Appreciative villagers enjoyed the cheap, clean, and bright electric lights. Some expressed a renewed sense of belonging to the nation. When Nunsanen villagers received independent PVs on December 24, 2011, their village chief, Marthen Manane, exclaimed, "We are now fully part of Indonesia, we receive electricity just like people in Jakarta. It is also timely considering we get it before Christmas, the birth of Christ, the Bringer of Light" (quoted in Tjandring 2011). Manane's comments expressed an important sentiment: many communities in isolated regions in Indonesia have long felt marginalized because for decades they were left out of the country's development agenda. Junaidi, a local government official in Tiga Barat Island in the Natuna archipelago, was quoted as saying, "In the past, we wondered whether or not we were still part of Indonesia because we never had PLN electricity. *Alhamdulillah* [thank God], for the last two years we have been enjoying PLN electricity" (quoted in Tanjung 2019).

In certain areas, PLN used both types of PV plants, as in Sebatik, the only border island that Indonesia shares with Malaysia (figure 4.4). In March 2012, a 340-kilowatt-peak communal PV began operation there, but since a few hamlets were still out of reach of PLN's distribution lines, in May the power company installed independent PVs for 150 residents in Lourdes (Ruru 2012). In 2013, Sebatik and Nunukan, the adjacent island, obtained additional electrical power via underwater cable from a natural gas-fired steam power plant located on the Kalimantan mainland (Trimukti 2013).

Developing Indonesia from the Periphery

In 2014, Indonesians elected Joko Widodo and Jusuf Kalla as their president and vice president, respectively. Both men had run on a platform widely known as *Nawacita* (Sanskrit for "nine goals"). President Jokowi (as he is popularly known) set "to develop Indonesia from the periphery" as one of these goals (Soleman and Noer 2017, 1964) in order to turn Indonesia into a "global maritime axis" (quoted in Shekhar and Liow 2014). He believed that territorially scaling up Indonesia's infrastructure would be essential in facilitating increased domestic trade, internal mobility, and inter-island connectivity, as well as in making Indonesia more globally competitive.

Taking advantage of low oil prices in 2014, he reduced the country's sizable domestic petrol subsidies and reallocated the state budget to increase funding for



Figure 4.4. Sebatik and Nunukan Islands. (Map by Dorothy Tang. Made with Natural Earth and GMTED2010 data. See GMTED2010 2011.)

repairing, building, and expanding Indonesia's roads, railways, seaports, airports, and power plants. He managed to more than double the state funds allocated for new infrastructure projects from 2014 to 2017. During his first term in office, he initiated more than two hundred "national strategic projects" across the archipelago (*Economist* 2018). His administration constructed more roads, airports, railways, dams, border posts, and bridges than any of his post-New Order predecessors. In a well-edited video showcasing the Jokowi administration's first-term accomplishments, the president said: "Only with an electricity network that reaches the entire *Nusantara* [Indonesian archipelago], seaports and airports that connect islands, dams that irrigate paddy fields, [and] roads and bridges that serve as logistical and transportation routes can Indonesia become an advanced nation. There is no other way" (Widodo 2019).

The statement, which connects Indonesia's future with infrastructure, sets the goal of countrywide electricity coverage. To use an analogy provided by Edwards (2003, 185), if "infrastructures are the connective tissues and the circulatory systems of modernity," then in Jokowi's mind, electrical current serves as the blood of those systems.

The Jokowi government acknowledged the country's existing power deficit and launched the "35,000 megawatts for Indonesia" project on May 4, 2015 (Wien 2015). The project involved constructing 109 power generating stations (PLN would build 35 of them, and independent power producers would build the remaining 74) in 210 locations across the country, most of which would be outside Java (Wien 2015). When this ambitious program was announced, some people were skeptical that it could be achieved, especially considering that the previous two fast-track 10,000-megawatt projects had suffered delays and failed to meet their five-year targets. In 2014, for example, the first of these projects was only 85 percent complete (Da Costa 2014). But Jokowi insisted on building his *Nawacita* electricity project, and he promised results. He framed the project as a "debt" that the government needed to repay to the Indonesian people because many citizens were still living without electricity (quoted in Wien 2015, 7).

Building on the momentum of his 35,000-megawatt project announcement, on August 28, 2015, Jokowi kicked off the Electrification of Fifty Frontier Islands and Border Regions Program (Program *Elektrifikasi Lima Puluh Lokasi di Pulau Terdepan dan Daerah Perbatasan*). The plan was to install 149 diesel power plants, which could supply from a hundred to a thousand kilowatts, in fifty locations spread over thirteen provinces. This project was undoubtedly important, although the technology chosen ran counter to PLN's attempts to use more renewable energy. Diesel power plants require high-speed diesel, a fuel whose use PLN has been trying to reduce since 2005 (*Fokus* 2005). Although PLN received government subsidies, the company was susceptible to the volatility of oil prices. Even when the prices were low, it was costly to procure diesel and transport it to remote locations.

PLN's rationale for choosing diesel power plants was that this choice was the result of a compromise. Even though solar panels would be much cheaper to operate, diesel power plants would be quicker and less expensive to build (Agustinus 2015). Speedy construction seemed to be the determining factor; Jokowi wanted to fulfill his campaign pledges quickly. Additionally, his *Nawacita* agenda promised not only to develop the country from the periphery inward, but also to ensure the state's presence in the borderlands (Soleman and Noer 2017). Providing electricity to these border regions would make the state visible to the projected 35,468 new electricity subscribers. The president also capitalized politically on the project by choosing the timing of the project's launch for its symbolic significance.

The launch was scheduled for the month when Indonesia celebrated the seventieth anniversary of its independence. The media, including PLN's internal magazine, covered the project as a special Independence Day gift to the residents of the fifty locations (*Fokus* 2015b).

One of these locations was the East Amfoang subdistrict in East Nusa Tenggara Province (Aditiasari 2015). Idrus Baleri, a resident in a border village there called North Netemnanu, noted a significant shift in his life and in the lives of many others in his village after the arrival of PLN electricity. His house and those of his fellow villagers were now brightly lit with electric lamps. He no longer needed to bring his phone to a neighbor's house to charge it, and his children could study better with electric lighting than they had been able to do with kerosene lamps. Now enthusiastic about his future, Idrus hoped to eventually start a small business (Amalo 2019).

PLN kept the spotlight on the border regions not just by illuminating new areas, but also by showing appreciation for some of its workers in outlying regions. On November 27, 2015, PLN invited forty employees to Jakarta to meet with the company's executives and to tour the headquarters and other facilities. It was a gesture of appreciation at the highest levels. The forty men, picked from some of PLN's most remote units across the country, were called "Electricity Warriors" (*Pejuang Listrik*), which likened them to heroes whose sacrifices and dedication to society were worthy of national recognition (*Fokus* 2015a). They were an eclectic group: operators, technicians, and maintainers of diesel power plants, as well as administrators and managers of small units. Their stay at the capital was brief, but their testimonials indicated that they were pleasantly surprised by their selection, and that they felt welcomed, appreciated, and entertained. The national discourse and attention on the borderlands helped elevate the status of this otherwise invisible workforce. In subsequent years, PLN periodically featured additional "Electricity Warriors" in *Fokus*, one of its internal publications. Even though it was long overdue, the acknowledgment of the contributions of PLN's low-ranking but essential labor force was a welcome change.

Electricity Conditions in the Border Regions

The Jokowi administration's emphasis on infrastructure development and nation-building from the periphery inward attracted much attention from the Indonesian media, which seized the opportunity to report on peripheral infrastructure's progress and its impact on local people. In turn, their coverage of Indonesia's borderlands increased traffic to their websites and social media accounts. In 2017, for example, *Detikcom*, an Indonesian digital media source, launched a multiyear,

multimedia project covering stories from the periphery (*Detikcom* 2022). Partnering with different enterprises, *Detikcom* has so far visited and reported on fourteen border regions. In late 2019, it partnered with PLN to write about electricity conditions and electrical customers in four areas, Miangas, Natuna, Nunukan, and Karimunjaya. The following stories are drawn from *Detikcom*'s coverage.

Asram, a fisherman in the Natuna Islands, reported that with the arrival of electricity he could go out to sea more frequently, because he could purchase ice (to preserve his catch) more often and more cheaply than before (*DetikFinance* 2019c). Other fishermen also reported an increase in revenues because they could better maintain the freshness of their sea harvests (*DetikFinance* 2019b). Ice blocks sold to Natuna fishermen are produced in a factory that doubles as a cold storage facility (*DetikFinance* 2019c). Roberto, the businessman who runs the facility, revealed that PLN electricity helped reduce his monthly electricity cost by half, down to 35 million rupiah (about USD 2,500) compared to when he used a diesel generator set, or genset (*DetikFinance* 2019a).

Nosnaima, a businesswoman in Long Midang Village, reported a similar new opportunity thanks to PLN electricity. She opened the Border Café along a newly constructed road near the West Kalimantan–Malaysia border in 2018 and has been running it since. Like many entrepreneurs in border regions, she had initially used a diesel genset to produce power for her café. PLN-supplied electricity enabled her to expand her business hours, and reignited her dream to build a small accommodation for tourists (*DetikNews* 2019c).

Another area affected by PLN electricity is education. Yosep Liang, a primary school principal in Long Midan, told *Detikcom* reporters that his newly electrified school was able to power computers for administrative and teaching purposes. He had once visited another school ten kilometers away in Malaysia, and had noted its more advanced facilities and pedagogical system. The availability of PLN electricity was a start, he said. His real hope was to have his school obtain the same resources as schools in big cities did (*DetikNews* 2019a). Sharon Abigail, a student at the Krayan State Primary School 006 in Long Midan, could not hide her joy that her home had PLN electricity. She had been used to studying at night using kerosene lamps with low light output (*DetikNews* 2019a).

Despite some successes, many communities continue to have inadequate electricity. The most important reason is the lack of underlying infrastructure. One significant characteristic of infrastructure is that it's "built on an installed base" (Star and Ruhdeler 1996, 113). The growth of electrical infrastructure relies on previously built infrastructure, which in most cases means paved roads. Smooth roads allow speedier transportation of materials and often serve as the paths along which electrical poles and distribution lines are erected. Many parts of Indonesia's

borderlands lack this installed base, which makes it challenging to electrify remote villages. In other words, the typically layered and hierarchical infrastructural construction that occurs in other places is not always considered or practiced in Indonesian infrastructural development.

Despite these conditions, PLN often erects electrical infrastructure with a non-existent or minimal installed base. To PLN, these work-arounds are important in showing that growing an electrical network can be done despite serious obstacles, although of course these obstacles limit what the power company can achieve. When a one-kilometer distribution line was needed on the island of Natuna to power a repeater tower at the top of Mount Ranai, PLN had to figure out where to erect the poles and how to transport its equipment. PLN's truck-mounted crane could reach only a certain point because there were no paved roads going to the top of the mountain. PLN crew members carried the pole to its intended location on foot and dug a hole using portable drilling equipment (*DetikNews* 2019b). This kind of extensive labor (combining a lot of muscle power with the use of modest tools) exists alongside work done using more sophisticated equipment. Elsewhere, Umartono, a project manager in charge of installing a small wind farm on top of Nusa Penida's highest peak in the mid-2000s, recounted that he and his team had had to transport twenty tons of wind turbine components from Bali using two fishing boats tied together (*Fokus* 2007). A story on the Electrification of Fifty Frontier Islands and Border Regions Program was accompanied by photos of PLN employees working together with residents, hauling an electrical pole, carrying a genset with a wooden pole on their shoulders, and transporting machinery by boat (*Fokus* 2015b, 21).

PLN has not only faced the challenge of inadequate installed bases, but it has also struggled to maintain what it has successfully built. For infrastructure to function for a long time, it needs to be constantly maintained, and "old infrastructural designs must be constantly retrofitted to meet new contingencies" (Howe et al. 2015, 553). The issue for Indonesia's peripheral electrical infrastructure is less the lack of a trained workforce and more a problem of spare parts procurement. In every location where PLN has an electrical generating station, the power company employs an operator who usually doubles as a maintenance person. But when a machine breaks down, acquiring the necessary parts to fix it can take days or even weeks. This happened, for example, to Raja Jumaida, a PLN employee working in Sedanau, Natuna. He recounted that when one of his diesel machines broke down, he had to wait three days to receive the required spare parts by ship from Bintan, the closest place with available items (Tanjung 2019). Some situations are worse still: broken installations may be left unrepaired for months or even years. Solar panels on Miangas stopped operating in 2018, and the only remaining

electrical generator runs on diesel. Bad weather conditions between October and December often prevent transport ships from bringing diesel fuel on time, which means that electricity supply is precarious during those months (Safuroh 2019).

Infrastructures, Edwards (2003, 199) writes, “consist not only of hardware, but also of legal, corporate, and political-economic elements.” These components normally support the construction and operation of infrastructure. However, sometimes the legal element can complicate rather than facilitate infrastructure’s growth. On Karimunbesar, an island in the Strait of Malacca, some residents cannot receive PLN electricity because of a zoning rule.

PLN had previously experienced a power deficit on the island, so the local government asked the Ministry of Energy and Mineral Resources to invite private companies to help, especially in its Free Trade Zone (Rusdianto 2016). The ministry therefore passed a regulation in 2014 that divided the island into three electrical zones. The designated suppliers were PT Soma Daya Utama (SDU) for the first zone, and PT Karimun Power Plant (KPP) for the second zone. PLN received the concession to electrify the third zone. KPP built a gas-fired power plant, but by November 2019, SDU still had not completed its own power plant. Because of the ministerial regulation, residents in the SDU zone have had to continue using costly diesel gensets in the evenings. Unfortunately, now that PLN has more than enough power to supply electricity to households and businesses in all three zones, it cannot do so legally (Kusuma 2019).

Those who received PLN solar home kits also still have limited access to electricity. The systems can power LED lightbulbs, but not other electric devices such as televisions and refrigerators (*Fokus* 2012). PLN has promised to bring additional power to these villages by extending its distribution lines or installing power plants. But so far, this plan has not materialized. Thus, while PLN aimed to raise the overall share of electrified homes in the country from 85 percent in 2015 to 97 percent by 2019 (*Fokus* 2016), in reality, many people remain electricity-poor.

Conclusion

During the Reformation Era, a heightened awareness of Indonesia’s borderlands prompted the Indonesian government to pay more attention to the country’s periphery. The governments that succeeded the Soeharto regime shifted their perception of Indonesia’s outlying areas, enacted laws, created a new national organization that manages borderlands, and constructed peripheral infrastructure. To electrify hundreds of villages in remote and border regions, PLN installed diesel power plants, communal PVs, and independent PV systems.

Endeavors to expand Indonesia's electrical infrastructure to the periphery received a boost during the Jokowi administration, which sought to scale up Indonesia's electrical infrastructure to reach long-neglected areas. PLN capitalized on the political and financial support it received from the government, launching several initiatives to increase electricity coverage and to install PV plants in new locations. PLN's infrastructure projects in the nation's periphery received media attention that promoted a new interest in Indonesia's borderlands by reporting on the lives of the citizens of those regions. When residents of many of these long-neglected border communities received electricity for the first time, they truly felt like part of the nation they had long observed from a distance.

However, as I have shown, although some notable efforts have been made to reverse the effects of center bias through the development of Indonesia's border regions and frontier islands, the country's peripheral electrical infrastructure has produced mixed results. Some border communities have enjoyed PLN electricity and increased attention from the national media. But many still either have no access to electricity or remain electricity-poor. Bringing Indonesia's borderlands into the national fold will be a continuing project for the Indonesian state. Indonesia's experience with electrifying its border regions thus far demonstrates that scaling up infrastructure territorially involves more than just increasing geographical coverage or adding another infrastructural layer. It raises questions of scale as a process rather than as a set of fabricated layers.

Notes

1. Another common spelling of Soeharto is Suharto.
2. The *Journal of Borderlands Studies* is one example of an academic journal that publishes work on borderlands by academics in various fields.
3. Indonesia's inadequate capacity to police its vast archipelago makes many of the country's maritime international borders porous. The smuggling of goods and people has been part of the country's reality since the colonial period (Tagliacozzo 2005).
4. These ninety-two islands are officially called *pulau-pulau kecil terluar* (small outer islands) in a government regulation specifying their management. The islands' names and coordinates are included in the regulation's appendix (Peraturan Presiden Republik Indonesia 2005).
5. Redrawn from <https://kkp.go.id/djprl/p4k/infografis-detail/5794-111-pulau-pulau-kecil-terluar-ppkt-di-indonesia>.
6. There were some exceptions. One was the electrification of Sangir, a remote island in North Sulawesi, to reduce the isolation of the islanders and decrease the inequalities between them and the more well-off neighboring population in the Philippines (Soemardjan et al. 1980, 87).
7. Wanadri and Rumah Nusantara published three books about their expedition (Pahlawan and Iskandar 2009, Soeratin 2011b, 2013).

8. Aat Soeratin (2011a), a member of the expedition team, gave a TEDx Talk in Bandung on March 11, 2011, describing his thoughts on frontier islands and his experience on the expedition.

9. Inspired by this expedition, PLN published a commemorative book titled *PLN's Light on Indonesia's Frontier Islands (Terang PLN di Gugusan Nusa Garda Terdepan Indonesia)*, which uses the suggested new term (Sukrislismo et al. 2009).

10. Badan Nasional Pengelola Perbatasan was founded using Presidential Regulation No. 12 of 2010. A short description of the agency, including a list of its members, can be viewed online (BNPP 2020).

11. As electricity demands continued to grow and outpaced supplies, the country experienced another power deficit in late 2014. PLN worked to address the issue and solved it by August 2017 (*Fokus* 2017).

12. I wrote a brief article on the origins and significance of Indonesia's National Electricity Day (Mohsin 2017b).

13. Redrawn from <http://www.radarindonesia.com/2016/04/menteri-susi-kirim-manajer-dan.html>.

14. PLTS stands for *Pembangkit Listrik Tenaga Surya* (solar power plant).

15. SEHEN stands for *Super Ekstra Hemat ENergi* (highly energy-efficient).

16. Unfortunately, in 2018 the communal PV stopped operating because of a maintenance problem, and the islanders have since been relying on the diesel power plant, which uses more expensive fuel (Safuroh 2019).

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