ARCHIPELAGIC NETWORKS OF POWER: VILLAGE ELECTRIFICATION, POLITICS, IDEOLOGY, AND DUAL NATIONAL IDENTITY IN INDONESIA (1966-1998)

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ARCHIPELAGIC NETWORKS OF POWER: VILLAGE ELECTRIFICATION, POLITICS, IDEOLOGY, AND DUAL NATIONAL IDENTITY IN INDONESIA (1966-1998)

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This dissertation examines Indonesia's Village Electrification Program in the so-called "New Order" period (1966-1998) under Soeharto. I investigate the New Order government's motives to supply electricity to the countryside, the ways it built the electrical infrastructure to light the villages, and the meanings attributed to electricity by some of the country's leaders, bureaucrats, the Indonesian State Electricity Company (PLN) engineers, and villagers.

I argue that the Soeharto government's rural electrification project was entangled with narratives of Indonesia's dual national identity. Domestically, Soeharto's program to light rural areas was governed by an overwhelming desire to establish an internal national identity as a "developing Pancasila nation," i.e. as a developmental nation-state based on the state ideology Pancasila. The principles heavily influenced the program and resulted in a "grid without a grid," i.e. a network of mostly diesel power generating stations that were not all connected physically. Instead PLN linked these power plants organizationally by operating and maintaining them. In addition, nationally the New Order government also connected the provision of electricity in the

villages with electoral politics. In a practice that I call *patrimonial technopolitics*, Soeharto brought electricity to the villages and held numerous village electricity inauguration ceremonies to persuade villagers to vote for the regime's ruling political party in the general elections.

In parallel, the New Order regime designed and constructed large-scale power plants using various primary energy sources and connected regional grids in Java, Madura, and Bali in one massive interconnected system (PLN grid). I contend that the development of this electrical infrastructure was tied to the New Order's constructed image of Indonesia as a capable nation completing notable infrastructure and economic development projects, which was mainly projected to the international audience. The main element of this external national identity was showcasing economic development and village electrification in Bali as an exemplary case of Indonesia's noted national development. The Soeharto government selected the island as a venue for wide-ranging regional and international gatherings. Some of these meetings involved high-level conferences of the Association of Southeast Asian Nations (ASEAN), a regional political-economic bloc, and the Organization of Petroleum Exporting Countries (OPEC). Through these two organizations New Order Indonesia performed its role regionally and internationally.

BIOGRAPHICAL SKETCH

Yulianto Mohsin (he goes by "Anto") was born in Indonesia and came to the United States in the 1990s. He studied mechanical engineering and earned both a bachelor's and a master's degree from the City College of New York. After interning at a small engineering firm in New York City and at General Electric Power Systems in Schenectady, New York, he subsequently found a gainful employment with GE as a mechanical engineer. The job allowed him to be part of a team that designed steam turbines for the company's customers, to see how a turbine's rotating components were made in the shops, to learn GE's various product lines, and to participate in the one of the company's "clean energy" initiatives. Although he had a keen interest in many energy topics, he felt that his engineering training did not fully equip him to understand and analyze the multidimensional issues of energy and the environment. His quest for a new understanding led him to take a Science and Technology Studies (STS) course at Rensselaer Polytechnic Institute (RPI). While working full time he took a "Technology and Social Theory" course that changed his mind and outlook about the study of science and technology. After working for six years, he decided to pursue his newfound passion by enrolling in Cornell University's Science and Technology Studies (S&TS) Department's doctoral program. When this dissertation is filed, he is working as a Henry Luce Asian Environmental Studies postdoctoral fellow at Hobart and William Smith Colleges in Geneva, NY.

To Titin, Sophia, and Dela
To my parents, brother, and sister
To my parents-in-law

ACKNOWLEDGMENTS

When I started graduate school in the fall of 2007, I developed an interest and a habit to read the acknowledgements section of many intellectual works. Initially I read them in books, but increasingly in peer-reviewed journal articles and in countless dissertations that I came across and downloaded from the ProQuest database (I have been collecting many dissertations about Indonesia after learning about the Cornell Modern Indonesia Project). I became aware that producing intellectual works is very much the result of a social process. The authors of many of these works are usually part of a community of other scholars whose works, comments, insights, feedback, and suggestions inspired and helped them to undertake their research and complete their work. For graduate students, at the very least, members of their dissertation committee form a small community that help them with their research, writing, and teaching. My primary goal in reading those acknowledgements was to learn how to best convey my outmost appreciation to the many people who have helped me on my exciting intellectual journey to complete this dissertation. I may still fall short in my attempt to express my sincerest gratitude. But I hope those who are mentioned in this acknowledgements section and many others who are not necessarily named here (for instance a few of my former teachers in primary and secondary schools as well as in college) know how grateful I am for their inspiration, encouragement, support, and guidance in helping me complete this project.

Perhaps to help me systematically thank all of the people I would like to thank for supporting me on my intellectual journey, I thought I would go through the list somewhat chronologically. First, I would like to thank Sulfikar Amir who encouraged me take my first STS course at Rensselaer Polytechnic Institute (RPI) in the fall of

2004, where he was completing his doctoral degree there. I initially hesitated, but he assured me that both the course and the professor teaching it (Langdon Winner) would help me get a better sense of what this strangely sounding discipline was all about. He was right. I learned a great deal and was very pleased with the course that I decided to sign up to take a second course called "Science Studies" taught by then another RPI faculty member (and later I found out a Cornell S&TS alumnus) Rayvon Fouché in the following semester. After taking two STS courses, I made up my mind to seriously prepare myself to apply for an STS graduate program. This is when another friend comes into the picture. I thank Merlyna Lim for helping me refine my personal statement and for her many useful advices. In fact, throughout my graduate study both Sulfikar Amir and Merlyna Lim constantly provided the encouragement and support that an inexperienced graduate student needed. *Terima kasih banyak*!

When the good news came that I have been accepted to pursue a graduate study at Cornell S&TS doctoral program, it was not an easy decision to readily accept the offer. At the time, my wife Titin and I were expecting our firstborn and we were in the middle of moving to a new place because a job promotion I had received earlier at work. The Cornell S&TS Department was kind enough to allow me to defer my enrollment for a year. This helped me settle down a bit and adjust to being a new parent. But it was my wife's full unconditional support and comforting assurances that allowed me to finally make the confident decision to go back to school. So I quit my job, enrolled in Cornell S&TS graduate program, and never looked back. I cannot thank her enough for this. Along the same line, I would like to thank my parents-in-law for believing in me. They offered a tremendous help when both of our daughters were born and provided "a home away from home" whenever we came to Denpasar for a visit and for an extended stay when I conducted my fieldwork. My parents and brother Kemal were initially opposed to my going back to school, but my sister Diana

wholly supported my vision and dream. Fortunately as time progressed, both my parents and brother started to understand my "stubbornness" and "eagerness" in this endeavor and they began to support my family and me. My mother constantly prayed and hopes the best for us. Kemal and Diana often gave me a lift to or from the many libraries I visited in Jakarta. I thank all of them for their support.

At Cornell University, where I arrived to start my graduate study in the fall of 2007, I was fortunate to be able to take a number of exciting classes with some S&TS faculty members. Of the faculty members whose courses I took, I eventually asked Ron Kline, Sara B. Pritchard, Trevor Pinch, and Tamara Loos to become my dissertation committee members. I could not have asked for a better dissertation committee.

First and foremost, I would like to thank Ron very much for agreeing to take me in and two other graduate students as his advisees at a time when he was already thinking of retiring and not taking another student. Ron's expertise in the field of history of science and technology and his general research interests were not my only main considerations to want to have Ron as the chair of my dissertation committee. In Ron I see a model teacher, advisor, and mentor whom I seek to emulate. Ron not only closely supervised the research, writing, and completion of my dissertation, but he also helped select my dissertation topic, assisted me in articulating my research questions, aided me in identifying my primary sources, and served as my course leader for the two First-Year Writing Seminars (FWS) I taught. Ron's patience, guidance, in-depth knowledge in the historiography of history of technology, spot on critique on my works, constant encouragement, insights, positive reinforcement, and valuable advice to focus on the positive aspects of my personal and professional development motivated me to overcome many challenges and move along steadily in my journey.

Second, I would like to thank Sara for serving as my other mentor and

dissertation committee member. Sara supervised closely my work in the first two and a half years of my graduate study including the completion of my second-year project. During a period when I was not just struggling to learn a new discipline but also how to survive graduate school in general Sara provided many helpful comments on my papers and grant proposals (I received two Mario Einaudi Center travel grants as a result) and valuable advices on how to navigate graduate school. Her expertise in environmental history and science and technology studies allowed me to do a directed study in the former discipline, which exposed me to many exciting ideas and approaches to doing history. Given that I enjoy the study of history in general, to read and think about the literatures of both environmental history and history of science and technology made my graduate training all the more enjoyable. Moreover, I also served as a teaching assistant for Sara's undergraduate course "Ethics and the Environment" three times, an experience I took pleasure in, and learned a great deal about teaching and mentoring from her. One of her teaching approaches, in fact, influenced my teaching philosophy. I also want to thank Sara for her close and critical reading of my dissertation drafts. Her constructive criticisms helped me to significantly improve my dissertation earlier drafts.

Third, I also thank Trevor for serving as my committee member and for allowing me to construct a syllabus for his A-exam (admission to PhD candidacy exam) on disaster STS, a topic of great interest to me. I used this syllabus to create my FWS syllabus and was fortunate to get a chance to teach it twice. Having taught this course and served as teaching assistant for a number of other undergraduate courses gave me a chance to compete for and received the Cornelia Ye Outstanding Teaching Assistant Award from the Cornell Center of Teaching Excellence in 2013. Trevor's expertise in the sociology of science and technology ensured that my dissertation combines both approaches of history and sociology of science and technology and that

it is a product of a science and technology studies scholarship.

Fourth, my immense thanks also go to Tamara who agreed to serve as my fourth committee member. Tamara was not only an enthusiastic supporter of my work, but she also read my dissertation drafts carefully and I benefit greatly from her critical comments. Tamara also nominated me to become a graduate student member of the Cornell Southeast Asia Program (SEAP) after I took her inspiring modern Southeast Asian history course. SEAP became my second home after the S&TS Department at Cornell. I feel very fortunate to have received my graduate training both at the S&TS Department and at SEAP, two highly regarded institutions in science and technology studies and Southeast Asian studies respectively.

For all of these and more, I owe a debt of gratitude to all four of my dissertation committee members. Their teaching, mentoring, and advising have been a continual source of inspiration for me. Their expertise has helped me to transform myself from being an engineer into an historian. Here I also want to extend my thanks to Bruce Lewenstein who served as the outside reader of my dissertation at my dissertation defense for his valuable feedback on my dissertation.

During the course of my graduate training, I made acquaintances with other SEAP faculty members (several of whom are Indonesianists) whose courses both on Indonesia and Southeast Asia I took and whose helpful advices and hospitality made our stay in Ithaca really pleasurable. I enjoyed Eric Tagliacozzo's seminar "Ocean: The Sea In Human History" and Marina Welker's "Ten Thousand Islands Indonesia in Historical and Contemporary Perspective." My thanks also go to Tom Pepinsky who provided useful references as I was completing my first peer-reviewed journal article based on an earlier draft of chapter 4 of my dissertation and Mike Montesano (the managing editor of *Sojourn*) for his suggested edits. I also want to offer our sincerest appreciation to Kaja McGowan and her husband Ketut Nawiana for welcoming us into

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locate valuable resources for my research and Sharon for extending the loan period of my library books a little bit longer when my borrowing privilege has expired. My thanks go also to the excellent staff of the S&TS Department, particularly Stacey Stone and Deb Van Galder for their many helps with courses, SSRG announcements, grant proposal application, etc.

Besides my family, advisors, and other key people who have supported my research and writing, I want to thank my colleagues both in the S&TS Department and SEAP for being good friends, offering advices, reading and commenting on my writing drafts, collaborating on our First-Year Writing Seminars, picking me up at the airports after coming back from a conference, helping me move to a new apartment, sharing delicious foods and company, sharing a Kahin office space, pointing out to valuable resources, and generally helping out with many other things. They are Katie Proctor, Lisa Onaga, Kathryn de Ridder-Vignone, Anna Geltzer, Honghong Tinn, Angie Boyce, Tyson Vaughan, Hansen Hsu, Benjamin Wang, Ling-Fei Lin, Carmen Krol, Kasia Tolwinski, Danya Glabau, Shoan Yin Cheung, Mehmet Ekinci, and Ranjit Singh (S&TS); Upik Djalins, Setefanus Suprajitno, Edmund Oh, Ika Nurhayani, Wah Guan Lim, Jack Chia, Matt Reeder, Courtney Work, Trais Pearson, Matt Minarchek, Rebakah Daro-Minarchek, Taomo Zhou, Mirabelle Yang, Ekarina Winarto, Ryan Buyco, Emiko Stock, and Icha Rahardi (SEAP). Mba Jolanda Pandin also helped me with my back translation of an IRB consent form to carry out research for my second year project and I thank her for that. I also want to thank our friends who have helped my family and me to settle in Ithaca and made our stay pleasurable: the Azzainos, the Pratamas, the Azises, the Adiwibowos, Michiyo Vaughan, Rizal Siddik and Lwinita Ranie, Zakki Hakim and Reni Putri, Bambang Rudyanto, Elsa Sinurat and Gunawan Wicaksono, Okki Kurniawan and Mega Kristiani, Budi Winursito and Sylvia Oktavi, the Waluyos, and Melissa Candra.

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MAP OF INDONESIA'S PROVINCES IN THE NEW ORDER

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AMD	ABRI Masuk Desa (Indonesian Armed Forces Enters into Villages)
ANIEM	Algemeene Nederlandsch-Indische Electriciteit Maatschappij (The Netherlands Indies General Electricity Company)
ANRI	Arsip Nasional Republik Indonesia (The Indonesian National Archive)
ANT	Actor-Network Theory
ASEAN	Association of Southeast Asian Nations
BAPPENAS	Badan Perencanaan Pembangunan Nasional (Indonesia's National Development Planning Agency)
BATAN	Badan Tenaga Nuklir Nasional (National Agency for Nuclear Power)
BIMAS	Bimbingan Massal (Agricultural Mass Guidance Program)
BP7	Badan Pembinaan Pendidikan Pelaksanaan Pedoman Penghayatan dan Pengamalan Pancasila (Agency for the Counsel Education Execution of the Guidance, Internalization, and Implementation of Pancasila)
BPPT	Badan Pengkajian dan Penerapan Teknologi (Indonesia's Agency for the Study and Application of Technology)
BPK	Badan Pemeriksa Keuangan (The Indonesian Financial Audit Board)
BPS	Biro Pusat Statistik (The Indonesian Central Bureau of Statistics)
BPU PLN	Badan Pimpinan Umum Perusahaan Listrik Negara (General Management Board for PLN)
BUUD	Badan Usaha Unit Desa (Village Enterprise Unit)
CEA	Commissariat à l'Energie Atomique (The French Atomic Energy Commission)
CMIP	Cornell Modern Indonesia Project
EDF	Electricité de France (Electricity of France)
ESDM	Energi dan Sumber Daya Mineral (Energy and Mineral Resources)
FEUI	Fakultas Ekonomi UI (Faculty of Economics of the University of Indonesia)

GATRIK	Direktorat Jenderal Tenaga dan Listrik (Directorate General of Power and Electricity)
GEBEO	Gemeenschappelijk Electriciteitsbedrijf Bandoeng en Omstreken (Electrical Companies in Bandung and Surrounding Areas)
GOLKAR	Golongan Karya (Functional Groups)
HAPUA	Head of ASEAN Power Utilities/Authorities
IAEA	International Atomic Energy Agency
ICA	International Cooperation Administration
INMAS	Intensifikasi Massal (Agricultural Mass Intensification Program)
ITB	Institut Teknologi Bandung (Bandung Institute of Technology)
ITS	Institut Teknologi Sepuluh November (Ten November Institute of Technology)
IPTN	Industri Pesawat Terbang Nusantara (Nusantara Aircraft Industry)
KASI	Kesatuan Aksi Sarjana Indonesia (Indonesian Graduates' Action Front)
KITLV	Koninklijk Instituut voor Taal-, Land- en Volkenkunde (The Royal Netherlands Institute of Southeast Asian and Caribbean Studies)
KLP	Koperasi Listrik Pedesaan (Village Electric Cooperatives)
KUD	Koperasi Unit Desa (Village Cooperative Unit)
KOPKAMTIB	Komando Operasi Pemulihan Keamanan dan Ketertiban (Operational Command for the Restoration of Security and Order)
KORPRI	Korps Pegawai Republik Indonesia (Indonesian Civil Servants Corps)
KOSTRAD	Komando Strategis Angkatan Darat (Army Strategic Reserve Command)
LMK	Lembaga Masalah Ketenagalistrikan (PLN's Power Research Institute)
LPPM	Lembaga Pendidikan dan Pelatihan Manajemen (Institute for Management Education and Training)
MIT	Massachusetts Institute of Technology
MPR	Majelis Permusyawarahtan Rakyat (People's Consultative Assembly)
MPRS	Majelis Permusyawarahtan Rakyat Sementara (Provisional People's Consultative Assembly)

NEA	National Electrification Administration of the Philippines
NIEM	NV Nedelandsch Indische Electriciteit Maatschappij (The Netherlands Indies Electricity Company)
NIGM	Nederlandsch-Indische Gas en Electriciteit Maatschappij (The Netherlands Indies Gas and Electricity Company)
NRECA	National Rural Electric Cooperative Association
OGEM	Overzeesche Gas en Electriciteit Maatschappij (Overseas Gas and Electricity Company)
OPEC	Organization of Petroleum Exporting Countries
P3B	Penyaluran dan Pusat Pengatur Beban (Transmission and Load-Dispatching Center)
P4	Pedoman Penghayatan dan Pengamalan Pancasila (Guidance, Internalization, and Implementation of Pancasila)
PDI	Partai Demokrasi Indonesia (Indonesian Democratic Party)
PELITA	Pembangunan Lima Tahun (Five Year Development)
PERTAMINA	Perusahaan Tambang dan Minyak Negara (The Indonesian Oil and Mining Company)
PERUM	Perusahaan Umum (General Company)
PGN	Perusahaan Gas Negara (The Indonesian Gas Company)
PJB	Perusahaan Listrik Negara Pembangkitan Tenaga Listrik Jawa Bali (PLN Java-Bali Generation)
PJP	Pembangunan Jangka Panjang (Long-Term Development)
PLN	Perusahaan Listrik Negara (The Indonesian State Electricity Company)
PLTA	Pembangkit Listrik Tenaga Air (Hydro Power Generating Station)
PLTD	Pembangkit Listrik Tenaga Diesel (Diesel Power Generating Station)
PLTM	Pembangkit Listrik Tenaga Mikrohidro (Microhydro Power Generating Station)
PLTS	Pembangkit Listrik Tenaga Surya (Solar Power Generating Station)
PMP	Pendidikan Moral Pancasila (Pancasila Moral Education)
PPP	Partai Persatuan Pembangunan (United Development Party)

REPELITA	Rencana Pembangunan Lima Tahun (Five Year Development Plan)
SCOT	Social Construction of Technology
SESKOAD	Sekolah Staf dan Komando Angkatan Darat (Commander of the Staff and Command School of the Army)
SHS	Solar Home System
SLS	Solar Lighting System
TVRI	Televisi Republik Indonesia (Republic of Indonesia Television)
USAID	United States Agency for International Development

PREFACE

In this preface I want to take the opportunity to mention two relevant things in regards to my dissertation. The first is the spelling convention of historical actors. *Bahasa Indonesia* underwent a change in spelling convention in 1972. The new spelling system was called the Enhanced Spelling System (*Ejaan Yang Disempurnakan* or EYD). The EYD system replaced the Soewandi Spelling System (*edjaan Soewandi*), which took effect in 1947 that replaced the earlier Van Ophuijsen Spelling System, which had been used in 1901. Some individuals who were born under the Van Ophuijsen Spelling System used the two-letter combination "oe" and "dj" for example, for "u" and "j" respectively in the spelling of their names. Many historical actors either followed the new EYD spelling convention ("u" for "oe") or retained the old one. In using which spelling of names to use in my dissertation I take cue from the autobiography of the person, if it is available. Thus, I opt to spell "Sukarno" using the EYD spelling system but retain the old spelling for "Soeharto" because their corresponding autobiographies used those spellings respectively.

The second item concerns the publication of the earlier version of chapter 4 in *Sojourn: Journal of Social Issues in Southeast Asia*. I presented this earlier version at the annual Southeast Asian Studies Graduate Conference in the winter of 2013, revised and submitted to the journal. The journal accepted my manuscript after further review and revision published it in its Volume 29, No. 1 (2014) edition. I thank the *Sojourn* Managing Editor Michael J. Montesano for giving me permission on the journal's behalf to publish excerpts of the article as chapter 4 of my dissertation.

CHAPTER 1

INTRODUCTION

In his detailed study of the emergence and development of the electric supply industry in three Western cities from 1880 to 1930, the historian of technology Thomas P. Hughes noted, "Electric power systems embody the physical, intellectual, and symbolic resources of the society that constructs them."[1] In my own study of Indonesia's electrical infrastructure development, I extend Hughes' insight to show that the electric power systems constructed by the Soeharto government (1966-1998) embodied Indonesia's dual national identity and helped enact the regime's domestic and international politics.

This dissertation examines the social, cultural, and political dimensions of Indonesia's village electrification program—also known in Indonesian as *Listrik Masuk Desa* (literally it means "Electricity Enters into Villages")—in the so-called "New Order" period. I analyze how and why the New Order government decided to bring electricity to the villages (I focus particularly on Balinese villages), developed the electrical infrastructure to support this effort, and used electricity in the service of building a modernizing state. I look at how the concept of modernity derived from the post World War II modernization theory was adopted and reconfigured by the Soeharto government as it sought to establish Indonesia as a socially just modern nation. The New Order's program to electrify rural areas along with other village improvement programs that the government rolled out helped President Soeharto gain political power in the countryside, a factor that supported his legitimacy to rule for 32 years.

Historians of Indonesia mark the New Order period between 1966 and 1998 to signify the time from the effective transfer of power from Sukarno to Soeharto on 11 March 1966, the date

[1] Thomas Parke Hughes, *Networks of Power: Electrification in Western Society, 1880-1930* (Baltimore: Johns Hopkins University Press, 1983), 2.

of a letter Sukarno gave to Soeharto authorizing him to restore order following a failed coup in October 1965, until Soeharto's resignation on 21 May 1998. The Indonesian Parliament did not actually appoint Soeharto president until March 1967. Once appointed as a head of state, Soeharto referred to his government as the "New Order" government to contrast it with the Sukarno government, which he referred to as the "Old Order" government (1945-1966).[2] One source of legitimacy that the New Order government used to establish itself was a claim that the Sukarno government had deviated from the principles of the state ideology *Pancasila* (Five Principles) and the 1945 Constitution. Subsequently, the New Order regime claimed that it would implement these two documents "purely and consistently" (*secara murni dan konsekuen*).[3] One important implication of this rhetoric was that it projected the New Order government to Indonesian citizens as a corrective force for all the wrongs that had supposedly occurred under the previous regime, the most important of which was Sukarno's neglecting Indonesia's economic development. This rhetoric worked mainly because at the end of the Sukarno's rule, Indonesian economy was about to collapse.

To maintain his legitimacy to rule, Soeharto conceived and implemented a national development agenda aiming to transform Indonesia into a "modern, just and prosperous society" based on Pancasila and the 1945 Constitution.[4] The principles of Pancasila, which appear in the

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[2] The Soeharto government used the term "Old Order " to mark and lump a period in Indonesian modern history that came before its rule. But this characterization is misleading since Indonesia had undergone a series of different historical periods from 1945-1966. Historians of Indonesia typically divide the period before Soeharto's rule into three eras: the Revolutionary period (1945-1950), the liberal democracy period (1950-1959), and the Guided Democracy period (1959-1966).

[3] Widodo, S. W. Barus and Ngasub Singarimbun, *30 Tahun Orde Baru Membangun* (Jakarta: Direktorat Jenderal Pembinaan Pers dan Grafika, Departemen Penerangan RI bekerjasama dengan Tim Penerbit Buku Swasta Nasional, 1995), 45.

[4] See Soeharto's short preface to Ali Moertopo's book *Some Basic Thoughts on the Acceleration and Modernization of 25 Years' Development* (Jakarta: Yayasan Proklamasi, Center for Strategic and International Studies, 1973), ix. President Soeharto often mentioned this national goal in many of his speeches including in the one he delivered in August 1968, his first annual state of the nation speech. See Soeharto, "Pidato Kenegaraan Presiden Republik Indonesia Djenderal Soeharto Di Depan Sidang DPR-

preamble of the 1945 Constitution, are belief in the oneness of God, just and civilized humanity, Indonesian unity, democratic rule that is guided by the wise deliberations among representatives, and social justice for all Indonesians. Pancasila became the "operational ideology" of the state and the New Order regime proclaimed Indonesia as "a *Pancasila State*, in which every aspect of daily life would be interpreted and conducted on the principles of Pancasila and the 1945 Constitution."[5] The regime's efforts to indoctrinate the Pancasila principles to the Indonesian population showed mixed results. The majority of Indonesians initially bought the idea of the Pancasila principles and the New Order managed to establish Indonesia as a "Pancasila state" by the mid 1980s.[6] By the end of the Soeharto era, however, many Indonesians came to loath the state ideology because to them, it was a cover for Soeharto's authoritarian rule.[7] Nevertheless, Pancasila became at one point the dominant ideology of the New Order government and the principles—particularly the fifth one—influenced how the Indonesian State Electricity (*Perusahaan Listrik Negara, PLN*) engineers thought about their efforts to electrify the country.

In my dissertation I ask the following research questions: 1) In the New Order's development agenda, how and why did electricity come to be thought of as important and what were the motivations and rationales of the New Order government to wire the country? 2) How did PLN choose the technologies to light rural areas and which technologies were given priorities and why? 3) What meanings did different groups (New Order bureaucrats, Indonesian journalists, PLN engineers, PLN leaders, and Balinese villagers) ascribe to electricity?

GR 16 Agustus 1968" (Annual State of the Nation Speech, 1968). A copy is available online at: http://soeharto.co/tag/dpr-gr.

[5] Seung-Won Song, "Back to Basics in Indonesia? Reassessing the Pancasila and Pancasila State and Society, 1945-2007" (PhD Diss, Ohio University, 2008), 10, original emphasis.

[6] See Donald E. Weatherbee, "Indonesia: The Pancasila State," *Southeast Asian Affairs*, (1985): 133-151.

[7] Song, "Back to Basics in Indonesia," 11.

To find the answers to the above questions I conducted archival research in the United States, Indonesia, and the Netherlands where I found many newspaper and magazine articles, other materials (e.g. a cassette tape), as well as reports, both published and unpublished, written by institutions such as the World Bank, United States Agency for International Development (USAID), the American National Rural Electric Cooperative Association (NRECA), various branches of the Indonesian State Electricity Company (PLN), the Indonesian Department of Public Works and Electrical Power, the Indonesian Department of Mining and Energy, and the Dutch Department of Agriculture, Industry, and Commerce that touch on various aspects of Indonesia's effort to electrify the villages.[8] The words of the historian of technology Rudolf Mrázek (even though he covered a different historical period), more or less sum up my archival research experience. He writes, "Indonesia is extraordinarily rich in extant sources. The archives and libraries in the Netherlands—Leiden, The Hague, or Amsterdam—[and I would add Ithaca and Washington, D.C. in the United States]—are meticulously ordered and easy to use. The archives and libraries in Indonesia—Jakarta, Bogor, Bandung, [Denpasar], or Medan—are rather messy, unwelcoming, and thus more exciting."[9]

An added excitement (and sometimes also frustration) for me was to look for these extant sources in many places. While in Indonesia between September 2011 and August 2012, I visited 19 libraries and archives to search for all relevant materials for my research project (see Appendix B). I also needed to find materials at the Royal Netherlands Institute of Southeast

[8] I use these sources to uncover and reconstruct the stories and even "dramas" that made up the boring and mind numbing statistics on "Energy Balance," "Productivity of Employee," "Number of Generating Stations," "Installed Capacity (MW)," "Length of Transmission Lines (kmc)," and other related information on the development of Indonesia's electrical infrastructure that appear in some PLN's publications (*PLN Statistics*) that contain. On this point, see Susan Leigh Star, "The Ethnography of Infrastructure," *The American Behavioral Scientist* 43, no. 3 (Nov/Dec 1999): 377-391.

[9] Rudolf Mrázek, *Engineers of Happy Land: Technology and Nationalism in a Colony* (Princeton, N.J.: Princeton University Press, 2002), xvi.

Asian and Caribbean Studies (KITLV) library in Leiden, which I visited in October 2012. Through a friend I obtained a report that was listed online only at the National Library of Australia in Canberra, even though an Udayana University economist (Made Arka) wrote the report in 1982.[10] The challenge of locating relevant sources in many repositories prompted me to collect several pertinent undergraduates' and master's thesis on electricity topics from the libraries of several universities in Indonesia to mine for the references cited.

I carried out oral history interviews as well. I spoke with at least a dozen current and former PLN employees, Indonesian journalists and academics, former New Order bureaucrats, as well as Balinese villagers whose hamlet either had been electrified or was about to get connected to the grid. Some of the PLN employees I talked to were engineers who produced engineering drawings, planned the execution of a power line construction, or generally supervised the building of electrical distribution lines. Others were former or current PLN managers.

A note about the sources I collected. The articles in the Indonesian magazine, newspapers, and journals I gathered and read were written and published in the New Order period. Although there was a press censorship in a form of a permit that the government issued to publishers, the print media had a certain degree of independence. Critical opinion pieces, editorials, and other articles appeared in newspapers and magazines from time to time. It was when a newspaper or a magazine coverage became too critical that the regime would revoke its permit. Or in the case of a piece written by a foreign journalist, he or she would be subsequently banned from coming to the country to cover an international event that was held in Indonesia. Overall, however, the Indonesian print media functioned as chronicles that helped me reconstruct

[10] Although I could not find the report at the Udayana University Faculty of Economics library, a librarian there gave me the phone number of the economist's son (Made Surya Putra) who happens to teach at the same department his father previously taught. After promising me that he would ask his father about the report, he regretfully told me later that his father did not keep a copy. Field Notes 29 June 2012.

past events. They contained not just detailed stories of the events, but also other materials such as speeches and writings of key historical actors that otherwise would have been difficult to find elsewhere including at the Indonesian National Archive (*Arsip Nasional Republik Indonesia*, *ANRI*). The information contained in these articles also helped me verify key factual events when I spoke with my informants and cross check the data in the reports produced by the World Bank and the USAID. Thus, although the New Order print media for the most part served as the mouthpiece of the regime, they served as useful primary sources for my study.

New Order Indonesia provides a good social and historical setting to investigate the role of electricity in national development for three main reasons. First, as a historically agricultural nation many Indonesians used to live (and a slightly more than half still do today) in the countryside.[11] In the New Order government's national consciousness, village life was deemed as important as town life. Ali Moertopo, one of President Soeharto's closest and most influential aides wrote in 1973, "in [Indonesian] national development, village and town must be regarded as a unity,"[12] and that "national development can only be successful if it is based on rural development."[13] This claim contrasted starkly with what many post-World War II international development experts saw as the rural and urban divide. This notion led Johannes J. Rumondor, the person PLN appointed in 1976 to take charge of its village electrification program, to assert, "The Village Electrification Program must be [thought of as a] part of the Total Electrification

[11] In the early 1970s, several PLN documents say that about 80 percent of the country's citizens lived in the countryside. Indonesia's *Badan Pusat Statistik* (Center Bureau of Statistics) reports that in 2010, Indonesia's rural population is 50.2 percent of the total population and the trend moves toward a greater number living in urban areas in the years to come. See "Percentage of Urban Population by Province, 2010 – 2035" http://www.bps.go.id/eng/menutab.php?tabel=1&kat=1&id_subyek=12 (accessed on 27 February 2014).
[12] Ali Moertopo, *Some Basic Thoughts on the Acceleration and Modernization of 25 Years' Development* (Jakarta: Yayasan Proklamasi, Center for Strategic and International Studies, 1973), 91.
[13] Ali Moertopo, *Some Basic Thoughts*, 92.

Program in Indonesia."[14] Suryono, PLN's Main Director (*Direktur Utama*) between 1975 and 1980, stressed this point again in a paper he presented in a symposium discussing "Energy Supply for the Villages," in May 1978. He wrote, "[T]he development of village electrification is part of an integrated and comprehensive program to develop the electrical infrastructure in Indonesia."[15] In this context and based on what my actors claimed, I examine the development of Indonesia's electric power systems as unified systems that were designed and constructed to supply electricity both to towns as well as to the villages even though my study focuses on the provision of electricity in the villages.

Second, the concept of *Wawasan Nusantara* (Archipelagic World View or Archipelagic State Doctrine) as a vision formulated during the Sukarno era to unite the entire archipelago as one territorially-integrated whole gained much currency in the New Order period. When Indonesia emerged as a post-independence state in 1945, not all of Indonesia's waters between the islands were under Indonesian sovereignty. On 13 December 1957, the government announced the "Djuanda Declaration," named after the Indonesian Prime Minister at the time Djuanda Kartawidjaja. The Declaration stated that all of the waters around, between, and that connect the islands in the Indonesian archipelago would now be part of Indonesia's territory and that the country's 12 nautical mile borders would be measured from the lines connecting "the outermost points of the outermost islands" of the archipelago.[16] When Indonesia declared this concept, it did not immediately go into effect because countries such as the United States, the United Kingdom, and the Netherlands opposed it. It would take the Indonesian government years of bilateral (with its neighboring countries) and multilateral negotiations (at the United

[14] Rumondor, "Program Perum Listrik Negara Untuk Perlistrikan Desa," 32.
[15] Suryono, "Penyediaan Tenaga Listrik Untuk Pedesaan," 74.
[16] Djoko Darmono et al., *Mineral Dan Energi Kekayaan Bangsa: Sejarah Pertambangan Dan Energi Indonesia* (Jakarta: Departemen Energi dan Sumber Daya Mineral, 2009), 217.

Nations) to push its "archipelagic state doctrine" on the international stage.[17] Indonesia's effort to get the Djuanda Declaration to be acknowledged by the international community finally succeeded when the United Nations issued its Convention of The Law of the Seas (UNCLOS) in 1982, which Indonesia ratified in 1985.[18] One crucial implication of the world's acknowledgement of the *Wawasan Nusantara* doctrine was Indonesia's claim to a vast new area (about 3 million square kilometers) to explore and exploit its natural resources that significantly increased the country's oil and gas production. Moreover, the technologies that the Soeharto government used to enact Archipelagic World View, I argue, were not just the communication technologies as some scholars have shown,[19] but also electrical technologies.[20] PLN created a huge organization with branches across the archipelago to install, operate, and maintain electric power generators and transmission and distribution lines in order to bring electricity to some of the remotest villages so that people there could receive television broadcasts of the Republic of Indonesia Television (*Televisi Republik Indonesia, TVRI*). To many Indonesians living in the countryside, electricity, television sets, and TVRI programs together helped them become more aware of their role as citizens of the new nation-state that stretches from Sabang (the northeastern most island in Sumatra) to Merauke (the westernmost city in Indonesia).

Third, the vast geographical expanse and challenges of bringing electricity to many Indonesian villages scattered across thousands of islands present an opportunity to examine the New Order's decision-making processes to light Indonesia's countryside. Succinctly, my study

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[17] For a brief legal history (between 1957- 1977) of Indonesia's endeavor to promote its *Wawasan Nusantara* worldview at the United Nations, see Jack A. Draper, "The Indonesian Archipelagic State Doctrine and Law of the Sea: 'Territorial Grab' Or Justifiable Necessity?" *International Lawyer* 11, no. 1 (1977), 143-162.
[18] Ibid., 20-21.
[19] Bart Simon and Joshua Barker, "Imagining the New Order Nation: Materiality and Hyperreality in Indonesia," *Culture, Theory and Critique* 43, no. 2 (January, 2002), 139 - 153.
[20] The title of my dissertation *Archipelagic Networks of Power* is inspired by this concept and by borrowing and extending Thomas P. Hughes' 1983 book *Networks of Power*.

reveals that in the beginning the availability of cheap fossil fuel for Indonesia's domestic consumption allowed PLN to install diesel power stations to supply electricity across the country. Installing diesel plants also permitted the New Order government to quickly bring electricity to many villages. Grateful villagers as a consequence were inclined to vote for the ruling political party *Golongan Karya* (Functional Groups) or GOLKAR during general elections, which helped cemented the New Order's legitimacy to govern the country. These two factors played a role in the early and continual adoption of diesel power plant as the technology of choice to generate electricity in rural areas. As more of these power stations were built, they expanded into PLN's "grid without a grid" system, i.e. scattered diesel power and a few hydro plants that were not all connected together physically but rather linked by PLN organizationally as its employees operate and maintain them.[21] When national consumption of oil increased, PLN began to build large-scale power plants using other fuel types (water, coal, and geothermal). The company constructed these massive power stations mainly in Java starting in the early 1980s. To efficiently distribute the electricity generated by these new plants, the New Order government erected a sophisticated interconnected transmission system linking the regional grids of the islands of Java, Madura, and Bali. The resulting system, the PLN grid (aka the Java-Bali system), supplied electricity mainly in the three islands. Elsewhere in Indonesia, PLN employees continued to construct a "grid without a grid" (aka the Outside Java-Bali system). The two power systems developed side by side and now largely make up the electric infrastructure in the country today.

Theories of Technological Change

[21] I thank Prof. Ronald Kline for suggesting the term "grid without a grid."

In Science and Technology Studies, the dominant theories of technological change are the social construction of technology (SCOT) approach (along with the closely related social shaping of technology or SST approach), the Actor-Network Theory (ANT) approach, and the systems approach.[22] All these approaches stress the historical contingency and sociocultural contexts of technological development. The SCOT approach analyzes how a piece of technology (its most famous case being the bicycle) is socially constructed. The key methodology of this approach is to open the "black box" of technology, which is to understand how a particular technical artifact is being designed, built, selected, and stabilized by different relevant social groups. Although it is connected to the SCOT approach, the SST approach is, according to Robin Williams and David Edge who reviewed the growing body of research using this approach in the mid-1990s, is better thought of as a "a 'broad church,' without any clear 'orthodoxy'," or an umbrella of different strands of approaches.[23] In addition, the two authors widely credited for formulating the SST approach insist on using the term "social shaping" instead of "social construction" for two main reasons. First, they want to stress that something real is being built (not just in people's mind) and second, both internal (e.g. how engineers' works are rewarded) and external (e.g. class, gender, ethnicity) social factors matter in shaping technological

[22] For an early formulation and sketch of these three theories, see Hughes' *Network of Power* (1983) for the systems approach; Trevor J. Pinch and Wiebe E. Bijker "The Social Construction of Facts and Artefacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other," *Social Studies of Science*, 14(3) (1984): 399-441 for SCOT; and Michel Callon, "Society in the Making: The Study of Technology as a Tool for Sociological Analysis," in Wiebe E. Bijker, Thomas P. Hughes, and Trevor Pinch (editors), *The Social Construction of Technological Systems* (Cambridge, MA: The MIT Press, 1987). The book in which Callon's article appears is also a good source for the articulation of the first three theoretical frameworks. For the SST approach see Donald A. MacKenzie and Judy Wajcman (editors), *The Social Shaping of Technology*, 2nd edition, (Buckingham [England]; Philadelphia: Open University Press, 1999).

[23] Robin Williams and David Edge, "The Social Shaping of Technology," *Research Policy* 25, no. 6 (9, 1996), 866 and 892.

artifacts.[24] The systems approach "stresses the importance of paying attention to the different but interlocking elements of physical artifacts, institutions, and their environment and thereby offers an integration of technical, social, economic, and political aspects."[25] ANT analyzes how a network that is made up of heterogeneous actors (humans and objects) interact with one another to shape the network while at the same time their associations are shaped by the condition of the network.

The approaches mentioned above are still widely used today in conceptualizing various technological developments, and each approach has refined its concepts over time adopting them to incorporate new case studies. Other scholars have expanded the SCOT conceptual framework by showing, for example, that users of a supposedly stabilized technologies can act "as agents of technological change" and reshape a technology by using it in a different way than designers intended.[26] The continued modification and adaptation of these concepts indicate two things. First, it shows how influential the social constructivist approach has been in analyzing technologies. Second, the modifications of the theories suggest that it has certain limitations that later scholars "notice."[27]

Since both SCOT and SST are perhaps best suited to examine the development of technical artifacts, I deem the systems and ANT approaches more useful in my analysis because

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[24] Donald A. MacKenzie and Judy Wajcman, "Introductory essay: the social shaping of technology," in MacKenzie and Wajcman (editors), *The Social Shaping of Technology*. This essay is available online at http://eprints.lse.ac.uk/28638/.

[25] Bijker, Hughes, and Pinch, "General Introduction," in Bijker et al. (editors) *The Social Construction of Technological Systems*, 4.

[26] Kline, Pinch and Pinch, "Users as Agents of Technological Change: The Social Construction of the Automobile in the Rural United States," *Technology and Culture* 37, no. 4 (Oct 1996): 763-795. Further refinement of the SCOT framework can also be found in Wiebe E. Bijker and John Law, *Shaping Technology/Building Society: Studies in Sociotechnical Change*, paperback edition (Cambridge, MA; London [England]: The MIT Press, 1994).

[27] For a good summary of the development of SCOT and ANT, see Steve Matthewman, *Technology and Social Theory* (Hampshire; New York: Palgrave Macmillan, 2011), chapters 5 and 6 respectively.

they were conceptualized to analyze large and complex technological systems.[28] Moreover, the SCOT approach emphasizes the human agency in relevant social groups as the shaper of technological development. The Hughesian systems approach is not necessarily married to the idea that only humans can shape the system. System builders build a system but a technological system can influence society as well. In fact, Hughes maintained that a technological system "can be both a cause and an effect; it can shape or be shaped by society. As they grow larger and more complex, systems tend to be more shaping of society and less shaped by it," to which Hughes attributed the concept of "technological momentum."[29] The Indonesian power systems, as we shall see, acquired this technological momentum.

ANT employs the generalized symmetry principle and seeks not to distinguish the different categories of its components and treats them all as actors (often also called "actants") of the network.[30] The actors and the network are mutually constitutive. In this approach, all components that make up a network therefore can be used to analyze how the network gets built, maintained, and defended. To draw a parallel to the systems approach, from ANT's perspective system builders are nothing but actants who may or may not successfully shape the network, depending of how other actants in the network behave (they could either resist or be enrolled in

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[28] Wiebe Bijker, one of the founders of SCOT, has extended the approach by introducing a conceptual framework he called "technological frame" in his book *Of Bicycles, Bakelites, and Bulbs: Toward a Theory of Sociotechnical Change* (1995). Arguably, "technological frame" can be used to analyze technological systems or in Bijker's term "sociotechnical ensembles." But even so, his three main examples in the book are about specific technical artifacts: the safey bicycle, Bakelites, and fluorescent light bulbs.

[29] Thomas P. Hughes, "Technological Momentum," in Merrit Roe Smith and Leo Marx (editors) *Does Technology Drive History? The Dilemma of Technological Determinism* (Cambridge, MA: The MIT Press, 1994), 112. A metaphor drawn from physics, "technological momentum" refers to a system's mass, direction (goals), and rate of growth. See Thomas P. Hughes, "The Evolution of Large Technical Systems," in The Social Construction of Technological Systems, eds. Wiebe E. Bijker, Trevor Pinch and Thomas Parke Hughes, Paperback ed. (Cambridge, MA; London, England: The MIT Press, 1989), 76-80.

[30] See Michel Callon and Bruno Latour, "Don't Throw the Baby Out with the Bath School! A Reply to Collins and Yearley," in *Science as Practice and Culture*, ed. Andrew Pickering (Chicago and London: The University of Chicago Press, 1992).

the effort). Treating all actants the same or at least having an equally agency is one of the main objections that some scholars have raised against ANT.[31] Another criticism is that ANT tends to disregard the power dynamics among actants and it is not generally concerned about human actors marginalized or excluded by a built network.[32] Additionally, the ANT approach lacks consideration of practices and cultures in structuring technoscientific actions.[33] In my analysis I examine the power dynamics among system builders and highlight how one aspect of culture—national identity—was an important factor shaping the development of Indonesia's electric infrastructure.

Thus, between the ANT and systems approach, I find the latter more useful than the former in my study not only because electric power systems fit into the mold of "messy, complex, [and] problem solving" systems, but many readily identifiable factors, including economic, social, and political, shaped their development.[34] Hughes especially paid particular attention to the political dimension of technological development, a key theme that interests many historians of technology and STS scholars. In his account of the development of electric power systems in Berlin, Chicago, and London, Hughes explored the interaction between technology and politics and concluded, "[in] Chicago, technology dominated politics; in London, the reverse was true; and in pre-World War I Berlin there was coordination of political and technological power."[35] Although perhaps this seems to be a too tidy summary of his detailed

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[31] For a summary of the main objections raised on ANT by some scholars, see Matthewman, *Technology and Social Theory*, 120-123.
[32] In the words of the sociologist Steve Matthewman, "ANT mostly tells grand tales of men and their machines, while other non-scientist humans and non-human non machines are left aside." Quoted in Matthewman, *Technology and Social Theory*, 121.
[33] On this point, see Sergio Sismondo, *Introduction to Science and Technology Studies*, 2nd ed, (Chichester, West Sussex, U.K.; Malden, MA: Wiley-Blackwell, 2010), 87-92.
[34] Thomas P. Hughes in Wiebe E. Bijker et al., *The Social Construction of Technological Systems*, 51.
[35] Hughes, *Networks of Power*, 461-462.

and lengthy study, Hughes pointed out the interconnectedness of politics and technology, a key aspect that the SCOT and ANT approaches had earlier neglected.[36]

Analytic Tools Used in the Dissertation

In my research, I use three main analytic tools, drawn largely from science and technology studies scholarship. They are the sociotechnical system approach, national identity and technology, and patrimonial technopolitics. The first conceptual tool I employ follows Hughes' approach in analyzing what he called large technological systems. Hughes argued that to understand the development of massive technological systems, historians need a more holistic analytical framework than just investigating the technical components of the built infrastructure. Social organizations, economic conditions, political order, available resources, and key individuals all play important roles in shaping that infrastructure. Hence, Hughes put forth an analytic tool he called the "sociotechnical system."[37] In this approach, analysts should not just view technology as a stand-alone artifact, but rather as a part of a seamless web of objects, people, regulations, organizations, knowledge, and technical know-how (codified and tacit) that are inseparable from the larger socioeconomic and political orders. The system builders then are not just engineers, but also other key decision makers who helped shape the development of the system, including in my case study Balinese village heads. To explain how a large sociotechnical system develops Hughes offered a concept called "reverse salients," defined as the critical

[36] For a critique of the SCOT approach for paying insufficient attention to power relations among the relevant social groups, see Langdon Winner, "Upon Opening the Black Box and Finding it Empty: Social Constructivism and the Philosophy of Technology," *Science, Technology, and Human Values* 18 (1993): 362-378. One of SCOT's early formulators would later acknowledge the crucial role politics plays in technological development. For his recent article on this, see Wiebe E. Bijker, "Dikes and Dams, Thick with Politics," *Isis* 98, no. 1 (March, 2007): 109-123. I should also note that not some ANT proponents in later writing considered power and technology. See for example, John Law ed., *A Sociology of Monsters: Essays on Power, Technology, and Domination* (London; New York: Routledge, 1991).
[37] Hughes, *Networks of Power*, 6, 140, and 465.

problems that system builders identify and correct so that they could develop the system further.[38] For the most part, reverse salients are technical problems that "conservative inventions" would solve whereas radical inventions, Hughes argued, "brought the birth of systems."[39] But reverse salients need not only be technical issues. In fact, Hughes wrote, "In a mature, complex technological system the need for organization may often be a reverse salient."[40] I use the term here to refer to the pattern of growth of the overall village electrification system development in Indonesia. In other words, I employ it in a meta-system manner. To the New Order electrical systems builders, unelectrified villages were an-archipelago-wide "reverse salient," that they would need to "correct" by building the needed components to get those villages electrified. For them, the ultimate goal to build Indonesia's electrical infrastructure was to electrify all of Indonesia's villages.

The second conceptual framework I use is the one provided by Gabrielle Hecht in her book *The Radiance of France* (1998), which I elaborate and situate in the larger STS literature in the section called "Science, Technology, and National Identity" below. Hecht describes the link between post-World War II French national identity and the development of the country's nuclear reactors. She argues that in an effort to regain its pre-World War II "radiance" the French constructed a national identity tying it intimately to the construction of its nuclear power industry. Additionally, previous studies of technology and society in Indonesia prompted me to examine closely how the New Order's technological development program was entwined with Indonesia's national identity. In one case involving the construction of a steel mill that Soeharto inherited from Sukarno, Suzanne Moon shows that the New Order government built and projected two images of Indonesian national identity. One, "for foreign consumption, was of a

[38] Thomas P. Hughes, "The Evolution of Large Technical Systems," 74.
[39] Hughes, "The Evolution of Large Technical Systems," 73.
[40] Hughes, "The Evolution of Large Technical Systems," 73-74.

rationally and responsibly managed economy, in which discipline and austerity were steadily producing dividends and a favorable environment for foreign investment."[41] Domestically, the other image projected "a rapidly developing and modernizing country, the reality of which was attested to by new schools, mosques, hospitals, roadways, and jobs in new industries."[42]

In the case of the Krakatau steel mill these two identities, however, did not hold up. A corruption scandal involving the head of the state-owned oil company (*Perusahaan Tambang dan Minyak Negara, PERTAMINA*), the enterprise that oversaw the construction of the steel mill tarnished Indonesia's constructed identity projected internationally. Ibnu Sutowo, who had served as the first head of Pertamina since 1957 and re-appointed by Soeharto, was shown to mismanage the company's finances and allegedly received kickbacks from Ferrostaal, the German company contracted to build the mill.[43] As a result, Moon writes, "The image of Indonesia that emerged was one in which rationally and carefully managed development was a mirage obscuring the reality of corruption and incompetence."[44] Soeharto defended the debacle as something that any aspiring modernizing nation would unavoidably encounter. The Indonesian state-controlled media also echoed Soeharto's reasoning and maintained, as Suzanne Moon asserts, "that a narrative of Indonesia's identity as a technologically developing country was deployed to explain and excuse Ibnu's actions."[45] This episode shows Soeharto's inclination and early attempt to project two different kinds of images of Indonesian identity. It proved to be more successful and durable in the development of its electric power systems than in the Krakatau steel mill project.

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[41] Suzanne Moon, "Justice, Geography, and Steel: Technology and National Identity in Indonesian Industrialization," *Osiris* 24 (2009), 268.
[42] Moon, "Justice, Geography, and Steel," 268.
[43] Moon, "Justice, Geography, and Steel," 269.
[44] Moon, "Justice, Geography, and Steel," 269.
[45] Moon, "Justice, Geography, and Steel," 270.

My investigation of the New Order's Village Electrification Program reveals the entanglement of Indonesia's dual national identity with its electrical infrastructure. The two Indonesian identities, which I call an internal and an external national identity, influenced how the electrical infrastructure in the country was developed. While the internal identity (projected to domestic audience) shaped the construction of a "grid without grid" electric system in the country, the external identity (promoted mainly for the international audience) influenced the establishment of a PLN grid in Java, Madura, and Bali.

Domestically, Soeharto's rural electrification program was governed by an overwhelming desire to establish an internal Indonesian identity as a developing "Pancasila state," i.e., as a developmental nation-state based on Pancasila. The term "developmental state" was coined by Chalmers Johnson.[46] The political scientist Tuong Vu has shown how the New Order Indonesia emerged as a developmental state equipped with a developmental structure and role much like South Korea under Rhee Syngman and Park Chung Hee.[47] In the case of Indonesia's village electrification, the Pancasila principles, particularly the fifth one "Social Justice for all Indonesians," heavily influenced the program, rhetorically and materially.

Rhetorically, providing electricity to the countryside was viewed as a means to achieve social equality by improving the lives of people in the villages. In particular, the regime thought

[46] Chalmers Johnson, *MITI and the Japanese Miracle: The Growth of Industrial Policy, 1925-1975* (Stanford, CA: Stanford University Press, 1982).

[47] Tuong Vu, "State Formation and the Origins of Developmental States in South Korea and Indonesia," *Studies in Comparative International Development* 41, no. 4 (Winter, 2007), 27-56. I must note that the roles of science and technology in Indonesia's national development in the Soeharto years were complex and varied. Sulfikar Amir's examination of the New Order regime's efforts to build a complex network of technological institutions and pursue the so-called "high-technology" projects in the 1980s and in the 1990s led him to argue that Indonesia in this period is better termed as a "technological state" rather than as a "developmental state." See Sulfikar Amir, *The Technological State in Indonesia: The Co-Constitution of High Technology and Authoritarian Politics* (London, New York: Routledge, 2012). My research suggests that the Indonesian state under the New Order regime was really a hybrid of a "developmental state" and a "technological state."

that electricity brought to the villages could accomplish the following aims: to correct the developmental imbalance between towns and villages, to improve the socioeconomic lot of rural folks, to stimulate economic activities in the villages, to transform villagers' sociocultural values, and to achieve the status of a modern nation. Even though this endeavor was not as profitable as selling electricity to the industry or to city dwellers, PLN managers deemed it necessary to wire the entire nation as an important program to bring the benefits of development to the countryside. PLN managers sought to balance and reconcile the drive to earn profit and to electrify the countryside even after PLN turned into a more profit-oriented company in 1994. From that point forward, PLN leaders regarded their institution as both a business enterprise and an "agent of development" (*agen pembangunan*).[48]

Materially, the principle of social justice played a major role in the main choice of technologies used to light many of Indonesia's villages. In the country's three most populated islands (Java, Madura, and Bali) PLN decided to design and build large power plants using a variety of primary energy sources and to connect regional grids in one massive transmission system (PLN grid). But the principle of social justice dictated that PLN would need to supply electricity to other less populated areas too. Because of this, the New Order government deemed it necessary to install diesel power plants in many other areas cheaply and quickly. The resulting PLN's "grid without a grid" dominated electric power supply outside of Java, Madura, and Bali.

Internationally, the New Order regime wanted to use Indonesia's identity as a technologically developing nation to perform a more active role on the global state. It crafted an

[48] Djiteng Marsudi, "PLN Menghadapi Era Globalisasi," *Berita PLN*, February 1996, 6. In the New Order era, PLN as an institution has changed its status twice. First in 1972, the government established it as a state-owned enterprise (Perusahaan Umum or Perum) and owned all of its capital. As a Perum PLN's main objective was to serve the public. In 1994, PLN became a semi-private entity called Perseroan Terbatas or PT, allowing it to earn capital by selling up to 49 percent of its stocks to the public and 59 percent of it is controlled by the government. Since 1994, PLN is known as PT PLN (Persero) and its primary goal was to earn a profit.

external national identity as a developing nation with notable achievement in its development projects. The main element of this second identity was that it showcased Balinese economic development generally and village electrification particularly as an exemplary case of Indonesia's noted infrastructure development and selected the island as a venue for wide-ranging regional and international gatherings. Some of these meetings involved high-level conferences of the Association of Southeast Asian Nations (ASEAN), a regional political-economic bloc, and the Organization of Petroleum Exporting Countries (OPEC). Through these two (and other) organizations Indonesia asserted its role on the global stage guided by its foreign policy dictum of "freely and actively" participating in international relations.

Indonesia's foreign policy directives, formulated in 1948 by then Vice President Mohammad Hatta in the midst of the Cold War geopolitical order, were to engage in international relations "freely and actively" (*bebas dan aktif*).[49] In other words, Indonesia must be free to determine its own course as an independent nation and to actively engage in achieving a peaceful world order by establishing a good relationship with every nation. This doctrine is encapsulated by a second Pancasila principle: "Just and Civilized Humanity," which was intimately connected to the third principle of "Indonesian Unity." When Sukarno delivered a speech formulating the Pancasila principles on 1 June 1945, he stressed that these two principles, which he then called "internationalism" and "nationalism" respectively, are actually inseparable. He said, "Internationalism can not flower if it does not rooted in the soil of nationalism."[50]

To accomplish the goal of creating a "just and civilized humanity," Sukarno helped establish and made Indonesia one of the leading nations of the Non-Aligned Movement.

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[49] See Hatta's preface in a book containing his speeches on this issue, Mohammad Hatta, *Mendayung Antara Dua Karang* (Jakarta: Bulan Bintang, 1976).
[50] D. R. SarDesai, *Southeast Asian History: Essential Readings* (Boulder, Colorado: Westview Press, 2006), 156.

Indonesia's national identity during the Sukarno era was intimately tied to its role as one of the anti-colonial champions of the newly emerging countries. President Soeharto, however, approached this principle differently. In international foreign affairs, Soeharto preferred that Indonesia work within regional and international organizations rather than going it alone. The Soeharto government wanted to use and highlight its consensus building approach to reaching an agreement and resolving a conflict. As I detail in chapter 5, to play its role regionally and internationally, the New Order made sure that the electricity supply to Bali was always adequate because the province had been selected as the venue to hold many important regional and global conferences since the mid-1970s. To accomplish this, the New Order developed the Balinese regional power system ahead of other regions and connected the provincial grid to the Java-Madura interconnected transmission system in the 1980s. This built infrastructure allowed Bali to be the first province to have all of its villages electrified by 1995.

My third conceptual framework has to do with examining the political dimension of technology. Also in her book *The Radiance of France* (1998) Hecht introduces the two related concepts: "technopolitics," defined as "the strategic practice of designing or using technology to constitute, embody or enact political goals,"[51] and "technopolitical regimes," which are

> grounded here in institutions, consist of linked sets of people, engineering and industrial practices, technological artifacts, political programs, and institutional ideologies, which act together to govern technological development and pursue technopolitics. … They emanate from different institutions, and they have distinct (if sometimes overlapping goals and ideologies).[52]

Hecht identifies two institutional bases for two different technopolitical regimes that shaped the French nuclear technological system: the Commissariat à l'Energie Atomique (CEA) and the

[51] Gabrielle Hecht, *The Radiance of France: Nuclear Power and National Identity After World War II* (Cambridge, Mass: MIT Press, 1998), 15.
[52] Hecht, *The Radiance of France*, 16.

Electricité de France (EDF). These two institutions nationally competed (and also collaborated) in the design of nuclear reactors for the French nuclear industry and offered distinct visions of a sociopolitical order. Hecht calls the regime based in the CEA the "nationalist regime" and another one based in EDF the "nationalized regime."[53] In the case of the New Order Indonesia's electrical power system, PLN, the dominant utility company, developed two system-level designs for village electrification (scattered diesel plants and an interconnected grid), which correspond to two different forms of technopolitics and two different national identities. Thus, two different technopolitical regimes (based on scattered diesel plants and an interconnected grid) were grounded in and promoted by PLN.

For the purpose of my study Gabrielle Hecht's concepts of "technopolitics" and "technopolitical regime" serve as useful analytical tools, especially since Hecht clarifies that technopolitics is not simply politics by other means but that the materiality (the design) of a system is entangled with political aims that constitute technopolitics.[54] In other words, Hecht's concept of technopolitics illustrates Bryan Pfaffenberger's words, "Technology is not politics pursued by other means, it is politics constructed by technological means."[55] This is different

[53] Ibid.

[54] Hecht, *The Radiance of France,*15. Timothy Mitchell in his book also uses a similar term "techno-politics," but to denote a slightly different phenomenon. See Timothy Mitchell, *Rule of Experts: Egypt, Techno-Politics, Modernity* (Berkeley, CA: University of California Press, 2002). His focus is on the power arising from the interactions among non-human nature, humans, and the human-built environment. In a recent book, Hecht notes that the two definitions are compatible and her edited volume "embraces both in order to explore a range of ways in which technologies become peculiar forms of politics." See Gabrielle Hecht, ed., *Entangled Geographies Empire and Technopolitics in the Global Cold War* (Cambridge, Mass.: The MIT Press, 2011), 3.

[55] Bryan Pfaffenberger, "Technological Dramas," *Science, Technology, and Human Values* 17, no. 3 (1992): 282-312.

from Langdon Winner's formulation that technology is political in a variety of ways.[56] It can be, but it is not merely the design of an artefact. Its uses, context, and development matter too.[57]

Inspired by Hecht's "technopolitics" concept, I conceive and develop a conceptual tool that helps me analyze the political dimension of the New Order electric power systems. This concept, which I call *patrimonial technopolitics*, focuses on the technopolitical practices between members of the ruling elite and the ruled. Drawing on Indonesian political science studies, I note that scholars who have analyzed Soeharto's New Order characterized the regime and its politics of development using various terms. The New Order has been portrayed as a "bureaucratic polity" by Karl D. Jackson, a modernizing nation that retains patrimonial characteristics by Harold Crouch, an extension of Dutch colonial state by Benedict Anderson, a form of "bureaucratic pluralism" by Donald K. Emmerson, and "a steeply-ascending pyramid" with Soeharto at its apex who controlled the military by R. William Liddle.[58] Jamie Mackie and Andrew MacIntrye persuasively argue in a survey of New Order politics up to the mid-1990s that patrimonialism represented an enduring feature of the New Order.[59] They write, "the extent to which control over key financial resources, licenses and essential facilities needed by business

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[56] Langdon Winner, "Do Artifacts have Politics?" *Daedalus* 109 (Winter, 1980): 121-136.

[57] In a section of his book that discusses the politics of technology, Steve Matthewman asserts, "Social practice, not design, ultimately determines [the] meaning [of technology]. Quoted in Matthewman, *Technology and Social Theory*, 83.

[58] Karl D. Jackson, "Bureaucratic Polity: A Theoretical Framework for the Analysis of Power and Communications in Indonesia," in *Political Power and Communications in Indonesia*, eds. Karl D. Jackson and Lucian W. Pye (Berkeley and Los Angeles: University of California Press, 1978); Harold Crouch, "Patrimonialism and Military Rule in Indonesia," *World Politics* 31, no. 4 (Jul., 1979), 571-587; Benedict R. O'G Anderson, "Old State, New Society: Indonesia's New Order in Comparative Historical Perspective," *The Journal of Asian Studies* 42, no. 3 (May, 1983), 477-496; Donald K. Emmerson, "The Bureaucracy in Political Context: Weakness in Strength," in *Political Power and Communications in Indonesia*, eds. Karl D. Jackson and Lucian W. Pye (Berkeley and Los Angeles: University of California Press, 1978); R. William Liddle, "Soeharto's Indonesia: Personal Rule and Political Institutions," *Pacific Affairs* 58, no. 1 (Spring, 1985), 71.

[59] Jamie Mackie and Andrew MacIntyre, "Politics," in I*ndonesia's New Order the Dynamics of Socio-Economic Transformation*, edited by Hal Hill (Honolulu: University of Hawaii Press, 1994), 1-53.

enterprises derive from the president and his immediate circle of lieutenants at the apex of the power structure."[60]

In undertaking village electrification projects, the New Order regime used its control over financial and technical resources to create a patron-client relationship with the populace. This relationship between the ruler and the ruled established a "'personal rulership' [that] does not require any belief in the ruler/leader's personal qualifications, but is based mainly on material incentives and rewards."[61] I will show that the Soeharto government's motivations to electrify the countryside, although frequently claimed to improve the socioeconomic conditions of people in the villages, were *also* political. In particular, the New Order regime connected the provision of electricity in the villages with electoral politics. As more and more villages were lit, the regime could show "proof" of the progress of its development programs. In return, the government asked people to support its development agenda by enrolling them in the national endeavor and to persuade villagers to vote for the ruling political party GOLKAR in the general elections. This way the New Order government could count on villagers to cast their votes to help GOLKAR and President Soeharto stay in power for thirty-two years. The technology that the New Order regime used and developed in this case was the installation of diesel power plants, which were easily constructed and fueled by oil that Indonesia produced abundantly. I call the Soeharto government's practices of rewarding technological benefits *patrimonial technopolitics*. The New Order government employed technology to extend political patronage and developed the corresponding sociotechnical system to enact this goal.

Science, Technology, and National Identity

[60] Mackie and MacIntyre, "Politics," 6.
[61] Robin Theobald, "Patrimonialism," *World Politics*, Vol. 34, No. 4 (Jul.,1982): 548-559, 549.

Benedict Anderson in his influential book about nationalism asserts, "Indeed, nation-ness is the most universally legitimate value in the political life of our time."[62] Many newly created nations following the end of World War II embraced the idea of nationhood and sought to create their distinctive national identities. Michael Billig who has studied how established nations continually "flag" or remind their citizens of their nationhood writes, "To have a national identity is to possess ways of talking about nationhood."[63] But nationalism and national identity are not just discursive acts about one nation's character. Gabrielle Hecht argues that materiality comes into play as well in defining and maintaining a national identity. In fact, her definition of national identity, which is "the ways in which people imagine the distinctiveness of their country and define uniquely national ways of doing things," encompasses both symbolic and material aspects of it.[64]

Hecht's insight came by critically examining the notion of "technological style," put forth by earlier scholars. Thomas P. Hughes who analyzed the history of electrification in three Western cities in his *Networks of Power* (1983) argued that even though electrical knowledge and technology remain the same where they travel, the resulting electrical systems built in these different areas differed "because the geographical, cultural, managerial, engineering, and entrepreneurial character of the three regions differed."[65] He wrote, "[the] concept of style suggests that there was-and probably is-no one best way of supplying electricity."[66] In a later publication, Hughes elaborated on the concept of technology style. He wrote:

> The concept of style also facilitates the writing of comparative history. The historian can search for an explanation for the different characteristics of a particular technology, such

[62] Benedict R. O'G Anderson, *Imagined Communities: Reflections on the Origin and Spread of Nationalism*, Revised ed. (London: Verso, 2006), 3.
[63] Michael Billig, *Banal Nationalism* (London: Sage, 1995), 8.
[64] Hecht, *The Radiance of France*, 10.
[65] Hughes, *Networks of Power*, 17.
[66] Hughes, *Networks of Power*, 17.

> as electric power, in different regions. The problem becomes especially interesting in this century when international pools of technology are available to the designers of regional technology because of the international circulation of patents, internationally circulated technical and scientific literature, international trade in technical goods and services, the migration of experts, technology transfer agreements, and other modes of exchange of knowledge and artifacts.[67]

Although Hughes admitted that the concept of technological style coupled with social shaping of technology help both analysts and practitioners "to avoid reductionist analyses of technology," Hecht problematizes the concept of technological style.[68] She argues that to ask, "'What is French about the French nuclear program?' has little value."[69] French engineers, scientists, and technicians did indeed design and create their own nuclear reactors. But they also interacted with people from outside of France. Hecht writes, "CEA's most important scientists had learned a great deal from their Canadian experiences. The 1955 Atoms for Peace conference had made possible a slow but steady international flow of information."[70] As a result, Hecht writes, "There was no such thing as an essential French technological style. Engineers did not make the choices they did *because* they were French."[71] Instead, Hecht offers the notion of national identity to analyze engineering choices "as part of a struggle to define Frenchness" after the Second World War.[72]

In their introductory article of a special edition exploring science, technology, and national identity, Carol Harrison and Ann Johnson write, "national identity is rooted in a tradition of invention as well as in the invention of tradition."[73] This argument points to the ways countries actively use science and technology in the struggle to define their identities. Often, the creation of a particular national identity shaped the trajectory of technological

[67] Hughes, "The Evolution of Large Technical Systems," 69.
[68] Hughes, "The Evolution of Large Technical Systems," 69.
[69] Hecht, *The Radiance of France*, 3.
[70] Hecht, *The Radiance of France*, 3.
[71] Hecht, *The Radiance of France*, 3, original emphasis.
[72] Hecht, *The Radiance of France*, 3.
[73] Carol E Harrison and Ann Johnson, "Introduction: Science and National Identity," *Osiris* 24 (2009), 3.

development and the perceptions of scientists, engineers, and policy makers in imagining and realizing their vision of modernity.[74] National identity has also been used as a strategic positioning by a country within a global community of other nations to exert its authority over a certain domain. For example, Canadian scientists used the distinct Canadian landscape and geography north of the 60th parallel to argue that only Canadians can and should conduct ionospheric research in the area.[75] Similarly, South Africa had argued that it deserved to become a member of International Atomic Energy Agency (IAEA) because it possessed a sufficient degree of "nuclearity."[76]

In his book *Encountering Development* (1995), the anthropologist Arturo Escobar traces the genealogy of the development discourses and contends that the idea of the "Third World" and the need to develop the peoples living there were shaped by several factors converging together, which among other things included the process of political decolonization in Asia and Africa, the Cold War, and the belief in science and technology.[77] He highlights several examples in which societies in Nepal, Papua New Guinea, Kenya, and Colombia have produced hybrid cultures by appropriating and combining the "modern" and the "traditional" ways of lives. In short, Escobar espouses the "unmaking of the Third World" to allow different perspectives of modernity to emerge and take shape.[78] There were some attempts by other thinkers such as Mohandas Gandhi who tried to offer an alternative view of modernity. But Gandhi's idea only had a marginal effect in the world. Gandhi's thinking, however, did manifest in E.F.

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[74] Ross Bassett, "MIT–Trained Swadeshis: MIT and Indian Nationalism, 1880–1947," *Osiris* 24 (2009), 212-230.
[75] Edward Jones-Imhotep, "Communicating the North: Scientific Practice and Canadian Postwar Identity," *Osiris* 24 (2009), 144-164.
[76] Gabrielle Hecht, "Negotiating Global Nuclearities: Apartheid, Decolonization, and the Cold War in the Making of the IAEA," *Osiris* 21 (2006), 25-48.
[77] Escobar, *Encountering Development*, 32.
[78] Escobar, *Encountering Development*, 48-54.

Schumacher's work *Small is Beautiful* (1973), which advocated, "intermediate machines, localized and labor-intensive production, environmental checks on human artifice, and sustainability."[79]

New Order Indonesia, too, tried to construct an alternative pathway to modernity. Ali Moertopo wrote, "Indonesia must find a unique development model, namely, one which can prove that modernization is not identical with 'westernization' thereby guaranteeing the success of development in developing countries."[80] As we will see in chapter 2, the New Order government found the answer in Pancasila. To the Soeharto regime, Pancasila did not just serve as "a workable ideology" uniting the entire population to achieve its own version of modernity, but also served as the basis of the country's national identity.[81] In other words, Eka Darmaputera asserts, Pancasila was the solution to "the problem of how to maintain the Indonesian identity without inhibiting progress, and how to progress without losing identity."[82]

Darmaputera argues that Pancasila, which had been taken up by many social groups and by both Sukarno and Suharto despite having opposite ideas about politics and economy, had successfully served to integrate Indonesia's stunningly diverse societies as one nation. The reason, Darmaputera added, is that Pancasila allows an ambiguous approach to offer an effective solution to an existential problem Indonesia had faced in its history, which was the threat of disintegration. Darmaputera calls Pancasila's "neither this nor that" approach as its most beneficial feature.[83] As a result, the so-called "Pancasila Democracy [espoused by Suharto] is *neither* a liberal democracy *nor* is a proletarian democracy. Pancasila Economy [put forth by Dr.

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[79] Adas, *Dominance by Design*, 274.
[80] Moertopo, *Some Basic Thoughts*, 105.
[81] Eka Darmaputera, "Pancasila and the Search for Identity and Modernity in Indonesian Society: A Cultural and Ethical Analysis" (PhD Diss, Boston College, 1982), 16.
[82] Darmaputera, "Pancasila and the Search for Identity and Modernity in Indonesian Society," 17.
[83] Eka Darmaputera, *Pancasila Identitas Dan Modernitas Tinjauan Etis Dan Budaya* (Jakarta: BPK Gunung Mulia, 1987), 135, 146.

Mubyarto in the New Order] is neither a capitalist economic system nor a socialist one that does not give space for the private industries to maneuver."[84] This "neither this nor that" aspect of Pancasila and a national character based on these principles, I would argue, made Indonesia's identity a "postcolonial" identity.

The adjective "postcolonial," here, drawn in part from Akhil Gupta's book *Postcolonial Developments* (1998) and several other works by science and technology studies scholars, refers not to the period following the decolonization process that found many new countries in Asia and Africa, but to the condition of hybridity.[85] While scholars of postcolonial technoscience highlight the hybrid condition of the practices and productions of scientific knowledge and technological artifacts in many countries arising from the historical interactions between former colonizers and their colonies as well as from contemporary interactions among nations, I contend that Indonesia's Pancasila-based national identity was a *blended identity* that allowed the incorporation of both "western" and "non-western" ideals and traditions. To the New Order regime, an identity of Indonesia as a developing Pancasila nation was important not just to construct, "the image of a quietly modernizing country, both to attract foreign investors and to create a climate in which they would be willing to work," but also to justify its development policies to the Indonesian citizens.[86]

A nation's national identity, however, is not just used as a key to having a legitimate political order and to bind people for justified collective action that's called by state. It is also used to place a country within the global sociopolitical context. Among several examples,

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[84] Darmaputera, *Pancasila Identitas Dan Modernitas*, 138.
[85] See for examples the introductory articles of two special issues on postcolonial science and technology studies: Warwick Anderson, "Introduction: Postcolonial Technoscience," *Social Studies of Science* 32, no. 5/6 (Oct. - Dec., 2002), 643-658; Suman Seth, "Putting Knowledge in its Place: Science, Colonialism, and the Postcolonial," *Postcolonial Studies* 12, no. 4 (2009), 373-388.
[86] Moon, "Justice, Geography, and Steel," 267.

historians of technology have examined the co-construction of national identities with nuclear reactors in post-World War II France, a long canal in nineteenth century France, a rocket program in 1950s Soviet Union, and a countrywide public railway network in post-independence Belgium in the 1830s.[87] In the case of Thailand, as detailed by Thongchai Winichakul in his book *Siam Mapped* (1994), an emerging sense of nationhood prompted the Thai monarchy in the nineteenth century to employ the science of cartography and the technology of map making to delineate a more precise territorial boundary of the Thai nation than was imagined before.[88] India developed a nuclear program with the primary goal of putting the country "[on the] international scientific and technological map." To give another example, Hecht and Edwards write, "More than any other nation, Japan explicitly connected computers with national identity."

Having a shared national identity legitimized and justified the state to undertake of a technoscientific project. John Krige and Kai-Henrik Barth who have written about science, technology, and international affairs, write, "A concept of development promulgated by the West provided elites in some of these countries with a vision of the postcolonial order and of national identity that included science and technology at its core."[89] In the case of New Order Indonesia, to create an identity of Indonesia as a successful developing country in its national development endeavor for an international audience, the New Order used Bali as a showplace to showcase its advancement in village electrification and other development projects. The attention given and

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[87] Hecht, *The Radiance of France Nuclear Power and National Identity After World War II* (Cambridge, MA: The MIT Press, 1998); Chandra Mukerji, "The New Rome: Infrastructure and National Identity on the Canal Du Midi," *Osiris* 24 (2009), 15-32; Asif A Siddiqi, "Germans in Russia: Cold War, Technology Transfer, and National Identity," *Osiris* 24 (2009), 120-143; Greet De Block, "Designing the Nation: The Belgian Railway Project, 1830-1837," *Technology and Culture* 52, no. 4 (October 2011), 703-732.
[88] Thongchai Winichakul, *Siam Mapped a History of the Geo-Body of a Nation* (Honolulu: University of Hawaii Press, 1994).
[89] John Krige and Kai-Henrik Barth, "Introduction: Science, Technology, and International Affairs," *Osiris* 21, no. 1 (2006), 9.

resources poured by the New Order regime to Bali's electrical development made Bali today remains the first and only province in Indonesia whose entire villages had been connected to the grid. This has occurred at the expense of many areas in the neighboring provinces whose importance to the New Order regime internationally is less than that of Bali.

Post World War II Modernization Theory

Following the end of the Second World War, many newly independent nations in Asia and Africa engaged in national development informed by the discourses of modernization theory. Michael Adas showed that modernization theory was born out of a historically specific moment during the Cold War when the United States wanted to exert and maintain influence in many newly created nation-states as it was fighting an ideological war with the Soviet Union. The launching of Sputnik by the Soviet Union on 4 October 1957 marked a special moment. Although the American public has generally understood that the Soviet's artificial satellite indicated the beginning of the space (and also the arms) race between the two global superpowers, it also denoted the beginning of the development of the modernization theory. Here I follow Michael Adas' interpretation and explanation of the event. He writes that the Soviet's launching of Sputnik and a month later Sputnik II shook Americans' confidence in their scientific and technological prowess, especially after the United States successfully led the Allies to victory in the Second World War.[90] In the wake of this event and others such as the Soviet-assisted Aswan Dam project in Egypt, the United States found it critical to change its approaches overseas to exert its clout among the newly independent Asian and African nations.[91]

[90] Michael Adas, *Dominance by Design: Technological Imperatives and America's Civilizing Mission* (Cambridge, MA: Belknap Press of Harvard University Press, 2006), 238-240.
[91] Adas, *Dominance by Design*, 242.

Part of the overall effort required producing knowledge of other societies and their foreign cultures. The institutionalization of this endeavor took the form of the creation of emerging disciplines of area studies programs, federally funded research, and think tanks. The first institution built was the Center for International Studies (CENIS) at the Massachusetts Institute of Technology (MIT). CENIS-produced studies became the embryo of what would be called the modernization theory that would be adopted by ruling regimes in some developing countries.[92] For example, at MIT, economics professor Benjamin Higgins headed the Indonesia Project in the 1950s and recruited "very able" American researchers including Ruth McVey, Clifford and Hildred Geertz.[93] Higgins wrote a book on Indonesia's post-independence economy *Indonesia's Stabilization and Development* (1957) and also published a "widely read textbook" *Economic Development* (1959).[94] He helped draw up Indonesia's first Five-Year Plan (1956-1960), which the New Order government later used as a model.[95]

One of Higgins' students at MIT in the 1950s was a young Indonesian named Mohammad Sadli who received a scholarship from the International Cooperation Administration (ICA) to earn his master's degree in economics.[96] Another young Indonesian named Subroto spent a year at MIT "under the care of Professors Benjamin Higgins and William Hollinger" to prepare his doctoral dissertation, which he would complete at the University of Indonesia in 1957.[97] Sadli and Subroto would later play an important role in shaping Soeharto's thinking about economic development. In the late Old Order period, Sadli and his colleagues at the Faculty of Economics of the University of Indonesia (FEUI) were invited by Sadli's "old friend"

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[92] Adas, *Dominance by Design*, 242.
[93] Jamie Mackie, "In Memoriam: Professor Benjami Higgins, 1912-2001," *Bulletin of Indonesian Economic Studies*, 37, No. 2 (2001), 186.
[94] Ibid., 183
[95] Ibid.
[96] Mohammad Sadli, in The Kian Wie (ed), *Recollections The Indonesian Economy, 1950s-1990s*, 122.
[97] Subroto, in The Kian Wie (ed), *Recollections The Indonesian Economy, 1950s-1990s*, 227.

Colonel Suwarto, Commander of the Staff and Command School of the Army (*Sekolah Staf dan Komando Angkatan Darat, Seskoad*), to teach there.[98] Suwarto thought that Indonesian army officers had to be trained in other areas than military affairs. Thus he designed the Seskoad curriculum, "which only 50% comprised [of] military courses, while the remainder consisted of economics, law, political science, sociology, and philosophy."[99] Soeharto, who was in attendance, heard lectures on economics delivered by Sadli and his fellow FEUI colleagues Widjojo Nitisastro, Subroto, and Emil Salim.[100]

Similar programs like the one established at MIT were established elsewhere. At Cornell University the Cornell Modern Indonesia Project (CMIP) was founded in January 1954 with substantial financial support from the Ford Foundation who funded it for two decades until 1974.[101] Under the directorship of George McT. Kahin CMIP would invite, recruit, and train generations of both Indonesian and non-Indonesian scholars. Some Indonesians who were trained at Cornell University in this period included the sociologist Selo Soemardjan who received his doctorate in 1959. When (by this time) Lt. General Suwarto held a follow-up gathering called the "Second Army Seminar" in Bandung in August 1966 to prepare several army officers for their role in the New Order government, the attendees were put into three different "syndicates": economics, politics, and military. Mohammad Sadli, Selo Soemardjan, Sarbinini Sumawinata, and a few others were invited to give lectures to members of the political syndicate.[102] Widjojo and his friends taught army officers in the economic syndicate. The

[98] Sadli, in *Recollections*, 125.
[99] Sadli, in *Recollections*, 126.
[100] Sadli, in *Recollections*, 126.
[101] Jean Gelman Taylor, "A History of Indonesian History," in *Producing Indonesia: The State of the Field of Indonesian Studies*, ed. Eric Tagliacozzo (Ithaca, NY: Southeast Asia Program Publications, 2014).
[102] Sadli, in *Recollections*, 126. See also Peter McCawley and Thee Kian Wie, "In Memoriam: Widjojo Nitisastro, 1927–2012," *Bulletin of Indonesian Economic Studies*, 48, no. 2 (2012), 277.

Seminar proved to be paramount importance in shaping the New Order government. General (ret.) Soemitro, a former Commander for the Restoration of Security and Order Operations (1971-1974), claimed, "to me that particular seminar was the main source, if not the only source, of inspiration for the New Order. The Bandung Seminar was the inspiration of the formation of the New Order government. … The New Order originated in Bandung."[103] Sadli shared the same opinion. He wrote that the Seminar was important because it "presented to the Army leadership—the crucial element in the New Order—a 'cookbook' of 'recipes' for dealing with Indonesia's serious economic problems."[104] Later, General Soeharto not only used the "cookbook" but also asked the "recipe" writers to repair Indonesia's battered economy. Consequently Mohammad Sadli, Widjojo Nitisastro, Subroto, Emil Salim, and Ali Wardhana became influential members of Soeharto's Team of Economic Advisers in the early years of the New Order.[105] As for Soemardjan, he served as the Secretary (1973-1978) to Soeharto's first vice president Sultan Hamengku Buwono IX.

As we can see, the establishment of these centers in the United States helped shape the thinking of the New Order influential advisers and cabinet members on doing development largely drawn from the works on post Word War II modernization theorists. When Soeharto rose to power, he strengthened the state's role in development, built a huge bureaucracy, appointed US-educated technocrats in his cabinet,[106] rolled out Five-Year Development programs

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[103] Soemitro and Ramadhan K.H., *Soemitro, mantan Pangkopkamtip: Dari Pangdam Mulawarman Sampai Pangkopkamtib,* (Jakarta: Pustaka Sinar Harapan, 1994), 124.
[104] Sadli, in *Recollections*, 127.
[105] Ibid., 41. Unlike his FEUI colleagues, Sadli did not stay long in the New Order regime. In 1978, he was not reappointed as minister and would later even become one of the radical critics of the regime. See Hal Hill and Thee Kian Wie, Moh. Sadli (1922-2008), "Economist, Minister, and Public Intellectual," *Bulletin of Indonesian Economic Studies*, Vol. 44, No. 1 (2008): 151–6.
[106] The most famous among them were the architects of the New Order economic development and members of the so-called "Berkeley Mafia," named after University of Berkeley where they received their economics training: Widjojo Nitisastro, Emil Salim, Ali Wardhana, and J.B. Soemarlin.

(*Pembangunan Lima Tahun, PELITA*), marshaled resources, and called Indonesian citizens to participate in his national development agenda.

The New Order's Ideology of National Development

Soeharto liked to say in many of his speeches that doing development programs was the sacred duty of all Indonesians to "fill in the era of independence" (*mengisi kemerdekaan*) with the aim of achieving Indonesia's national goal.[107] PERTAMINA Main Director Piet Haryono, who Soeharto installed to succeed Ibnu Sutowo, wrote in a 1978 speech that the only way to improve the lives of Indonesian was through development. He wrote, "Ever since the New Order [began], it has been stressed that to fill in the independence can only be done with a planned development, staged development, and with development according to our ability."[108] Although the phrase "*mengisi kemerdekaan*" invoked a nationalistic sentiment (what else do Indonesians need to do but to develop after gaining independence?), the notion of national development that Soeharto advocated, as I indicate above, was heavily influenced by the discourses and practices of "national development" that was occurring in many newly emerging countries. Itty Abraham writes:

> Development was the name given to a wide range of practices that took as their object the 'third' world of newly independent nations. These practices sought especially to improve economic growth as measure through GDP statistics; saw economic change as something that could be induced from without, relying on strengthening the state and using Keynesian fiscal policy; and were based on a selective and partial reading of Western experiences in the 18th and 19th centuries to reify a normalised trajectory of historical change. This was a modernist project, deeply influenced by the Enlightenment's values

[107] In his autobiography Soeharto wrote, "[T]he determination of the New Order is to make development successful in filling in the national independence. Its philosophical foundation is Pancasila, its constitutional foundation is the 1945 Constitution, and its operational foundation is GBHN [Broad Outlines of State Policy]." Soeharto, G. Dwipayana and K. H. Ramadhan, *Soeharto, Pikiran, Ucapan, Dan Tindakan Saya Otobiografi* (Jakarta: Citra Lamtoro Gung Persada, 1989), 524.

[108] Piet Haryono, Peranan Minyak Dalam Pembangunan Nasional Pidato Sambutan Direktur Utama PERTAMINA," in *Penyediaan Energi Untuk Daerah Pedesaan (Hasil-hasil Lokakarya Energi, 25-26 Mei 1978, Jakarta)*, edited by Pramono Djojowikromo et al. (Jakarta: Percetakan Pertamina, 1978), 17.

> of secularism, faith in science, exploitation of nature, and above all, optimism for the future that transmutes into hubris about what is possible through the application of these values. These ideas and practices were institutionalized as the ideology of modernisation, its 'house name' being development studies.[109]

One aspect of this "normalized trajectory of historical change" is the notion of unproblematic technological (and with it the implied social) progress moving along a linear pathway. Science and technology studies scholars have unpacked and problematized this so-called "master narrative" of history of technology, i.e. the belief that the historical trajectory of technology in the West could or should be a model and even a standard for the development of technology elsewhere, which spurred the so-called technological and scientific transfers in international development.[110] In reality, the introduction of technology from one society to another involved, as Suzanne Moon has shown, a "technological dialogue" between the "transferring and receiving agents" (even though this "dialogue" was usually asymmetrical).[111] Even when a technology is introduced within a society, there could have been modes of "transformative resistance" that shaped how the technology would be eventually used and given meanings by its users.[112]

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[109] Itty Abraham, *The Making of the Indian Atomic Bomb: Science, Secrecy and the Postcolonial State* (London; New York; New York, NY: Zed Books; Distributed exclusively in the USA by St. Martin's Press, 1998), 11-12.

[110] For a survey on the "technology transfer" literature, see Bruce E. Seely, "Historical Patterns in the Scholarship of Technology Transfer," *Comparative Technology Transfer and Society* 1, no. 1 (April, 2003), pp. 7-48. For studies that have problematized technological transfers in development, see for examples Shannon R. Brown, "The Ewo Filature: A Study in the Transfer of Technology to China in the 19th Century," *Technology and Culture* 20, no. 3 (1979), 550-568; Deborah Fitzgerald, "Exporting American Agriculture: The Rockefeller Foundation in Mexico, 1943-53," *Social Studies of Science* 16, no. 3 (1986), 457-483; Judith Carney, "Landscapes of Technology Transfer: Rice Cultivation and African Continuities," *Technology and Culture* 37, no. 1 (1996), 5; Bryan Pfaffenberger, "The Harsh Facts of Hydraulics: Technology and Society in Sri Lanka's Colonization Schemes," *Technology and Culture* 31, no. 3 (1990), 361-397.

[111] For technological dialogue see Suzanne M. Moon, "Takeoff of Self-Sufficiency? Ideologies of Development in Indonesia, 1957-1961," *Technology and Culture* 39, no. 2 (1998): 187-212.

[112] Ronald R. Kline, "Resisting Development, Reinventing Modernity: Rural Electrification in the United States before World War II," *Environmental Values* 11, no. 3 (2002), 327-44.

Michael Adas criticizes the models of post-World War II development offered by the Soviet Union and by the United States. Even though the two seemed to be radically different he writes, "Both [models] viewed the mastery of western science and industrialization as essential to the improvement of humankind."[113] Furthermore, the notion of using science and technology to develop and modernize "backward" peoples has a historical precedent that can be traced back to nineteenth-century European imperialism.[114] Adas argues that the belief that material achievement is an important mark of modernity or advancement ("machines as the measure of men") undermines and even denigrates efforts to seek alternatives to modernity or even to question what other societies thought of being modern. Adas does not deny the benefits of American (or the Soviet's) role in development. But he argues that while American aid in the some of the countries he highlights in his book "undoubtedly contributed to infrastructural improvements, economic growth, and higher living standards for some—especially urban and elite—social groups in emerging nations. […] the development formulas promoted by both capitalists and communists neglected--or espoused transformations that were contrary to--the interests of most of the people in these nations."[115]

Highly influenced by the discourse of post-World War II modernization theorists, Soeharto aimed to modernize the country along the same path mentioned by W.W. Rostow in his book *The Stages of Economic Growth* (1960).[116] In fact, Soeharto's repeated refrain was to prepare Indonesia to get to the "takeoff" (*tinggal landas*) stage within the first long-term development program (*Pembangunan Jangka Panjang I, PJP*-I) in 25 years. To achieve this

[113] Adas, *Dominance by Design*, 247.
[114] Michael Adas, *Machines as the Measure of Men: Science, Technology, and Ideologies of Western Dominance* (Ithaca, NY: Cornell University Press, 1989).
[115] Adas, *Dominance by Design*, 276-277.
[116] W. W. Rostow, *The Stages of Economic Growth: A Non-Communist Manifesto* (Cambridge, England: Cambridge University Press, 1960).

intermediate goal, the Soeharto government found it imperative to employ technology as "an accelerator in the process of modernization."[117] In other words, technology did not serve as an end to the New Order's development agenda (at least in the beginning), but rather as a means to achieve the status of a modern state.

Village Development in New Order's National Development Agenda

Central to Soeharto's agenda of national development was developing Indonesia's countryside. The New Order regime was aware that most Indonesians lived and made their living in the rural areas. It therefore set a course on its national development emphasizing the development of Indonesia's numerous villages. A little over year after Soeharto formed his first cabinet in June 1968, he delivered his second annual state of the nation address on 16 August 1969 before Parliament. In his speech, President Soeharto declared, "Development needs technology, development needs an open mind […] Renewal must rise in the villages, because it is in these villages the strength of our development resides."[118] In the same speech, he reported that the money (Rp 100,000) he had allocated a year earlier and sent to some Javanese village chiefs to develop their villages "had been used well."[119]

To help plan village development the Soeharto government through the Department of Home Affairs (*Departemen Dalam Negeri*) categorized Indonesia's then estimated 60,000 villages into three types according to their state of development: a *swasembada* (self-supporting) village was ranked as the most developed village, a *swadaya* (self-help) village as a kind of

[117] Moertopo, *Some Basic Thoughts*, 54.
[118] Soeharto, "Pidato Kenegaraan Presiden Republik Indonesia Djenderal Soeharto Di Depan Sidang DPR-GR 16 Agustus 1969" (Annual State of the Nation Speech, 1969). A copy is available online at: http://soeharto.co/tag/dpr-gr.
[119] Soeharto, "Pidato Kenegaraan 1969." In 1968, the average exchange rate was 269 rupiahs to the US dollar.

transitory village in the middle, and a *swakarya* (self-working) village was thought to be the least developed of all three.[120]

In making these classifications, the Department of Home Affairs tied people's way of life and their adoption and use of technology to the type of village they lived in. Thus in a swakarya village people there were still thought to be "traditional" and their relationships were strongly governed by local customs. Their livelihood was typically homogenous and only to subsist themselves. In a swakarya village, the local customs were undergoing a transition from outside influences and people's livelihoods in this village were more diversified. In a swasembada village, the local customs no longer bound the relationships among people in that village, villagers earned their living in a variety of occupations, there were adequate infrastructures (e.g. roads, irrigation system, schools, health centers, and electricity), and the adoption of a new technology was high.[121]

These categories provided the New Order government a language for its development program. One of the objectives in each of the New Order's Five-Year Development period (April 1969 – March 1974) was to transform as many lower-ranked villages to the next level as possible.[122] The main goal was to transform all of Indonesian villages into *swasembada* villages

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[120] The reported total number of Indonesia's villages has changed over time, as new villages were formed and better census techniques produced more accurate data. For example, in an elaboration of a 1975 ministerial decree on village electrification policy, the number of villages was estimated at around 58,164. In an unpublished 1980 PLN report, the number was given as 61,106 (PLN 1980). In 1984, Indonesia's Department of Home Affairs counted that there were 66.173 villages, quoted in "Kunjungan Kerja Menteri Pertambangan dan Energi," *Pertambangan dan Energi*, No. 3 1987, 15. PLN tends to use the rounded up figure of 60,000 villages its official publications (e.g. PLN 1997, 11).

[121] PLN's former Main Director Sardjono (1980-1988) elaborated these village categories during a question and answer session after his predecessor Suryono presented a paper in a workshop on energy provision for the villages. See Suryono, "Penyediaan Tenaga Listrik Untuk Pedesaan," in *Penyediaan Energi Untuk Daerah Pedesaan (Hasil-hasil Lokakarya Energi, 25-26 Mei 1978, Jakarta)*, edited by Pramono Djojowikromo et al. (Jakarta: Percetakan Pertamina, 1978), 91.

[122] The acronym PELITA was used interchangeably with REPELITA, a short for *Rencana Pembangunan Lima Tahun* (Five-Year Development Plan).

by the year 2000.[123] At one point, in fact the Minister of Home Affairs Amirmachmud once expressed in 1978 that the real intent of Indonesia's village development was to turn all of them into Pancasila villages, which I think he meant to make all of Indonesia's villages swasembada villages steeped in the Pancasila principles.[124]

Initially, the New Order's village improvement program consisted mainly of rolling out an agricultural intensification program. Subroto, one of Soeharto's long-serving cabinet ministers, wrote that as the Minister of Transmigration and Cooperatives in the Soeharto's first cabinet, he introduced the Law of Cooperatives to help establish village coops in the countryside. He wrote that it was through these "village cooperatives" (*Koperasi Unit Desa, KUD*) and "village enterprises" (*Badan Usaha Unit Desa, BUUD*) that "the 'Mass Guidance' (BIMAS) and 'Mass Intensification' (INMAS) agricultural intensification programs were launched."[125] While the farmers were free to sell their rice to any buyers, KUD would purchase their rice at a guaranteed minimum price, assuring farmers of a minimum income.

Subroto further added that there was an intense debate among "five economic technocrats" in Soeharto's first cabinet about which development model the New Order government should follow.[126] In the end, they decided to emphasize village development. Subroto recounted the episode as follows:

> A popular model of development was the Indian model[,] which from the beginning emphasized the development of heavy industry. Our emphasis, however, was to begin by developing the rural sector. Fortunately in promoting this idea we had a very sympathetic ear from President Soeharto because of his background. Our simple model was based on the assumption that an 'upward spiral movement' would result from increased effective

[123] Umar Said, the Director General of Village Development of the Department of Home Affairs was quoted by *Bali Post* to say that he hoped all of Indonesia's villages can be swasembada villages by the year 2000. Made Dibia, "Harapan Di Tahun 2000: Semua Desa Berswasembada," *Bali Post Edisi Pedesaan* (Bali Post Village Edition), 16 September, 1981.
[124] "Menuju Desa Pancasila," *Bali Post*, 3 March 1978.
[125] Subroto, in *Recollections*, 235.
[126] Subroto, in *Recollections*, 236.

> demand by the agricultural sector and from the increased supply of agricultural inputs to stimulate the growth of the industrial sector.[127]

Noting President Soeharto's preference and background, Subroto showed how the New Order government came to prioritize developing Indonesia's countryside in Indonesia's national development agenda. President Soeharto himself admitted to paying a great deal of attention to village development, which he wrote in his autobiography.[128] Thus, early on the New Order government had emphasized developing the countryside in its national development plan. The government claimed that village development was the "backbone of national development" and that bringing electricity to the villages was a vital part of this effort.[129] In fact, in 1970 the Director General of Village Development (*Direktorat Djenderal Pembangunan Masjarakat Desa*) of the Department of Internal Affairs Soedharmo Djajadiwangsa asserted that village development and modernization could not be imagined without electricity.[130]

When the Soeharto government evaluated its overall village development program at the end of its second Five-Year Development period, however, it noticed to its dismay that it had not succeeded in transforming as many villages into *swadaya* villages as it had hoped. At the end of the first PELITA on 31 March 1974, there were 3 percent *swasembada*, 44 percent *swadaya*, and 53 percent *swakarsa* villages.[131] By the end of the second PELITA on 31 March 1979, the Department of Home Affairs assessed that there were 19.1 percent *swasembada,* 23.5 percent

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[127] Subroto, in *Recollections*, 236.
[128] For Soeharto's admission on paying a great attention to village development, see Soeharto et al., *Soeharto*, 400.
[129] I have noted several New Order bureaucrats who have used this expression. Johannes J. Rumodor, the first and only head of PLN's Sub-Directorate of Village Electrification mentioned this in his 1978 article on the national program of village electrification in Johannes J. Rumondor, "Program Perusahaan Umum Listrik Negara Untuk Perlistrikan Desa," *Berita PLN*, January, 1978, 32, 40. The District Head of Garut in West Java uttered these words when he inaugurated a micro diesel power plant in a village in 1979. See "Pedesaan Adalah Tulang Punggung Pembangunan," *Berita PLN*, May 1979, 35.
[130] Direktorat Djenderal Tenaga dan Listrik, *Hasil-Hasil Workshop Kelistrikan Desa 12 s/D 14 Maret 1970* (Dirjen Gatrik Departemen PUTL, 1970), 1.
[131] PLN Sub Direktorat Perlistrikan Desa, "Program Perusahaan Umum Listrik Negara Untuk Perlistrikan Desa" Jakarta, 1977, 20.

swadaya, and 57.4 percent *swakarsa* villages.[132] The bulk of the villages still fell into the lower rank categories.

Because its goal fell short, the Soeharto government began to systematize its village development endeavor. Soeharto's Three Principles of Development (known in Indonesian as *Trilogi Pembangunan*) aimed to secure national stability, to increase economic growth, and to equalize the benefits of development, in that order, during for the first ten years of his rule. Starting in the third PELITA, Soeharto reversed the second and third of these goals. The objective, therefore, was to achieve equality and social justice across the archipelago by transforming more villages into swasembada villages. Equalization (*pemerataan*) became the regime's key word in the third PELITA and the Eight Paths to Equalization (*Delapan Jalur Pemerataan*) spelled out areas that government programs must address. These areas included equity in meeting basic needs, in education, income, employment, entrepreneurial opportunities—as especially as these concerned women and youth—and in justice, and among regions.[133]

In the same year the Soeharto regime enacted a Village Law (Law No. 5/1979) that homogenized Indonesia's varied village government structures using the Javanese village system as a model. It also expanded its village development program to include bringing newspapers, television, and electricity to the countryside. The programs, respectively known as *Koran Masuk Desa* (Newspaper Enters into Villages), *Televisi Masuk Desa* (Television Enters into Villages),

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[132] Departemen Penerangan, *Kegiatan Dan Hasil ABRI Masuk Desa Manunggal I s/D X* (Jakarta: Departemen Penerangan Republik Indonesia, 1983), 7. The increase (rather than the decrease) of the number of *swakarsa* villages were most likely because additional villages had been identified and/or more villages created by the government program of transmigrating people from the heavily populated Java to other islands in the country.

[133] For an elaboration of these eight paths, see Widjojo Nitisastro, "Program Pemerataan," in Widjojo Nitisastro, *Pengalaman Pembangunan Indonesia Kumpulan Tulisan dan Uraian Widjojo Nitisastro* (Jakarta: Penerbit Kompas, 2010), chapter 22.

and *Listrik Masuk Desa* (Electricity Enters into Villages), were later supplemented in 1980 by a program to send soldiers to the villages, also known as the *ABRI Masuk Desa* or AMD (the Indonesian Armed Forces Enter the Villages) program. Together with villagers these soldiers built roads, bridges, and sanitation facilities.[134] In some cases AMD soldiers worked with PLN employees to install electrical poles and lines in the villages.[135] The other main task these soldiers carried out was to educate and train villagers in their rights and responsibilities as citizens with an emphasis on how to participate in national defense.[136]

All of these programs occurred more or less simultaneously in the third PELITA period, although planned, led, and implemented by different government departments. Bringing electricity to the villages became a leading village improvement program.[137] The New Order government believed that electricity would stimulate economic activities and increase the welfare of the people living in the countryside as a consequence poured huge resources to

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[134] President Soeharto reiterated these programs in his annual State of the Union address (pidato kenegaraan) in August 1980. See Soeharto, "Pidato Kenegaraan Presiden Republik Indonesia Soeharto Di Depan Sidang Dewan Perwakilan Rakyat 16 Agustus 1980" (Annual State of the Nation Speech, 1980). For studies on the BIMAS program see Irlan Soejono and Wirjadi Prawirohardjo, *Program "Bimas" Sebagai Pendorong Modernisasi Usahatani* (Bogor, Indonesia: Survey Agro Ekonomi Indonesia, 1968); William L. Collier, *Use of High Yielding Rice Varieties and Participation in Bimas Programs on Java* (Bogor, Indonesia: Agro Economic Survey, 1972); Achmad T. Birowo, *BIMAS: A Package Program for Intensification of Food Crop Production in Indonesia* (New York: Asia Society, SEADAG, 1975). For ABRI Masuk Desa, see Dinas Penerangan Angkatan Darat, *Sewindu TNI-ABRI Masuk Desa, 1980-1988* (Jakarta: Dispenad, 1988).

[135] See Dinas Penerangan Angkatan Darat, *Sewindu TNI-ABRI Masuk Desa, 1980-1988* (Jakarta: Dispenad, 1988), 171.

[136] Angkatan Darat, *Sewindu TNI-ABRI Masuk Desa*, 32.

[137] The domestic fund allocated to develop Indonesia's electrical infrastructure from 1969 until 1984 amounted to Rp 1,556 billion and the foreign fund the regime received for the same period totaled US$ 5,501 million. See Moenir, A.S. et al., *40 Tahun Peranan Pertambangan Dan Energi Indonesia 1945-1985* (Jakarta: Departemen Pertambangan dan Energi, 1986), 387-388. By 1986, PLN had emerged as the second largest state-owned enterprise (after PERTAMINA) with 50,000 employees, an operational budget of Rp 1.46 trillion (US$ 1.2 billion), and an investment fund totaling Rp 1.64 trillion (US$ 1.35 billion) for the fiscal year 1986/1987. The company at the time was servicing 6.7 million customers, about 2.7 million of whom lived in rural areas. PLN's big size led the Minister of Mining and Energy to create the Board of Supervisors of PLN (*Dewan Pengawas PLN*) to oversee the company a few years earlier. See "Pengambilan Sumpah Jabatan Dan Pelantikan Dewan Pengawas PLN," *Berita PLN*, June 1986, 12-13.

electrify the rural areas. The Soeharto government also believed that electricity was a symbol of modernity: a well-lit country was a symbol of the modern state.

In the larger global context and under the rubric of post World-War II international development, lighting villages was a principal program taken up by many newly independent countries in Asia and Africa, often with large amount of funding and technical assistance from wealthier countries and international financial institutions such as the World Bank.[138] This undertaking attracts various scholars—especially development economists—who have been producing abundant studies on rural electrification. These studies mainly focus on what had been done and what could be done to improve rural electrification so more areas can be lit.[139] Thus, the normative assumption of the majority of studies on Indonesian village electrification, for example, was that if electricity were brought to the Indonesian villages in certain ways, desired social changes would follow. The economist Peter McCawley, for example, asked "Rural

[138] World Bank noted that its investments in rural electrification until 1971 was around $10 billion, with another $10 to $15 billion slated to be channeled in the following decade. See World Bank, *Rural Electrification A World Bank Paper* (Washington, D.C.: World Bank, 1975), 3.

[139] For studies on rural electrification in Indonesia and a few other countries in Southeast Asia see Peter McCawley, "The Indonesian Electric Supply Industry" (PhD diss., Australian National University, 1971); Peter McCawley, *Perlistrikan Di Indonesia* (Jakarta: Indonesia Raya, 1973); Peter McCawley, "Rural Electrification in Indonesia--is it Time?" *Bulletin of Indonesian Economic Studies* 14, no. 2 (1978), 34-69; David Spencer, "A Study of Rural Electrification in South-East Asia" (PhD diss., University of Edinburgh, 1988); Mohan Munasinghe, "Rural Electrification: International Experience and Policy in Indonesia," *Bulletin of Indonesian Economic Studies* 24, no. 2 (1988), 87-105; Douglas F. Barnes, *Electric Power for Rural Growth: How Electricity Affects Rural Life in Developing Countries* (Boulder: Westview Press, 1988); Imron Husin, "Rural Electrification in Indonesia Policy Implementation in Theory and Practice" (PhD diss., Australian National University, 1989); Sukamdi, Heru Nugroho and Wini Tamtiari, *Listrik, Kemiskinan, Dan Perubahan Sosial* (Yogyakarta: Pusat Penelitian Kependudukan, Universitas Gadjah Mada, 1995); Christopher Edmund Greacen, "The Marginalization of "Small is Beautiful: Micro-Hydroelectricity, Common Property, and the Politics of Rural Electricity Provision in Thailand" (PhD diss., University of California Berkeley, 1997). For one of the most recent studies, see Subhes C. Bhattacharyya, *Rural Electrification through Decentralised Off-Grid Systems in Developing Countries* (London; New York: Springer, 2013). For a study on rural electrification in Brazil, Cambodia, and China, see Hisham Zerriffi, *Rural Electrification Strategies for Distributed Generation* (Dordrecht; New York: Springer, 2011).

Electrification in Indonesia—Is It time?"[140] He argued, "on strictly economic criteria rural electrification seems a doubtful priority in Indonesia at present," particularly to meet the objective of improving the socio-economic situation of the villagers. Writing in the late 1970s, he found the country's village electrification program, "disorganized, fragmented, and uncoordinated."[141] He suggested that the Indonesian government to extend the power lines on Java into rural areas, to use diesel generators on other islands, and to maintain benefiting the poor as its goal in drawing up an electrification policy.[142] His focus on how to pursue village electrification in order to affect a certain technological "impact" on society tends to mask the broader cultural and political contexts of this program.[143] My study takes a closer look at the cultural and political forces that helped shape how an understanding of electricity and modernization was adopted and translated by one "developing" country in Southeast Asia.

Chapter Outline

I organize my analysis of the New Order's village electrification program around five main chapters. Chapter 2 describes and analyzes the principal role PLN played in lighting the country. In this chapter, I argue that the two main reasons PLN came to be the main institution in the electricity sector are Indonesia's colonial experience and the country's post-independence

[140] McCawley, "Rural Electrification in Indonesia--is it Time?"
[141] McCawley, "Rural Electrification in Indonesia--is it Time?" 69. In my interview with Peter McCawley in Jakarta on 24 October 2011, McCawley maintained his position that he felt that Village Electrification Program was not a priority for the PLN. His reasons had to do with PLN's numerous "to do" list and lack of funding. Hi claim, however, stood in stark contrast with the evidence I present in this study about the resources that the Soeharto government allocated to electrify Indonesia's tens of thousands of villages.
[142] McCawley, "Rural Electrification in Indonesia--is it Time?" 69.
[143] In her study on Indonesian village electrification in the 1980s, Janice Brodman acknowledged the role of the larger political and economic structures and how they conditioned the outcome of village electrification. See Janice Donna Brodman, "Technology Change, Equity, and Growth: A Case Study of Rural Electrification in Java" (PhD diss., Harvard University, 1983).

leaders' strong desire to achieve social justice for all Indonesians, encapsulated by the fifth principle of Pancasila. I sketch out why and how the Dutch colonial government illuminated some areas of the archipelago and what electricity symbolized to the colonial regime. In the post-independence era, I elaborate how the Sukarno government nationalized all the Dutch electrical companies, setup PLN, and connected electrification with his vision of Indonesia's social order based on socialism. The Soeharto government deemed electricity as one of the driving forces of development and established PLN as both a utility company and one of its prominent development agencies. PLN's existence and mission in the New Order were strongly governed by the aim to realize "social justice for all Indonesians."

Chapter 3, "Powering PELITAs," details the reasons why and how the Indonesian archipelago came to be dotted with hundreds of small and medium scale diesel power plants. I argue that the New Order regime installed many of these diesel generators in order to quickly electrify as many villages as possible and to show to the Indonesian citizens that it was working hard to achieve social equality. The regime benefited in large part from its oil production and windfall that funded the construction of these power stations and subsidized the domestic oil prices. This form of *patrimonial technopolitics* resulted in PLN's "grid without a grid" that provided many villages with electricity at an affordable price. As the regime was continually demonstrating to the Indonesian population that it continually built more electrical generating capacity and lighting increasing number of villages, it created a narrative of an internal national identity of Indonesia as a developing Pancasila nation. This identity narrative lent the regime a powerful legitimacy to rule and to suppress dissenting voices that opposed the government's large dam projects for irrigation and electrification in some areas.

In chapter 4, "Wiring the New Order," I argue that although touted as an effort to improve the economic conditions of villagers, Soeharto's village electrification program *also* served to consolidate his political power. It sought to convince villagers to vote for the government's political party GOLKAR in the general elections. In this regard, the New Order village electrification program embodied another manifestation of a *patrimonial technopolitics*. President Soeharto distributed electricity to the villages to win and retain voluntary political support from the populace of the Indonesian countryside. He also used electrification inauguration ceremonies to create a sense of Indonesia as a rapidly developing society with himself at the helm directing the country's development. Consequently, his political support in the countryside increased, a factor that helped him stay in power for 32 years. Although PLN disliked this kind of New Order's *patrimonial technopolitics*, it continued to electrify the nation, as it was convinced of the socioeconomic benefits of village electrification.

Chapter 5, "Lighting 'Paradise'," focuses on how Balinese villages came to be fully electrified much earlier than any other areas of the country. I argue that the development of Balinese electrical infrastructure was tightly linked with the development of Indonesia's national television system. The New Order government's main motivation to build these two systems in parallel was tied to a desire to create and reinforce Indonesia's external national identity as a country with notable economic success and therefore could play a larger role globally. The New Order government projected this identity to the international audience by showcasing Balinese development to foreign VIPs who came to the island to attend various important meetings including the high-level conferences of OPEC and ASEAN. To ensure that Bali would have a reliably supply of electricity, the Soeharto government decided to connect the island to an interconnected electrical transmission erected in Java in the 1980s. By 1989, Bali had secured

more than enough electricity supply to meet its increasing demand. In mid-1995, Bali became the first—and thus far the only—province in Indonesia to achieve complete village electrification. This occurred at a price. PLN Eleventh Region's limited budget and resources were mostly poured into electrifying Bali even though its area of jurisdiction included three additional neighboring provinces.

In the last chapter, I summarize and conclude my study as well as describe some of the New Order regime's legacies and their implications in the post-Soeharto era. I discuss my study's contributions by highlighting how it engages with the literatures on Southeast Asian Studies and Science and Technology Studies.

CHAPTER 2

PLN's ROLE IN THE NEW ORDER

Introduction

In the story about Indonesia's village electrification endeavors, the New Order state through its State Electricity Company (PLN) played a large role in developing electrical infrastructure. The New Order regime allowed other entities such as the local governments and independent electric cooperatives to participate in electrifying the country. The East Java provincial government, for example, worked together with a local technical institute in Surabaya to plan and build power plants and distribution lines in the mid-1970s. PLN welcomed their collaborative effort. Its Development Director Bambang Sarah in a letter sent to all of PLN regional branches' managers even asked his colleagues to approach their local governors to cooperate in a similar endeavor.[1] But in the end these local governments transferred their electrical facilities to PLN, an organization they deemed to have more technical manpower to reliably operate them.[2] In another example, the New Order regime, assisted by foreign aid agencies, established three independent electric cooperatives (*Koperasi Listrik Pedesaan, KLP*) on the islands of Sumatra, Lombok, and Sulawesi in the 1980s. Although these electric cooperatives were quite successful in the beginning, they eventually went bankrupt and their assets had to be transferred over to PLN. The regime also attempted to entice private Indonesian

[1] Letter from Ir. Bambang Sarah to PLN Regions I through XIII, PLN West Java Distribution and PLN Jakarta and Tangerang Distribution dated 13 September 1978. A copy of this letter can be found in Direktorat Jenderal Ketenagaan, *Listrik Makalah Pedesaan*, unpublished report, March 1981, 76.
[2] "8 Lokasi Proyek Kelistrikan Desa Pemerintahan Daerah Jawa Timur Diserahkan Pengelolaannya Kepada PLN," *Berita PLN*, May 1978, 10-12; "Pemerintah Kalimantan Selatan Menyerahkan Pengusahaan dan Pengelolaan Kelistrikan 7 Kabupatennya Kepada Perusahaan Umum Listrik Negara," *Berita PLN*, March 1978, 6-8. The Aceh Provincial government also handed over to PLN its Rp 390 million (about US$ 181,226) worth of electrical assets to PLN in July 1991. See "272 Desa Lagi Di Daerah Istimewa Aceh Mendapati Aliran Listrik" *Berita PLN*, July 1991, 26-28.

and foreign companies into the electricity sector. Although it attracted some private companies, very few of them supplied electricity for the public. By 1994 PLN's total production (13,128 MW) was still larger than the one produced by private entities (8,240 MW) most of which was for their own consumption.[3] As far as electricity for the public was concerned, PLN dominated. Thus, in the overall scheme of things, PLN stood as a near-monopoly in the generation, transmission, and distribution of electricity in the country.

I argue in this chapter that there are two main reasons why the New Order regime relied too much on PLN for its electrical infrastructure development and was ambivalent if not reluctant to enroll cooperatives and private enterprises. The first explanation has to do with Indonesia's colonial experience broadly and in the electrical sector particularly. Many post-independence Indonesia leaders thought that capitalism was the underlying ideology of colonialism and exploitation. Sutan Sjahrir, one of the prime ministers in the Sukarno era, for example, equated Indonesia's nationalism with anti-capitalism. He was quoted in 1956 to say, "nationalism in Indonesia is anti-capitalist—largely because capitalism here is Western, and specifically Dutch."[4] This sentiment is reflected in the country's 1945 Constitution, especially Article 33 Section 2 ("Sectors of production which are important for the country and affect the life of the people shall be under the powers of the State") and Section 3 ("The land, the waters and the natural resources within shall be under the powers of the State and shall be used to the greatest benefit of the people").[5] Indonesian nationalists deemed that electricity was one of the

[3] Artono Arismunandar, "Overview of Electric Power Development in Indonesia," *Energi & Listrik*, Volume VI No. 2, June 1996, 5-6.
[4] Quoted in Bradley Simpson, *Economists with Guns: Authoritarian Development and U.S.-Indonesia Relations, 1960-1968* (Stanford, CA: Stanford University Press, 2008), 27.
[5] Since the fall of Soeharto in 1998 the 1945 Constitution had been amended four times (1999, 2000, 200, and 2002) but Article 33 Sections 1, 2, and 3 remain unchanged. Two additional sections were added to Article 33 stipulating how the national economy should be organized and carried out as well as the regulations needed to implement them.

country's important production sectors and therefore decided that the state had to control the electric supply industry and the natural resources needed to produce electricity. They sought to seize Dutch utility facilities during the Revolutionary War period (1945-1949) and beginning in 1950 put in motion a nationalization effort that would be completed in 1958.

The second reason had to do with the desire of realizing the "social justice for all Indonesians" goal, stated as the fifth Pancasila principle. Both Sukarno and Soeharto were fixated in the idea of achieving social justice, although their approaches differed from one another. To President Sukarno, socialism was the answer. As I will show below, in an effort to call more Indonesians to embrace electricity Sukarno even claimed that socialism would be impossible without electricity in a 1960 speech to commemorate a National Electricity and Gas Day. President Soeharto, on the other hand, was not wedded to the idea of socialism and allowed some form of capitalism to work in the country. But to ensure that social justice would be achieved, at least rhetorically, he employed Pancasila and the 1945 Constitution as the rationale for his state-led development. Soeharto's strong belief in the ideals of Pancasila principles led him to decide to inculcate all of state employees (including PLN's) in these principles starting in the late 1970s. One implication was that even after PLN became a semi-private company in 1994, its leaders still regarded the company as an "agent of development" with an important duty to spread development program to the countryside by electrifying the villages.[6] In this regard, the New Order regime saw "electricity as a driving force of development."[7]

Illuminating the Colony

[6] Djiteng Marsudi, "PLN Menghadapi Era Globalisasi," *Berita PLN*, February 1996, 6.
[7] Darmono et al., *Mineral Dan Energi Kekayaan Bangsa*, 307.

When the Dutch colonial government decided to light its "biggest and most lucrative colony, the [Netherlands East] Indies,"[8] it built technological systems that symbolized and facilitated the exercise of its power. Throughout the nineteenth up to the mid-twentieth centuries the Dutch East Indies was not only Holland's largest colony overseas, but it also was (and still is) the largest archipelago in the world. For centuries after the arrival in Batavia (now Jakarta) of Cornelis de Houtman, a Dutch navigator and explorer in 1596, Europeans had been navigating the vast equatorial island chain using various waterways and sea routes. In the second half of the nineteenth century with increased merchant marine traffic in Southeast Asia waters, both the Dutch and the British colonial governments decided to start lighting the coasts of their respective colonies to help decrease maritime accidents. Their efforts to build a system of lighthouses, beacons, and buoys started in 1860 and by 1910, the archipelago was sufficiently lit for their merchant ships. Initially the lights and beacons were powered by oil and then gas. After electricity was more widely available in the early 1900s, they started to use electric lighting in those lighthouses.[9] The result, as Eric Tagliacozzo writes, "[t]he darkened maze of islands that confronted the British and Dutch in 1860, [had] by 1910 been transformed into a lit archipelago capable of being watched and policed in the burgeoning twentieth century."[10]

Attempts to illuminate the landscapes of the Netherlands East Indies using electric power began later than the endeavor to light its waterscapes. In 1890, the Dutch colonial government issued the legal basis that regulated the provision of electricity in its colony. Called the *Ordonnantie* No. 190 Year 1890, the regulation gave all Dutch citizens in the Netherland East

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[8] Susie Protschky, "The Empire Illuminated: Electricity, 'Ethical' Colonialism and Enlightened Monarchy in Photographs of Dutch Royal Celebrations, 1898-1948," *Journal of Colonialism and Colonial History* 13, no. 3 (2012). The article is available online: https://muse.jhu.edu/journals/journal_of_colonialism_and_colonial_history/v013/13.3.protschky.html

[9] Eric Tagliacozzo, "The Lit Archipelago: Coast Lighting and the Imperial Optic in Insular Southeast Asia, 1860-1910," *Technology and Culture* 46, no. 2 (2005), 306-328.

[10] Tagliacozzo, "The Lit Archipelago," 308.

Indies, all companies established in the colony, as well as all local governments there the legal means to form a business venture in the electricity sector by obtaining an *electriciteitvergunning* or a business license in electricity. The license allowed non-Dutch citizens to generate electricity, but only for their own consumption. Any person or entity that wanted to generate electricity for the public had to request a license from the Governor General.[11]

Even though the 1890 *Ordonnantie* technically permitted individuals to get into the business of generating and distributing electricity, in practice only corporations could afford to do so. Some of the earliest companies that generated electricity for their own uses were the ones that had been extracting natural resources of the colony such as sugar factories, tea factories, various plantations, and mining companies. In 1892, for example, the Ombilin Coal Mine in Sumatra built a steam-powered electrical generator in Sawahlunto located in the western part of Sumatra using the available coal as fuel. The electricity was used to operate the mine and to light the mining area. At first the mine generated about 750 kW of electricity, but soaring demand prompted it to increase its capacity threefold to 2,250 kW. Two decades later, a train company named *Sumatra Staatsspoorwegen* built a similar steam-powered generator in Kampung Durian, on the bank of the Batang Arau river to light the *Emmahaen* port constructed to ship coal from the mine overseas.[12]

The 1890 *Ordonnantie* provided a business license to any private Dutch company that wanted to light a certain area (*plaatselijke concessie*) or to operate in a certain region (*regionale concessie*) for a period of up to forty years allowing them to get the return on their investment. This meant that private companies that requested this license or *concessie* mainly wanted to electrify urban areas where they could get customers who would pay the fee. Licenses to

[11] Darmono et al., *Mineral Dan Energi Kekayaan Bangsa*, 101-102.
[12] Darmono et al., *Mineral Dan Energi Kekayaan Bangsa*, 101.

electrify cities were issued by the colonial government starting in 1892 for Surabaya and Semarang and in 1893 for Batavia. The Dutch utility company *NV Nedelandsch Indische Electriciteit Maatschappij* (NIEM) or the Netherlands Indies Electricity Company installed electricity in Batavia, then the seat of the colonial government, in 1897. The installed electrical lighting in the city was built to complement the existing gas lighting system that was put in place in 1859. The company seemed to have profited so handsomely from the endeavor that by 1912, the density of electric street lamps in downtown Batavia was greater than in Amsterdam at the same time.[13]

Likewise, Surabaya, the biggest city in East Java, received special attention from the colonial government as far as electrification was concerned. Its strategic place and role in the government's trade activities made it by 1900 "the busiest port and largest metropolis in the entire Netherlands Indies, and one of only three major Indies cities to have acquired an operational electricity network."[14] By 1912, the city was already fully illuminated. When Sukarno, Indonesia's future first president, was living in the city to attend a secondary school in 1916, he observed, "Surabaya already boasted electricity. Each room had an outlet and each boarder paid extra for his lamp. Only my room didn't have one. I had no money for the bulb. I would study late into the night by candle."[15]

In 1901, the Dutch Queen Wilhelmina made a speech in which she espoused a new approach to governing the Dutch colonies overseas. Stating that the Dutch owed their colonies a "debt of honour" for many years of Dutch prosperity, her "Ethical Policy" called for a renewed

[13] Mrázek, *Engineers of Happy Land*, 93.
[14] Protschky, "The Empire Illuminated."
[15] Soekarno and Cindy Heller Adams, *Sukarno an Autobiography as Told to Cindy Adams*, Second Printing ed. (Hong Kong: Gunung Agung, 1966), 34-35.

sense of responsibility in establishing the relationship with the local population.[16] In the global context, the Dutch's Ethical Policy mirrored similar civilizing mission programs carried out by the other European colonial powers in their respective colonies.

The Dutch used various technologies to enact and embody their ethical ideals.[17] Following Queen Wilhelmina's announcement, many Dutch private companies started to electrify the colony's other less populated urban areas in Java and in the other islands. One company called Maintz & Co obtained and distributed electrical licenses to several subsidiary companies. One of them was the *Solosche Electriciteit Maatschappij* that electrified the city of Surakarta (also known as Solo) in 1902. One of Maintz & Co's bigger subsidiaries, NV *Algemeene Nederlandsch-Indische Electriciteit Maatschappij* (ANIEM) or the Netherlands Indies General Electricity Company and founded in 1919, would later have its own subordinate companies that electrified eight different areas in Java between 1925 and 1939.[18]

In 1905 NIEM merged with a gas company and became NV *Nederlandsch-Indische Gas en Electriciteit Maatschappij* (NIGM) or the Netherlands Indies Gas and Electricity Company. NIGM would expand its business venture outside Java and electrified the city of Makassar in South Sulawesi.[19] It eventually became the NV *Overzeesche Gas en Electriciteit Maatschappij* (OGEM) or the Overseas Gas and Electricity Company in 1947.[20] ANIEM followed suit and acquired some smaller companies that already operated outside Java. Two of them were NV *West Borneo Electriciteit Maatschappij* that electrified the cities of Pontianak and Singkawang in

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[16] Quoted in Christopher Silver, *Planning the Megacity: Jakarta in the Twentieth Century* (London; New York: Routledge, 2008), 46.
[17] For technologies of agriculture, see Suzanne Moon, *Technology and Ethical Idealism: A History of Development in the Netherlands East Indies* (Leiden: CNWS Publications, 2007).
[18] Darmono et al., *Mineral Dan Energi Kekayaan Bangsa*, 103; PT PLN (Persero), *Lintasan Kegiatan 51 Tahun Hari Listrik Nasional Tahun 1996* (Jakarta: PLN (Persero), 1996), 13-14.
[19] Darmono et al., *Mineral Dan Energi Kekayaan Bangsa*, 104.
[20] PT PLN (Persero), *Lintasan Kegiatan 51 Tahun*, 13. See also a brief history of PLN Distribution Jakarta and Tangerang. http://www.pln.co.id/disjaya/?p=62 (accessed on March 19, 2014).

West Kalimantan and NV *Electriciteit Maatschappij Bali en Lombok (EBALOM)* in the islands of Bali and Lombok, which as I detail in chapter 5 was the precursor of the PLN Denpasar Branch.[21] Two other companies also operated under the auspices of ANIEM. One company operated in Sumatra and it was called NV *Electriciteit Maatschappij Sumatra* (EMS) of the Sumatra Electricity Company. ANIEM became so well known that when NV West Borneo was acquired by it, people in the city of Singkawang labeled many things electrical using "aniem." There was an Aniem Street (presumably where the company's office was located), electricians were called "aniem men," and electrical pole was called "aniem pole."[22] Another company, *Gemeenschappelijk Electriciteitsbedrijf Bandoeng en Omstreken* (GEBEO) operated in the western part of Java except Cirebon, Jakarta, and Tangerang.[23] By 1931, about three dozen cities in Java, Sumatra, Sulawesi, and Kalimantan had been electrified.[24]

Beginning in 1917, requests for licenses had to be submitted to the *Dienst voor Waterkracht en Electricitiewezen* (the Service for Waterpower and Electricity), an agency established by the colonial government to initially electrify the Dutch State Railways but later to manage Dutch private electrical companies in the colony.[25] The Service was setup as part of the Department of Government Enterprises (*Department van Verkeer en Waterstaat*) and was tasked to

> promote a supply of economical energy for the territories, which are in want of it, to make a proper use of the country's waterpower and to give every assistance, not only in

[21] Darmono et al., *Mineral Dan Energi Kekayaan Bangsa*, 104.
[22] Sugiarta Sriwibawa and Ramadhan K.H (eds), *50 Years of PLN Dedication* [50 Tahun Pengabdian PLN], trans. E. Jasjfi, English ed. (Jakarta: PT PLN (Persero), 1996), 51.
[23] The areas of operations of these Dutch electric companies shaped the regional coverage of PLN branches later. For example, the West Java Distribution Region of PLN included more or less the old GEBEO's area of operation except Cirebon. In other words, it included all of West Java province except Tangerang, which falls under the Jakarta and Tangerang Distribution branch.
[24] Darmono et al., *Mineral Dan Energi Kekayaan Bangsa*, 105.
[25] Wim Ravesteijn, Marie-Louise Ten and Horn-Van Nispen, "Engineering an Empire: The Creation of Infrastructural Systems in the Netherlands East Indies 1800-1950," *Indonesia & the Malay World* 35, no. 103 (11, 2007), 281.

> the interest of the industrial development of these districts in general, but also for the benefit of the State Railways and other Government services.[26]

Noticing that the Indonesian archipelago had rivers and streams and wet and dry seasons, the Service set up "watercourses" across the archipelago: 65 in Java, 4 in Sumatra, and 10 in Sulawesi.[27] In addition, the Service built 74 rainfall measurement stations in Java and 44 outside Java.[28] The stations consisted of a simple measuring device that collected rainwater. Its operation and maintenance were delegated to people in various areas such as plantations, forests, mining, volcano station, and irrigation posts scattered across the archipelago. Every month the recorded data was submitted to the *Meteorologish-Geophysisch Observatorium* in Batavia that published data yearly. Based on the data, the Service created a map of rainfall in the archipelago, which the Dutch used to construct several hydropower plants, exploiting one abundant natural resource that was (and still is) widely available in the archipelago.

One of the first hydropower plants was built in Plengan in 1920 in southern Bandung, West Java, which still stands today. Other hydropower plants were constructed in Jelok, Central Java; Giringan, East Java; Tes, Sumatra; and Tonsea Lama, Sulawesi.[29] Later, the Dutch colonial government established a utility company called *s'Lands Waterkracht Bedrijven* (LBW) in 1927 to manage all of its hydropower plants. Between 1918 and 1940, the colonial government increased the electrical capacity from 8.7 MW to 93.8 MW while the private sector expanded it from 13 MW to 115.3 MW. The total generating electrical capacity in 1940 was 209.1 MW about a tenfold increase in 26 years, attesting the important contribution of the Dutch

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[26] Division of Commerce of the Department of Agriculture, Industry, and Commerce, *Handbook of the Netherlands East-Indies* (Batavia, Java: Printed by G. Kolff & Co., 1920), 293.
[27] *Division of Commerce of the Department of Agriculture, Industry, and Commerce, Handbook of the Netherlands East Indies (Batavia, Java: Printed by G. Kolff & Co., 1930), 261.*
[28] Darmono et al., *Mineral Dan Energi Kekayaan Bangsa*, 107.
[29] Darmono et al., *Mineral Dan Energi Kekayaan Bangsa*, 107.

private companies in the electricity sector.[30] Some of the built or planned hydropower plants in the East Indies had comparable capacity to the ones constructed in North America and Australia. On a graph comparing these power plants, it is depicted that the Asahan River hydropower plant in Sumatra (215,000 horsepower) even surpassed the capacity of the Niagara Falls Power Plant of the Ontario Power Company of Canada (200,000 horsepower),[31] showing that the Netherlands had a valuable colony with the natural resources to construct an equally if not bigger technological project as the other big countries did.

When the Dutch electrified several urban areas in Java, electricity not only served to light the streets and administrative buildings, run theaters or factories, but also symbolized its power and a vision of modernity. In an illuminating study, Susie Protschky showed that lavish nocturnal lighting of prominent colonial buildings were deliberately designed to commemorate royal festivities in the colony between 1898 and 1948.[32] In one such occasion, when Queen Wilhelmina marked the twenty-fifth anniversary of her reign on 6 September 1923, family photographs from a personal collection of Max and Petronella Foltynski show two illuminated buildings in Bandung. One of the buildings was the city's brand new Technical College (later to be called the Bandung Institute of Technology or ITB). Sukarno, who at the time was a 22-year old student there, might have also witnessed this event. Many photographs that Protschky's discovered in her study point towards using electricity to enact the Dutch ethical policy. She writes,

> Light generated by electricity and captured by cameras in the Netherlands and the Indies during the first half of the twentieth century leave traces, in photographs, of a visual culture that located spectators and participants in royal celebrations within a transnational community of subjects who shared the fruits of an enlightened monarchy. This triumphalist vision became salient at distinct historical moments in particular places

[30] McCawley, "The Indonesian Electric Supply Industry," 7.
[31] Division of Commerce, *Handbook of the Netherlands East-Indies*, 295.
[32] Protschky, "The Empire Illuminated."

> according to its political utility as a symbol of progress: in the Indies, during the polarisation of conservative and radical opinion in the early 1920s, and in the Netherlands, in the context of looming war during the late 1930s. The idea at the core of such photographs—that electrification demonstrated the effectiveness of ethical colonial rule, a principle that was championed by a well-intentioned queen—circulated both in visual and in textual forms throughout Wilhelmina's reign, trafficking back and forth between the Netherlands and the Indies in a lively current of exchange.[33]

One consequence of the projection of this image of modernity was the imbalance of development of electrical networks between Java, the most heavily populated island, and other islands in the archipelago as well as within urban regions in Java as opposed to its rural hinterland. This imbalance elicited self-criticism among some of the practitioners of the electrical industry. A Dutch director of a state-run electric company, for example, complained in 1938 about the approach of building electrical infrastructure using an expensive network construction that prevented a more even distribution of electricity. He blamed the skewed Dutch colonial energy policy saying, "here, in the Indies, amidst purely an Eastern society, [we] build up an electric technology on an exclusively Western bias."[34]

Sukarno recounted a similar "Western bias" when he studied at the Bandung's technical school (Technische Hogeschool). In his autobiography Sukarno wrote:

> Our curriculum was geared toward a society of Dutch rule. The science I learned was science of a capitalist technique; for instance, the knowledge about irrigation systems. It was not how to irrigate rice fields in the best manner. It was only about the water supply systems for sugar cane and tobacco. This was irrigation in the interest of imperialism and capitalism, irrigation not to feed the starving masses, but to fatten the plantation owners. Our instruction in road building could never befit the population. Roads weren't engineered to be cross-jungle or interisland so our people could ride or walk better. We were taught only to play byways along the seacoast from harbor to harbor so factories might have maximum transportation of goods and proper communication between sailing vessels. Take mathematics. No universities anywhere else taught the measure chain. Here it was taught. This is a tape 20 meters long used solely by overseers of slave labor on plantations. In sketching class, when we drafted a model town we also had to indicate the residence of the *Kabupaten*, the District Chief who watches over the slaving peasants.[35]

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[33] Ibid.
[34] Quoted in Mrázek, E*ngineers of Happy Land*, 95.
[35] Soekarno and Adams, *Sukarno an Autobiography*, 67.

But even though Sukarno realized the main aim of his colonial education was to perpetuate colonial rule (and this was confirmed by one of his teachers, Professor Ir. G. Klopper, ME in a conversation that took place shortly before he graduated), he admitted, "And so it seemed that although I was to devote my entire life to crushing the colonialists' rule, I had them to thank for my education."[36]

In his study about technology and colonialism, Rudolf Mrázek recounted how various technologies that were introduced in the Netherlands East Indies during the last seventy-five years of colonial rule stimulated Indonesian nationalism and identity.[37] One technology that succeeded in defining the archipelago as "modern colonial space" better than other technologies previously introduced, Mrázek argued, was the radio.[38] The radio, which requires electricity to run its broadcasting stations helped bypass local spatial restraints, spurred a new hobby, and facilitated the "*kroncong* [the popular Hawaiian-like songs of the Indies] to become the dominant Indonesian national, indeed nationalist, music."[39] The Eastern Radio, a local radio station that broadcasted live a public kroncong concert in 1941, helped define its identity in the colony as a separate radio station from the Dutch one.[40] As a result, two parallel cultures of radio existed and one of them published the *Soeara Timoer* (Voice of the East) journal. Some of its editorial board members later became prominent figures in the post-independence state of the Republic of Indonesia.[41]

Likewise, the introduction of electricity in the Netherland East Indies exposed the readers of a Malay language publication *Pandji Poestaka* to the idea of enlightenment, modernity, and

[36] Soekarno and Adams, *Sukarno an Autobiography*, 68.
[37] Mrázek, E*ngineers of Happy Land*.
[38] Mrázek, E*ngineers of Happy Land*, 168.
[39] Mrázek, E*ngineers of Happy Land*, 180.
[40] Mrázek, E*ngineers of Happy Land*, 185.
[41] Mrázek, E*ngineers of Happy Land*, 186.

indirectly, nationalism. Henk Maier recounted that the Dutch company Philips advertised its electric light bulbs in a *Pandji Poestaka* edition in 1940. The ad showed an Indonesian family of three (a father reading a newspaper, a mother embroidering, and their daughter reading a book around a table under a Philips light bulb with a caption "*Terang Sebagai Siang*" (Bright as Day). The company claimed that a Philips light bulb was an efficient and a low wattage light bulb that could save its users money.[42] Meir interpreted the ad by writing,

> It reads like perfect propaganda of a colonial order that tries to domesticate anxiety and desire; this is how all Javanese people are supposed to live: in small and peaceful nuclear families… Family values, literacy, reading, smiling, and embroidering in the rhetorical light that is created by Philips—these are elements in the set of words that could be related to the forces of modernity.[43]

The ad's Malay language caption certainly suggests that the targeted audience of the ad was Indonesians. In addition, *Pandji Poestaka* was published by Balai Poestaka, a government-sponsored publishing house, which aimed to provide a variety of type of Malay-language publications. Meir wrote, "One of the great contributions Balai Poestaka made to modernity, nationalism, and the concurrent feelings of transience in the Indies was the leading role it played in propagating a standard for written Malay, to be followed by all inhabitants of the Indies alike."[44]

The seeds of nationalism sown during the late colonial period, in part by the adoption and adaptation of technologies introduced in the Netherlands Indies, were reaped during the Japanese occupation. In March 1942, the Japanese military entered and took over the Netherlands East Indies. The Japanese military authority rounded up many Dutch and put them in jails. Peter McCawley wrote, "ANIEM's top executive, Mr. E. van Elk, was interned soon after the Japanese

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[42] H. M. J. Maier, "Maelstrom and Electricity: Modernity in the Indies," in *Outward Appearances: Dressing State and Society in Indonesia*, ed. Henk Schulte Nordholt (Leiden, The Netherlands: KITLV Press, 1997), 184.
[43] Maier, "Maelstrom and Electricity," 188.
[44] Maier, "Maelstrom and Electricity," 191.

occupation, but the majority of the Dutch employees remained at work until January 1943 when most of the remainder were also interned."[45] One result of the internment of Dutch workers was a lack of maintenance of the electrical infrastructure in the archipelago. By the time the Japanese surrendered in 1945 many electrical facilities were damaged and in dire need of repairs.

The Japanese occupation in Indonesia was short, but many Indonesians remembered it as a brutal subjugation.[46] The Japanese military government in the archipelago instituted a forced labor system called *romusha* to build and repair many infrastructural projects, including electrical infrastructure, which were vital to the Japanese. Countless *romusha* workers, for example, were compelled to construct an electrical transmission line between Ketenger and Tegal in Central Java and a 2-km water tunnel in Baturaden in Purwokerto, Central Java.[47] In another instance, while hundreds of *romusha* laborers were working at the Mendalam and Siman hydropower plants, the Allied Forces bombed the two installations burying and killing many of them.[48]

Even though some PLN leaders in the 1990s remembered *romusha* as a cruel institutionalized indentured servitude under the Japanese,[49] Sukarno had a different take on the whole situation. He was aware of Japanese's ruthlessness in their occupied territories, but he sought to take advantage of the situation to get many of his trusted friends and fellow nationalists trained in many areas. Speaking to his friend Waworunto shortly after the Japanese had just landed in Padang, West Sumatra, in 1942 Sukarno said to him "I know all about their brutality. I

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[45] "The Indonesian Electric Supply Industry," 35.
[46] For example, Indonesia's most famous author Pramoedya Ananta Toer recalled with bitterness the Japanese occupation. His memory of it was quoted in Adrian Vickers, *A History of Modern Indonesia* (Cambridge, UK; New York: Cambridge University Press, 2005), 85.
[47] Sriwibawa and K.H., *50 Years of PLN Dedication*, 17. Perusahaan Listrik Negara, *50 Years of PLN Dedication* [50 Tahun Pengabdian PLN], eds. Sugiarta Sriwibawa and Ramadhan K.H., trans. E. Jasjfi, English ed. (Jakarta: PT PLN (Persero), 1996). p. 17.
[48] Sriwibawa and K.H., *50 Years of PLN Dedication*, 18.
[49] Their sentiment is captured in the book Sriwibawa and K.H., *50 Years of PLN Dedication*.

know of Nipponese behavior in occupied territory—but okay. I am fully prepared for a few years of this. I must rationally consider what they can do for my people. We must be grateful to the Japanese. We can use them."[50] And use them he did. Sukarno was able to persuade the Japanese to give military and administrative training to some Indonesians. At another time, Sukarno told Mohammad Hatta who would become Indonesia's first vice president, "At Japanese government expense we will teach our people to be executives. To give orders, not just take them. To prepare them to be chiefs and administrators. To put the reins of government in their hands for that someday when we take over and proclaim independence."[51] Sukarno's "cooperation" with the Japanese was encapsulated in his statement: "I did not say we were cooperating with the Rising Sun. I said we were cooperating UNDER the Rising Sun."[52]

Indonesians did not just receive administrative training but also technical know-how. Many employees of the Dutch utility companies were forced out and as a result there were massive openings that needed to be filled quickly. The Japanese civilian authority that took over the operation of these utility companies asked Indonesians to fill the spots. In Surabaya, for example, a Dutch engineer named Spanjaard and an Indonesian engineer R.M. Saljo, who joined the ANIEM staff in 1938, taught some Indonesians the skills needed to run the electrical system to ensure the continuous supply of electricity in the city.[53]

Constructing an "Electricity-Minded" Nation

[50] Soekarno and Adams, *Sukarno an Autobiography*, 157.
[51] Soekarno and Adams, *Sukarno an Autobiography*, 176.
[52] Soekarno and Adams, *Sukarno an Autobiography*, 179.
[53] Darmono et al., *Mineral Dan Energi Kekayaan Bangsa*, 38.

According to David E. Nye, "the meaning of a tool is inseparable from the stories that surround it."[54] In post-independence Indonesia electricity as a new form of energy and technology has been given certain cultural, social, and political meanings. Most of all, electricity has been tied to the idea of modernity and the construction of a modern nation. A fully electrified country, a symbol of a modern nation, was the aim of both the Sukarno and the Soeharto government. Each leader has expressed this goal publicly and connected it to a particular vision of a sociopolitical order. Sukarno emphasized the importance of electricity in building a socialist state. Soeharto's aim to take Indonesia to the "take-off" stage required that Indonesia be fully illuminated. Stories abound about newly electrified villages, the construction of hydroelectric power stations, the beginning of a ultra high-voltage transmission line project, village electrification inauguration ceremonies, as well as the "heroic" efforts of a few individuals who worked independently to electrify their villages.[55] Thus, in the New Order era, electricity's introduction, spread, and role in national development were kept alive by stories printed in various print media.[56]

Various stories created around electricity are, of course, not unique to Indonesia. When electricity was introduced and spread in the United States in its first six decades, Americans from all walks of life ascribed a variety of social and cultural meanings to electricity. Electricity

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[54] David E. Nye, *Technology Matters: Questions to Live With* (Cambridge, MA: The MIT Press, 2006), 3.
[55] In the chapters that follow, I draw from many of these stories to illustrate my narrative and argument. For the story about a villager named Soekartono who built his own microhydro village power station, see "'PLN' Dari Cimara," *Tempo*, 5 July 1980, 37.
[56] In addition to popular newspapers and magazines that published these electrical stories, I discovered close to 4 dozens electricity-themed magazines published in Indonesia. Many were written and printed by various PLN divisions and branches across Indonesia. A few were published by for-profit publishers. Several no longer existed. A number of magazines sprung up after the collapse of the New Order. But a great deal was published when Soeharto was still in power. I provide a more complete list in Appendix C, but the titles of these publications include: *Berita PLN*, *Fokus*, *Listrik Indonesia*, *Pelangi Nusra*, *Cahaya*, *Suluah Nagari*, *Kilau Borneo*, and *Pijar Khatulistiwa*.

inspired utopian writings and entered into the everyday speeches of regular people.[57] Carolyn Marvin describes how American electrical experts in the late 1800s worked to create a distinct identity for themselves as experts in electrical knowledge. Their boundary work not only demarcated who were the "insiders and outsiders in electrical culture, to enforce standards for professional, training, and to arbitrate the use of technical language," but they also made fun of those who did not want to acknowledge their expertise.[58] The American print media likewise painted a similar picture of agriculturists in the countryside as "antimodern farmers" because they still lacked electricity and toilets in their homes.[59] When the New Deal government created the Rural Electrification Administration, the idea was to modernize the farmers. But as Ronald Kline demonstrates, some rural folks in America resisted the introduction of electricity and they actively adopted it to suit their cultural preferences. As a result they shaped a distinct rural modernity, different from the kind of urban modernity envisioned by the people who introduced these technologies in the first place.[60]

The same phenomenon occurred in the Soviet Union. The emerging science of electromagnetism and electricity in the late nineteenth century inspired a few of what Anindita Banerjee called Russian "scientific fantasy" writings in the time when science fiction books were not yet widely produced and read in the Anglophone world.[61] Largely because of the proliferation of Russian science fiction Banerjee argued that Lenin's famous quote equating communism and electrification, was actually the apogee of a specific story of modernity instead

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[57] David E. Nye, *Electrifying America: Social Meanings of a New Technology, 1880-1940* (Cambridge, MA: MIT Press, 1990).
[58] Carolyn Marvin, *When Old Technologies were New: Thinking about Electric Communication in the Late Nineteenth Century* (New York: Oxford University Press, 1988), 61-62.
[59] Ronald R. Kline, *Consumers in the Country: Technology and Social Change in Rural America* (Baltimore, MD: Johns Hopkins University Press, 2000), 131.
[60] Kline, *Consumers in the Country*.
[61] Anindita Banerjee, *We Modern People: Science Fiction and the Making of Russian Modernity* (Middletown, CT: Wesleyan University Press, 2012), 1.

of the beginning of it.[62] The Soviets, in other words, had had a long idea about modernity (shaped in part by electricity) way before the country was fully lit.

In Indonesia, one manifestation of the important sociocultural meanings attributed to electricity for the nation is the establishment of and annual commemoration of the National Electricity Day (*Hari Listrik Nasional*). Every year in October since 1996 PLN has been holding a photography competition, an essay contest, or both photography and essay contests together to celebrate the annual occasion. The role of electricity in Indonesia's village development and education was captured well in the winning entry of the first PLN's photography contest. The photography titled "*Listrik Masuk Desa Membantu Mengentaskan Buta Aksara*" (Village Electrification Helps Fight Illiteracy) by Ruslan Edy who was a PLN employee who worked at a PLN Branch in Samarinda, East Kalimantan, shows two boys under an incandescent light bulb sitting at a table near an open window studying.[63] So important electricity is attributed to the nation's life, when I was in Indonesia for my fieldwork, the slogan of PLN's photography contest in October 2011 was "*Listrik Menggerakkan Kehidupan Bangsa*" (Electricity Moves the Life of the Nation).[64]

The history of the National Electricity Day began in 1960. Shortly after Major General D. Soeprajogi, then the acting Minister of Public Works, decreed on 19 October 1960 that the founding date of the Gas and Electricity Agency (*Djawatan Gas dan Listrik*) on 27 October fifteen years earlier should henceforth be commemorated as the National Electricity and Gas Day, President Sukarno delivered a speech on 27 October 1960 in Kebayoran Baru, a neighborhood in Jakarta where PLN's Head Office would be located. Standing before a packed audience (for Sukarno's speeches had always been well attended for his noted oratory skills), he

[62] Banerjee, *We Modern People*, 90-118.
[63] PT PLN (Persero), *Lintasan Kegiatan 51 Tahun*, 40.
[64] http://www.pln.co.id/?p=3996 (accessed on 16 February 2014).

called his people to transform from a "water-minded" nation, in which he meant an agricultural country, to an "electricity minded" one or an industrialized state in the twentieth century. Connecting electricity with socialism in a clear reference to Lenin's famous phrase, Sukarno said, "electricity is very important to our life as a nation, and it is especially very important in our life as a nation aiming at socialism. […] It is my wish and my desire that we should also become electricity minded, because socialism is not possible without electricity."[65] Sukarno had been trying to build a socialist Indonesian state; a kind of state that he often argued was neither a capitalist nor a communist one.[66]

Sukarno acknowledged the importance of agriculture, for "man cannot live without food and drink and for those we need water," he said. But, Sukarno continued, "next to irrigation we now need industrialization and other things also. In these other fields we more and more realize the need for electricity."[67] This is not to say that there was not any effort to industrialize prior to 1960,[68] but on this particular occasion, Sukarno explicitly linked electricity with Indonesia's need and goal to industrialize, part of his larger nation-building endeavor. He also used the platform to connect electricity with his political agenda and vision of an Indonesian identity, known widely by its Indonesian acronym *MANIPOL USDEK,* which stands for ***Mani****festasi* ***Pol****itik* (political manifesto) ***U****ndang-Undang Dasar 1945* (the 1945 Constitution), ***S****osialisme Indonesia* (Indonesian Socialism), ***D****emokrasi Terpimpin* (Guided Democracy), ***E****konomi Terpimpin* (Guided Economy), and ***K****epribadian Indonesia* (Indonesian Identity).

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[65] Sukarno, "Speech by President Sukarno on the 15th Anniversary of Electricity Day, Kebajoran Baru, 27 October 1960" (Speech, Indonesian National Archive: President Sukarno's Speech no. 227, 1960), 1.
[66] Soekarno and Adams, *Sukarno an Autobiography*, 75.
[67] Sukarno, "Speech by President Sukarno on the 15th Anniversary," 2.
[68] On mechanized agriculture see Suzanne Moon, "Takeoff of Self-Sufficiency? Ideologies of Development in Indonesia, 1957-1961," *Technology and Culture* 39 no. 2 (1998): 187-212; On the construction of a steel mill see Suzanne Moon, "Justice, Geography, and Steel: Technology and National Identity in Indonesian Industrialization," *Osiris*, Vol. 24 (2009), 253-277.

A year earlier on 5 July 1959, Sukarno issued a decree to return to Indonesia's 1945 Constitution after a legislative assembly known as the *Konstituante* (Constituent Assembly) reached a stalemate in drawing Indonesia's new constitution. One scholar lamented Sukarno's seemingly unilateral move to squash what could perhaps become a comprehensive new constitution containing noted human rights protection.[69] But another showed that Sukarno's call to go back to the 1945 Constitution was to offer a solution to a deadlock between two major factions: those who wanted to use Islam as the foundation of the country and those who desired socialism. The return to the 1945 Constitution whose preamble contains Pancasila was fully supported by the public and deemed as an effective compromise. On 17 August that same year, Sukarno delivered his annual state address introducing MANIPOL USDEK to the public.[70]

In his National Electricity and Gas Day speech, Sukarno reiterated his political manifesto. He was pleased that "the Indonesian people, with God's Blessing, have already arrived at that ideal of Manipol and USDEK" in just fifteen years since independence and "[t]his growth of thought and ideals also include the matter of electricity."[71] How were electricity and his political manifesto connected? Sukarno envisioned the following:

> If Indonesia's independence is undisturbed, if we can develop in an atmosphere of independence, God willing, in another 25 years, I said, in each house on he tops of the mountains there should be public radios, each town of some significance should have landing strips for airplanes, communication should be smooth everywhere, our country should be a country which is full of not only agrarian enterprises but also industrial enterprises. We cannot live anymore without electricity, without steam [author's note: mostly like in reference to steam-powered locomotives]; not very long from now we cannot even live anymore without atomic energy. Our ideal is a development in that direction.[72]

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[69] Adam Schwarz, *A Nation in Waiting: Indonesia's Search for Stability*, Second ed. (St. Leonards, N.S.W.: Allen & Unwin, 1999), 14.
[70] Eka Darmaputera, *Pancasila Identitas Dan Modernitas Tinjauan Etis Dan Budaya* (Jakarta: BPK Gunung Mulia, 1987), 112.
[71] Sukarno, "Speech by President Sukarno on the 15th Anniversary," 2.
[72] Sukarno, "Speech by President Sukarno on the 15th Anniversary," 5.

The direction Sukarno took in his official development plan, however, was not quite toward the orientation he indicated in his speech. Sukarno's 1956-1960 development plan focused on supplying electricity to urban areas, not rural areas. This emphasis on electrifying cities was repeated in his second development plan, drawn up in December 1960, two months after his speech.[73] The plan put the electrical infrastructure development under a heavy industry, tying the construction of large-scale electrical generators to the development of industrial projects to project Sukarno's vision of an Indonesian identity. For example, the most notable of Sukarno-era electrical infrastructure project was the Jatiluhur Multipurse Dam constructed in 1957, which was completed ten years later. It was the largest hydropower plant built in post-independence Indonesia. Electricity from the Jatiluhur Hydropower Plant, however, was mainly distributed to supply power to Jakarta and Bandung, two large nearby cities, not to the countryside. Sukarno wanted to build Jakarta as "beacon of the new emerging forces,"[74] and Sukarno deemed it imperative that this "beacon" would have enough electricity supply.

Nationalization of Dutch Electrical Companies

Sukarno's speech was also delivered on the heels of a nationalization effort of all of Dutch electrical (and other) companies, which was a long process that occurred in the 1950s. But the desire to seize control of Dutch assets in the archipelago really began in 1946 when Indonesian nationalists tried to take over Dutch utility companies. This matter was a point of contention in the Linggardjati Agreement, the first of a series of meetings between the new

[73] Majelis Permusyawaratan Rakyat, *Lampiran Ketetapan MPRS Tentang Garis-Garis Besar Pola Pembangunan Nasional Semesta Berentjana Tahapan Pertama 1961-1969 no.* 2 (Djakarta: MPRS dan Departemen Penerangan, 1960).
[74] Susan Abeyasekere, Jakarta: A History (Singapore; New York: Oxford University Press, 1987), 168.

republican government and the Dutch held in March 1947.[75] The Indonesian government bowed to Dutch pressure to return the industries to their Dutch owners. When a final negotiation in the so-called Round Table Conference was convened between August and November 1949, this contentious point came up again but it was not fully resolved. The Indonesian government, whose authority was by now fully recognized by the Dutch as a result of this meeting, "held firm to the principle that important branches of the economy must be under its effective control."[76]

In 1950, with the revolutionary wars behind them, the leaders of the Indonesian government quickly consolidated their authority. Whereas in December 1949, the Round Table Conference dictated the creation of a federal government called *Republik Indonesia Serikat* (RIS) or the United States of Indonesia, on 17 August 1950, the government decided to dissolve the RIS and united all of the states under a unitary republic. Two months later on 25 October 1950, the labor activist Kobarsjih and his six colleagues filed a motion in the Indonesian Parliament to nationalize all of the Dutch electrical companies so that funding for these nationalized enterprises could be included in the 1951 national budget.[77] The Wilopo Cabinet finally carried out Kobarsjih's motion on 23 December 1952 when it decided to nationalize all of the Dutch electricity companies, leaving out the gas corporations. This decision was not, in fact, announced until 2 September 1953 by the Ali Sastroamidjojo Cabinet and legalized by a Presidential decree that retroactively start on 23 December 1952.[78] Late in 1953 the government began nationalizing smaller electrical companies such as Electriciteits Mij. Ambon and Electriciteits Mij. Balikpapan. The takeover of bigger companies followed suit. OGEM was nationalized on 1 January 1954 and ANIEM, which by that time was the largest private Dutch

[75] McCawley, "The Indonesian Electric Supply Industry," 39.
[76] McCawley, "The Indonesian Electric Supply Industry," 40.
[77] John Orval Sutter, *Indonesianisasi Politics in a Changing Economy, 1940-1955* (Ithaca, NY: Southeast Asia Program, Dept. of Far Eastern Studies, Cornell University, 1959), 871.
[78] Sutter, *Indonesianisasi*, 886.

electrical company, in November of that year. OGEM's assets became the property of the newly created PLN Djakarta or the Jakarta branch of PLN and ANIEM turned into PLN Djawa Tengah and Djawa Timur or the West & East Java branches of PLN.[79] By this time although almost all of Dutch electricity companies in Java had been nationalized, many private companies in the other islands were still owned by the Dutch. Kobarsjih urged the newly installed Boerhadoedin Harapah Cabinet to nationalize all the remaining electrical private enterprises be nationalized by the end 1955, arguing that "nationalization could lead to lowering the deficit in the State Budget."[80] But Prime Minister Harahap rejected this argument showing that the already nationalized companies "showed losses running at the rate of Rp 20 million annually" instead of turning in a profit.[81]

The debates on the Kobarsjih's motion in Parliament and the drawn out process of nationalizing the Dutch private companies, John Oral Sutter argued, did not indicate that the political climate was opposed to nationalization, which started since the mid-1940s. Rather, it was on the timing of nationalization. The "radical nationalists and ultra-Marxists" Kobarsjih and his friends wanted to nationalize immediately, but others such as the moderate members of the Parliament and government bureaucrats wanted to nationalize only after the Indonesia had acquired more funds in its treasury.[82]

In 1957, there was a turn of event that sped up the nationalization effort. West New Guinea was part of Holland's colony when Sukarno and Mohammad Hatta proclaimed Indonesia's independence in 1945 and thus was understood to be a part of the new Republic of Indonesia. The Dutch, however, maintained control of it and in the Round Table Conference, it

[79] McCawley, "The Indonesian Electric Supply Industry," 60.
[80] Sutter, *Indonesianisasi*, 890.
[81] Sutter, *Indonesianisasi*, 890.
[82] Sutter, *Indonesianisasi*, 891.

insisted on keeping it. Indonesian leaders expected that the Dutch government would eventually transfer the region in the early 1950s. But the Dutch resisted and after failed negotiations, Indonesia took matter in its own hand. In 1957, it seized all Dutch corporations and kicked out Dutch citizens.[83] In 1958 Sukarno issued the Government Regulation No. 23/1958 to put all Dutch companies under the Indonesian control. By the end of the year the Indonesian Parliament ratified this decision by passing the Nationalization Bill.[84]

Initially the Indonesian army quickly moved to take charge of the seized Dutch companies, but later handed over the electric enterprises to civilian control. In 1960, Sukarno issued the Government Regulation No. 19/1960 to introduce *Badan Pimpinan Umum* (BPU) or the General Management Board for PLN. McCawley wrote that the establishment of BPU-PLN was an important event that marked "the end of the transition phase to full nationalization, which had in effect taking place for almost a decade, and was the first attempt to lay down a permanent set of basic ground rules and an organizational structure."[85]

The existence of BPU-PLN did not last very long. The reasons, according to McCawley, were threefold. The first was BPU-PLN's increasing reliance on government's subsidies and its inability of turning in profits, largely because of an incoherent accounting system.[86] The second reason had to do with communications problems that mainly stem from the dual role Srigati Santoso played as the President Director of PLN and the Secretary General of the Department of Public Works.[87] Third, infighting and regionalism, which in turn had 3 causes: bad communications between Jakarta and PLN offices in other regions, diverse background of former Dutch companies, and different operating conditions for each region. Besides a factional

[83] Simpson, *Economists with Guns*, 25.
[84] McCawley, "The Indonesian Electric Supply Industry," 62-64.
[85] McCawley, "The Indonesian Electric Supply Industry," 73.
[86] McCawley, "The Indonesian Electric Supply Industry," 81-82.
[87] McCawley, "The Indonesian Electric Supply Industry," 82-83.

infighting among the Board of Directors, McCawley opined that there were also tension and friction between the old and young PLN employees.[88] Another quarrel also occurred "between the militant left wing groups and their opponents."[89] These internal conflicts would re-emerge as a PLN labor conflict known as the "77 Employees Problem," which I describe in chapter 4.

President Sukarno dissolved BPU-PLN in December 1965, after which two companies, the State Gas Company (*Perusahaan Gas Negara, PGN*) and the State Electricity Company (*Perusahaan Listrik Negara, PLN*) were formed.[90] A few months earlier, a cabinet reshuffle in June 1965 created a new Department of Electricity and Power headed by Setiadi Reksoprodjo. At the time there were some discussions about allowing some private enterprises and even electric cooperatives in the electricity business, but the Minister of Public Works and Power D. Soeprajogi "strongly favored state enterprise."[91] Soeprajogi's preference won out and in the New Order PLN would emerge and rise as the dominant institution in the electricity sector.

Electric Cooperatives

On 10 November 1975, the United States Agency for International Development (USAID) sent in a proposal to Widjojo Nitisastro, Chairman of the National Development Planning Agency (*Badan Perencanaan Pembangunan Nasional, BAPPENAS*), to undertake a pre-feasibility study to explore the possibility of expanding rural electrification activities in Indonesia.[92] The offer was to have a team from the American National Rural Electric Cooperative Association (NRECA), which at the time was "a non-profit organization in the

[88] McCawley, "The Indonesian Electric Supply Industry," 92.
[89] McCawley, "The Indonesian Electric Supply Industry," 93.
[90] McCawley, "The Indonesian Electric Supply Industry," 97-98.
[91] McCawley, "The Indonesian Electric Supply Industry," 103.
[92] National Rural Electric Cooperative Association, *Rural Electrification for Indonesia; Report of the NRECA Study Team*. (USAID document control no. PNAAK593), May 1976, 10.

private sector of the U.S. economy, representing nearly 1,000 rural electric cooperatives" to conduct the study.[93] Indonesia's Minister of Manpower, Transmigration, and Cooperative Subroto accepted the offer on 21 November 1975 and appointed the Director General of Cooperative (DGC) as the Indonesian counterpart of the study.[94]

The NRECA team arrived in Indonesia in February 1976 and traveled widely in Indonesia visiting seven provinces and thirty-five districts (*kabupaten*) to survey the most appropriate locations to setup electric cooperatives.[95] In its report, the NRECA team enthusiastically concluded that, "conditions are favorable for rather spectacular progress in rural electrification in Indonesia" and believed that "if its recommendations are followed that the typical farm family can receive electricity for home lighting cheaper than current costs paid for kerosene!"[96] The Team also recommended a two-phase follow-up program should the Indonesian government wanted to further explore its recommendations, the most important of which was the "establishment of a new, national organization for administering and financing a phased program to provide electric service to the majority of rural Indonesians over a 25-30 year period."[97] This new agency was not unlike the Rural Electrical Administration (REA) in the United States, which was created in 1935 initially as "a temporary relief agency" but made permanent in January 1936.[98]

PLN did not follow NRECA's recommendation to create a separate agency to oversee village electrification. Instead on 29 October 1976 Sutami issued a Ministerial Regulation

[93] Ibid., 10.
[94] Ibid., 11.
[95] Ibid., 11.
[96] Ibid., 12.
[97] Ibid., 28.
[98] Kline, *Consumers in the Country*, 140-141.

(*Peraturan Menteri*) to instruct PLN to found a Sub-Directorate of Village Electrification.[99] PLN leadership appointed a career PLN employee Johannes J. Rumondor to head this division.

The NRECA team agreed to work with PLN arguing that was already "staffed with [the] engineering, construction and operating personnel as well as management and financial staff" to carry out the project.[100] Moreover, PLN's organization already covered the entire archipelago, which divided into thirteen PLN regions (*PLN wilayah*), (see figure 1), making it the only utility in the country with a national coverage.[101]

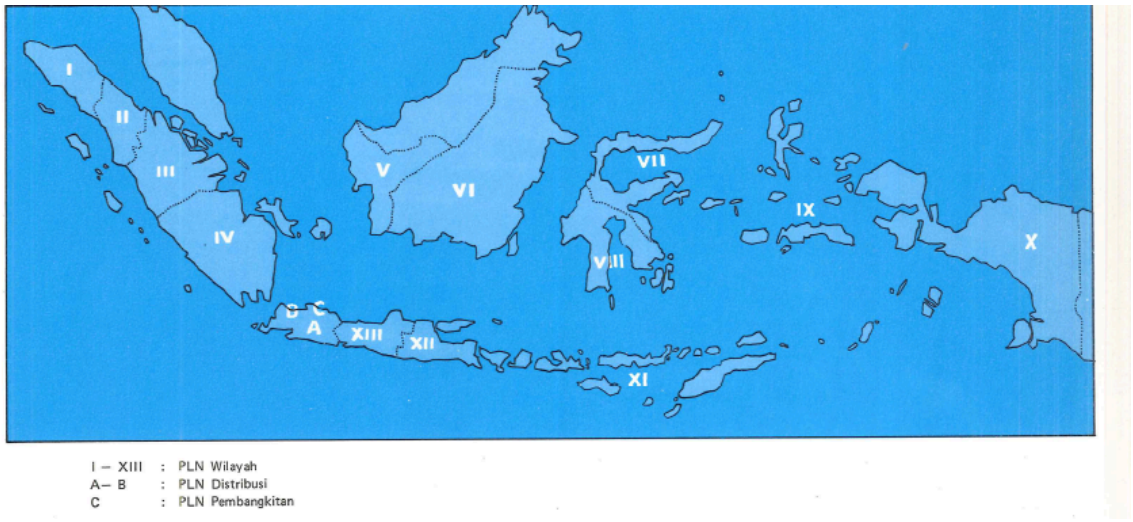


Figure 1 - PLN Regional Areas of Operation[102]

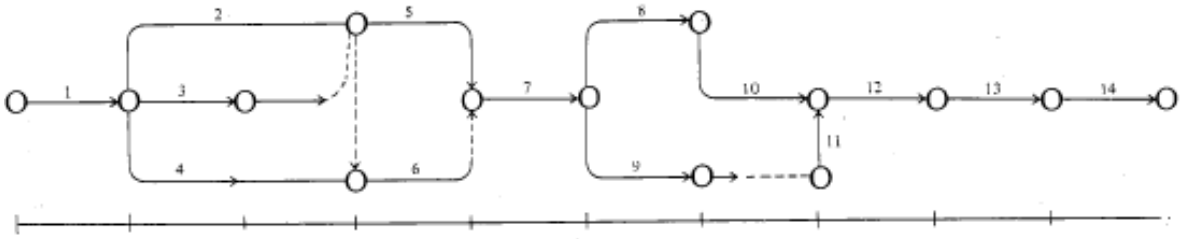
Rumondor grabbed the opportunity of USAID's technical and financial assistance to train some PLN's employees in completing the feasibility studies needed to assess, select, and prioritize village electrification. Rumondor's idea was shaped by his experience learning the Philippines' village electrification program. In January 1977, at the invitation of the National

[99] Keputusan Menteri Pekerjaan Umum dan Tenaga Listrik Nomor 016/PRT/1976 (Public Works and Electrical Power Ministerial Decision Number 016/PRT/1976).
[100] *Rural Electrification for Indonesia*, 29.
[101] Perusahaan Umum Listrik Negara, *PLN 1975/76* (Jakarta: Perusahaan Umum Listrik Negara (PLN), 1976), 7.
[102] Ibid., 11.

Electrification Administration (NEA) of the Philippines, Rumondor and his three PLN colleagues, as well as officials from the Directorate General of Cooperatives participated in a workshop held in Manila to discuss the steps needed to build electric cooperatives in the villages. They presented a paper, attended a discussion on creating a feasibility study, and went on field trips to visit nine Philippines village cooperatives. In their report, it was clear that the Indonesian delegation was quite impressed by what they saw and learned and recommended that additional PLN employees get training on feasibility study. They wrote in the conclusion, "Feasibility Study is a tool for the development of Rural Electrification Program" and these studies could be used to set technical requirements, prioritizes locations, and request funding from foreign institutions and the Indonesian government.[103] Rumondor later elaborated this idea in an article published in a January 1978 issue of *Berita PLN*, a PLN's internal magazine. In the essay, he provided a diagram of a "*Work Flow Feasibility Study Program Perlistrikan Desa*" (Work Flow Feasibility Study of Village Electrification Program) (see figure 2). This workflow diagram encapsulated all fourteen activities deemed necessary to conduct a feasibility study including the

[103] Johannes J. Rumondor et al., "Laporan Mengikuti Conference/Workshop on Initial Steps on Electric Cooperative Development Di Manila Tgl 16 Januari s/D 26 Februari 1977," in *Rural Electrification for Indonesia: A Proposal for USAID Assistance,* 12.

responsible parties for each activity with the end result of producing a typed report.



Aktivitas	Uraian	Penanggung jawab
1.	Penentuan lokasi	1. PLN Pusat
2.	Pengumpulan Data-data dasar dan penelitian lapangan	2. PLN Wilayah dan Bappeda
3.	Kepadatan penduduk (masalah kependudukan)	3. PLN Wilayah dan Bappeda
4.	Membuat peta proyek pelistrikan pedesaan	4. PLN Wilayah
5.	Analisa beban	5. PLN Wilayah
6.	Koreksi dan mencetak peta	6. PLN Wilayah
7.	Peta beban (kw), *system design* dan *voltage drops calculation*	7. PLN Wilayah
8.	*System cost*	8. PLN Wilayah
9.	Menggambar *trace distribution system* pada peta sistem operasi	9. PLN Wilayah
10.	Analisa finansiil	10. PLN Wilayah bersama PLN Pusat
11.	Mencetak peta sistim operasi	11. PLN Wilayah
12.	Diskusi tentang proyek dan rekomendasi	12. PLN Wilayah dan PLN Pusat (rekomendasi terakhir oleh PLN Pusat)
13.	Pemeriksaan kembali dan persetujuan	13. PLN Pusat/Bappenas
14.	Mencetak dan membagikan hasil studi kelayakan untuk proses selanjutnya (penyediaan dana)	14. PLN Pusat

Figure 2 - Work Flow of a Village Electrification Feasibility Study[104]

To train PLN employees to conduct a sound feasibility study, PLN held a series of workshops between October 1977 and August 1978. The four workshops were held in four different cities and involved representatives of several PLN Regions.[105] During each of these workshops, participants did a "feasibility study exercise" of one or two villages in the area and produced a typed description of their activities. In the second workshop, for example, participants carried out a feasibility study for Tabanan, a district in Bali. Some of important documents produced from these workshops were construction standards and a guidebook in

[104] Rumondor, "Program Perusahaan Umum Listrik Negara Untuk Perlistrikan Desa."
[105] The first workshop was held in Semarang between 17 and 22 October 1977, the second in Denpasar between 5 and 10 December 1977, the third in Manado between 23 and 28 January 1978, and the fourth one in Medan between 28 July and 3 August 1978.

conducting and producing a feasibility study report.[106] PLN benefited, in part, from the consultancy of the representatives from the USAID and the NRECA personnel who attended these workshops too.

USAID's proposed a loan to setup demonstration electrical cooperatives in Indonesia was readily accepted by the Soeharto government. In 1978 the Department of Cooperatives created the Project Development Office (PDO) as the agency to implement the USAID-financed project (US$ 10 million). [107] Together the New Order government and the USAID worked to setup ten pilot electrical cooperatives (7 in Central Java and 3 outside Java) following NRECA's recommendations of the sites.[108] The three cooperatives outside Java were to be wholly independent cooperatives. These three rural electric cooperatives were: *Sinar Siwo Mego* in Central Lampung, Lampung; *Samabotuna* in Luwu, South Sulawesi; *Sinar Rinjani* in East Lombok, East Nusa Tenggara.

The Soeharto government tried to expand the pilot projects by setting up more village cooperatives. In 1979 Soeharto issued a Government Regulation No. 36/1979 to allow cooperatives and private entities to undertake electrification works. Also in the same year, Subroto, who by that time headed the newly created Department of Mining and Energy, and his colleague the Minister of Department of Trade and Cooperatives together issued a Ministerial Decision in 1979 to regulate the establishment of electric cooperatives in the villages.[109] The

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[106] For the guidebook, see Perusahaan Umum Listrik Negara, *Pedoman Dan Petunjuk Penyusunan Feasibility Study Listrik Pedesaan* (Jakarta, Indonesia: Perusahaan Umum Listrik Negara, 1977).
[107] *Rural Electrification for Indonesia: A Proposal for USAID Assistance*, April 1977, 6.
[108] Lalit Kumar Sen, *Rural Electrification in Indonesia: Current and Future Perspectives* (Cambridge, MA: Harvard Institute for International Development, Harvard University, 1982), 15-16.
[109] Surat Keputusan Bersama No. 755/Kpts/M/Pertamb/1979 dan No. 613/KPB/X/1979 tentang Pelaksanaan Pengembangan dan Pembinaan Usaha Koperasi Unit Desa di bidang Kelistrikan dan Penyaluran Minyak Tanah (Joint Decision Letter No. 755/Kpts/M/Pertamb/1979 and No. 613/KPB/X/1979 on the Implementation of Developing and Guiding the Endeavor of Village Cooperative Unit in the Electricity Sector and Distribution of Kerosene).

Decision stated that the provision of electricity by these village cooperatives (*Koperasi Unit Desa, KUD*) must follow one of four schemes (*pola*) that regulate their collaboration with PLN. In the first scheme (*Pola I*), KUD employees read electric meter, maintain power lines in the village, and solve minor technical problems. The second scheme (*Pola II*) called for the cooperatives to install electricity in households and extend low voltage distribution lines. For the third scheme (*Pola III*), cooperatives buy electricity from PLN in bulk, do all of the things in the second scheme plus collect electrical bills, keep books, and administer an office and storage facility. Cooperatives had the most leverage and independence in the fourth scheme (*Pola IV*) in which they would also be responsible for the upkeep of electrical generators and substations as well as operator training.[110]

Despite the establishment of these four different schemes, PLN seemed to be highly reluctant working with cooperatives. Munawar Amarullah, PLN's former Deputy Chief Financial Officer, wrote an essay in 1986 that shone light on this issue. In his essay Amarullah said the he favored the PLN-KUD cooperation, especially the third scheme model. He wrote, "PLN-KUD relationship should be seen as a relationship between a 'factory' and a 'retailer' whereby both need and complement each other."[111] He argued that conceptually, the third scheme would allow cooperatives to increase their role in managing and using electricity and simplify PLN's bookkeeping significantly (having just one instead of hundreds of customers in one area). However, according to Amarullah, PLN seemed to be ambivalent about this scheme as evidenced from the electricity price employed. PLN tended to charge the cooperatives an unreasonably high price so that it would be difficult for them to retail electricity at a profit to

[110] Darmono et al., *Mineral Dan Energi Kekayaan Bangsa,* 323.
[111] Munawar Amarullah, "Listrik Masuk Desa," *Prisma* 12 (1986), 82.

their potential subscribers in the village.[112] Amarullah said that he had suggested that PLN sells electricity to cooperatives using a slightly lower price than it had charged. The price suggested (Rp 85/kWh) was already above the PLN's production cost (Rp 80/kWh). This way the cooperatives could retail the electricity at Rp 89/kWh, earning a profit of Rp 4/kWh.[113] But Amarullah's suggestion went unheeded since PLN never followed up on his recommendations. Additionally, PLN seemed to have another concern. Administratively PLN worried that that there would be delinquent cooperatives that would not pay their monthly electricity bills. But Amarullah countered that this was not a problem that PLN could not solve by installing a PLN official in these electric cooperatives.[114]

Haroen, the head of PLN Eleventh Region (1979-1989), penned the same recommendation in December 1986. He wrote that the main challenge to electrify villages was PLN's limited resources. To effectively solve this issue, he wrote that he had given considerable amount of thought to initiate a program to work with some cooperatives using the third scheme. Related to this was his request to the PLN Board of Directors in Jakarta to determine the right price for selling electricity in bulk to the cooperatives.[115] But his request was disregarded. In a subsequent report he wrote in 1990, he criticized the government for neglecting to set the price for selling electricity in bulk to cooperatives when it rolled out the 1989 electricity tariff structure.[116] He was quite critical in his write-up when he chided PLN's lack of cooperation with village cooperatives. Citing the objective of bringing electricity to the villages was for the sake of national interest and not to make a short-term profit, Haroen wrote, "there is no need to fight [for this] such as PLN holding onto 'plump' villages and not giving it to the Cooperatives; or

[112] Ibid., 80.
[113] Ibid., 82.
[114] Ibid., 81.
[115] Haroen, "Usaha Ke Arah Melistriki Desa Di Bali Dengan Pola III," unpublished report, 1986.
[116] Haroen, "Listrik Pedesaan dan Permasalahannya," unpublished report, 1990, 16.

vice versa the Cooperatives do not want to handle 'lean' villages."[117] Haroen's comment suggests that PLN was unwilling, if not resistant, to working with cooperatives. He was still hopeful when he wrote that one way for PLN and cooperatives to successfully work together was "to align their understanding, objectives, collaboration, education, and training."[118]

Subroto's position on this matter was foreshadowed in an interview he did with the *Tempo* magazine in September 1978. Subroto was quoted to say that although he supported the creation and continuing operation of electric cooperatives, he would rather see that this scheme be implemented in only certain areas, namely in the demonstration areas that received funding from the USAID. He reasoned that PLN should still play the central role in generating and transmitting electricity to the villages.[119] His remark hinted at his inclination to maintain PLN as the sole institution in charge of electrification in the country. In addition, part of Soeharto's cabinet restructure in 1978 was the creation of another new department called Department of Trade and Cooperatives. The problem was less of an awkward combination of "trade" and "cooperatives" under one ministerial portfolio (Soeharto later corrected this by splitting the department into two separate Department of Trade and Department of Cooperatives in 1983) than the overlapping responsibilities within that department. Within the Department of Trade and Cooperatives (headed by one Minister Radius Prawiro), there was the Junior Minister of Cooperatives Bustanil Arifin and the Director General of Cooperatives Soedjanadi. In other words, there were three men who were put in charge of cooperatives! It was quite probable that these three men competed for attention and resources to do their tasks, which resulted very little thing accomplished. As a result, despite the Department of Cooperatives' intention to increase the number of electric cooperatives beyond the three demonstration projects (it created an agency

[117] Ibid., 15.
[118] Ibid., 16.
[119] "Bagaimana Menteri Subroto?" *Tempo*, 2 September, 1978, 48.

called the Directorate for the Promotion of Electric Cooperatives in 1979), no additional electric cooperative was ever established.

Having a reluctant PLN and a seemingly ineffective ministry were two main reasons for the lack of the establishment of electric cooperatives in Indonesia. But unfortunately the established ones did not fare well, either. In 1980, PLN commissioned several University of Indonesia social scientists led by Selo Soemardjan to study village electrification in three provinces. Their report provided a comprehensive observation and analysis of the state of village electrification in Central Java, East Java, and North Sulawesi. In the report, Soemardjan and his colleagues mentioned that many cooperatives in Indonesia failed in the past mainly because of poor management and corruption. Consequently they could not compete with private entities that were more business oriented.[120] Their analysis seemed to foretell the fate of the three independent electric cooperatives, which eventually folded and their assets and customers were transferred over to PLN.

The NRECA team's report in 1984 verified what Soemardjan et al. had been concerned with. The team wrote that members of the Rural Electric Cooperatives (REC) board of directors meddled in the day-to-day management activities of the REC. Even though they received a small allowance, they could not let the managers manage the cooperatives. In fact, "In some instances, REC transportation equipment was monopolized by board members to the detriment of REC operations. REC managers have learned to live with this situation."[121] This issue, coupled with a low retention of REC employees due to small wage and a low bill collection rate, made the RECs

[120] Selo Soemardjan et al., *Laporan Penelitian Listrik Masuk Desa* (Jakarta: Direktorat Pembinaan Penelitian dan Pengabdian pada Masyarakat, Direktorat Jenderal Pendidikan Tinggi, Departemen Pendidikan dan Kebudayaan, 1980), 46-47.
[121] National Rural Electric Cooperative Association*, NRECA Final Report: Rural Electrification Projects Department of Cooperatives Contract AID/ASIA-C-1357 AID Loan No. 497-T-052*. (USAID document control no. PDCAM984), December 1984, 29.

struggled to keep their heads above water. Moreover, according to the NRECA team, these cooperatives were continually on the brink of failure because their electricity pricing did not increase in lockstep with the price of fossil fuel for their diesel power plant. The NRECA team wrote, "The REC's were new entities in the electrical power field in Indonesia. As a result, it was not easily defined as to what agency controlled their tariff. As a result, tariff increases always lagged far behind diesel fuel increases resulting in a sizeable deficit financial operation at each REC."[122] The Soeharto government subsidized the operational cost of these cooperatives from its "DIP funds,"[123] but it seemed that it could not do so for a prolonged period of time. Thus, even though in 1992, Samabotuna had a total of 15,793 customers in 66 villages, [124] its electrical assets had to be handed over to PLN in 1996.[125] Also in 1992 Sinar Rinjani had the most subscribers at 16,858 people spread in 97 villages and Sinar Siwo Mego served 14,000 consumers in 30 villages. [126] But in 2010 Sinar Rinjani finally went bankrupt and followed by Sinar Siwo Mego in 2011.[127]

PLN and Private Electrical Companies

In 1985, the New Order government enacted a new law on electrification to supersede what it deemed to be the outdated *Ordonnantie* No. 190 Year 1890.[128] This law, in the drafting

[122] Ibid., 23.
[123] Ibid., 23.
[124] Haryo Soetendro et al., "Rural Electrification in Indonesia" in G. Saunier, ed. *Rural Electrification Guidebook for Asia and the Pacific*. (Bangkok, Asian Institute of Technology, 1992), 374.
[125] "Pendandatanganan Naskah Kesepakatan Bersama Perubahaan Pola Pengelolaan Kelistrikan Eks KLP Samabotuna Kabupaten Luwu—Sulawesi Selatan," *Warta PLN 8*, Juli-Agustus 1996 and "Ditandangani Naskah Kesepakatan Bersama Tentang Perubahan Pola Pengelolaan Kelistrikan eks KPL [sic] Samabotuna," *Berita PLN* July 1996, 18 & 20.
[126] Soetendro et al., "Rural Electrification in Indonesia," 374.
[127] "Tinggalkan Utang Miliaran Rupiah Bupati Lotim Bubarkan KLP Sinar Rinjani." *Suara NTB* 1 July, 2010; "MoU Tidak Selesaikan Masalah KLP SSM," *Lampung Post*, 28 April 2011;
[128] Darmono et al., Mineral Dan Energi Kekayaan Bangsa, 309.

of which three noted figures (Abdul Kadir, Sardjono, and Artono Arismunandar) had a major hand, stipulated what electrical power means (a secondary power derived from various primary forms of energy) and how it could be generated, transmitted, and distributed for purposes other than communications. This proviso, spelled out in the first article of the law, was deemed important by the government to allow other entities beside PLN (including cooperatives and private businesses) to participate in electrifying the country.[129] The law dictated that PLN was going to be the holder of electrification business authority (*Pemegang Kuasa Usaha Ketenagalistrikan, PKUK*) and that other bodies would need a permit to get involved in the electricity sector either to supply it for its own use or for the public.[130] The Soeharto government envisioned two general schemes for private entities to participate. The first one was the so-called "solicited projects," in which these private companies submitted their bids to government-approved electrical projects. When they won the contract, the government would issue a permit to them. The second arrangement was called "unsolicited projects," whereby private companies with their own initiative would build their own electrical infrastructure either for their own consumption or to sell it to the public.[131]

Despite having these two schemes and a guarantee that PLN would buy the electricity generated by any private entities that participated in the solicited project, Law No.15/1985 did not sufficiently entice private companies to get involved in the electricity sector. A Presidential Decision No. 37/1992, issued in 1992, attempted to lure more private companies to invest in the electricity sector using either of two schemes: Build, Operate, and Transfer (BOT) or Build, Operate, and Own (BOO). PLN welcomed the president's invitation asking private corporations to get involved, but at the same time, PLN Board of Directors were uneasy about the future fate

[129] Undang-undang No. 15/1985 Pasal 1 (Law No. 15/1985 Article 1).
[130] Darmono et al., *Mineral Dan Energi Kekayaan Bangsa*, 310.
[131] Darmono et al., *Mineral Dan Energi Kekayaan Bangsa,* 333.

of the company. Djiteng Marsudi, one member of the Board of Directors in the early 1990s who later went on to become PLN's Main Director in 1995, recalled his take of the situation in an interview with me.

> I noticed that PLN was asked to compete with private companies, [but] it would be difficult for PLN to compete as a perum. PLN's maneuver would be rigid. Perum law stipulates that a perum capital cannot be in a form of stocks. A persero could do this. This means that a persero could create a joint venture with someone else, to create a company. A perum cannot do this.[132]

He admitted to me that he was one of the "ringleaders" in an effort to change PLN's status from a perum to become a persero. A *perum* is a type of Indonesian state-owned enterprise in which the government solely owns the company's capital and a *persero* is a limited liability company whose majority shares are owned by the government. Convinced that PLN would be better served as a persero, PLN Board of Directors lobbied the New Order government to finally change the company's status to a *persero* on 30 July 1994.

To ensure that village electrification would still be carried out, following PLN's change of status, PLN setup what was called *Proyek Listrik Pedesaan* or *Prolisdes* (Village Electrification Project), a division that was put under each of PLN regional offices. Thus, PLN First Region in Aceh had an Aceh Prolisdes office. Likewise for PLN Eleventh Region that covered the provinces of Bali, East, and West Nusatenggara, had a Prolisdes office in Denpasar. Funding for Prolisdes came from the state annual budget. When H. Mukhtar Azis was appointed as the new head of PLN Third Region (*PLN Wilayah III*), he was quoted by *Berita PLN* to say that "in the future the village electrification project [prolisdes] would hold a strategic function and role since PLN would electrify remote and isolated villages."[133] Furthermore, *Berita PLN*

[132] Interview with Djiteng Marsudi on 17 February 2012 in Jakarta.
[133] "Pelantikan Pejabat PLN Wilayah III: Desa-Desa Tertinggal Akan Segera Menikmati Listrik," *Berita PLN*, May 1994, 23.

reported that PLN Third Region planned to create an inventory of unlit villages and would electrify 43 villages, 32 in West Sumatra and 11 in the Riau province in the near future.[134]

The 1992 Presidential Decision managed to get some private companies into the electricity sector. The most notable one among them was PT Paiton Energy Company (PEC) that would build a large-scale coal-fired power station in East Java. The initial total capacity of PEC's electrical output was going to be 2 x 615 MW, the largest electricity produced by a private company in Indonesia at the time. PLN management team successfully negotiated the terms of electricity sale with PEC and signed the contract on 12 February 1994.[135]

The deal signing was a breakthrough since one of the reasons that private companies were reluctant to participate in producing electricity in Indonesia earlier, the government admitted, was because of the rigidity of the price structure. Any private entities that had a surplus capacity could sell its electricity but had to do so only through PLN with prices set by the government.[136] The main fear for the private enterprises was that they could not make a profit by selling electricity to a state company who did not have a control over its own pricing. Here we see another manifestation of PLN's monopoly and government's attempt to control this sector important of production. PLN-PEC agreement was a move toward assuring private companies to participate in generating electricity. But few ended up joining PEC. By 1994, PLN generated more total electrical power than all private companies combined. Even so, not all of those private enterprises produced electricity for the public consumption. People still relied on PLN to get electricity in their households.

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[134] Ibid.
[135] "Perjanjian Jual-Beli Tenaga Listrik: Investasi PLTU Paiton Swasta I Terbesar di Dunia di Bidang Tenaga Listrik Swasta," *Berita PLN*, February 1994, 15.
[136] Moenir et al., *40 Tahun Peranan Pertambangan Dan Energi Indonesia 1945-1985*, 401.

Electrifying a Pancasila Nation

The Indonesian state ideology Pancasila figured prominently in the New Order and many PLN employees were "trained" to embody these principles of the state ideology. The following story from my fieldwork illustrates well how Pancasila came be personified by PLN employees.

In early February 2012, I got a chance to talk to Djiteng Marsudi in his office. It took me a while to gain his trust. I had to introduce myself and answered several personal questions for about 20 minutes before he allowed me to interview him. We discussed several aspects of Indonesia's electrical infrastructure development, particularly its village electrification program before he told me that he wanted to tell me the history of PLN. In his narrative, the story of how PLN came into being was tied to Indonesia's struggle for independence.

At the end of his story, he mentioned, "This is the difference between Indonesia and Malaysia," he said. He then recounted an episode in which he met with a high-ranking Malaysian bureaucrat and had the following conversation with her. He said to her, "From the viewpoint of administration your country is much better than Indonesia because we got our independence through a revolution while your independence was prepared by the British." He said that she concurred. 'That is true,' she said. 'That's one thing I'm jealous [of] Indonesia. We don't have Pancasila,' she admitted. The brief exchange apparently left a deep impression in my informant's mind that when he told me he became very emotional and tears streamed down his cheeks. He told me that as far as he could tell his interlocutor was sincere when she made that remark.[137]

Indonesia's national identity as a Pancasila nation figured most notably in New Order Indonesia. It's the one thing that, as my informant expressed, marks Indonesia's distinctive character as a nation. During the New Order, Pancasila did not just serve as the state ideology, but also supposedly the principles that underlie the conduct of all of Indonesian citizens. The

[137] Interview with Djiteng Marsudi on 10 February 2012 in Jakarta.

Soeharto government asked Indonesians of all walks of lives to become Pancasila individuals (*manusia Pancasilais*) embodying the Pancasila principles. A Pancasila individual, Soeharto wrote, "is a person with a Pancasila worldview, who firmly believes Pancasila to be her or his state ideology and who because of this belief will strive to implement Pancasila to the best of her or his ability."[138]

To accomplish this objective, in late 1970s Soeharto conceived of an idea to inculcate Pancasila values to all of state employees from cabinet ministers down to low-rank employees in dozens of state ministries and agencies. Starting in November 1978 and slowly throughout the 1980s, many Indonesian bureaucrats (including PLN employees), academics, schoolchildren, military personnel, college students, and even prisoners were required to learn, to internalize, and to absorb the Pancasila principles. Initially Soeharto mandated state employees and military personnel in a two-week long course called the Guidance, Internalization, and Implementation of Pancasila (*Pedoman, Penghayatan, dan Pengamalan Pancasila, P4*). The reason, he said in his autobiography:

> Because civil servants and members of ABRI [Indonesian Armed forces] make up the state employees, therefore I deem the course start with them. Only state employees and ABRI personnel who really understand Pancasila, the 1945 Constitution, and GBHN who can shoulder their duties as good state and civil servants [*abdi negara dan abdi masyarakat*]. I place a great meaning on this course so that all of the upper echelon employees and our ambassadors can participate in this intensive course. I remember, until March 1983, no less than 1.8 million state employees and almost 150,000 ABRI personnel had taken the course. The workshops for other elements of society such as political party and Golangan Karya [GOLKAR] members, ulemas and clergymen, youth and college students, entrepreneurs, women, journalists, artists, etc. Seeing the benefits and importance of this course for society at large, I consider it vital that this course [penataran P4] to be continued and expanded in the future, especially for village leaders.[139]

[138] Soeharto, "Pidato pada upacara pembukaan penataran calon penatar tingkat nasional/Manggala Bp-7, pada tanggal 19 Maret 1985 di Istana Bogor," (Speech, Indonesian National Archive: President Soeharto's Speech RA16b no. 132).
[139] Soeharto et al., *Soeharto*, 337.

In the thirteenth nation-wide Pancasila course for upper echelons of state employees, held in October 1979, among the top ten "best participants" were the Indonesian Ambassador to Thailand Adnil Hasnan Habib and PLN Director of Program Development Sardjono, who would later be appointed as PLN Main Director in 1980.[140]

College students, academics, teachers, professionals, farmers, fishermen, and laborers followed suit. Schoolchildren were mandated to take a course called the Pancasila Moral Education (*Pendidikan Moral Pancasila, PMP*). Less well known was that inmates were also introduced to the P4 courses. In September 1982 Hari Suharto, the head of the Agency for the Counsel Education Execution of the Guidance, Internalization, and Implementation of Pancasila (*Badan Pembinaan Pendidikan Pelaksanaan Pedoman Penghayatan dan Pengamalan Pancasila, BP7*), an agency created to institutionalize the P4 courses tried out the course materials on some inmates in the Lowokwaru Penitentiary in Malang.[141] Prisoners incarcerated in other prisons across the country would also receive "training" in the P4 courses.[142] The scope of Pancasila inculcation in Indonesian society during the New Order was quite extensive.

Michael Morfit, who analyzed this indoctrination effort, argued that the New Order government did not really want to bring any fundamental social changes by basing its development discourse on the state ideology. Morfit wrote,

> Pancasila, according to the New Order government, is an ideology of containment rather than one of mobilization. That is, it is conceived in such broad and general terms that it can embrace the wide cultural and religious diversities of the Indonesian nation. While it provides an encompassing umbrella [sic] of university, it is not designed to excite mass participation in the development process or galvanize the nation into action.[143]

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[140] "Laporan Ketua Penyelenggara Penataran Pada Penutupan Penataran Tingkat Nasional Angkatan XII," *Majalah Bulanan KORPRI*, October 1979, 8.
[141] "P4 Bagi Narapidana," *Kompas* 8 September 1982, 1 & 9.
[142] In October 1982, Cipinang Penitentiary took the P4 courses. It was reported in "Pancasila dan UUD 1945 Juga Milik Narapidana," *Kompas*, 22 Oktober 1982.
[143] Michael Morfit, "Pancasila: The Indonesian State Ideology According to the New Order Government," *Asian Survey* 21, no. 8 (Aug., 1981), 846.

Writing and publishing his article in 1981, only a few years after the Soeharto government rolled out this course, Morfit hastily concluded the outcome of the P4 course. While Morfit was correct that Pancasila provided a tool to unify the nation, he failed to see the longer-term consequences of this indoctrination process and how it actually mobilized many state employees in the regime's development efforts. Pancasila, in fact, did provide direction in the New Order development effort. Eka Darmaputera pointed out that not only Pancasila served as a uniting ideology, but also functioned as a driving force to achieve modernity.[144]

How did Pancasila play role in the New Order's electrification effort? First, Pancasila appeared in the oft-repeated national goal. PLN employees and people who worked in PLN's parent institutions thought that electricity played a vital role in realizing the national dream. For example, practically all of the attendees of the seminars on electricity held in August 1969 and in March 1970 concluded that Indonesia's goal of "a just and prosperous society based on Pancasila and the 1945 Constitution cannot be realized without electricity in the villages."[145] Second, various PLN leaders frequently connected village electrification with Pancasila-based national objective in many occasions (inauguration ceremonies, flag raising ceremonies, interviews). Johannes J. Rumondor in an interview with *Berita PLN* was quoted to say, "The target of village electrification is to improve the lot and welfare of people in the villages, to equalize development benefits, and to stimulate economic activities in village society in order to achieve the national end, which is a just and prosperous society based on Pancasila and the 1945 Constitution."[146] Additionally, when President Soeharto inaugurated electrification projects in

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[144] Darmaputera, *Pancasila Identitas Dan Modernitas Tinjauan Etis Dan Budaya* (Jakarta: BPK Gunung Mulia, 1987).
[145] Tahir Harahap, *Perlistrikan Desa,* Publikasi LMK No. 04-EP-77. (Jakarta, Indonesia: Perusahaan Umum Listrik Negara, Pusat Penyelidikan Masalah Kelistrikan, 1977), 35.
[146] "Pembangunan Kelistrikan Desa Sebagai Upaya Meningkatkan Taraf Hidup Masyarakat Desa," *Berita PLN*, November 1985, 4.

many places, he reinforced this outlook. For example, in 1986, during the launching ceremony of the Cirata Hydropower plant, Soeharto was quoted to say, "Without sufficient electrical provision, it would be difficult to realize the kind our goal of creating an advanced, prosperous, and just society based on Pancasila."[147] Third, PLN's leaders deemed that village electrification was to realize Pancasila principles. Thus, even after PLN became a *persero* PLN leaders thought it prudent to continue to electrify the villages to help the government achieve social justice for all Indonesians.

Zuhal, PLN's chief at the time, articulated this vision in his paper "*Peranan PLN Sebagai Persero Dalam Penyediaan Listrik Nasional*" (PLN's Role in the National Provision of Electricity) during a celebration of the forty-ninth National Electricity Day on 7 and 8 November 1994. In his article, Zuhal highlighted PLN's "double missions," which were to increase people's welfare justly and equally as well as to earn a profit in order to finance the development of electrical infrastructure for the public.[148]

Djiteng Marsudi, Zuhal's successor in January 1995, repeated PLN's two principal missions in his essay entitled "*Peluang dan Tantangan Pembangunan Sektor Tenaga Listrik Yang Terpadu dan Efisien*" (Opportunities and Challenges in the Development of Integrated and Efficient Electricity Sector) delivered in a National Seminar on Electrification to commemorate the Indonesia's fiftieth independence anniversary in 1995.[149] He took it a step further by elaborating the ways in which PLN would accomplish its missions as a profit earning corporation and a state-owned utility company. The two main strategies he laid out were to restructure PLN's

[147] "Rasa Hormat Yang Setinggi-Tingginya Atas Kesadaran Dan Kesediaan Penduduk Untuk Meninggalkan Daerah Ini Demi Pembangunan PLTA Cirata," *Berita PLN*, May, 1986, 3-7.
[148] Zuhal, "Peranan PLN Sebagai Persero Dalam Penyediaan Listrik Nasional," *Berita PLN*, December 1994, 29-32, 40-41.
[149] "Peluang dan Tantangan Pembangunan Sektor Tenaga Listrik Yang Terpadu dan Efisien," *Berita PLN*, November 1995, 3-5.

organization and to decentralize its operations. It is for these reasons that after PLN became a *persero*, in October 1995 Marsudi created two PLN subsidiaries called *PT PLN Pembangkitan Tenaga Listrik Jawa Bali 1* (PJB 1) and *PT PLN Pembangkitan Tenaga Listrik Jawa Bali 2* (PJB 2), each responsible for the operation and maintenance of PLN's large-scale power generators in Java and Bali. The two subsidiary companies would compete to sell the electricity generated by their electrical generators to PLN's Transmission and Load-Dispatching Center (*Penyaluran dan Pusat Pengatur Beban, P3B*) itself a newly created business unit, which in turn would transmit it to PLN inter-island grid in Java, Madura, and Bali. The creation of these three subsidiaries allowed PLN to generate and distribute its electricity more efficiently than before and positioned the company in a better shape to face competition from private enterprises. It also paved a way for PLN to host the twelfth forum of the Head of ASEAN Power Utilities/Authorities (HAPUA) in Bali in January 1996, which as I will detail in chapter 5 was one of a series of important regional and international meetings held on the island.

At the most basic level, PLN's dual missions were actually in tension with one another. To make money a company would strive to increase revenue and reduce cost. But engaging in village electrification served neither of those goals. The investment needed to extend PLN's power lines or to build new power plants for new villages was more than the return PLN would get, at least for the foreseeable future. But PLN leaders insisted that this tension was somehow reconcilable. In another essay titled "PLN Menghadapi Era Globalisasi" (PLN Faces the Globalization Era), Marsudi reiterated PLN's dual missions and stressed, "PLN as a persero still has a social as a well as a commercial tasks. A social mission such as village electrification must still be done by PLN even though commercially this is not profitable, but this is a duty that the

government gave PLN as an agent of development."[150] I.B. Sudjana, the Mining and Energy Minister at the time, assured PLN Board of Directors that while he urged them to start thinking like business people and accept competition from private companies, they should not worry about losing money. He reminded them that PLN was still a monopoly since the transmission and distribution lines were still under its control and the state could still regulate the electricity sector. At the same time, he asked PLN managers not to forget Article 33 of the 1945 Constitution, which stipulated that electricity production while under the state's control had to still be distributed for the benefits of the people.[151] Thus PLN's role in the New Order, in essence, was less as an electrical company than as an extension of the New Order regime tasked with the important mission to develop the country in the electrical sector.

Conclusion

I have argued in this chapter that the main factors contributing to PLN's status as the principal institution in the electricity sector were Indonesia's colonial experience with electricity and the country's leaders' dream to realize the ideal goal of "a just and prosperous society" using this technology.

When Holland illuminated its colony, it was both to literally light the land and waters of the East Indies *and* to demonstrate its "enlightened" rule, i.e. as justification for its Ethical Policy to lift up the plight of the indigenous populations. Equating electrical illumination with material progress and economic development might have also been a strategy to suppress dissent and the emerging anti-colonial movements as Susie Protschky indicated in her article. But exposing

[150] Djiteng Marsudi, "PLN Menghadapi Era Globalisasi," *Berita PLN*, February 1996, 6.
[151] "Tahun 1996 Target Penjualan Tenaga Listrik 17% Dana Investasi Dalam RKAP Mencapai Rp. 7,8 Triliun," *Berita PLN*, February 1996, 8.

electrical technologies to its colonial population had the unintended effect of introducing an idea of modernity that aspired some Indonesian leaders a country of its own.

In a study of early nationalism in five countries, Liah Greenfeld persuasively argued that nationalism "*forms the constitutive element of modernity*. […] Rather than define nationalism by its modernity, I see modernity as defined by nationalism. The Weberian idea of the social provides a rational for this view.[152] I interpret Greenfeld's argument to mean that while nationalism may not be prerequisite of modernity, its important role in spearheading modernization efforts should not be overlooked. And as Rudolf Mrázek illustrates in his book, introduced technologies in the Netherland East Indies were continually adopted, adapted, modified, and reinterpreted by various peoples in the colony as they were constructing their self and national identities. Technology, nationalism, national identity, and modernity were intertwined in the Dutch East Indies.

In post-independence Indonesia electricity was also interlaced with nation-building efforts, nationalism, and national identity. Not long after Indonesia proclaimed its independence, one of the aims of Indonesian nationalist leaders was to seize control of the Dutch utility companies, which they saw was an important nation building tools. This point was brought up and debated in several rounds of negotiations between the new republican government and the Netherlands government. Taking advantage of expiring licenses that the Dutch gas and electrical enterprises held from before World War II, the Sukarno government started a process of nationalization of Dutch companies in the early 1950s. The process sped up when Irian Jaya (western part of Papua New Guinea) became a point of contention between the two countries. Sukarno nationalized all of Dutch companies in Indonesia as part of his effort to claim the

[152] Liah Greenfeld, *Nationalism: Five Roads to Modernity* (Cambridge, MA: Harvard University Press, 1992), 18 (original emphasis).

territory to complete the nationalists' claim that a new Indonesia had to consist of the former Netherland East Indies. Sukarno's speech in 1960 further emphasized the importance of the nationalization effort completed two years earlier. When Sukarno claimed in his speech that socialism without electricity would not be possible, he attempted to link the new technology with his vision of society and modernity. Sukarno established PLN in 1965, which would emerge as the principal electrical institution under the Soeharto government.

President Soeharto underscored national development and connected all programs his regime conceived and developed to a rather narrow idea to economic development. Soeharto rolled out his village electrification program as one of the main drivers of his national development. His government trusted and wanted PLN to carry out this important task and issued several government regulations, decrees, and laws to facilitate this mammoth organization to bring electricity to the villages. The ideals of Pancasila principles shaped the worldview of both PLN leaders and employees. To them, electricity was not merely a commodity, but a means to realize a dream to create a just and prosperous society. In its attempt to light the countryside, even though the New Order regime welcomed other entities to electrify the country, PLN ended up doing much of the work. Constrained in its movement as *perum* for 22 years, PLN was able to turn into a *persero*, but only to continue to exercise control over electrification in Indonesia. The roles other entities played in New Order's electrification efforts got diminished and PLN's near-monopoly would, as I will show in the next two chapters, shape the constructed electrical infrastructure and allow the New Order regime to entangle electricity with electoral politics.

CHAPTER 3

POWERING PELITAs[1]

Introduction

In 1996 PLN published a thick and glossy commemorative book celebrating its fiftieth year journey as the dominant institution tasked to electrify the nation.[2] The planned launching of the book in October 1995, a year earlier, was supposed to coincide with the fiftieth anniversary of the Indonesian Independence Day. The year 1995 also marked another important moment in the official narrative of Indonesian electrical history: the celebration of the fiftieth National Electricity Day (*Hari Listrik Nasional*). On 27 October 1945 President Sukarno created an organization called the Gas and Electricity Agency under the Department of Public Works as the first organization in post-independence Indonesia founded to manage the provision of gas and electricity. In 1960, this date was later set retrospectively as the founding date of Indonesia's electrical institution even though PLN was established at a much later date.[3] When the book was launched in October 1996, it therefore occurred at the same time as the fifty-first National Electricity Day, celebrated by PLN employees across the nation with great fanfare.[4]

The book was published in two languages, Indonesian and English. Both versions contain virtually the same narrative and carefully selected photographs that highlight PLN's contributions over the past five decades. At the very end of the book, there are 22 maps of electricity coverage in Indonesia, divided according to (mostly) PLN thirteen regional areas of

[1] PELITA is an Indonesian acronym for *Pembangunan Lima Tahun* or Five-Year Development programs, which started on 1 April 1969. The acronym PELITA was used interchangeably with REPELITA, a short for *Rencana Pembangunan Lima Tahun* (Five-Year Development Plan).
[2] Sriwibawa and K.H., *50 Years of PLN Dedication*.
[3] I provide a more detailed description of this event in chapter 2.
[4] PLN Public Relations Office published a book documenting the various activities held that year in commemoration of this event. See PT PLN (Persero), *Lintasan Kegiatan 51 Tahun*.

operation.[5] In certain instances where some operational areas are too wide to be displayed on one page, the maps are split into the provinces that make up the operational region. There is also one map showing the electrical network of one tiny island of Batam, which was then part of the Riau province in northern Sumatra but was run and operated by a special branch of PLN.[6] Each of these maps displays the installed power plants, built sub-stations, and transmission lines (both planned and realized). On these maps, different types of electricity generators are represented by different symbols. A diesel power plant, for example, is represented by a small red square (for example, see figure 4 below). A quick glance at these maps indicates that by 1995, the Indonesian archipelago was doted by hundreds of these diesel power stations.[7]

The book *PLN Statistics 1995* (1996), a compendium of electrical statistical data of the country, reported that there were at the time a total of 3,646 diesel units in all of Indonesia, the majority of which (3,539 units) could be found outside Java.[8] The total rated capacity of all of these diesel-fueled power plants was 2,265.4 MW, constituting a mere 15.12 percent of all the electrical power generated in the country at the time.[9] The bulk of the power produced came from steam-powered (32.16 percent) and combined cycle (29.46 percent) power plants, which were located in only a few areas of the country, mostly on Java.[10] Despite the small percentage of the total generating capacity, these diesel power plants formed a crucial part of Indonesia's power infrastructure supplying electricity to villages that were located far from PLN's main

[5] See figure 2 in chapter 2.
[6] PLN Special Region of Batam [PLN Wilayah Khusus Batam] was established on 1 January 1993. http://info.plnbatam.com/info/index.php?page=sejarah-perusahaan (accessed on 30 December 2013).
[7] To view the maps, see Sribawa and K.H., *50 Years of PLN Dedication*, 356-377.
[8] PT PLN (Persero), *PLN Statistics 1995* (Jakarta: PT PLN (Persero), 1996). Table 16: Number of Generating Units, 17.
[9] Ibid., Table 17: Installed Capacity (MW), 18.
[10] Ibid.

power lines. Outside Java, they powered many localities and without them electricity provision would only be available in only about a dozen regions.

In this chapter, I argue that the majority of these numerous and widespread diesel power stations were installed to support the Soeharto government's objective to electrify as many areas of the country as possible, demonstrating to the masses that it worked hard to develop their villages. It managed to do so by allocating large amounts of funds from its oil windfall, subsidizing domestic oil prices, eliminating tariffs on the importation of diesel generation sets, and issuing village electrification standards that allowed the construction of cheap but technically sound power stations and lines. Although not all of these diesel plants were physically connected to each other, they nonetheless formed a national "grid" because they were "linked" organizationally by PLN who continues to run and keep them in good condition. PLN's vast bureaucracy, reaching down to many remote villages in the archipelago, operated, maintained, and knitted these diesel power plants together as one huge electrical "grid without a grid." This resulted in PLN's networks of diesel power stations that provided many Indonesian villages with cheap electricity, which was a form of *patrimonial technopolitics*. There were some proposals to build alternative power generating stations using non fossil fuels. But for the most part, PLN engineers who proposed these alternatives deferred to their supervisors to make a decision to pursue their ideas, a wide practice among the New Order bureaucrats working in the Javanese-infused cultural atmosphere.[11] As a result, although some engineers managed to publish their ideas, they could not developed them further for a lack of interest among PLN high-ranking

[11] In another instance of how this cultural norm manifested in the bureaucratic practice of the New Order government was when one former PLN employee revealed to me in an interview that his rank (*pangkat*) in the bureaucracy had been delayed. But he accepted his condition by saying, "Because, my principle is that an employee's rank [or promotion] is not supposed to be the employee's concern. That's a matter of the employee's supervisor. If a supervisor wanted to reward [his or her subordinate's performance], then he would promote that employee." Interview with Bagoes Moerdijantoro on 5 March 2012.

officials. This was quite unfortunate because one viable alternative to diesel power plants could have been developed by PLN.

The regime's eagerness to electrify many villages motivated it to install the so-called Pioneer Diesel Plant in some of the remotest areas of the region. The initial plan was to have this generating station temporarily, but many became permanent power stations. Overall, the Soeharto government's emphasis on showing the increasing numbers of villages electrified in every PELITA period was tied to a narrative Indonesian identity as a country working hard to achieve its national goal through its Five-Year Development programs. This identity narrative lent the regime a powerful legitimacy to rule the nation and even suppress dissent when it deemed necessary. Additionally, the outcome of Soeharto's village electrification showed mixed results. While some areas benefited from having electricity, in other areas inequality increased because their underlying socioeconomic structure was not considered in their overall village development planning.

Many nations' technoscientific projects, as I noted in the introductory chapter, had been tied to that country's national identity.[12] The constructed mega projects typify the kind of huge enterprises nations undertake to create and project an equally grand identity, which would situate these nations prominently on the global stage.[13] The historian of technology David Nye has also pointed out that another motivation nations embarked on gargantuan technological undertakings was to create a distinct national character to bind their citizens together and evoke a national

[12] See my discussion on this in the introductory chapter.

[13] Another example in Southeast Asia and in energy sector is the construction of the Bakun Hydroelectric Project in Sarawak, Malaysia. The project is, Benjamin Sovacool and L.C. Bulan write, "intimately intertwined with visions of making Sarawak an industrialized state and Malaysia as a whole a modern country and an emerging player on the international stage." See Benjamin K. Sovacool and L. C. Bulan, "Behind an Ambitious Megaproject in Asia: The History and Implications of the Bakun Hydroelectric Dam in Borneo," *Energy Policy* 39 (2011), 4847.

collective sense of awe and the sublime.[14] Less examined are small-scale, localized, scattered technologies that were built in support of a national identity. One reason, as David Edgerton argues in his book *The Shock of the Old* (2008), is that scholars tend to focus on innovation-centric account in writing histories of technology, which closes up many regions in the world as potential sites for historical investigation of technological development since people there are thought not to "invent" technologies. Edgerton instead calls for examining "technology-in-use" to open up both a methodological space and a research site to produce a history of technology that engages "with all the world's population, which is mostly poor, non-white and half-female."[15] It must be pointed out that investigating technology-in-use is not the same as analyzing users' perspective on technology, which can produce different interpretations or meanings of a particular technology.[16] Rather, Edgerton emphasized the study of what he calls, "creole" technologies or "technologies that have been transplanted from their place of origin finding uses on a greater scale elsewhere."[17]

One notable example of "creole" technologies can be found in the area of transportation. Bicycle and motorcycle had been adopted, transformed, and found much widespread use in many big cities of Asia. Edgerton writes, "By 1950 [cycle-rickshaw] were present in every country in south and east Asia. Japan had never had many."[18] The design variations in each country led to a diversity of names for this mode of transportation. The cycle-rickshaw design that had the driver

[14] See for example David E. Nye, *American Technological Sublime* (Cambridge, MA: The MIT Press, 1994).
[15] David Edgerton, *The Shock of the Old: Technology and Global History since 1900* (Oxford; New York: Oxford University Press, 2007), xiii.
[16] See for example Nelly Oudshoorn and Trevor Pinch, *How Users Matter: The Co-Construction of Users and Technology* (Cambridge, MA: The MIT Press, 2005); Ronald Kline and Trevor Pinch, "Users as Agents."
[17] Edgerton, *The Shock of the Old: Technology and Global History since 1900* (Oxford; New York: Oxford University Press, 2007), xiv.
[18] Ibid., 46.

sitting in front of the passengers were called "*triciclo*," most commonly found in India, Bangladesh, China, and the Macao. The Indonesian "*becak,*" the Vietnamese "*cyclo*," and the Malaysian "trishaw," had the opposite configuration in which the driver was placed behind the passengers. There was yet another version with the passengers sitting alongside the driver. In the Philippines, they were called "sidecar," in Myanmar it was called "*sai kaa*," and in Singapore "trishaw."[19] For the motorized rickshaw, perhaps the "*tuk-tuk*" is one example of a world's "creole" technology that often associated with an identity of a particular nation. The ubiquitous three-wheeled vehicle is always identified with Thailand. In the Mekong Delta a 6-hp Kohler-manufactured motor (called *máy kô-le* in the local vernacular) attached to a Vietnamese sampan became the wide mode of transportation in the region during the Second Indochina War.[20]

To a certain extent, PLN's diesel power stations could be deemed a "creole" technology. PLN imported diesel generator sets that were manufactured in industrialized countries and installed them using standards that combined them with local materials (e.g. wooden poles) or locally produced machines (e.g. dynamos) that allowed for wide use in many rural areas. PLN's term for diesel power station is *Pembangkit Listrik Tenaga Diesel* (PLTD). The hundreds of PLTDs that PLN installed powered not just villages but also the New Order regime's development agenda to increase the welfare of villagers. The photo in figure 3 below captures a scene inside of a diesel power station in Nusa Dua, an island southeast off the coast of Bali.

[19] Ibid., 46.
[20] David A. Biggs, Quagmire: Nation-Building and Nature in the Mekong Delta (Seattle: University of Washington Press, 2010).

Figure 3 – Inside of PLTD Nusa Dua, Bali, Indonesia[21]

To the Soeharto government, the Indonesian village was a crucial national building unit. In its view, a program of national development must involve village development. But while roads, bridges, irrigation canals, and clean water supplies were important and much needed, many government officials thought that these technologies would not quite transform villagers into modern people. Instead it deemed that electricity would do that job. This is reflected, for example, by Minister Sutami's statement when he inaugurated eight new diesel-fueled power plants in West Java in 1977. He said that the country's village electrification project was a very important program because, "in addition to allowing people in the villages enjoy the benefits of development, it would also train their mentality so that they could face challenges ahead and advance their thoughts."[22] South Sulawesi Deputy Governor H.M.D. Nompa hoped that when electric currents were delivered to village households, they would not just light the houses but

[21] Photo taken by the author on 17 May 2012.
[22] "Peresmian 8 PLTD Kelistrikan Di Jawa Barat." *Berita PLN*, May, 1977a, 1-3.

would also brighten people's hearts and thoughts in order to make national development successful.[23]

A fully electrified nation thus became the government's stated goal and in order to achieve this end it asked many people in the villages to support the regime's PELITA programs. Coincidentally the word *pelita* also means a light or a lamp in Indonesian. Thus powering PELITA has a double meaning here. Literally, it means to light (electric) lamps. Figuratively, it means to empower the government's development programs many of which centered on energy projects including the village electrification program. These development programs became the source of legitimacy and political power for the Soeharto government. Since Soeharto relied heavily on the perceived success of its development programs, his political power and *raison d'être* for governing the nation crumbled when the 1997 financial crisis affected Indonesia's economy severely, shook the foundations of his national development agenda, and prompted student protests, which led to his resignation in May 1998.

The New Order's Rise, National Identity, and PELITA Programs

Soeharto came to power following an event historians have called the September 30th movement (*Gerakan 30 September*) in 1965 for the date when some members of the Presidential Guard led by Lieutenant Colonel Untung kidnapped six army generals who were later killed and dumped into a well called *Lubang Buaya* (Crocodile Hole) in Halim, an area on the outskirts of Jakarta. Untung and his men managed to temporarily seize the main radio station in Jakarta and broadcasted a message claiming to have prevented an attempted coup against President Sukarno by the so-called "Council of Generals." Major General Soeharto later led his Army Strategic

[23] "Menteri Subroto resmikan proyek-proyek kelistrikan dan 67 listrik pedesaan di Sulawesi Selatan," *Berita PLN*, November 1984, 22.

Reserve Command (*Komando Strategis Angkatan Darat, Kostrad*) troops to take control of the situation and restore order.

On 1 November 1965 Major General Soeharto formed the Operational Command for the Restoration of Security and Order (*Komando Operasi Pemulihan Keamanan dan Ketertiban, Kopkamtib*). Five months later on 11 March 1966 President Sukarno, using a stroke of his signature on a letter, gave Soeharto unlimited power to continue to restore order and security. Although the whereabouts of the original letter remains to this day a mystery and thus its validity is in question, in effect, a transfer of power had occurred. Soeharto was eventually named Acting President on 12 March 1967 by the Provisional People's Consultative Assembly (*Majelis Permusyawarahtan Rakyat Sementara, MPRS*), which was formed by President Sukarno using his famous 5 July 1959 decree that dissolved the *Konstituante* (Constituent Assembly). Sukarno's decree, which was supported by the army, dismissed the law-making body composed of elected representatives in the 1955 general election and called for the return to the 1945 Constitution. As a result, he subsequently began a period of increasing authoritarian rule commonly known as the era of Guided Democracy (*Demokrasi Terpimpin*). The MPRS was composed of mostly Sukarno's appointees. But in the wake of the September 30th Movement in 1965, many parliamentarians who were thought to be communists were ousted and a new MPRS led by General Abdul Haris Nasution (the only high-ranking army general who escaped the alleged bloody coup attempt by the communists) was formed. It was this MPRS that finally appointed General Soeharto as president of the republic on 27 March 1968. Soeharto then began to rule the country calling his reign the New Order (*Orde Baru*) period to distinguish it from Sukarno's era that was termed the Old Order (*Orde Lama*).

The motives and brains behind the September 30th Movement, its alleged attempted coup, and the subsequent response by Soeharto that some historians have called it a "countercoup," have never been conclusively explained. Several interpretations of the event have been offered by various academic and New Order historians.[24] Soeharto's New Order government blamed the Indonesian Communist Party (*Partai Komunis Indonesia, PKI*) as the mastermind behind the Movement. In the months following Untung's men's action, the soldiers under Soeharto's command aided by some religious organizations hunted down and killed up to a million PKI members and alleged sympathizers, although the exact number was not known for certain. In fact, the pogrom became the New Order's justification for its rise to power: to eliminate a communist "threat" and to avenge the death of six generals who were killed in what was supposedly an abortive coup.

Banning PKI and eliminating Indonesian communists were the sources of authority for the rise of the New Order government. To maintain legitimacy of his rule, Soeharto set about to economically develop the country and created a national development agenda. Soeharto often argued that Sukarno had neglected economic development. In his autobiography, he wrote, "The source of all the national crises that occurred before 1966 were deviations of the spirit and implementation of Pancasila and the 1945 Constitution. That was the first reason. The second reason, all of the backwardness we experienced was rooted in the negligence of economic development."[25] Soeharto thus thought that to fix the country's problems, two main things would need to be done: go back to the "true" spirit of Pancasila and 1945 Constitution and develop the country economically. The situation, however, was more complicated than what

[24] For summaries of five main different interpretations of the 1965-1966 events including the one offered by Benedict Anderson and Ruth McVey, see Hermawan Sulistyo, "Theories Behind the Events of 1965-1966," in John H McGlynn et al. (eds), *Indonesia in the Soeharto Years: Issues, Incidents and Images* (Jakarta, Indonesia: Lontar in association with Ridge Book, 2007), 6-8.
[25] Soeharto et al. *Soeharto*, 232.

Soeharto suggested. For example, the Sukarno government had not completely neglected economic development and in fact had come up with a comprehensive Eight-Year Development Plan in 1960.[26] Although the plan did not fully materialize, there was a proposal to start economically developing the country before Soeharto. But many people bought Soeharto's argument, in large part, because the country's economy was virtually in ruin during the last years of the Sukarno era and they longed to see their lot improve. Subsequently, in his numerous speeches and public addresses Soeharto kept saying that his New Order regime was committed to develop Indonesia.

Soeharto also believed that having a strong national identity was vital for his regime's development agenda. In his autobiography, he provided the intertwining relationship between national identity and development,

> Only a nation with an identity will become a nation that will have confidence in itself. Without confidence, it would be impossible that Indonesia would do this big task such as the task to develop a country this big, a country with this much population. Believing in oneself will engender creativity. This belief in oneself, in one's own ability and creativity becomes the key to a successful development.[27]

Soeharto connected national identity and his development agenda because he believed that the two were tightly related to each other. The kind of national identity Soeharto believed that would instill confidence is one that is based on Pancasila. In this regard, the New Order government connected its efforts to electrify rural areas to an internal national identity as a country endeavoring hard to catch up with the developed world to achieve a Pancasila-based modernity.

As a leader of a developing nation, Soeharto aimed to build Indonesia along a path of modernization informed by a discourse of modernity written by authors such as W.W. Rostow

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[26] For the challenges that Sukarno faced and how he tried to navigate the geopolitics of Cold War and resisted attempts by the US government that tried to impose military modernization theory on his government, see Simpson, *Economists with Guns.*

[27] Soeharto et al., *Soeharto,* 387-388.

who argued that nations go through five stages of growth from a traditional society to become a mass consumptive nation passing a middle stage called "take off."[28] Soeharto's thinking was clearly shaped by this discourse as evidenced, for example, in how his government setup the Five-Year Development (PELITA) programs with the goal of launching Indonesia into the third stage before taking it off to reach its national goal. Soeharto explicitly expressed these stages of development in his autobiography in a chapter called "Thinking about Taking-Off."

> People must be made to understand that a just and prosperous society based on Pancasila that is our national goal, cannot be achieved all at once, cannot come down from the sky just like that. We have to achieve it through development, in stages and according to our ability. To start realizing a just and prosperous society, we have to have a solid foundation. Economic foundation is a condition of economic life that is supported by a strong industry buttressed by a robust agriculture. Without the strong *foundational* industries and without the support of the robust agriculture it would be difficult to realize a just and prosperous society. …The general pattern of long-term development spelled out in GBHN [Broad Guidelines of State Policies], which is the strategy of long-term development, is that the foundation of a just and prosperous society can be achieved after doing five to six times Repelita. We can be assured that what we have achieved by the end of Pelita III can help us get to that foundation by the end of Repelita V. Therefore, Repelita IV (1984-1989) was set to create the scaffolding of the foundation, while Pelita V (1989-1994) to strengthen the foundation. This way, in Repelita VI (1994-1999) we can start realizing a just and prosperous society based on Pancasila with our own strengths [and this period] is known as *tinggal landas* [takeoff] (original emphasis).[29]

Soeharto designed each PELITA to prepare Indonesia to get to the "takeoff" stage. The idea of taking off took a literal turn when the Soeharto government decided to pour in a huge amount of resources starting in the mid-1980s to fund a national airplane company (*Industri Pesawat Terbang Nusantara, IPTN*), one of the ten "strategic" industries, under the command of B.J. Habibie, Soeharto's most trusted protégé and a long-serving Minister of Research and Technology. In August 1995, the second year of the sixth PELITA, IPTN rolled out N250, its first designed and manufactured turboprop commercial aircraft. The plane flew its maiden flight on 10 August 1995. But as Sulfikar Amir recounts in his book, despite this seeming achievement,

[28] W. W. Rostow, *The Stages of Economic Growth: A Non-Communist Manifesto* (Cambridge, England: Cambridge University Press, 1960), chapter 2.
[29] Soeharto et al., *Soeharto,* 362.

the overall endeavor to usher Indonesia into the industrialization stage failed.[30] In 1997 Indonesia along with a few other Asian countries were hit by a sweeping financial crisis. This event and a confluence of other factors led to Soeharto's downfall in 1998.[31]

PLN's In-Depth Study of Diesel Power Stations

Minister Sutami was once quoted in a newspaper that he would like to have electricity available in the mountains by the end of the twentieth century. In order to do this he called for PLN employees to seriously think and plan for village electrification.[32] Tahir Harahap and a few of his PLN colleagues answered this call by writing a paper in 1971 with recommendations to help realize Sutami's goal. In their paper, Harahap and his friends wrote that to efficiently light thousands of people who lived in many district capitals in the country, a skid-mounted 25 kW diesel generator equipped with safety features and control could be installed quickly in these areas. Each of these diesel generators on average could be manned by a technician who had a primary education with 5-7 years of experience or with a secondary education with 3-4 years of experience. The assumption was that the technicians could be recruited and trained locally by PLN. Harahap estimated that if one of these machines could supply electricity between 250 and 300 subscribers, the government could install 2 diesel sets for 1 village (with an initial plan to supply 1,000 villages), which could supply between 500,000 to 600,000 subscribers easily. Assuming that each household subscriber had 6 people, a total of between 3 to 3.6 million people would receive electricity when the fist 1,000 villages had been fully electrified.[33]

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[30] Sulfikar Amir, *The Technological State in Indonesia: The Co-Constitution of High Technology and Authoritarian Politics* (London, New York: Routledge, 2012).
[31] For one account of the factors leading to Soeharto's downfall, see Kevin O'Rourke, *Reformasi: The Struggle for Power in Post-Soeharto Indonesia* (Crows Nest, N.S.W.: Allen & Unwin, 2002), part I.
[32] Harahap, *Perlistrikan Desa*, 38.
[33] Harahap, *Perlistrikan Desa*, 35-39.

PLN Board of Directors responded to their paper by rolling out three micro diesel plant demonstration projects. On 3 August 1973, without much fanfare or an official ceremony, PLN started to operate these pilot projects in the sub-district capitals of Breneun, Panton Labu, and Samalanga, in Aceh, the northernmost province in Sumatra. Two years later on 1 June 1975, a fourth pilot project was added in the sub-district of Lhok Sukon, also in Aceh.

Harahap later studied the Aceh diesel plants and wrote a detailed report about them. Harahap's report, titled simply "Perlistrikan Desa" (Village Electrification), analyzed two of the four Aceh diesel plants: Samalanga (1 unit of 28 kW diesel generator with 148 total subscribers) and Panton Labu (2 units of 28 kW diesel generator with 134 total subscribers). He detailed the investment, power produced, number of technicians employed to run each plant, costs of running the plants, revenues generated, as well as profits earned in order to promote the construction of micro-diesel plants.[34]

Harahap implicitly advocated the use of diesel power plants in the villages. For example, in a section describing the "advantages and disadvantages" of micro diesel plants, he only outlined the benefits: they can be installed anywhere in the country, they are independent of the season and weather, they can be constructed in under one year, their installation cost is about a fifth of the cost to build a micro hydro plant, and since many are located in the center of towns it would be easy to find qualified personnel to operate them.[35] Based on his evaluation of the two Aceh diesel plants, Harahap suggested that the government build 150 Panton Labu-like plants (2 units of 28 kW generators) and 50 of Samalanga-like (1 unit of 28 kW) plants for the 1977-1978

[34] Harahap, *Perlistrikan Desa*, 3-5. Tahir Harahap, *Perlistrikan Desa* (Jakarta, Indonesia: Perusahaan Umum Listrik Negara, Pusat Penyelidikan Masalah Kelistrikan,[1977])., pp. 3-5.
[35] Harahap, *Perlistrikan Desa*, 6.

budget year at an estimated cost of 3 percent of PLN's construction budget of that year.[36] Taking Samalanga total customers as a baseline but rounding it up to 150 subscribers, Harahap estimated that by the end of the fiscal year, there would be 37,500 new PLN customers. If each household subscriber consisted of 8 people then by year's end, there would be 300,000 villagers who would enjoy electricity.[37]

What Harahap tried to do was to show that with a minimal cost as well as an effective and practical planning, micro diesel plants would be suitable to electrify villages and that these units can be operated independently of other plants. If one village electrification unit consisted of a combination of Panton Labu and Samalanga plants (i.e. 3 units of 28 kW diesel generators) and if 200 units were added annually then by the end of the twentieth century, Harahap calculated, Indonesia would have 4,800 plants with about 900,000 consumers. The investment needed was Rp 57.6 million, less than PLN's one-year budget, Harahap argued.[38] Harahap also added that Panton Labu and Samalanga plants did generate profits even with a 10 percent interest rate on the investment and inevitable losses on electricity generation and distribution: Rp 21,000 per month for the former and Rp 13,000 per month for the latter. They performed better financially than some of the installed power plants in big cities in Medan, Palembang, and Ujung Pandang. The main reasons were fourfold: simple planning and construction, simplified electricity pricing structure, effective investment, and easy administration. Panton Labu power

[36] Harahap, *Perlistrikan Desa*, 9. Tahir Harahap, *Perlistrikan Desa* (Jakarta, Indonesia: Perusahaan Umum Listrik Negara, Pusat Penyelidikan Masalah Kelistrikan,[1977])., p. 9.
[37] Harahap, *Perlistrikan Desa*, 9-10. Harahap was not consistent in his assumption. I think he increased it from 6 in his 1971 paper to 8 in his 1977 report to show more potential total subscribers. Although Harahap did not provide a rationale for his assumption, his estimate was not without basis. At the time large families lived in the villages. To give an example, my father and mother each had 6 and 8 siblings respectively living in the same house together when they were growing up.
[38] Harahap, *Perlistrikan Desa*, 11. Tahir Harahap, *Perlistrikan Desa* (Jakarta, Indonesia: Perusahaan Umum Listrik Negara, Pusat Penyelidikan Masalah Kelistrikan,[1977])., p. 11.

plant could even generate more profit since it was only supplying electricity to half (150 subscribers) of its potential customers at the time.[39]

Harahap's study emphasized on the "benefits" of installing micro diesel plants to electrify the countryside even though in the end of the first part of his report, Harahap said that a similarly detailed study on wind-powered, ocean tide-powered, solar-powered, micro hydro-powered plants was needed to have a good alternative comparison.[40] Harahap's report was published as one of PLN's Power Research Institute (LMK)'s publication and written for PLN internal organizations as well as for local government officials.[41] It was widely circulated and became one source of knowledge that PLN used to install many diesel power plants. For example, in a study done by some researchers from the 10 November Institute of Technology (ITS) on the pattern and development of village electrification in Central Kalimantan, the authors cited Harahap's document.[42]

Harahap's report would later be followed by two important standards that PLN drew up and published to specify the procedure of village electrification construction. In October 1985, a team from the World Bank visited Indonesia to assess the country's village electrification effort to date. The team published its report in November 1986 after discussing a draft of it with the New Order government two months earlier. The World Bank team noted that PLN's current electrification strategy, "which largely consists of financing PLN's extension into every village according to Repelita targets, is no longer affordable under its current conditions."[43] The team

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[39] Harahap, *Perlistrikan Desa*, 17-19.
[40] Tahir Harahap, *Perlistrikan Desa* (Jakarta, Indonesia: Perusahaan Umum Listrik Negara, Pusat Penyelidikan Masalah Kelistrikan,[1977])., p. 33.Harahap, *Perlistrikan Desa*, 33.
[41] Harahap, *Perlistrikan Desa*, 71.
[42] Institut Teknologi 10 Nopember, *Laporan penelitian pola pembangunan dan pengembangan listrik masuk desa di Kalimantan Tengah*, (Surabaya: Pusat Penelitian, Institut Teknologi Sepuluh Nopember & BAPPEDA Propinsi Daerah Tingkat I Kalimantan Tengah, 1984).
[43] World Bank, *Indonesia Rural Electrification Review*, vi.

suggested that it was about time that the Indonesian government mobilizes other non-governmental organizations to electrify the villages, make electricity more accessible and more affordable to many villagers, and finance the whole enterprise using a more reliable source of funds. Technically, the World Bank team recommended "an acceleration of PLN's ongoing comprehensive revision of technical design and construction standards to adapt them to rural conditions."[44] PLN took note and addressed the technical design recommendation by issuing its first standard: *Standar Listrik Pedesaan* (Village Electrification Standard), published in 1987 as SPLN 74: 1987.[45] A few years later, PLN issued a revised version in 1991 called SPLN 87: 1991 *Standar Konstruksi Listrik Pedesaan* (Village Electrification Construction Standard).[46] Both documents specified in details the calculations, materials of constructions, and fabrication of village electrification electrical infrastructure. The most prominent feature of both documents is the provision of electricity using diesel generators.

Soeharto's Village Electrification and the Spread of Diesel Power Stations

The efforts to wire the country using diesel generators actually much began much earlier than the start of the Samalanga and Panton Labu pilot projects. In the late 1950s, the Sukarno government installed diesel power stations using technical and financial assistance from the United States and Czechhoslovakia. The American aid helped install these plants in 40 different sites in Sumatra and Kalimantan. The Czechhoslovakian units were installed in 54 different sites, mostly in eastern Indonesia. The Sukarno government also bought small-scale German made

[44] Ibid., xiii.
[45] This PLN standard was issued as an attachment to Letter of Decision of PLN Board of Directors No. 062/DIR/87 (Surat Keputusan Direksi PLN) dated 4 July 1987.
[46] This PLN standard was issued as an attachment to Letter of Decision of PLN Board of Directors No. 036.K/0594/DIR/1991 (Surat Keputusan Direksi PLN) dated 25 April 1991.

diesel units ranging between 150 and 250 kW.[47] Peter McCawley wrote that these three schemes might have been employed to appease "increasing dissatisfaction in the Outer Islands [i.e. outside Java]."[48] The Indonesian government faced some challenges with installing these diesel plants in remote areas. Additionally, because of a lack of standardization and coordination, in some power plants the government placed three different diesel units side-by-side, further complicating the operation and maintenance of them. Many of these diesel plants stopped operating for a long time because of lack of spare parts supply.[49]

When Soeharto was in power, one of the earliest things his government did was to rehabilitate broken diesel power plants in several places in West Java and East Java as well as in a few provincial capitals (Medan, Menado, Ambon, Denpasar, Kupang, and Banda Aceh) in 1968.[50] Despite a warning from Artono Arismunandar and Ibnu Sutowo that the 1950s "diesel-electrification schemes have been found to be inefficient,"[51] PLN pressed on with using diesel power plants. It began installing various sizes of them starting in 1973.[52] To ensure a better coordinated effort, the company created a Sub-Directorate of Village Electrification to oversee PLN's entire rural electrification program in 1976. PLN also started a series of courses to train its technicians in the operation and upkeep of a variety of diesel generators. When Hasjim Rambe opened the second course on 27 November 1978, he said to the trainees, "Diesel in Indonesia will still be needed in the next 10 years."[53] His message, although perhaps meant to

[47] McCawley, "The Indonesian Electric Supply Industry," 251.
[48] McCawley, "Rural Electrification in Indonesia—Is it Time?," 51.
[49] Ibid., 52.
[50] Direktorat Tata Kota dan Daerah Departemen Pekerdjaan Umum, "Nota Pendjelasan Projek Tenaga Listrik 1968 (Diperbaharui) Pembinaan Projek/Masalah Prasarana" Studio, Djakarta, 1968). 1.
[51] McCawley, "Rural Electrification in Indonesia—Is it Time?," 52.
[52] Abdul Kadir, *PLN Dalam Pembangunan Kelistrikan Naskah Pidato Pengarahan Direktur Utama PLN Pada Rapat Dinas PUTL 1974* (Jakarta: Departemen PUTL, 1974), Lampiran C.
[53] "Ir. Hasjim Rambe Pada Siswa: Diesel di Indonesia Sampai 10 Tahun Yang Akan Datang Masih Tetap Dibutuhkan," *Berita PLN*, January 1979, 41.

motivate the students in the course, foreshadowed a trajectory of Indonesia's village electrical infrastructure outside Java.

The practice of using diesel generators to light rural areas continued because PLN believed that providing electricity to the villages was an important mission. One of the New Order's goals was to transform most of Indonesia's villages to become *swasembada* villages by the year 2000, which means that they all should have been electrified by the same year. Using small and medium scale diesel generators, PLN engineers as system builders could determine relatively easily and quickly where and how much it would cost to construct a diesel power plant. This way, they could plan how many villages to electrify in each PELITA. For example, in the third PELITA (1979-1984), the goal was to electrify 3,700 villages. PLN managed to exceed its own target by connecting 90 percent more customers and 56 percent more villages using special budget allocated by the New Order government. For the fourth PELITA (1984-1989), PLN aimed to connect 7,000 villages and 1.6 million customers. In the fifth PELITA (1989-1994), PLN wanted to add 2.4 million customer and 9,500 villages.[54] Based on these targets (and what it had actually achieved) PLN officials could report the steady increase of the amount of power generated and villages electrified in the country every year.

The Soeharto government, likewise, could report the constant upward trend every five years.[55] This helped project the idea that it led the nation in a steady march toward prosperity, equity, and modernity. The government was obsessed with producing statistical data on many aspects of development. Officially, the rationale was to collect and compile "accurate, complete

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[54] World Bank, *Indonesia Rural Electrification Review* (Report No. 6144-IND), East Asia and Pacific Regional Office, 15 November 1986, 50.

[55] Science studies scholar Theodore Porter traces the genealogy of quantifications in the sciences and elucidates the cultural meanings of objectivity that is often associated with quantification in his book Theodore M. Porter, *Trust in Numbers: The Pursuit of Objectivity in Science and Public Life* (Princeton, NJ: Princeton University Press, 1995).

and comprehensive statistical data … to prepare a development plan" and to avoid mistakes and wastes of resources and time.[56] Another unstated reason seemed to be that these data provided measurable indicators of the government's development activities, showing "objective" proof of development progress to Indonesian citizens. Spearheading the effort was the Central Bureau of Statistics (*Biro Pusat Statistik, BPS*), founded in 1980, which the government tasked to obtain various social, demographic, and economic data by conducting censuses and surveys. When BPS was founded, the government also introduced an Integrated National Statistical System (*Sistem Perstatistikan Nasional Terpadu*) to coordinate all statistical activities in the country by clearly delineating what surveys could be done by which non-departmental government agencies, government institutions, state universities, and research centers. Among several non-ministerial bodies that the New Order setup, BPS would rise to become one of the well-known and prominent institutions. In the 1980s, BPS conducted surveys on the impacts of village electrification in several areas in Java.[57]

But the New Order government's fixation on producing yearly electrical (and other kinds of) statistics and on showing the growing numbers of electrified villages masked the conditions on the ground where a village that had received electricity did not necessarily mean that it had the means to develop economically. In addition, as I will show later in the chapter, the New Order's progress-in-numbers statistics said little about the opposition that some villagers mounted against the construction of some of these large multipurpose dams.

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[56] S. Sjamsuddin, 25 Tahun Pembangunan Pemerintah Orde Baru (25 Year Development of the New Order Government) (Jakarta: Tuhe Lowarutu Utama, 1991), 134.

[57] Biro Pusat Statistik, *Dampak Listrik Masuk Desa Dan Perusahaan Listrik Non PLN Propinsi Jawa Tengah 1982* (Jakarta, Indonesia: Biro Pusat Statistik, 1983); Biro Pusat Statistik, *Dampak Listrik Masuk Desa Dan Perusahaan Listrik Non PLN Propinsi Sumatera Utara Dan Sulawesi Selatan* (Jakarta, Indonesia: Biro Pusat Statistik, 1984); Biro Pusat Statistik, *Dampak Listrik Masuk Desa Dan Perusahaan Listrik Non PLN Propinsi: Jawa Barat, D.I. Yogyakarta, Dan Jawa Timur 1983* (Jakarta, Indonesia: Biro Pusat Statistik, 1985); Biro Pusat Statistik, *Dampak Listrik Masuk Desa 1987* (The Impact of Village Electrification 1987) (Jakarta: Biro Pusat Statistik,1987).

PLN was aware that building small-scale diesel power stations were not economically desirable for the long term and it intended to use these diesel-powered electrical generators temporarily as a stopgap measure until large-scale power plants were built.[58] But even after the company constructed large-scale power generators on Java in the 1980s to take advantage of big economies of scale and to diversify its energy mix, it continued to install and run diesel power plants on other islands up to the late 1990s. According to some PLN officials, the reason there were many diesel generators installed was that they were cheaper to source and quicker to install than other types of power plants. Suryono, the PLN Main Director between 1975 and 1980, mentioned this in a 1978 energy seminar held to discuss the availability of various energy sources in rural areas. He said that among the three types of power plants PLN considered: gas turbine, diesel generator, and hydropower plant, the cost of diesel generator was the cheapest.[59] Ali Herman Ibrahim, a former member of PLN Board of Directors in the mid-2000, elaborated that of the three main considerations PLN had in deciding which type of power plant to build (operational concerns, availability of fuel, cost, and electricity demand in an area), he writes, "diesel-power plant is flexible in terms of meeting electrical load, easy to maintain and it has a varied capacity from small to large," making it the most appealing choice.[60] Another factor, though often not explicitly stated, was the ease of importing diesel generators from abroad because the New Order government levied no import tariff on the machines.[61]

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[58] Munawar Amarullah, "Pengembangan Wilayah dan Manpower Planning Pelistrikan Desa," *Berita PLN*, March 1978.
[59] Suryono, "Penyediaan Tenaga Listrik Untuk Pedesaan," in *Penyediaan Energi Untuk Daerah Pedesaan (Hasil-hasil Lokakarya Energi, 25-26 Mei 1978, Jakarta)*, edited by Pramono Djojowikromo et al. (Jakarta: Percetakan Pertamina, 1978), 89.
[60] Ali Herman Ibrahim and Akbar Faizal, *General Check-Up Kelistrikan Nasional* (Jakarta: Mediaplus Network, 2008), 75.
[61] Arismunandar, "Overview of Electric Power Development in Indonesia," 6.

Moreover, the availability of cheap oil in Indonesia contributed to the widespread use of these diesel units. This in turn was facilitated by a number of factors. First, the New Order government passed a favorable foreign investment law in 1967 that lured foreign companies to do their businesses in Indonesia.[62] Soon after many companies including oil and gas multinational corporations started to invest in the country. Second, in 1968, the state oil company PERTAMINA was founded, as a merger of two companies: PN Permigan and PN Permina. In 1970, a law passed by the government strengthened PERTAMINA's position, allowing it to establish joint ventures with other companies. From that point on, PERTAMINA acted as the Indonesian partner for multinational corporations interested to invest in the oil and gas sector in the country. Third, as a result of the first two and the discoveries of several new oil and gas fields in the country between 1969 and 1974,[63] oil production in the archipelago soared since Soeharto took power. From 1968 until 1978 Indonesia's oil output increased from 0.75 million barrel a day to 1.7 million barrel a day.[64] Oil became widely available both for export and national consumption. The government's emphasis from the beginning was to use Indonesia's fossil fuel wealth as export commodity to increase its foreign exchange reserve. The country's revenues from oil export jumped significantly, from 39 percent of its total income in 1972/1973 fiscal year to 64 percent in 1975/1976, constituting its majority of revenue in just over three years.[65] Fourth, the Soeharto government subsidized oil prices at home. The subsidy did not

[62] Undang-Undang No. 1 Tahun 1967 Tetang Penanaman Modal Asing (Law No. 1 Year 1967 On Foreign Invesment).
[63] Darmono et al. , *Mineral Dan Energi Kekayaan Bangsa*, 222.
[64] Abdul Kadir, "Pidato Pembukaan," in *Penyediaan Energi Untuk Daerah Pedesaan (Hasil-hasil Lokakarya Energi, 25-26 Mei 1978, Jakarta)* ed. Pramono Djojowikromo et al. (Jakarta: Percetakan Pertamina, 1978), 29.
[65] Artono Arismunandar, "Availability of Conventional Energy Resources in Indonesia to Meet Present and Future Domestic Demands," a paper presented in the tenth meeting of the World Energy Conference in Istanbul in 1977. A copy of this paper is available Pramono Djojowikromo et al. (eds), *Penyediaan*

actually start until the fiscal year 1974/1975, but it continued throughout the New Order. Ensuring cheap domestic oil allowed the government to set low electricity prices for its household consumers, a highly populist policy. As a state-owned enterprise, PLN had little say in setting electricity prices. The government with the parliament's approval set the prices. PLN tried to make a profit by selling electricity to industries and large enterprises that were charged at a higher price. This "cross-subsidy" strategy permitted PLN to earn its revenue. The government felt a pinch in 1982 when an increased domestic demand of oil and high world's oil price forced it to reduce its subsidy. That year, the price of diesel fuel in Indonesia was Rp 45 per liter even though the production cost already reached Rp 132.69 per liter. [66] Even though the regime decreased its subsidy, it continued to provide this financial support. And finally fifth, Indonesia's concept of the Archipelagic World View (*Wawasan Nusantara*), which I described in chapter 1, enabled further exploration and exploitation of fossil fuel in the country whose territorial area significantly increased. It now covers 2,077 square km of land and 3,166 square km of water for a total area of 5,243 square km.[67]

In 1966 Indonesia's overall oil and condensate production was about 400 thousand barrel a day. It steadily increased until it reached its peak in 1977 at 1,685 thousand barrel a day. Since that time, it dipped in the 1980s (the lowest was in 1982 and 1985 at 1,337 thousand barrel a day) and rose again in the 1990s (the highest was in 1994 at 1,611 thousand barrel a day).[68] To

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Energi Untuk Daerah Pedesaan (Hasil-hasil Lokakarya Energi, 25-26 Mei 1978, Jakarta), (Jakarta: Percetakan Pertamina, 1978), appendix 1.

[66] Widjojo Nitisastro, "Harga BBM Melonjak," January 1982. (A TV interview about the increase in oil prices and its connection with the government's budget given by Widjojo Nitisastro). A transcribed copy of this interview is available in Widjojo Nitisastro, *Pengalaman Pembangunan Indonesia*, (Jakarta: Penerbit Buku Kompas, 2010), chapter 18.

[67] Darmono et al., *Mineral Dan Energi Kekayaan Bangsa*, 20.

[68] Darmono et al., *Mineral Dan Energi Kekayaan Bangsa*, 227.

process its significant oil output, the New Order government built new refineries in the 1980s. By 1998 a total of nine of them had been constructed to supply national demand.

PLN Main Director Piet Haryono had already expressed a concern about the wide use consumption of oil in the country as early as in 1978. He was concerned (correctly as it turned out) that oil consumption would increase and pose a problem in the future. In the same energy seminar PLN Main Director Suryono attended, he delivered a word of caution in an opening speech in which he said, "The convenience afforded by oil as one source of energy and a low price led to high use. Another effect of this is that to switch from this liquid energy source to another source of energy would take a long time."[69] PLN's choice to build diesel power stations in many areas, facilitated by all the factors above, expanded its "grid without a grid" system. This system gained a "high momentum," which according to Hughes is akin to a "conservative force reacting against abrupt changes in the line of development" of a technological system."[70] One consequence of it was that it would become hard for PLN to switch to other available alternatives. As a result, the PLN's scattered diesel plant system influenced how PLN's practice of providing electricity in remote areas and the relations between the New Order government and the villagers.

Underdeveloped Alternatives to PLTDs

PLN's penchant and emphasis on diesel power stations notwithstanding, there had been discussions and efforts to light rural areas using other kinds of technology. Indonesia is endowed with both renewable (solar, wind, water, geothermal) and non-renewable (oil, natural gas, coal) natural resources. The Dutch used the water resource extensively by building many hydropower

[69] Piet Haryono, "Peranan Minyak Dalam Pembangunan Nasional," 89.
[70] Hughes, *Networks of Power*, 465.

stations across the country in the colonial period. President Sukarno initiated the Jatiluhur Multipurpose Dam for irrigation and electricity production in the late 1950s. In the New Order era, there had been discussions of exploiting other sources of energy. For example, in the countryside, one practical alternative was to harness water in hydro-rich villages for electricity. Although there were some initial efforts to pursue this course, PLN did not develop it fully. The company built some micro hydropower stations or *Pembangkit Listrik Tenaga Mikrohidro* (PLTM) in the mid 1980s, but diesel generator was still the preferred choice of technology for rural electrification.

In 1979 the Department of Mining and Energy held a seminar to discuss energy conservation efforts to address increased oil demand in the country.[71] Participants in this seminar presented and discussed 21 working papers. In his opening speech Minister Subroto said that the rationale for Indonesia's energy conservation (the second of four pillar of his energy policy) was less about Indonesia's need to import oil than to maximize it for export, which would generate the much-needed foreign exchange reserve. He stressed, "Therein lies our challenges, to quickly develop [power plants based on] geothermal, water, coal, natural gas, biogas, biomass, etc., to quickly switch from using oil as well as to use it prudently and economically."[72] This seminar was followed up by another seminar a year later to talk about ways to diversify Indonesia's energy uses.[73] In this seminar, Sardjono, PLN's then Director of

[71] The conference proceeding was published as a book. See Panitia Penyelenggara Lokakarya Konservasi Energi 1979 ed, *Konservasi Energi Hasil-Hasil Lokakarya Konservasi Energi, 24-25 September 1979* (Jakarta: Departemen Pertambangan dan Energi Republik Indonesia, 1979).
[72] Subroto, "Pidato Pembukaan Menteri Pertambangan dan Energi Pada Lokakarya Konservasi Energi," in *Konservasi Energi Hasil-Hasil Lokakarya Konservasi Energi, 24-25 September 1979*, Panitia Penyelenggara Lokakarya Konservasi Energi 1979 ed. (Jakarta: Departemen Pertambangan dan Energi Republik Indonesia, 1979), 7.
[73] The conference proceeding was published as a book. See Budi Sudarsono, ed., *Diversifikasi Energi Dalam Sektor Tenaga Listrik (Hasil-hasil Lokakarya Energi 17-18 April 1980)* (Jakarta: Komite Nasional Indonesia, World Energy Conference, 1980).

Production Development, described his company's long-term plan. Sardjono wrote that while in 1979, PLN's generating stations were composed mainly of hydropower (28 percent) and diesel (72 percent), by the year 2000, the company hoped to have the following energy mix: hydropower (6 percent), oil (2 percent), geothermal (2 percent), coal (43 percent), nuclear (47 percent).[74] Sardjono reasoned that in Java where the projected demand would be 119,196 GWh PLN's long-term plan was drawn up to take advantage of Indonesia's coal reserve and the idea of building power-generating stations using an economy of scale. Thus, the only alternative to coal-fired plants was nuclear energy.[75]

But even though PLN eventually constructed a massive coal-fired plant in Suralaya in West Java as well as a few hydropower and geothermal plants spread in Java, it never got around to erect a nuclear power plant. PLN upper echelons throughout the early 1980s did not think it was urgent and left the decision to the New Order government to pursue this course. Plus there was another government agency, the National Agency for Nuclear Power (*Badan Tenaga Nuklir Nasional, BATAN*), charged to study and come up with a plan to build a nuclear power plant. Founded in 1964, BATAN acquired its nuclear expertise by building and operating three experimental reactors since 1965.

A public debate about whether or not Indonesia should have a nuclear power plant erupted in the wake of the Chernobyl nuclear disaster in April 1986. Djali Ahimsa, the head of BATAN at the time, said in a press conference that his agency would continue to study the possibility and he assured concerned citizens that it would not employ Soviet's reactor

[74] Sardjono, "Usaha-Usaha Diversifikasi Energi Dalam Sektor Tenaga Listrik," in *Diversifikasi Energi Dalam Sektor Tenaga Listrik (Hasil-hasil Lokakarya Energi 17-18 April 1980)* edited by Budi Sudarsono, (Jakarta: Komite Nasional Indonesia, World Energy Conference, 1980), 26.
[75] Ibid., 30.

technology.[76] He also mentioned a plan to establish a center of atomic safety in Serpong, the location of one of the three experimental reactors, to study past nuclear accidents with experts from France, German, and Canada, deliberately leaving out the United States and Soviet Union where two past nuclear accidents had occurred.[77] Ahimsa saw the risk of a nuclear accident mainly from a scientific perspective in which risk could be calculated, managed, and controlled. His "technico-scientific" risk perception was later countered by a group of non-governmental environmental organizations that called themselves the Group of Ten (*Kelompok Sepuluh*).[78] The Group gained attention by holding its own press conference and argued an accident would inevitably occur due to "human negligence" in a technologically risky system such as a nuclear power plant no matter how "tidy" its safety mechanism.[79] Referring to the recent Chernobyl accident they argued that the potential human costs of a nuclear power plant outweigh the benefits and asked the government to consider other energy sources to generate electricity.[80] Noticing raising public concerns, Minister Subroto finally issued a statement in Jakarta claiming that the government had not made a decision regarding a nuclear power plant. He added that BATAN's study at this point was still preliminary and it was still "far to reach a conclusion [to build one]."[81] To bolster his assurance, Subroto cited some statistics showing that Indonesia's potential to generate electricity from hydropower plants (up to 75,000 MW) and geothermal plants (up to 15,000 MW) had only been developed at a fraction of that estimated numbers

[76] "Studi Kemungkinan Membangun PLTN di Indonesia Diteruskan, *Surabaya Post*, 9 May 1986.
[77] Ibid.
[78] See Deborah Lupton, *Risk* (London; New York: Routledge, 1999), 18.
[79] "Rapinya Pengamanan PLTN Tidak Menutup Kemungkinan Kecelakaan," *Surabaya Post*, 13 May 1986.
[80] The sociologists Charles Perrow similarly argued the same point in his influential book *Normal Accidents: Living With High-Risk Technologies* (New York: Basic Books 1984).
[81] "Belum Ada Keputusan Tentang Rencana Pembangunan PLTN," *Surabaya Post*, 14 May 1986.

(1,000 MW for hydro and 30 MW for geothermal).[82] Subroto's statement helped calm down the public's anxiety about Indonesia's plan to go nuclear.

Four years elapsed until talks about nuclear energy emerged again. On 17 July 1990 PLN and BATAN signed a collaborative deal to start developing a nuclear power project.[83] Together they developed a plan to construct a nuclear plant in Muria in Central Java beginning in the 1998/1999 fiscal year. However, a meeting between the Minister of Mining and Energy and some members of Indonesian Parliament in 1996 derailed the plan. Both agreed that nuclear power plant had to be the last alternative to supply electricity since there were other energy resources that Indonesia could use first.[84] The nuclear project was abandoned altogether when Indonesia was hit by a financial crisis in 1997 where its currency devaluated up to 80 percent. As of 2014, Indonesia has not built a nuclear power plant.

One alternative that PLN pursued for a time was to harness waterpower on a small scale in hydro-rich areas. In 1984 Soejoedi Soerachmad, a PLN employee in the division of Central Java Hydro Generation Parent Project (*Proyek Induk Pembangkitan Hidro Jawa Tengah*), proposed that PLN build PLTMs using domestically produced parts instead of importing them to decrease the cost of the machinery. He suggested that PLN use what he called an "adaptive design" using the readily available generators made locally for diesel gensets and connecting it to the water turbine using a gear transmission box purchased from the automotive industry. Calling the hybrid design *Harades*, an acronym for *Harapan Desa* (Village Hope), Soerachmad in fact described in an article that two types of *Harades* turbine had been installed in two separate areas in Central Java as demonstration projects. The first micro hydropower plant in Kalikuning used

[82] Ibid.
[83] "Kerjasama PLN-BATAN," *Berita PLN*, Special Edition, 1990, 32 & 49.
[84] "Rapat Kerja Komisi VI DPR-RI Dengan Mentamben: PLTN Tetap Alternatif Terakhir," *Berita PLN*, January 1996, 20-23.

Harades propeller turbine, which had been operated reliably for one and a half years and the second one in Winong used *Harades* crossflow turbine, which had successfully clocked one month of operation time. The average cost to build these two PLTM Harades, Soerachmad reported, was US$ 1,000 per kilowatt, which was significantly cheaper than to import the entire generating equipment that at a price of US$ 5,000 per kilowatt on average. [85]

Soerachmad was not alone in inventing and advocating the use of inexpensive PLTM. Two additional individuals had invented easy-to-build and cheap micro-hydro turbines to generate electricity from water flowing through the irrigation channels. In West Sumatra, there was a PLN employee named Zamrisyaf who won the 1985 *Kalpataru* award, an honor accorded to citizens who made a nationally recognized effort for preserving the environment. Zamrisyaf invented a mini water turbine for generating electricity sustainably.[86] In Bali, I Dewa Made Suambara came up with a micro-hydro turbine using simple technologies that took about 1-2 months to build. By November 1984 it was reported that his creation had been installed in 13 locations throughout the island.[87]

In the mid-1980s PLN seemed to be committed to spread micro hydro power stations in the villages, especially given that the company's target was to electrify 7,000 new villages in the fourth PELITA (1984-1989). The task was given to a special division of the company called *PLN Proyek Induk Sarana Fisik dan Penunjang* (PISFP) whose leader in the 1980s Bambang Prajitno reported that PLN in 1985 had managed to install a total capacity of 50 MW of PLTMs.[88] But in the end the total number of PLTDs still far outnumbered PLTMs. A tabulated village

[85] Soejoedi Soerachmad, "Desain Adaptasi Sebagai Kunci PLTM Produksi Dalam Negeri," *Berita PLN*, September 1984, 10-13, 25.
[86] Moenir, *40 Tahun Peranan Pertambangan Dan Energi Indonesia 1945-1985*, 384; "PLTM Swadaya Masyarakat Memegang Peranan Penting," *Berita PLN*, February 1985, 13-14, 28.
[87] Ibid., 384-385.
[88] "Pengembangan PLTM oleh PLN," *Berita PLN*, February 1985, 3.

electrification plan for the Sixth PELITA, drawn up in 1994, showed many more PLTDs than PLTMs to be constructed. Even though the numbers were not given, the total capacity of these PLTDs (40 MW) was almost quadruple the total capacity of PLTMs (10.45 MW).[89] Other proposed alternatives included building small-scale wind-turbine and solar panels for households in some of the remotest villages.[90] These proposals, however, were not taken up by PLN. Thus, although a PLTM seemed at one point a feasible alternative to a PLTD, PLN managers and the New Order regime unfortunately did not develop and spread it more widely in the Indonesian countryside.

When PLN installed a diesel power plant outside Java, it did so by installing what was called Pioneer Diesel Plant or *PLTD Perintis*.[91] The idea of a pioneer diesel plant mirrored pioneer airline and shipping lines that Emil Salim advocated when he was the Minister of Communications (1973-1978). He reasoned that these so-called pioneer technologies and services were needed "Because of the crucial importance of infrastructure in uniting and developing our country—and because private enterprise was not moving into this field—I felt that government intervention was needed."[92] The installation of a Pioneer Diesel Plant was supposed to be temporary and mobile. PLN's 1987 Village Electrification Standard required there should be one backup transportable diesel generator that could be moved around within an

[89] "Raker Komisi VI DPR-RI Dengan MPE," *Berita PLN*, July 1994, 6.
[90] For mini wind turbine proposal see Haryo Soetendro, "Mengenal Sumber Energi Alternatip Untuk Kelistrikan Desa Daerah Terpencil," *Berita PLN*, September, 1989, 8-12. Kosasih Abbas explored using solar power to electrify villages in his article "Tenaga Matahari Sebagai Sumber Energi Pedesaan," *Pertambangan dan Energi* No. 2-3, 1988, 74-79.
[91] Perusahaan Listrik Negara, *Program Pembangunan Kelistrikan Desa 1983/1984*, Jakarta:Perusahaan Umum Listrik Negara, unpublished report, 11-12. The plan on using pioneer diesel plants was also mentioned in Perusahaan Listrik Negara, *Makalah: Listrik Pedesaan* (Jakarta, Indonesia: Perusahaan Umum Listrik Negara, 1980), 5.
[92] Salim, in Recollections, 204.

area where these pioneer diesel plants were installed.[93] But many of these supposedly short-term power stations became lasting fixtures. In fact, the number of installed diesel power plants increased across Indonesia in the following years. Between the 1989/1990 and 1992/1993 fiscal years, there was an almost threefold increase in the number of total diesel units installed (from 1041 to 2990) in all of PLN regions plus the special region of Batam. In Java during the same period, there was about a twofold increase (from 68 to 136).[94]

Except in Bali, North Sumatra, and South Sulawesi, PLN did not link these diesel stations together using a high-voltage transmission lines. It relied on its branches and sub-branches to operate the power plant independently. One example is in the "thousand-islands" Maluku province. At the end of March of 1976, there were a total of 6 diesel plants there (two mid-size and 4 micro).[95] In 1985 there were 26—more than a fourfold increase—distributed in 14 islands (3 with a capacity of at least 6 MW, 1 with a 2MW output, and the rest below 1 MW).[96] By 1993, 173 diesel generators with a total capacity of 84.8 MW had been installed in 65 locations. A few of these diesel power plants were linked by a 20 kV power line or underwater cable, but many stood as stand-alone units.[97] A map of the installed diesel plants on the Maluku province can be seen in figure 4 below.

[93] SPLN 74:1987, 19-20.
[94] Perusahaan Umum Listrik Negara, *PLN Statistics 1989/1990* and Perusahaan Umum Listrik Negara, *PLN Statistics 1992/1993*.
[95] Perusahaan Umum Listrik Negara, *PLN 1975/76*, 56.
[96] "Perkembangan Kelistrikan PLN Wilayah IX Maluku," *Berita PLN*, March 1985, 3-8.
[97] "Selayang Pandang Perkembangan Kelistrikan Di Maluku," *Berita PLN*, March 1993, 51-54.

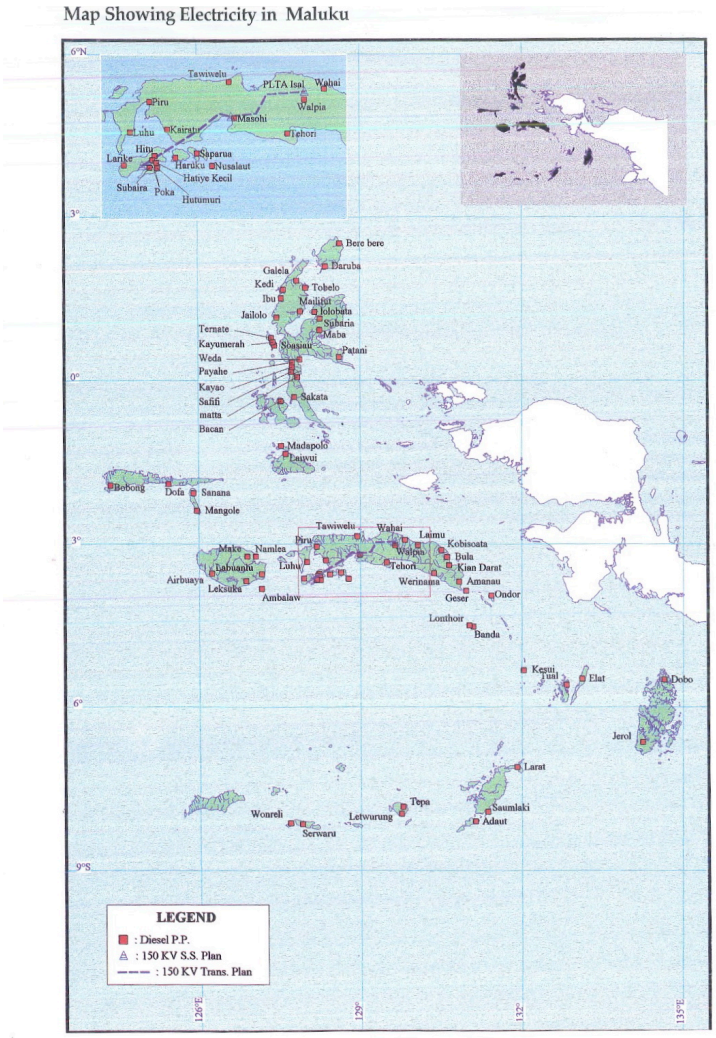

Figure 4 - Electricity Coverage of the Maluku Province in 1995[98]

One implicit reason diesel generators became the main choice of electricity generators in the countryside was, in the words of one former PLN Main Director, "it was easy to build and to be corrupted."[99] When Djiteng Marsudi gave this reason to me, I understood him to mean that constructing diesel power plants was a source of financial and accounting manipulations in which marked up expenses allowed people involved in the projects to pocket the differences in prices or to receive kickback from suppliers. Bribery resulting from a conflict interest of

[98] Sribawa, *50 Years of PLN Dedication*, 367.
[99] Interview with Djiteng Marsudi on 10 February 2012 in Jakarta.

bureaucrats holding high positions in the government occurred often in the New Order. Emil Salim, one of Soeharto's ministers, had the following to say when he reflected on his tenure as Minister of State for the Improvement of the State Apparatus (1971-1973):

> The basic issue in Indonesia is one of conflict of interest: if the boss wants something, he gets it, and you don't ask him how he obtained it. This feudal pattern continues to prevail in modern Indonesia, with its cabinet ministers, directors general and so on being 'served' by their subordinates. With the prevalence of such a mentality, how can you even start to talk about 'conflict of interest'? I had a great trouble just explaining what a conflict of interest was.[100]

He recounted with a tone of disappointment about his hard task to ensure clean governance. The problem stemmed, in part, in how President Soeharto managed his cabinet ministers. As a Javanese, Soeharto was brought up in the old Javanese traditional customs that permitted this conflict of interest to occur. Salim added, "Where I come from [West Sumatra] we have an egalitarian community, so I did not have an instinctive 'feel' for this Javanese feudalism. In West Sumatra, the village head (*kepala desa*) is not the only boss in the community; the datuk, the teacher and the religious leader are also community leaders and socially rank equal."[101] Moreover, as the PERTAMINA scandal that I mentioned in the introduction shows, President Soeharto did not believe that Ibnu Soetowo had done something wrong. Instead of formally charging him with corruption, the Soeharto government assumed PERTAMINA's debt. Although Soeharto did replace Sutowo, the president defended his actions, which in effect absolved Sutowo's of any wrongdoings.

In the case of PLN and as indicated by what Marsudi said, there could well have been a similar "feudal" practice in which the PLN officials might have distributed projects to build diesel power stations in the countryside as an act of supporting and financing small private

[100] Emil Salim, in *Recollections*, 202.
[101] Ibid.

contractors or business partners in the region, which constitutes a patrimonial technopolitical practice. This was likely to occur given the prevalence of a culture of a "conflict of interest" that Salim mentioned. I must note that I could not, however, find any hard evidence to support this practice within PLN, though given the climate of press censorship and other means to suppress information there was very little chance that any of this was reported or investigated at all.

One indication that this might have occurred was revealed in the post-Soeharto period when the media was willing to report allegations of graft and corruption of government officials more openly than before. For an example, in a transcribed interview between *Tajuk* magazine and Djiteng Marsudi, the *Tajuk* reporter asked him pointedly about money exchanged "under the table." Marsudi replied, "You can ask to all of the contractors whose contracts I had signed, I never called them and said, 'I sign this, but you give me money.' Never. You can ask." But the reporter pressed further: "But the chance to do that [to receive kickbacks] was high, wasn't it?" To which Marsudi responded, "Oh, if I wanted, yes. In fact, after I no longer with PLN, I heard that many people whose contracts have not been signed already gave money [to the contract signor]. …There were some who told me, 'Your subordinates are wealthier than you.' I replied, 'That's okay, I let it go (*saya ikhlaskan*)." Tajuk journalist further asked: "Don't you feel alienated, while KKN [Corruption, Collusion, and Nepotism] was already widespread at the time?" Marsudi said, "No. … It lies on our faith. I concluded that God is just. Our sustenance is not just in the form of money [but also friends and family] … My salary as the Main Director was enough. I never played around with the contracts."[102]

I also found evidence of a different kind of manipulation. As I will show in the next chapter, the Soeharto government connected electricity provision in the villages to electoral

[102] "Mantan Dirut PLN Ir. Djiteng Marsudi: Kuntoro Minta Maaf Kepada Saya," *Tajuk*, No. 18, Thn III, 26 October – 8 November 2000, 38.

politics. An electrified village was visible, evidence that the government worked hard to bring this new technology to the villages and demanded people in the countryside to vote for its political party *Golangan Karya* or *GOLKAR*. GOLKAR and national development became synonymous. Thus, to the New Order regime, the decision to bring electricity to the villages mainly using diesel power plants had financial, technical, as well as political motives. The patrimonial technopolitical nature of Indonesia's Village Electrification program comes into full view when I discuss this in chapter 4.

Internal National Identity and the Suppression of Dissent

The New Order bureaucrats routinely delivered messages stressing the vital role of the New Order regime in national development. They used every chance they got (mainly during various ceremonies) to deliver speeches connecting, for example, the provision of electricity with the regime's programs to develop the country and to tie electricity to the country's effort to modernize. On one such occasion, Minister Subroto said, "The result of an electrical development in South Sulawesi that cost 5.6 billion rupiahs is a one concrete evidence of the realization of the New Order's will under the leadership of President Soeharto."[103] Similar messages were repeated at other events as well. On 17 May 1982, shortly after the completion of the third general election in which GOLKAR won a landslide victory as it did in the previous election, Minister Subroto prepared a written speech that was read by a PLN official during the monthly flag raising ceremony at the PLN Head Office. A passage of the speech said, "From the results of the General Election, it is clear that the Indonesian people have placed their trust on the New Order government to continue with national development, materially and spiritually based

[103] "Hasil Pembangunan Di Bidang Di Sulawesi Selatan Yang Menelan Biaya 5,6 Milyar, Sebagai Bukti Nyata Dari Hasil Pelaksanaan Tekad Orde Baru Kata Menteri Subroto," *Berita PLN*, January 1979, 27-28.

on Pancasila and the 1945 Constitution."[104] These repeated refrains reinforced the New Order's internal national identity narrative portraying Indonesia as a developing Pancasila nation. To support the regime meant to support the national development for the benefits of many people, and vice versa, those who opposed development were readily branded as communists, sworn enemies of the regime as is illustrated by the story of the inauguration of one multi-purpose dam below.

In the early 1980s, the New Order government begun to build several large-scale electrical power plants using coal, geothermal, and water as the primary energy resources. One of the four major hydropower plants built during this period was the Mrica plant located in Banjarnegara, Central Java. The project started in 1983 with funding from British and Swedish export credits, a grant from the British government, as well as the state and PLN's budgets.[105] The British and Swedish governments also provided the "portable knowledge" for the project supplying technical expertise and consultancy through a consortium of contractors that included the Swedish civil engineering company AB Skansa Cemengjuteriet and the British electromechanical corporation Asea AB and Boving & Co, Ltd.[106]

The Mrica multi-purpose dam required 1,519 hectares of land, 1,059 of which for the reservoir holding water from the Serayu River. To make way for the reservoir, the government had to remove about 10,500 villagers in 32 villages. They were mostly relocated to places outside of Java under the government's transmigration program. The Department of Mining and Energy reported that the Mrica hydropower plant, when it started operation, produced 184.5 MW

[104] "Pidato Menteri Pertambangan dan Energi Pada Upacara Bendera 17 Juni 1982," *Berita PLN*, July 1982.
[105] "Tiga PLTA Mulai Beroperasi," *Pertambangan dan Energi*, No. 2, 1989, 23-24.
[106] "Proyek PLTA Mrica," *Pertambangan dan Energi*, No. 2, 1987, 6. For the concept of "portable knowledge," see Donna C. Mehos and Suzanne Moon, "The Uses of Portability: Circulating Experts in the Technopolitics of Cold War and Decolonization," in *Entangled Geographies Empire and Technopolitics in the Global Cold War*, ed. Gabrielle Hecht (Cambridge, MA: The MIT Press, 2011).

pollution-free electricity saving the country 290,000 tons or 1.83 million of barrels of oil per year.[107] A total of 579 PLN employees were involved in this project, along with 9 British and Swedish technical consultants, 107 foreign contractors and close to 3,000 Indonesian workers.[108]

The completion of the Mrica hydropower plant occurred at about the same time as that of two other hydropower plants in Java: the Cirata plant in West Java and the Sengguruh plant in East Java. President Soeharto decided to inaugurate all three on the same day and chose to hold the inauguration ceremony at the site of the Mrica plant. In his speech, President Soeharto also had the following to say:

> Electrical power has become a need of a modern society. Electrical power is needed to support the development of industry and to propel the advancement of society. Electrical power has become the condition and measure of the development of society. It is because of these reasons that the addition of electrical capacity is a vital part of our national development. We have been building many electricity generators. Ever since the First Repelita up to the last days of the Fourth Repelita now, we have added 16 times additional electrical power. More electric currents have been delivered to households and there are now 9 million subscribers. Electricity has also entered more than 18 thousand villages, powering economic and industrial activities in the villages. There are currently no less than 4.5 million families spread in the villages that have been enjoying the bright rays of electric lights at night. Our electrification task in the future is still big. At the end of the fifth Repelita, for example, we endeavor that half of our people would receive electricity, including those who live in 30 thousand villages.[109]

Note that President Soeharto referred to the timeline of his government not by any of the calendar systems widely used in the country (Gregorian, Javanese, Balinese, or even Islamic calendar), but rather he used the temporal framework of "Repelita," which by that time was already familiar to many Indonesians. REPELITA or PELITA had become closely associated with the Soeharto government's timeline and by rhetorically framing its development agenda using this temporal framework Soeharto wanted to enroll Indonesian citizens in achieving the

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[107] "Tiga PLTA Mulai Beroperasi," *Pertambangan dan Energi*, No. 2, 1989, 23-24; "Proyek PLTA Mrica," *Pertambangan dan Energi*, No. 2, 1987, 6.
[108] "Proyek PLTA Mrica," *Pertambangan dan Energi*, No. 2, 1987, 7.
[109] Soeharto, "Sambutan Presiden Soeharto Pada Peresmian PLTA Cirata, PLTA Sengguruh Dan PLTA Mrica/Panglima Besar Sudirman," *Pertambangan Dan Energi*, No. 2, 1989, 25-26.

"takeoff" phase, which he said would start at the beginning of the sixth REPELITA or the beginning of the second long-term development plan (*Pembangunan Jangka Panjang Tahap II, PJP II*).

But linking his PELITA programs with the steady increase of the number of electrified villages was not the only thing Soeharto said in his speech. When he inaugurated it on 23 March 1989, he decided to rename the power plant the General Sudirman Hydropower Plant (*Pembangkit Listrik Tenaga Air or PLTA Jenderal Sudirman*). According to the sociologist George Aditjondro, the reason was not only because the dam's location in Banyumas, which happened to be the birthplace of the first commander-in-chief of the fledging Indonesian revolutionary army and a revered Indonesian national hero, but also because there was a student protest in the area.[110] The student demonstration was carried out in solidarity with another protest elsewhere launched against the construction of the Kedungombo Dam, famous, or rather infamous as the site of the most well known resistance to large dam building in Indonesia.[111] Soeharto used the same event, Aditjondro argued, to denounce publicly the Kedungombo protestors as 'communists,' and claimed that 'in God's name, the government had no ill intentions against the people.'"[112] Renaming the Mrica Dam, calling the protestors communists, and invoking a Muslim vow were Soeharto's way to gain support of the army and Muslim politicians as he did when he rose to power in 1965. Aditjondro wrote, "And conveniently enough, the Kedungombo reservoir site was formerly covered by dense teak forests where

[110] George Aditjondro, "Large Dam Victims and their Defenders: The Emergence of an Anti-Dam Movement in Indonesia," in *The Politics of Environment in Southeast Asia: Resources and Resistance*, eds. P. Hirsch and C. Warren (New York: Routledge, 1998).
[111] See Stanly, *Seputar Kedung Ombo*, (Jakarta, Indonesia : Lembaga Studi dan Advokasi Masyarakat, 1994); Agustinus Rumansara, "Indonesia: The Struggle of the People of Kedung Ombo," in Jonathan Fox & L David Brown (editors), *The Struggle for Accountability: the World Bank, NGOs, and Grassroots Movements* (Cambridge, MA: The MIT Press, 1998). See also World Bank reports on Kedung Ombo.
[112] George Aditjondro, "Large Dam Victims and their Defenders," 44.

underground communist factions, brutally hunted down by the army in the late 1960s, had hidden."[113]

Socioeconomic Effects of Electricity in Some Villages

Many Indonesian political and technical elites believed in the transformative effect of technologies in shaping social change. They thought that by merely introducing technologies to the villages, a reordering of society would take place. Some villages did transform, but they did so with the aid of other factors working in tandem with the introduction of electricity such as the rise of economic opportunities facilitated by the development of other infrastructure such as schools, health clinics, and paved roads. For example, the Cisande Village in Sukabumi, West Java was located alongside a provincial road with heavy traffic bringing people from big cities such as Bandung, Bogor, and Jakarta. The village had already had clothing and other businesses before PLN even brought electricity there in 1974. Once the village had been electrified, the businesses thrived. Tailors were able to switch to electric sewing machines from mechanical ones and subsequently increased their output. Retail stores and restaurants could open their businesses longer, afforded by the cheap electrical lighting. Using electricity the restaurateurs could install radios and televisions to entertain their guests, making them want to stay longer and spend more. These business owners also used electricity to motor their refrigerators, water pumps, mixer, and electric irons to help increase their productivities.[114]

A similar study on the impact of electricity on the socioeconomic lives of villagers in four Balinese villages reported a similar pattern. Made Arka, the study author, described that two

[113] George Aditjondro, "Large Dam Victims and their Defenders," 45.
[114] Sugiarto Dakung et al., *Dampak Listrik Masuk Desa Di Desa Cisande, Kecamatan Cibadak Kabupaten Sukabumi* (Jakarta: Departemen Pendidikan Dan Kebudayaan Direktorat Jenderal Kebudayaan Direktorat Sejarah Dan Nilai Tradisional Proyek Inventarisasi Dan Pembinaan Nilai-Nilai Budaya, 1990), 40-47.

of the villages he studied (Mas and Celuk) were considered "touristic villages" (*desa pariwisata*) where the facilities that supported tourism (paved roads and public markets) had been built there.[115] The other two villages (Kapal and Mengwi), even though they were considered non-touristic villages, were located along the road connecting the southern and northern parts of the island with "heavy traffic."[116] After electricity had been brought to these villages, Arka reported that there were noticeable social and economic changes of the residents of the four villages. While residents of the villages used electricity to create handicrafts at night, the non-touristic villagers mainly used it to support their cattle raising businesses.[117]

From the two studies above, the availability of roads and other public facilities supported a positive outcome of village electrification. In many remote villages, however, these amenities were not necessarily available or made available by the government. Considering that the Soeharto government's main motive was to light as many villages as possible to gain support from the people in the countryside for his development programs, an integrated village development in *all* villages was not its main consideration.

Imron Husin studied the gap between theory and implementation of village electrification program's objectives in two villages in East Java in the 1980s. The villages in the Sub-District of Pare were agricultural ones and the villages in the Pandaan Sub-District were more industrialized.[118] One of the important findings of Husin's study highlights the small correlation of electricity and desired village transformation. Husin writes:

> This study has found that the length of supply of electricity seems to bear no relationship at all to the growth of industry. There is very little evidence to support the proposition

[115] Made Arka, *Pengaruh Listrik Pedesaan Terhadap Kegiatan Sosioekonomi Masyarakat Di Bali* (Denpasar: Fakulas Ekonomi Universitas Udayana 1981/1982, 1982), 5
[116] Ibid.
[117] Ibid., 28.
[118] Pare was Clifford Geertz's fieldwork site when he first visited Indonesia in the 1950s. The result of his study there led to the publication of one of his books *Agricultural Involution* (1963).

> that the program has improved income, created employment opportunities or stimulated much industrialization in rural areas. Instead, in the absence of many household activities in the area concerned, electrification has stimulated higher consumerism among electricity consumers. In Pare, the existence of a variety of household activities prior to electrification has helped to increase slightly the average power consumption for productive activities, while in Pandaan the household consumers mostly used the power for consumption purposes. Moreover, the failure to take into account the existing unequal distribution of economic and social power in rural communities has added to greater inequalities.[119]

Imron Husin's study concludes that in these two areas there was a huge disconnect between PLN's village electrification policy formulation process and its policy implementation in practice. While Husin specifically criticizes PLN Twelfth Region (*PLN Wilayah XII*) as the implementation agency who failed to translate the objectives of the village electrification project, Husin also blamed the New Order government who neglected to put a feedback loop mechanism and a monitoring process in place to ensure the policies formulated were carried out according to the stated goals.[120]

As part of his concluding remarks, Husin recommends four points to improve the project: to avoid separating policy implementation from its formulation process, to combine a top-down with a bottom-up approach, to strengthen PLN's Village Electrification Sub-Directorate, and to move away from simply achieving numerical targets of how many villages electrified as this "is not a reliable means of assessing whether the government's objectives for the rural electrification program are being achieved."[121] I think Husin's criticism is valid since as I have shown in this chapter that the New Order regime's village electrification objective was mainly to show the increasing number of electrified villages as evidence of its effort developing the country. This, in turn, supported the regime's narrative of Indonesia as developing nation aiming to light more and more villages in the successive PELITA periods until all of them would have been illuminated.

[119] Imron Husin, "Rural Electrification in Indonesia Policy Implementation in Theory and Practice" (PhD Diss., Australian National University, 1989), v.
[120] Imron Husin, "Rural Electrification in Indonesia," 255-271.
[121] Imron Husin, "Rural Electrification in Indonesia," 269-270.

There was little in-depth examination, as Husin had done, to check as whether electricity brought to many of these villages in fact afforded the villagers there to improve their lot.

Conclusion

By the end of Soeharto's rule, diesel generators existed in great numbers across the Indonesian archipelago. Despite the construction and operation of Mrica, Kedungombo, Sengguruh, and Cirata hydropower plants, diesel power stations predominated electricity generation on islands other than Java. By 1994, the total installed capacity from these plants exceeded other types of power plants. Outside Java 1,997,308 kW were produced from hundreds of diesel generators, compared to 299,036 kW from hydro, 440,600 from steam-powered and 555,806 kW from gas-powered plants.[122] In Java, the proportion was the opposite. PLTDs supplied a mere 105,206 kW compared to 1,878,588 kW (hydro), 3,450,400 kW (steam-powered), and 2,172,400 kW (combined cycle), and 687.050 kW (gas-powered), and 140,000 kW (geothermal).[123] In other words, except for Java, Madura, and Bali, which are linked by Indonesia's first sophisticated interconnected system, other islands in the archipelago relied heavily on diesel generators to power their areas.

There were several reasons why this happened. First, the government argued that diesel plants were easy to procure and fast to install. Harahap's 1977 report claimed that installing a micro diesel would be cheaper than constructing a micro hydro plant of similar capacity. PLN's 1987 and 1991 Village Electrification Standards made it easy to construct this power plant in many villages since the all the necessary technical and construction requirements are spelled out explicitly in the document. Building many of these diesel plants allowed the New Order

[122] "Raker Menteri P&E - Komisi VI DPR-RI," *Berita PLN*, February 1994, 3 & 14.
[123] Ibid., 10.

government's to light many villages quickly showing people in rural areas that it tried hard to electrify their villages.

Second, the New Order subsidized the price of oil for domestic consumption and thus diesel was cheaply available. The subsidy kept the price of diesel artificially low; significantly lower than its production and distribution cost. In some instances PLN was even willing to transport the fuel to various parts of the country. A remote and isolated village in Papua even received fuel for its diesel generator by air. A chartered small plane would load barrels of diesel and drop them in one of the lakes there for the locals to fish out of the water.[124] In addition, the PLN Standards required that each PLTD build a diesel fuel storage unit that would ensure the continuous operation of the plant. The volume of the tank must be calculated and built to keep diesel for at least one month of operation or at the very least can store one truckload of fuel.[125]

Third, there was a free tariff on the importation of diesel generators, making it highly competitive among some other alternatives such as the PLTM Harades. In July 1997, when Indonesia was hit by the Asian Financial crisis, PLN bore the brunt of some of its effects, in part because of the type of power plants that have been installed across the archipelago. Because of the crisis, the exchange rate of the Indonesian rupiah to the US dollar decreased considerably. Its exchange rate went down from around Rp 2,900 to the US dollar before the crisis to Rp 3,300 dollar by the end of the year. In December 1997 the PLN Board of Directors reported to the Parliament's Fifth and Seventh Commissions that the company projected a total loss of Rp 1.3 trillion in the following year to pay in order to pay its debt in US dollar and to pay the cost of

[124] A color photo of a woman swimming with a red barrel of oil pushing it to shore while being looked on by another woman in a *sampan* became the back cover of a January 1998 cover of *Berita PLN*.
[125] SPLN 74:1987, 12.

fossil fuels for PLN's power plants.[126] During this meeting, PLN's Main Director Djiteng Marsudi was quoted to say that he regretted the ease with which the government provided in encouraging the use of diesel fuel, which included no tax levied on it, subsidized price, as well as no tax on street lighting.[127] All of these put a huge burden on PLN's cost of operating hundreds of diesel power plants and a reduction in potential income. In this meeting, PLN requested for an increase in electricity prices for its consumers but the Parliament asked to postpone it for fear that it would further exacerbate the crisis for many people if the electricity prices were increased.

Fourth, although it was not reported in the documents, reports, and newspaper articles I collected there could have been a technopolitcal dimension of a patrimonial kind. PLN's program to electrify rural areas might have benefited electrical contractors and other business partners in the villages, something that was conducive to do in a bureaucracy filled with officials who saw no issue with having a conflict of interest. In the post-Soeharto period, Indonesia established an independent agency with the task to reduce corruption among bureaucrats. This institution, the Corruption Eradication Commission (*Komisi Pemberantasan Korupsi, KPK*), investigated, arrested, and brought (mainly) government officials to court it found to have committed a crime of corruption. The highest profile case involving PLN was the indictment of its former Main Director Eddie Widiono who was found guilty of corruption in a Customer Information System Project-Information Systems Master Plan (CIS-RISI). He was sentenced to five years in prison and a fine of Rp 500 million.[128]

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[126] "Rapat Dengar Pendapat Dirut PLN dengan Komisi V dan VIII DPR-RI: PLN Harapkan Tarif Listrik naik dan Minta Penundaan Bayar Hutang," *Berita PLN*, October-November-December 1997, 4.
[127] Ibid., 6.
[128] Moksa Hutasoit, "Korupsi Proyek CIS-RISI Mantan Dirut PLN Divonis 5 Tahun Penjara & Denda Rp 500 Juta," 21 December 2011 http://news.detik.com/read/2011/12/21/151411/1796721/10/mantan-dirut-pln-divonis-5-tahun-penjara--denda-rp-500-juta (accessed on July 13, 2014).

At one point PLN attempted to replace these fuel inefficient power plants, although an economic consideration seemed to have prevented it. In its 1996 commemorative book PLN reasoned that one crucial factor hindering its "de-dieselization" process was the low consumption of electricity in many villages, which was "about 45 kWh/ customer/month."[129] This coupled with a load factor, which is a measure efficiency of electricity usage, in some systems of about 20-25% that resulted in "high long run cost and low revenue in the villages."[130] In other words, because not many villagers use electricity supplied from these diesel power plants optimally, PLN did not want to bother dismantling the plants and replace them with other kinds of power plants. The company reasoned that to economically install and run a mini hydro plant or a small-scale geothermal plant in the villages, PLN added, required a "utilization factor of 70-85%," or at least 7 out of 10 people in the villages became electricity subscribers. [131]

This "techno-economic problem" was actually a part of a larger issue with bringing electricity to Indonesian villages.[132] The villagers' small use of electricity was tied to their low income, which did not seem to necessarily increase with the availability of electricity. In the examples I provided above, some villages managed to thrive after they had been electrified because they had other supporting infrastructure such as paved roads allowing access to the world beyond their villages. Many remote villages in Indonesia that received electricity did not necessarily have the same conveniences. The main reason for this was the New Order's top-down approach to development, driven by the notion that technology drives social changes. The New Order political climate did not encourage people in village administration to send their input back up to the chain of bureaucracy. When some villagers tried to voice their opinions on

[129] Sriwibawa and K.H (eds), *50 Years of PLN Dedication*, 125.
[130] Ibid.
[131] Ibid. Perusahaan Listrik Negara, *50 Years of PLN Dedication* [50 Tahun Pengabdian PLN], eds. Sriwibawa and K.H., trans. Jasjfi, English ed. (Jakarta: PT PLN (Persero), 1996)., p. 125.
[132] Ibid.

matters of development as in the case of the protestors to the Kedungombo Dam, they were branded as enemies of the state. Because of this "father knows best" mentality, villagers were rarely, if ever, enrolled in the New Order's development projects. Instead development projects were "handed out" to them as form of patronage, which enacted patrimonial technopolitics. This shaped the thinking and practice of Indonesia's energy policy makers and implementers. To quickly distribute these development "benefits" to people in remote rural areas, PLN employees deemed it best to use diesel generators to light their villages. This was made easy by the New Order's government policies of making available cheap oil and imposing no tax on the purchase of diesel generators. As a consequence a feasible alternative to electrify the countryside using other technologies did not gain a favor and while some villages did benefit from electricity others suffer from increased inequality.

CHAPTER 4

WIRING THE NEW ORDER

Introduction

In late April 2007 PLN launched an ambitious plan. Under its "75-100" vision, PLN aimed to achieve full electricity coverage by the year 2020, to coincide with the seventy-fifth anniversary of Indonesia's independence.[1] It is quite common in Indonesia that a government objective or accomplishment is tied to Indonesia's independence anniversary celebration to give it a symbolic significance. The most notable example is the Indonesian aircraft industry's launch of N250, an indigenously designed and built a turboprop commuter airplane. The launch date on 10 August 1995 occurred in the year that Indonesia celebrated the fiftieth anniversary of its independence.[2] PLN's intention to provide electricity to every household in the country was an audacious goal, considering that by the end of 2006 Indonesia had just achieved a 64 percent electrification rate (ratio of electrified households to the total households).[3] Other challenges included Indonesia's vast size and archipelagic geography, in which many communities are isolated from one another.

But 2007 was not the first time that a commitment to electrify the entire nation had been articulated, or that resources to achieve that objective had been allocated. As I have written in earlier chapters, President Sukarno in his 1960 speech had envisioned that the whole country would have been electrified by 1985.[4] In the 1970s, several New Order bureaucrats had

[1] Kementerian Energi dan Sumber Daya Mineral, "Kejar Rasio Elektrifikasi 100%, PT PLN Canangkan Visi 75-100," 28 April 2007 http://www.esdm.go.id/berita/listrik/39-listrik/76-kejar-rasio-elektrifikasi-100-pt-pln-canangkan-visi-75-100.html (Accessed 1 November 2011).
[2] See Amir, *Technological State in Indonesia*, 140-143.
[3] Ibrahim and Faizal, *General Check-Up*, 82.
[4] Sukarno, "Speech by President Sukarno on the 15th Anniversary of Electricity Day," 5.

expressed the goal to completely electrify the county by the year 2000, the year in which the New Order had hoped would have transformed the bulk of Indonesia's villages into *swasembada* villages. For example, when the New Order regime started thinking about setting up electric cooperatives, Ibnoe Soedjono (the Director General of Cooperative of the country's Department of Manpower, Transmigration, and Cooperative) said in 1976 that Indonesia aimed to have electrified the majority of its 60,000 villages by the year 2000.[5] When in 1997 only slightly more than half of the country's households had electricity, PLN again expressed its intention to electrify all of the villages by 2004 and to achieve a 100 percent electrification rate by 2019.[6] The main motivations that the Soeharto government repeatedly said about its village electrification program were to achieve equality and social justice in the villages. It thought that by bringing electricity to the villages the technology would improve the villagers' welfare.

In this chapter, I argue that although touted as an effort to improve the socioeconomic conditions of villagers, Soeharto's village electrification program also served to achieve a political end. It functioned, that is, to secure votes from rural people in the general elections. The Soeharto government distributed electricity to the villages to win and retain "voluntary" political support from Indonesians in the countryside. It did so by mainly installing diesel power stations and by other means such as extending PLN's power lines and placing Solar Home Systems (SHS). In some instances, particularly on the eve of a general election, Soeharto even provided rural communities with electrical generators for free. Some scholars have labeled Soeharto's patrimonial style of governance *bapak-ism* (father-ism), highlighting the notion of

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[5] See Ibnoe Soedjono, *Perumusan Kumpulan Pendapat Dan Saran Dari Seminar Pembangunan Listrik Pedesaan Secara Koperatif, Jakarta 6-8 Desember 1976* (Jakarta: Direktorat Jenderal Koperasi, Departemen Tenaga Kerja, Transmigrasi dan Koperasi, 1976), 17. PLN had also put in place a village electrification plan until the year 2000, see Perusahaan Umum Listrik Negara, *Pelaksanaan Listrik Pedesaan oleh PLN*, unpublished report, 1981.

[6] PT PLN (Persero), *Terang Desaku, Sejahtera Bangsaku* (Jakarta, Indonesia: PT PLN (Persero), 1997), 15 and 41.

Soeharto as the father of the nation who demanded a deferential treatment.[7] In this regard, Soeharto's donations mirrored a father's gifts to his children, who were expected to thank him in return, which serves as *patrimonial technopolitics*.

Moreover, Soeharto used inauguration ceremonies in recently electrified villages to create the sense of a rapidly developing community with himself as the "Father of Indonesian Development," a man leading the nation in its progress toward modernity.[8] This approach stood in contrast to some of the repressive measures that the Soeharto government used to obtain people's acquiescence in the countryside. And even though the PLN leadership resisted Soeharto's attempts to politicize village electrification, it did not oppose those attempts openly. Rather, it worked within the given constraints and offered its expertise and knowledge to help electrify as many villages as possible in the firm belief that electricity would improve the villagers' socioeconomic conditions.

To be sure, the New Order regime used a number of different strategies to ensure that its political party GOLKAR kept winning the general elections. Scholars have noted that Soeharto created an Indonesian Civil Servants Corps (*Korps Pegawai Republik Indonesia, KORPRI*) to enforce civil servants' "monoloyalty" (*monoloyalitas*) to the regime,[9] put labor associations and professional organizations under the umbrella of GOLKAR,[10] prevented political activities at the village level, and imposed a uniform village administrative structure across the country while

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[7] Adam Schwarz, *A Nation in Waiting: Indonesia's Search for Stability*, Second ed. (St. Leonards, N.S.W.: Allen & Unwin, 1999), 40.

[8] Soeharto was conferred on the title by the parliament in Ketetapan MPR RI Nomor V/MPR/1983 tentang Pertanggung-jawaban Presiden Republik Indonesia Soeharto selaku Mandataris Majelis Permusyawaratan Rakyat serta Pengukuhan Pemberian Penghargaan sebagai Bapak Pembangunan Indonesia (MPR Decision No. V/ MPR/1983 on the Responsibilities of President Soeharto of the Republic of Indonesia as Mandated by the People's Consultative Assembly and on the Bestowal of the Title of Father of Indonesian Development).

[9] Emmerson, "The Bureaucracy in Political Context," 106-107.

[10] Geoffrey C. Gunn, "Ideology and the Concept of Government in the Indonesian New Order," *Asian Survey* 19, no. 8 (Aug., 1979), 760.

creating a passive political citizenry called the "floating mass" (*massa mengambang)*.[11] In short, Soeharto created a "hegemonic party system" with GOLKAR in control.[12]

GOLKAR's hegemony notwithstanding, villagers had some degree of freedom to choose their preferred political party during a general election. There were attempts by the village administrators loyal to the regime to persuade them to vote for the ruling party, but many would follow the advice of noted figures such as their religious leaders. And unlike government employees who were expected to vote for GOLKAR because of their affiliation with KORPRI, the majority of people in rural areas had a range of reasons for casting their ballots. In his 1992 study of Javanese voting attitudes, Afan Gaffar divided the voters that he surveyed into two socio-religious groups of *abangan* and *santri*.[13] The devout Muslim *santri* preferred to vote for the United Development Party (*Partai Persatuan Pembangunan*), an Islamic-oriented party and known by its Indonesian acronym PPP. The *abangan* followers of the syncretic Hindu-Javanese tradition were inclined to vote either for the Indonesian Democratic Party (the product of a forced merger of the nationalist and Christian parties in the wake of 1971 general election and also known as the *Partai Demokrasi Indonesia*, *PDI*) or for GOLKAR. Gaffar showed that people who voted for PDI usually disliked both the PPP and GOLKAR, were pressured by their peers, or identified PDI with Sukarno.[14]

Those who voted for GOLKAR fell into three types. The first group identified GOLKAR as the party of their village officials, who usually tried to persuade them to vote for that party in the months preceding a general election. The second group saw that the venerable Sultan

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[11] Hans Antlöv, "Village Government and Rural Development in Indonesia: The New Democratic Framework," *Bulletin of Indonesian Economic Studies* 39 (2003), 196.
[12] Afan Gaffar, *Javanese Voters: A Case Study of Election Under a Hegemonic Party System* (Yogyakarta, Indonesia: Gadjah Mada University Press, 1992).
[13] Clifford Geertz introduced these categories to the study of Indonesian religion and society in his book *The Religion of Java* (Glencoe, Ill.: Free Press, 1960).
[14] Gaffar, *Javanese Voters*, 192.

Hamengku Buwono IX of Yogjakarta was a GOLKAR member and thus chose GOLKAR simply because it was the sultan's party. The third type of GOLKAR supporters regarded GOLKAR as a party that successfully "promoted development not politics" as illustrated by the presence of roads, bridges, dams and markets.[15] To this list I would add electricity. An electrified village was visible material "proof" that the New Order regime was doing all that it could to develop the countryside, asking in return that villagers vote for GOLKAR. GOLKAR and development became synonymous. And development programs gave Soeharto's rule a form of legitimacy.

Gatrik and PLN

After the effective transfer of power occurred from Sukarno to Soeharto in March 1966, Soeharto referred to his new regime as the "New Order" regime and set about restoring the country's economy, in virtual ruins at the time. He recruited economists and intellectuals to serve in the Ampera Cabinet that he formed with the Sultan of Yogyakarta and Adam Malik—a triumvirate of military-civilian allies—on 28 July 1966. The Ampera Cabinet enhanced the state's role in carrying out economic policies and reinstated Indonesia's membership in the International Monetary Fund and the World Bank. Sukarno had earlier pulled Indonesia out of the two institutions.[16] With relations with the West repaired and fresh capital flowing into the country, Soeharto made economic development his regime's most important agenda. On 10 June 1968, Soeharto formed a new cabinet, dubbed the "First Development Cabinet" (*Kabinet Pembangunan Pertama*) in order to highlight his regime's focus in that area.[17] As far as

[15] Gaffar, *Javanese Voters*, 192.
[16] J. Panglaykim and K. D. Thomas, "The New Order and the Economy," *Indonesia* 3 (Apr., 1967), 83.
[17] S. Sjamsuddin, *25 Tahun Pembangunan Pemerintah Orde Baru* (25 Year Development of the New Order Government) (Jakarta: Tuhe Lowarutu Utama, 1991).

electrification was concerned, in his first annual state of nation speech the president said that he wanted to provide more electrical power to several important cities on Java and Sumatera immediately and to electrify rural areas in the long run.[18] While this plan was eventually carried out, what also transpired was that his government tried to remove the Old Order influence within the institutions tasked to electrify the country.

The embryonic stage of the New Order's village electrification program dated to the formation of the Directorate General of Power and Electricity (*Direktorat Jenderal Tenaga dan Listrik*, or Gatrik) to replace the Department of Electricity and Power in August 1966. Originally placed within the Department of Basic and Light Industries and Power under Mohammad Jusuf, from 1968 on Gatrik was placed under the Department of Public Works and Electrical Power, headed by a "reticent and smart" engineer named Sutami.[19] The transfer reflected Soeharto's decision to place both public works projects and power plant construction in a single department under the leadership of a trusted and experienced person. Mutohar Sudiro, a close aid of Sutami, is quoted to say "Sutami is a very loyal person to his supervisor, and every task assigned to him would be done to the best of his ability."[20] Because of his personality, Hendropranoto Suselo, one of his biographers, wrote that Sutami was "easily accepted" by the Old Order and the New Order regimes.[21] The move also demonstrated Soeharto's preference for a familial style of governance and practice of appointing highly credentialed and loyal technocrats to his cabinet.

Sutami held a degree from the Bandung Institute of Technology (ITB), the country's most prestigious school of engineering. He had also taught engineering at the University of

[18] Soeharto, Pidato Kenegaraan Di Depan Sidang DPR-GR, 1968).
[19] Suselo, "Sutami: Sosok Manusia Pembangunan," 179.
[20] Quoted in Suselo, "Sutami: Sosok Manusia Pembangunan," 192.
[21] Ibid.

Indonesia, an institution that would give him a new chair in regional science in 1976.[22] Also in 1968, Ahmad Mohammad Hoesni became the head of Gatrik and Amir Hoesein the PLN's chief. Gatrik under Hoesni wasted no time in drawing up plans to electrify the country, especially after Hoesni began reporting to Sutami. A year later in August 1969, Hoesni organized a limited workshop on electricity to discuss in detail Indonesia's national electrification plan. This workshop was the first of a series held by Gatrik between 1969 and 1970.[23]

One workshop in particular, held in March 1970, deserves mention. Concerned that sporadic efforts on the part of local governments and private groups to install their own generators and transmission lines would not conform to the same standards, Gatrik gathered several Indonesian experts to discuss rural electrification. All thirty workshop participants—representatives from several government agencies, one PLN branch, the Electrical Research Institute, a government-owned bank, the state-owned corporation PN Pantja Niaga and ITB academics—presented papers discussing the potential benefits and pitfalls of rural electrification. They also discussed approaches to successfully electrify the countryside. The workshop resulted in a dozen recommendations for the government. It also clearly defined the village electrification program as one meant to provide electricity provision to settlements below the level of the Sub-District (*kecamatan*) that were not connected to a PLN grid. Its report stated that the basis of the village electrification program must be a fair distribution of electricity to improve the lot of the villagers, which in turn would increase village economic productivity. This thinking was rather technologically deterministic, although to be fair PLN would eventually setup an office that would "guide" villagers in using electricity productively, i.e. to earn more income by creating a home industry or a small shop. Other recommendations called for the creation of a

[22] George Aditjondro, "Large Dam Victims and their Defenders," 32.
[23] Harahap, *Perlistrikan Desa*, 35.

coordinating body with members drawn from various relevant government institutions to handle the electrification endeavor; the involvement of village cooperatives and private entities in electrifying rural areas; laws on power generation and distribution and on village governance; detailed studies on the technical, social, economic and industrial aspects of electrifying villages; the use of domestically produced materials to the degree possible; the construction of a "demonstration centre" to stimulate popular interest in electrification; and government funding for all of these goals.[24]

Gatrik did not, however, exist for very long. A labor dispute, which came to be known as the "77 employees problem" (*Masalah/Persoalan 77 Karyawan Gatrik/PLN*) for the number of Gatrik and PLN employees who wrote to Sutami and other high-ranking officials in his department complaining about Hoesni's and Hoesein's handling of Gatrik and PLN respectively, eventually led to Gatrik's elimination and the dismissal of the two men.[25] In the letter, the employees requested that the management of Gatrik and PLN explain in a transparent fashion the rationales for some of their budgetary and personnel policies. The letter received wide support from many people inside PLN and Gatrik including some senior people in the two organizations. Hoesni's response, involving the punishment of some the 77 signatories of the letter, did not bode well. Hoesni fired 2 and transferred 18 members of the group, some to remote posts. After two newspapers, *Kompas* and *Harian Kami*, and the Jakarta branch of the Indonesian Graduates' Action Front (*Kesatuan Aksi Sarjana Indonesia,* KASI) protested this decision and Sutami was pressured to take action, Hoesni and Hoesein were finally removed from their positions in 1970. At the same time Sutami transferred Gatrik's functions to PLN. In addition, the authorities arrested an advisor to Hoesni on charges of being a communist even though, according to Peter

[24] Direktorat Djenderal Tenaga dan Listrik, H*asil-Hasil Workshop Kelistrikan Desa 12 s/D 14 Maret 1970* (Dirjen Gatrik Departemen PUTL, 1970a), 2-5.
[25] McCawley, "The Indonesian Electric Supply Industry," 325-359.

McCawley, there was no indication that Hoesni and Hoesein were sympathetic to the Indonesian Communist Party.[26] But, in the broader political context of the time, when Soeharto's New Order was said to be obsessed with eliminating communists from the Indonesian bureaucracy,[27] the removal of Hoesni and Hoesin's suggests a means of ridding Gatrik of the Old Order influence. Finally in 1973, Presidential Decree No. 9/1973 (*Keputusan Presiden* No. 9/1973) abolished Gatrik and put PLN directly under Minister Sutami.[28] Sutami appointed Abdul Kadir, a former member of PLN's Board of Directors in the mid-1960s, as PLN's new chief in 1970.

PLN's new Board of Directors in 1970 was composed of a Main Director (*Direktur Utama*), a Planning Director (*Direktur Perancangan*), a Development Director (*Direktur Pembangunan*), a Business Development Director (*Direktur Pengusahaan*), and an Administration Director (*Direktur Administrasi*). Sutami appointed Bagoes Moedijantoro as its Development Director, whom I got a chance to speak with in Jakarta. Moedijantoro informed me that all of PLN's managers in the new Board of Directors faced huge challenges in transforming PLN from disparate Dutch electricity companies into a coherent organization.[29] Trained as a civil engineer at the Bandung Institute of Technology (ITB) in the 1950s, Moedijantoro recounted to me that as a Director of Development in the 1970s, he was in charge of PLN's construction projects all over Indonesia. Although he felt competent in matters of engineering, he was not trained as a manager, a skill he learned on the job and later after he stepped down as director studied seriously at the Institute for Management Education and Training (*Lembaga Pendidikan dan Pelatihan Manajemen or LPPM*), in his words, "the best management institution at the

[26] McCawley, "The Indonesian Electric Supply Industry," 355.
[27] Emmerson, "The Bureaucracy in Political Context," 89.
[28] Darmono et al., *Mineral Dan Energi Kekayaan Bangsa*, 307.
[29] Interview with Bagoes Moerdijantoro on 5 March 2012 in Jakarta.

time."[30] He brought his training to PLN by heading a new division called the Center for Management Services (*Pusat Pelayanan Manajemen, PPM*) in the 1980s.

When Moedijantoro and his colleagues served in a PLN management team in 1970, PLN's status was still as a state electricity company (*perusahaan listrik negara*). Its main task was to "endeavor in electricity provision broadly construed, especially to increase the degree of life of society."[31] In order to accomplish this, PLN needed funds to build the much-needed electrical infrastructure. A former PLN Main Director told me that the World Bank, which in 1968 had promised a US$15 million loan to PLN to build a transmission line in Jakarta, required PLN to exist as a lawful institution in the country with a valid credit rating.[32] In 1972, the Soeharto government changed PLN's status into a Perusahaan Umum (*Perum*) Listrik Negara by issuing Government Regulation No. 18/1972. The regulation authorized PLN to produce, transmit, and distribute electricity; to plan and build electrical infrastructure; to develop electrical power; and to provide services in the electricity sector.[33] Following the transformation of PLN into a *perum*, the government managed to obtain a loan from the World Bank to finance PLN's operations since PLN's new status facilitated the Financial Audit Board (*Badan Pemeriksa Keuangan, BPK*) to audit PLN's books and issue its audit report.

Many PLN officials viewed the 1972 Government Regulation as the official founding document of their organization, further erasing the Old Order connection. In 1975, Minister Sutami passed a Ministerial Decree to further reaffirm PLN's status as a government-owned agency tasked with supporting the national development in the electricity sector.[34] Sutami's

[30] Interview with Bagoes Moerdijantoro on 5 March 2012 in Jakarta.
[31] Peraturan Pemerintah Republik Indonesia No. 19 Tahun 1965 Pasal 7 (Government Regulation No. 19 Year 1965 Article 7).
[32] Interview with Djiteng Marsudi on 10 February 2012, Jakarta.
[33] Government Regulation No. 17/1972, Article 6.
[34] Minister of Public Works and Electrical Power Decree No. 013/PRT/1975.

decree put PLN in lockstep with Soeharto's national development agenda. On the one hand these laws empowered PLN employees to methodically start powering the country. On the other hand, its intimate tie with the New Order regime meant that its electrification policies had to cater to the regime's objectives.

The Technopolitics of the New Order

As a new institution charged with electrifying the archipelago, in the 1970s PLN tried to take charge of managing and coordinating endeavors to bring electricity to the countryside. There had been many rural people who could not wait for PLN to build power lines to their villages. Instead, they either worked with their regional government officials or attempted on their own to build power plants and lines themselves. Those who wanted to generate their own electricity would collectively raise funds to procure the generators and other needed materials. As long as the electricity generated did not exceed a certain threshold limit, they did not need government permission for such projects. The New Order government referred to this form of independent or private electricity generations as "non-PLN" electricity.[35] Non-PLN power plants were usually small diesel generators. But one PLN report noted that local residents lacking technical and operational skills operated and maintained most of village-level makeshift electrical networks poorly. Often, these power plants failed and were eventually handed over to PLN, which had to expend scarce resources to rehabilitate them. By December 1980, as many as 77 such non-PLN plants had been transferred to PLN, and another 35 plants were in the process of being transferred.[36]

[35] Soemardjan et al., *Laporan Penelitian Listrik Masuk Desa*, 49.
[36] Perusahaan Listrik Negara, *Makalah: Listrik Pedesaan* (Jakarta, Indonesia: Perusahaan Umum Listrik Negara, 1980), 1.

But the issue was not just that many villagers wanted to furnish their communities with electrical power themselves. In some cases, villagers received instructions to build diesel power plants using generator sets donated by the president. In their report on village electrification in three provinces Selo Soemardjan and his colleagues wrote, "On the eve of the 1977 general election, there were some villages in Java that, without prior consultation [with PLN] were ordered to receive an electrical generator machine to be used for the villagers' benefit."[37] A district head (*bupati*) of Ponorogo instructed a village leader (*lurah*) in his district to install a donated diesel set from the East Java provincial governor's office in his village in 1972. The *lurah* followed the order, but because, according to him, the operator lacked technical skills, the electricity generated was unreliable. As a result not many people wanted to become customers of the undertaking.[38] Two villages in the Bantul District of Yogyakarta had a similar experience. They received one of Soeharto's diesel generator sets in 1977, right before the general election of that year. All the sub-district head (*camat*) cared about was that the presence of these distributed diesel sets hopefully could persuade villagers to vote for GOLKAR. The electricity supply lasted for two years until it became unreliable, presumably because of shoddy construction. A Chinese Indonesian businessman from Yogyakarta took over the effort, although only for three months. Afterward, a group of residents of Karangtalun and Imogiri villages managed electricity generation and distribution for the two villages. In exchange for their work, they received free electricity. The University of Indonesia researchers concluded that this scheme of receiving electricity for free was not "healthy" financially; their calculations indicated that the effort was not profitable or sustainable.[39]

[37] Soemardjan et al., *Laporan Penelitian Listrik Masuk Desa*, 50.
[38] Soemardjan et al., *Laporan Penelitian Listrik Masuk Desa*, 102-104.
[39] Soemardjan et al., *Laporan Penelitian Listrik Masuk Desa*, 100.

In an interview a former PLN Main Director suggested that the government's actual rationale for building and distributing diesel-powered electrical generators in Indonesia was the achievement of a certain political goal. In response to my question whether there was a discussion to build a power generation station using a particular village's natural resource, he replied, "No, back then it was more about accomplishing a target. The timing of village electrification was tied to the general election and villages needed to be electrified quickly." He recalled an incident in Irian Jaya, Indonesia's easternmost province. A village chief there, under pressure from his supervisor to electrify his village before an upcoming general election, installed a diesel-powered electrical plant. But after it became operational, no one in the village wanted to pay for the electricity generated because it was too expensive for them. PLN later had to uninstall the generator set, not always an easy task. Moreover, the villagers did not want the electricity in the first place and they in fact urged PLN to uninstall the system. "We never wanted it," they said to PLN. "It was the wish of *Pak Lurah* [village chief]." When I probed further, asking my informant why he claimed that village electrification was connected to *Pemilu* [the general election], he told me that the idea was to link GOLKAR with electrification. "Well, the idea was that after electricity was provided, people would vote for GOLKAR. [People would think that] GOLKAR was great," he said.[40]

The provision of electricity in the Aceh province appears correlated with voting patterns in the province. A 1998 commemorative book documenting and celebrating its forty years of development presents a table showing general-election results in Aceh from 1977 to 1997. It shows a correspondence between voting patterns there and the number of electricity

[40] Interview with Djiteng Marsudi on 17 February 2012, Jakarta.

subscribers.[41] I observe that there was more GOLKAR support in areas that had been electrified. More voters in devoutly Muslim Aceh supported the PPP than GOLKAR or the PDI in the 1977 and 1982 elections. It was not until the 1987 general election that GOLKAR won the most votes in the region, a total of 804,121 votes as against 659,505 for the PPP and 78,219 for the PDI. In the subsequent elections, GOLKAR secured more than a million votes while PPP vote totals hovered around 600,000. From around 1984, three years before GOLKAR would win there for the first time, there was an exponential increase in the number of households that had access to electricity in the province. Between 1984 and 1996, the number of electricity subscribers jumped from about 50,000 people to slightly above 300,000, a six-fold increase in 12 years; between 1969 and 1984, the number increased less significantly, from about 10,000 to about 50,000, a five-fold increase in 15 years.[42]

Historically, the people of Aceh often resisted the New Order regime. Between 1976 and 1982, separatist rebels opposed Jakarta's attempt to control the resource rich province.[43] The Indonesian army finally managed to suppress the rebellion and after 1982 the New Order government started to electrify the Aceh countryside. The role of Ibrahim Hasan, Aceh's governor at the time, proved instrumental. Under his leadership, the provincial government provided the funds needed to install electrical generators and to erect power lines across rural regions in the central, southeastern, western, and southern parts of Aceh. As a result, the number of electrified villages in the province almost tripled in five years. In 1985, 664 out of 5,463 villages had already been electrified. Four years later, a total of 1,951 villages had been lit. PLN

[41] Tim Penyusun, *Development Progress of Provinsi Daerah Istimewa Aceh 40 Tahun Derap Langkah Pembangunan 1959-1998/1999* (Banda Aceh: Pemerintah Provinsi Daerah Istimewa Aceh, 1998), 143, 170.
[42] Tim Penyusun, *Development Progress*, 170.
[43] M. C. Ricklefs, *A History of Modern Indonesia since C. 1200*, Third ed. (Houndmills, Basingstoke, Hampshire: Palgrave Macmillan, 2001), 388.

pride in this accomplishment notwithstanding, Aceh's electrification rate in 1989 was still only 35.7 percent, no better than the national average of 36.20 percent.[44] PLN defended this low rate by claiming that an electrification program was a multidimensional endeavor, one that should not be seen solely from an economic point view.[45] In the context of New Order press control and censorship, this defense was PLN's way of saying that there was more to its story of village electrification in Aceh, including its political dimension, than what it could openly relate.

Similar stories occurred elsewhere in Indonesia. An internal and unpublished report prepared by the West Java branch of PLN in 1976 illuminates another example of the patrimonial technopolitics of village electrification in Indonesia. Soeharto had made a gift of 20 diesel electrical generator sets for the province. The provincial government was eager to use these diesel sets in the villages "so that [they] would have been electrified before the 1977 general election."[46] Although the number of donated generator sets was small, the implication of the donation was big. PLN recognized the tie to patrimonial politics and admitted this. The same PLN report lamented the fact that the distribution of free diesel generators undermined its effort to install more cost-effective electrical infrastructure. PLN believed that small electrical generators were appropriate for use only temporarily and in remote and isolated locations, until its own power lines could reach such areas. The report stated, "The unwise selection of location [for installation of diesel generators] in areas where the villagers cannot afford to pay [for electricity] is a hindrance, but often the selection of those locations is based on strategic and political considerations."[47] The patrimonial aims of the New Order regime conflicted with the

[44] "Selintas Tentang Daerah Istimewa Aceh Kiprah PLN Di Tanah Rencong," *Berita PLN*, January, 1991b, 45, 53, 50.
[45] "Selintas Tentang Daerah Istimewa Aceh Kiprah PLN Di Tanah Rencong," 45, 53.
[46] PLN Distribusi Jawa Barat, *Kertas Kerja: Kebijaksanaan Kelistrikan Desa Di Wilayah PLN Distribusi Jawa Barat* (PLN Distribusi Jawa Barat, 1976), 1.
[47] PLN Distribusi Jawa Barat, *Kertas Kerja*, 4.

economic and technical goals of PLN. The company was reluctant to supply electricity in the way that the Soeharto government provided it. But because the state controlled PLN, the company had to follow the government's agenda.

Realizing the urgent need to start coordinating sporadic village electrification efforts in the country and perhaps to avoid Soeharto's further encroachment into PLN's area of responsibility, Sutami finally issued a ministerial decree in 1976 instructing the PLN leadership to create a Sub-Directorate of Village Electrification. This was an important step in the effort to electrify Indonesia's villages. Prior to the establishment of this division, PLN only managed to electrify villages around urban centers. Under the leadership of Johannes J. Rumondor, PLN's new division set about to hold a series of workshops to discuss village electrification strategies between October 1977 and August 1978. The workshops produced many recommendations, including detailed guidelines for feasibility studies and for the preparation of reports on those studies.[48] In his typed notes on the first workshop meeting, M. Machfud, a PLN Eleventh Region XI (*PLN Wilayah XI*) employee, wrote that Rumondor had mentioned that one of the reasons for training on the conduct of feasibility studies was to enable PLN to obtain foreign loans if needed. Rumondor's target was that within four years all fourteen PLN regional offices would have produced these feasibility studies reports.[49] He thought that well-prepared studies would help determine objectively which villages should be electrified first and that producing them would be one way to assert PLN's role in electrifying rural areas.[50]

[48] The first workshop was held in Semarang between 17 and 22 October 1977, the second in Denpasar between 5 and 10 December 1977, the third in Manado between 23 and 28 January 1978, and the fourth one in Medan between 28 July and 3 August 1978.
[49] M. Machfud, "Beberapa Catatan Dari 'Session on Rural Electrification Feasibility Study Training' Yang Diadakan Oleh PLN Atas Bantuan USAID/NRECA Di PLN WIl XIII Semarang 17 Okt - 22 Okt 1977," unpublished report, 1977.
[50] Rumondor, "Program Perusahaan Umum Listrik Negara Untuk Perlistrikan Desa."

Despite PLN's attempt to gain some autonomy in directing the country's electrification endeavor, the government later reduced its role in this effort. In March 1978, Soeharto decided to place major state enterprises dealing with energy under the control of a newly created Department of Mining and Energy, headed by Subroto. This newly created ministry was to oversee five state enterprises in the energy sector: *Perusahaan Gas Negara* (PGN) for gas distribution, *Perusahaan Pertambangan Minyak Bumi dan Gas Negara* (PERTAMINA) for oil and gas exploration and mining, PLN for electricity generation and distribution, and *Perusahaan Negara Tambang Batubara* for coal mining, which shortly thereafter split into *PN Tambang Batubara* and *PT Tambang Batubara Bukit Asam*. Under this new arrangement, PLN was no longer put under the Department of Public Works and Electrical Power and its Main Director did not report directly to Subroto but rather to a Director General of Power under the new ministry.

Perhaps to allay some concerns over this change and to rally support within PLN, Subroto held a symposium on village electrification symposium for all provincial-level bureaucrats in his department in mid-July 1978. He assured them that village electrification remained a top government priority since, as the seminar report declared, "[the] history of the development in the world illustrates that the main factor in the development of nation-state is the sufficient and cheap provision of electricity."[51] Six months later, Subroto announced that a nation-wide electrification campaign would begin on 1 April 1979, the starting date of the third PELITA.[52]

Lighting the Villages, Electrifying the Villagers

[51] Perusahaan Listrik Negara, *Listrik Pedesaan Dalam Pekan Apresiasi Bidang Pertambangan Dan Energi Bagi Para Pejabat-Pejabat Daerah Tingkat I Seluruh Indonesia Tanggal 17 S/D 24 Juli 1978 Di Jakarta, 1978* (Jakarta, Indonesia: PLN, 1978), 9.
[52] "Seminar Tarif Listrik Kedua Asia Pasifik Di Denpasar," *Berita PLN*, January 1979, 1-3.

In the same year that the New Order regime launched a national program of village electrification, it passed Law No. 5/1979 on Village Administration. Some scholars have seen this law as an attempt to bring administrative uniformity to all Indonesian villages through the nation-wide imposition of Javanese village structure, much to the displeasure of many non-Javanese.[53] Hans Antlöv, in fact, asserted that the law made village administrations "miniature replicas of the central government, enforcing decrees and policies determined from above," allowing the state to penetrate deep into the villages.[54] Soeharto took advantage of the new structure of village government to establish a patrimonial relationship with many village elites, cultivating their dutiful stance toward his regime. The New Order government constantly reminded village chiefs that their loyalty to the regime would bring benefits to their villages. Antlöv, who studied a village in West Java in the 1980s, recounted the following episode, one relating directly to rural electrification.

> People in Sariendah are told over and over again that the New Order is directed by righteous rulers: they hear it on television, on the radio, at school, at the mosque, at the local wayang performance, or whenever they are in contact with one of the 350 persons in Sariendah who have passed the government's Pancasila Promotion Programme [i.e. the P4 course]. A typical example was when Otong-the chairman of Leumachai--announced that the hamlet was getting electricity. He summoned a meeting with the most important local notables at the Leumachai mosque. Headman Wirahmat was specially invited to provide for the guidelines of the official programme, *Listrik Masuk Desa* (Electricity Enters the Village). Wirahmat started the meeting by saying how grateful (*berterima kasih*) Sariendah should be for having the honour of being chosen for the programme. It was only through the hard struggle of the New Order government that the present level of prosperity could have been attained. Now it was time for people in Sariendah to repay their debt (*hutang*) by being loyal (*setia*) and support Golkar at the upcoming election. The 'age of modernity' (*zaman moderen*), he continued, was a creation of the New Order.[55]

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[53] M.C. Ricklefs, *A History of Modern Indonesia since C. 1200*, Third ed. (Houndmills, Basingstoke, Hampshire: Palgrave Macmillan, 2001), 373; Patrik Guiness, "Local Society and Culture," in *Indonesia's New Order the Dynamics of Socio-Economic Transformation*, edited by Hal Hill (Honolulu: University of Hawaii Press, 1994), 272-276.

[54] Antlöv, "Village Government and Rural Development in Indonesia: The New Democratic Framework," *Bulletin of Indonesian Economic Studies*, Vol. 39, No. 2 (2003), 196.

[55] Hans Antlöv, *Exemplary Centre, Administrative Periphery: Rural Leadership and the New Order in Java* (Richmond, Surrey: Curzon Press, 1995), 59-60.

Wirahmat, the village head, tried to persuade his fellow villagers to support GOLKAR, and was connecting the provision of electricity with the upcoming election. The village eventually got its electricity, and GOLKAR won in "Sariendah" in the 1982 election.

"Sariendah" was one of thousands of villages electrified before the 1982 election, in a concerted effort on the part of PLN and the government. A 1980 internal PLN report noted,

> It is known that village electrification investment is expensive, but [the project] aims to enter villages where 80% of the population resides, to improve their lives. The 1980/1981 village electrification program in particular must not fail since PLN's main task is to support the government's program that we must safeguard and implement successfully, especially ahead of the 1982 Election.[56]

To electrify 1,000 villages the Soeharto government appropriated a Project Content Form (*Daftar Isian Proyek*, *DIP*) fund of Rp 62.661 billion, a large sum of money even for today.[57] The intensive endeavor to electrify those villages paid off both in terms of getting electricity to villages and to reap villagers' votes. By March 1982, 1,116 new villages had been illuminated, and 2,268 additional villages were slated to have electricity within the next two years.[58] Soeharto used these achievements to campaign aggressively for GOLKAR. Many villages were electrified. But villagers did not only get electricity in their homes, they were also "electrified" to cast their ballots for GOLKAR.

Soeharto sent several of his cabinet ministers to inaugurate the electrification of recently lit villages. These ceremonies were usually attended by villagers, PLN representatives, the governor of the province, district heads and village chiefs, along with a crew from national television and several journalists to cover the event. The inauguration ritual typically included speeches from the cabinet minister in attendance and from the governor. The designated PLN representative would give the statistics of electrical infrastructure built. He (for all of PLN high-

[56] Perusahaan Umum Listrik Negara, *Makalah: Listrik Pedesaan*, 31.
[57] Ibid., 14. In 1980, the average exchange rate was 649 rupiahs to the US dollar.
[58] Sardjono, "Pidato Direktur Utama PLN Pada Upacara Bendera Tanggal 17 Yang Diselenggarakan Pada Tanggal 17 Maret 1982," *Berita PLN*, March 1982, 42.

ranking officials were men at the time) would mention the number of diesel power plants installed with their capacities, the total kilometers transmission and distribution lines erected, as well as the total fund needed to construct all of them. Afterward, the cabinet minister would turn on an electric light symbolizing the beginning of an era electricity in the villages in question, followed by the signing of a large stone inscription (*prasasti*) containing the name of the electrified villages and the date of the ceremonies. An example of the stone inscription is shown in figure 5 below.

Figure 5 - A 1995 Stone Inscription of Balinese Villages Electrified[59]

During each ceremony, cabinet ministers over and over credited GOLKAR and the New Order government with the success of the village electrification program. When Sudharmono—Soeharto's State Secretary and the head of GOLKAR's Central Leadership Council (*Dewan Pimpinan Pusat*)—inaugurated several electrified villages in Maribu, Jayapura, and Irian Jaya, in 1986, for example, his speech stressed that bringing electricity to the villages was part of the

[59] Photo taken by the author on 13 April 2012.

New Order's development program and that the results of this program were due to the hard work of everyone, "especially those who channeled their aspirations through GOLKAR."[60]

Junior Minister for Women's Affairs and GOLKAR cadre Lasiah Soetanto presided over an inauguration ceremony on 22 March 1982 to celebrate the electrification of 34 villages in Bali.[61] On 25 March 1982 Minister of Industry A. R. Soehoed inaugurated 25 recently lit villages in West Sumatera and donated some equipment for the Bung Hatta University there. He was a GOLKAR representative of the region.[62] On the same day, but in Central Java, 142 newly illuminated villages were celebrated in a ceremony attended by Coordinating Minister for People's Welfare Surono, Central Java Governor Soepardjo Roestam, and PLN Main Director Sardjono, among other important officials.[63] Meanwhile, Minister of Finance Ali Wardhana was in Tolo, South Sulawesi, to usher in the era of electric lighting in 14 villages on 25 March 1982.[64]

When Sudharmono inaugurated 84 newly illuminated villages in Central Java in March 1982, he was quoted chatting with villagers about which political party they would choose in the upcoming election. *Kompas* newspaper noted that the majority of people there shouted the name of GOLKAR's banyan tree symbol and held up two fingers to denote GOLKAR's number in the election.[65] Similarly, on 30 March 1982 Subroto attended a ceremony in East Kalimantan, at which he donated a television to each of 14 newly electrified villages. *Berita PLN* reported, after the ceremony Minister Subroto "accepted the determination (*kebulatan tekad*) of the villagers in

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[60] "Menteri Sekretaris Negara Sudharmono, SH Meresmikan Listrik Pedesaan Di Desa Maribu, Jayapura," *Berita PLN*, September 1986, 26-27.
[61] "37 Persen Desa Di Bali Sudah Menikmati Listrik," *Bali Post*, 23 March 1982.
[62] "Listrik Masuk 25 Desa Di Sumbar," *Kompas* 27 March 1982.
[63] "Listrik Masuk Desa Di Jateng Dan Sulsel," *Kompas* 30 March 1982.
[64] Ibid.
[65] "Mensegneg Sudharmono Serahkan DIP Dan Resmikan LMD Di Jawa Tengah," *Kompas* 31 March 1982.

attendance to appoint General (Ret.) Soeharto to serve as Indonesia's next president for the 1983/1988 period and to name him as the Father of National Development."[66] A number of PLN employees reported that people in many Indonesian villages were happy to receive electricity. Johannes Rumondor was quoted to say, "I felt and witnessed it myself, how pleased, satisfied and happy the villagers were after receiving electricity."[67] A village elder in the Sidogiri Village told *Berita PLN* reporter that Minister Subroto's presence with his entourage was "like a lightning flash during daylight giving him and his fellow villagers an overflow of joy (*luapan kegembiraan*)."[68] Minister Subroto confirmed this when he said that he had the same impression of the villagers' happiness for the "present" that they had just received from the New Order government.[69] My interviews with several village heads in Bali also confirmed the villagers' contentment upon receiving electricity. Their satisfaction helped GOLKAR win votes. In the 1982 general election, M. C. Ricklefs noted that GOLKAR won the majority of votes in all provinces but Aceh and managed to regain the national capital after losing it to the PPP in the previous election. PDI and PPP's total votes fell by some 8 and 28 percent, respectively.[70]

In 1986, a year ahead of the 1987 election, Soeharto re-launched the strategy of electrifying villages and villagers. Throughout the year, *Berita PLN* reported that GOLKAR chairman Sudharmono inaugurated a total of 326 electrified villages in Central Java, West Java,

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[66] "Menteri Pertambangan Dan Energi: 'Program LMD Bukan Dimaksudkan Untuk Penerangan Saja, Namun Yang Lebih Penting Lagi Untuk Mencerdaskan Masyarakat Banyak'," *Berita PLN*, March 1982, 5-6.
[67] Johannes J. Rumondor, "Pembangunan Kelistrikan Desa Sebagai Upaya Meningkatkan Taraf Hidup Masyarakat Desa," *Berita PLN*, November 1985, 3-9.
[68] "30,83 Persen Penduduk Jatim Sudah Nikmati Listrik, *Berita PLN*, February 1987, 19-21.
[69] Ibid.
[70] Ricklefs, *A History of Modern Indonesia since C. 1200*, 375.

South Sulawesi, Yogyakarta, East Java, and Irian Jaya.[71] Meanwhile, Subroto inaugurated a total of 208 electrified villages in East Java on two separate occasions in 1986.[72]

And Sudharmono and Subroto were by no means alone. In the same year, Junior Minister for the Promotion of the Use of Domestic Products Ginandjar Kartasasmita inaugurated 5 electrified villages in West Java,[73] and Minister of Forestry Soedjarwo 13 villages in East Kalimantan. In the first few months of the following year, *Berita PLN* reported that Sudharmono turned on the lights in an additional 50 villages in Jakarta;[74] that Subroto inaugurated a total of 256 electrified villages in West Nusa Tenggara, East Timor and East Java;[75] and that Minister of Communications Roesmin Nurjadin officiated at a ceremony marking the illumination of 70 villages in South Sulawesi.[76]

By April 1987, Soeharto's cabinet ministers had inaugurated hundreds of electrified villages. This accomplishment, coupled with the decision of the Nadhatul Ulama (NU)—one of the two Islamic organizations that made up the PPP—to withdraw from the party and the resultant fall in PPP votes, helped GOLKAR win the 1987 election. The NU's vote deflation tactic (*penggembosan*) was designed to exert its independence, although, according to the

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[71] "Menteri Sekretaris Negara Sudharmono, SH Resmikan Listrik Masuk Desa Di Jawa Tengah," *Berita PLN*, January 1986, 21 & 29; "Peresmian Listrik Masuk Desa Di Jawa Barat," *Berita PLN*, February 1986, 22-24; "Peresmian Listrik Masuk Desa Di 4 Kabupaten Propinsi Sulawesi Selatan," *Berita PLN*, April 1986, 20-21; "Listrik Masuk Desa Di Kabupaten Sleman Propinsi DIY Diresmikan Mensekneg Sudharmono, SH," *Berita PLN*, July, 1986, 29; "Menteri Sekretaris Negara Sudharmono, SH Meresmikan Listrik Masuk Desa Di Kabupaten Lamongan--Jawa Timur," *Berita PLN*, August 1986, 14 & 20; "Menteri Sekretaris Negara Sudharmono, SH Meresmikan Listrik Pedesaan Di Desa Maribu, Jayapura," September 1986, 26-27.

[72] "188 Desa Lagi Berhasil Dilistriki PLN Di Jawa Timur," *Berita PLN*, March 1986a, 3-5.

[73] "Menteri Kehutanan Resmikan Listrik Masuk Desa di Kalimantan Timur," *Berita PLN* November 1986, 24, 27.

[74] "Walaupun Hujan Lebat Masyarakat Tetap Menghadiri Peresmian Listrik Masuk Desa," *Berita PLN*, January 1987, 19-21.

[75] "Menteri Pertambangan dan Energi Subroto Resmikan PLTD Dan Listrik Desa di Tim-Tim," *Berita PLN*, January 1987, 25-26; "30,83% Penduduk Jatim Sudah Menikmati Listrik," *Berita PLN*, February 1987,19-21.

[76] "Kabupaten Lahat Mendapat Listrik," *Berita PLN*, April 1987, 22-23.

political scientist R. William Liddle, it received government largesse for its schools and teachers in return.[77]

In December 1991 several members of the Fifth Development Cabinet (1988-1993) simultaneously inaugurated dozens of electrified villages in several provinces.[78] During one of these inauguration ceremonies, the Governor of North Sulawesi asked villagers in his province to make the 1992 general election successful, "for the sake of continuing development" (*demi kesinambungan pembangunan*). This line was, in fact, a code phrase urging those who heard it to vote for the government party GOLKAR.[79] Saadillah Mursyid, the cabinet secretary, apparently uttered the same phrase when he inaugurated 20 newly electrified Balinese villages in 1991. *Berita PLN* reported that Mursyid hoped that villagers would help make the upcoming 1992 general election successful "for the sake of continuing development" (*demi kelangsungan pembangunan*).[80]

Solar Power for One Million Homes

In another example of a patrimonial technopolitics, the New Order government in June 1997 launched a program it dubbed *PLTS Sejuta Rumah* (One Million Rural Solar Home System Program). The program originated ten years earlier in 1987 when the Agency for the Assessment and Application of Technology (*Badan Pengkajian dan Penerapan Teknologi*, *BPPT*) initiated a pilot project to light houses using solar energy. Knowing that PLN's capacity to extend its power lines to remote villages was limited, BPPT inserted itself in the village

[77] R. William Liddle, "Indonesia in 1987: The New Order at the Height of its Power," *Asian Survey* 28, no. 2, A Survey of Asia in 1987: Part II (1988), 184.
[78] "Peresmian Listrik Masuk Desa," Berita PLN, October-November-December, 1991, 39-44, 70-77.
[79] Ibid., 43. "Peresmian Listrik Masuk Desa." *Berita PLN,* October-November-December, 1991, pp. 39-44, 70-77., p. 43.
[80] Ibid., 74.

electrification endeavor. The agency specifically wanted to target a poor village and one that had not been connected to PLN's grid. After searching for possible locations, BPPT settled on the Village of Sukatani in West Java for two reasons: the sparse households in the village made it an ideal candidate for a decentralized electrification scheme and its location at the foot of Mount Salak was deemed ideal to test the solar panels. [81]

The agency worked with a Dutch company called R&S Renewable Energy Systems (it later changed its name to Shell Solar Energy) to begin the installation of 86 Solar Home Systems (SHS) and 15 Solar Lighting System (SLS) for streetlights in September 1988. BPPT engineers who were involved in the project wrote, "Every [solar home] system includes 2 photovoltaic modules (40 Wp), 1 battery (100 Ah), 1 battery charge regulator, 2 tubular lamps (6 W), 1 tubular lamp (10 W) and 1 socket for black and white television. This system was designed for a daily load of 210 Wh with battery autonomy of 4 days."[82] The SLS consists of 2 photovoltaic modules, (40 Wp), 2 batteries (100 Ah/battery), 1-time control unit cables, and 1 low-pressure sodium light (18 W).[83] After three months of construction B.J. Habibie, the BPPT Chairman and Indonesia's then Minister of Research and Technology, inaugurated the Sukatani Photovoltaic Pilot Project in December 1988.

Indonesia's "solar village" attracted attention from some researchers who had paid a visit to check and follow up on the operation of the solar modules. For the most part everything went well and was going strong after ten years of operation that *Listrik Indonesia*, a trade magazine,

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[81] Lolo M. Panggabean, "Four Years of Sukatani, 'The solar village Indonesia'," S*olar Energy Materials and Solar Cells* 35 (1994): 387-394.
[82] Martin Djamin, Agus Salim Dasuki, Ahmad Yusak Lubis, "Performance Evaluation of Solar Home Systems After more Than Ten Years of Operation in Indonesia," in *World Renewable Energy Congress VI* edited by A.A.M. Sayigh (Elsevier Science Ltd., 2000).
[83] A.H.M.E. Reinders et al. "Sukatani revisited: on the performance of nine-year-old solar home systems and street lighting systems in Indonesia," *Renewable and Sustainable Energy Reviews*, 3 (1999): 1-47, 6.

hailed it as a success.[84] The main reason was because Sukatani was "primarily a model project."[85] According to the six researchers who came there in 1997 to do an in-depth technical study, "The SHS project in Sukatani was executed under rather specific circumstances, as the technical functioning of the systems was intensively controlled and the users were instructed thoroughly about the correct use of the systems. Moreover, the price that the users pay for the generated electricity is remarkably low."[86] BPPT's scrutiny and subsidy of the project had a larger political context and motive. Around this time, BPPT and BAPPENAS were highly influential agencies competing for Soeharto's attention. BPPT, under B.J. Habibie's helm, was mostly staffed by engineers while BAPPENAS by economists. The two groups had a different vision of Indonesia's technological future. On the one hand, BAPPENAS economists, most of whom, were influenced (and some even studied with) the Berkeley Mafia technocrats, wanted Indonesia to develop Indonesia's technical capabilities in stages. Habibie, a German-trained aerospace engineer who was called home by Soeharto in the mid-1970s to serve the country, sought to leapfrog Indonesia's industrialization process.[87] It was crucial for BPPT engineers to demonstrate that they could successfully carry out their technological projects to earn Habibie's trust and Soeharto's continued support and funding.

When the word spread that the Sukatani project was successfully carried out, other government institutions such as the Department of Cooperatives, the Department of Home Affairs, along with some universities and non-governmental organizations, jumped in to participate.[88] It seems that they wanted a stake in what they envisioned to be a big government project, which materialized soon afterward. The New Order regime decided to enroll these

[84] "Menangkap Matahari, Menerangi Sejuta Rumah," *Listrik Indonesia*, Juli/Agustus 1997, 8-23.
[85] A.H.M.E. Reinders et al. "Sukatani revisited," 4.
[86] Ibid.
[87] See Amir, *The Technological State in Indonesia*, 57-76.
[88] "Menangkap Matahari, Menerangi Sejuta Rumah," 10.

institutions, put BPPT in charge, and scale-up the project to install photovoltaic systems on 1 million houses or 10 percent of 10 million rural households that had not been electrified at that time. President Soeharto launched this program in a ceremony on 2 June 1997. The timing could not have been picked better. It was a week before the general election was to be held that year. In his speech, Soeharto explicitly said that he hoped that all of Indonesian villages would be electrified by the end of the Seventh PELITA (2004), a point that PLN reiterated in a book it published that year titled *Terang Desaku Sejahtera Bangsaku* (Brightened My Village, Prosperous My Nation) (1997).[89] Implicitly, President Soeharto envisioned that his New Order government would continue wiring the nation up to that point and therefore requested Indonesian citizens to support his regime politically to stay in power. Thus, the New Order government used another electrification project as campaign material, which helped GOLKAR in the general election. GOLKAR won again in the 1997 election and held the majority of seats in the People's Consultative Assembly (*Majelis Permusyarawatan Rakyat, MPR*). In March of the following year, President Soeharto was reappointed by MPR and would serve his seventh term with B.J. Habibie as his vice president.

The *PLTS Sejuta Rumah* program appeared to be a well-intentioned program, although I discovered that the government did not help ensure the continuance of it. I spoke with Agus Sugiono, a BPPT engineer who was part of a team that planned and rolled out this program. Sugiono recalled that the program got its funding from the Global Environment Fund (GEF) an institution that provided grants to countries with projects that address environmental concerns.[90] GEF's grant of US$24.3 million was one of four sources of funding that financed the entire

[89] Soeharto, "Sambutan Pada Peluncuran Program Listrik Tenaga Surya Sejuta Rumah Serta Pembukaan Seminar dan Pameran Tentang Perspektif Pengembangan Energi Baru dan Terbarukan Dalam Mengatasi Penyediaan Listrik di Pedesaan dan Peningkatan Daya Saing Industri Energi pada tanggal 2 Juni 1997 di Istana Negara" (Speech, Indonesian National Archive: President Soeharto's Speech RA16b no. 2147).
[90] Interview with Agus Sugiono on 14 March 2012 in Jakarta.

program. The Australian government through AUSAID gave a soft loan to install 36,400 SHS units in more than 150 villages in nine eastern Indonesian provinces. World Bank chipped in with a loan of US$20 million to bring 200,000 SHSs within four years (1997-2001). Another source of money came from the Federal State of Bavaria, Federal Republic of Germany, which gave a grant to put 35,000 SHSs and 300 units of Solar Village Center in the District of Lamongan, East Java.[91]

Solar-generated electricity was (and still is) thought to be an environmentally friendly electrical generation. Sugiono added that the many houses that had been installed with the SHS system stopped getting electricity after a few years. Sugiono framed it in terms of technology transfer. He said,

> Transfer of knowledge or transfer of technology to people in the villagers turned out to be difficult. We had trained them how to change the electrical battery that needed to be replaced every 2 years. How to clean the solar panels to make them continuously work. After we left the villages and these components broke down, they did not care. There were many, not all, that got stuck due to [a lack of] maintenance. The upkeep was not done and so the program stopped working.[92]

But it was not just that many villagers neglected to maintain their solar home system. Sugiono added that people in the villages did not really have enough funding to operate and maintain the equipment. Many cooperatives that were setup for some reasons could not collect the required fees and as a result they did not have money for upkeep.[93] It was not fully clear why the cooperatives failed to collect the required fees from their members, particularly since the fund was needed to operate and maintain a system that generate electricity in their households. But the timing of the rollout of this program suggests that the New Order government's aim was not

[91] Martin Djamin, Agus Salim Dasuki, Ahmad Yusak Lubis, "The strategy of photovoltaic technology development in Indonesia," *Renewable Energy* 22 (2001): 321-326, 324-325.
[92] Interview with Agus Sugiono on 14 March 2012 in Jakarta.
[93] Interview with Agus Sugiono on 14 March 2012 in Jakarta.

merely to electrify the villages (and to ensure that the villages stay lit), but also to "electrify" the villagers to support the government party in the general election.

Conclusion

Using the village electrification and other development programs, GOLKAR managed to create and project the image of a "caring" political party. This success left the two other parties permitted to contest in the Indonesian elections during most of the New Order, the PPP and the PDI, at a severe competitive disadvantage. They did not have access to the same resources that GOLKAR had. By 1997, the year of the last general election of the New Order, many villagers identified programs to bring "things" to their villages—including electricity, television and newspapers—as the result of Soeharto government largesse for which they should be thankful.

One current PLN employee who asked that his name not be spelled out completely confessed to me, "The aura of rural electrification in the Orba [*Orde Baru* or New Order] era was filled with the political interest of the Orba regime. After Orba, this 'aura' stopped. Although it seems to start again."[94] He added, "Back then village electrification was always connected to the GOLKAR's campaign."[95] He volunteered this information in light of the planned village electrification inauguration ceremony to be held in Kintamani, Bali, in early May 2012. Indonesia's Minister of Energy and Mineral Resources Jero Wacik who would preside over the ceremony hails from this area. This PLN employee was kind enough to invite me to attend the inauguration ceremony, which took place on 12 May 2012 in Batur Volcano Museum in Kintamani. Schoolchildren and representatives whose hamlets had recently been electrified were also there. Among high-ranking officials in attendance were Jero Wacik, PLN's Main Director,

[94] Interview with NS on 2 April 2012 in Denpasar, Bali.
[95] Ibid.

and the head of PLN Bali Distribution.[96] The tradition of holding a village inauguration ceremony, which briefly stopped after Soeharto stepped down in 1998, seemed to start again, proving to be an effective campaign strategy. Jero Wacik is a member of the Democrat Party of President Susilo Bambang Yudhoyono who decided to nominate Made Mangku Pastika, the incumbent Governor of Bali in the following gubernatorial race in 2013. Governor Pastika won a second term.

In different setting, another PLN employee admitted to me without prompting that a leading consideration in the effort to take electricity to the villages of Indonesia was helping GOLKAR win elections. "That's the history of village electrification. One of [the regime's] campaign materials (*bahan kampanye*) was rural electrification," he said. He quickly added that, although the regime profited from this endeavor, at least the villagers benefited from this program, too, particularly because many villagers longed to have access to what was then a new and attractive technology.[97] His sentiment was echoed by Goenawan Mohamad, the poet, essayist, co-founder of Indonesia's highly regarded weekly *Tempo* magazine and one of the New Order era's leading public intellectuals. Finding nothing wrong with using electrification as a campaign tool, he said to me "At least villagers got something out of it." His words clearly implied his approval.[98] Goenawan Mohamad made this remark in the context of a discussion of Indonesia's post-New Order money politics, which sees some candidates literally buy votes from villagers by giving them money before they cast their ballots. His remark may sound like an excuse for the New Order government, although I think he tried to express his frustration of the current practice of money politics.

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[96] Field Notes 12 May 2012.
[97] Interview with IBGMP on 25 May 2012 in Denpasar, Bali.
[98] Conversation with Goenawan Mohamad during dinner reception at the "Bali in Global Asia" conference, 16 July 2012, Denpasar, Bali.

Scholars have argued for the patrimonial characteristics of the New Order regime mainly by demonstrating Soeharto's distribution of benefits among high-ranking members of Indonesia's military and bureaucratic elite. This chapter demonstrates that the New Order regime extended its patronage to the broader populace by extending electricity into their homes. Electricity represented a new technology, one desired by many rural people for the material benefit that it brought: lighting at night, added time to hold social gatherings, and increased safety. Coupled with television, a national network of television stations and government-produced television programs, electricity also provided villagers with a new form of entertainment. Villagers who received electricity appreciated this technology, and rural people who did not yet receive it waited for the government to expand its electricity coverage to their areas. In both cases, they willingly supported GOLKAR and the New Order to ensure the regime's continuation of the national development program. Soeharto's New Order succeeded in using electricity for a broader purpose than just bringing a new form of energy to the countryside. An understanding of Soeharto's patrimonial technopolitics makes clear that his rule did not solely rely on repression and fear, as some scholars have argued.[99] Rather, his rule also relied on the creation of the collective sense of a nation working hard to pursue modernity.

PLN, which implemented electrification on Soeharto's behalf, did not always agree with the New Order regime's practices. But its contestation was limited, as its principal view of its mission was that it should support the government's development programs. PLN tolerated GOLKAR's political use of electrification. It believed that, as an organization, it had a dual role as a commercial enterprise earning profits from serving electrical customers and as an "agent of

[99] For example, see Joshua Barker, "State of Fear: Controlling the Criminal Contagion in Soeharto's New Order," *Indonesia* 66 (1998), 6-43.

development" spreading this technology to the rural areas.[100] But in carrying this dual role, PLN did not have a full authority. The government determined electricity prices in an effort to make it affordable for villagers. To an economist, the price of a commodity and service is a crucial measure and indicator of the company's performance. Because of PLN's inability to set price or subsidy, Peter McCawley exclaimed in an interview with me, "PLN has been in a straightjacket," referring to PLN's limited maneuverability.[101]

The New Order government's technopolitical practices, although drew mild resistance from PLN, had been criticized by other entities. *Listrik Indonesia* once published an article censuring the New Order for using rural electrification as a vote-buying strategy on the eve of general elections. The technique worked well, the article said, because "there are still so many village folks who have not received electricity, even though Indonesia has been independent for more than fifty years."[102] It remains to be seen whether Indonesia will have fully electrified its rural areas when it celebrates its seventy-fifth Independence Day in 2020.

[100] Djiteng Marsudi, "PLN Menghadapi Era Globalisasi," *Berita PLN*, February 1996, 6.
[101] Interview with Peter McCawley on 10 October 2011 in Jakarta.
[102] "Pemilihan Umum, 29 Mei 1997," *Listrik Indonesia*, May/June 1997, 27.

CHAPTER 5

LIGHTING "PARADISE"

Introduction

On Friday, 11 August 1995, a special event was held in Siakin, a remote village in Kintamani in the Bangli District (*kabupaten*) of Bali (see figure 6). Siakin residents donned their best Balinese attire and their village chief, I Made Madi, looked sharp in his uniform. He was not the only village head in attendance; his counterpart from a neighboring and equally isolated Subaya village, I Wayan Jingga, wearing the same outfit, was also there. Both had been invited to participate in an inauguration ceremony marking a milestone in the Balinese village electrification project. Their villages were the last two villages to receive electricity, making Bali the first — and thus far the only — province in Indonesia where every village had been electrified.

Figure 6 - Administrative Map of Bali[1]

Bali's then Governor, Ida Bagus Oka, presided over the ceremony. He was accompanied

[1] R. B. Cribb, Digital Atlas of Indonesian History (Copenhagen: NIAS, 2010).

by several officials from PLN sporting blue Batik shirts. The Governor, who wore a yellow and red Batik shirt, lowered a kerosene lamp (*lampu petromak*) hung from a tall bamboo pole and then switched on an electric lamp. This action symbolized the end of an oil lamp era and the beginning of an electric lighting period in both villages. Teeming with pride, Oka was quoted in *Bali Post*, the island's widely circulated daily, to say, "PLN's commitment is very high to make the people prosper and I am so proud of the accomplishments that PLN Eleventh Region has achieved all this time."[2] Officials of PLN Eleventh Region (*PLN Wilayah XI*), a PLN branch that covered Bali, East Timor, West and East Nusa Tenggara provinces, were extraordinarily pleased with their achievements.[3] To commemorate the noteworthy occasion, the company published two cover articles in the July and October 1995 issues of *Pelangi Nusra*, its internal magazine. The headline on the July edition proudly claimed "*Bali Propinsi Pertama Bebas dari Desa Tak Berlistrik*" (Bali is the First Province Free From Unelectrified Villages). The magazine articles described its efforts wiring 18 villages in Kintamani including Siakin and Subaya, reported on the inauguration ceremony, and set as PLN's next goal to fully electrify all hamlets in Bali. As part of the inauguration ceremony's activities that Friday, Governor Oka later turned on a PLN-donated television set that was plugged into an electrical outlet in the Siakin's Village Office.

Although PLN declared that all Balinese villages had been electrified by 1995, not all hamlets (in Indonesian they are called *dusun* and in Balinese they are called *banjar*) within those villages actually had access to electricity. A "lit village" (*desa nyala*) simply meant that an electrical distribution network had reached at least one point in that village, a criteria that PLN used in its village electrification program to mark a reverse salient has been corrected.[4] Many

[2] "Gubernur Turunkan Petromak, 636 Desa Terjangkau Listrik," *Bali Post* 12 August 1995, 15.
[3] East Timor was part of PLN Eleventh Region since it was annexed by Indonesia in 1976 until 1999 when it seceded.
[4] Perusahaan Listrik Negara, *Program Pembangunan Kelistrikan Desa 1983/1984*, 14.

villages in Bali consisted of two or more hamlets, but when electricity is said to have "entered" a village, it did not necessarily mean that all of the *banjars* in that village were connected to the grid, an island-wide network of power lines completed in 1989. Regardless of this, PLN's noted accomplishment seemed to set a precedent for future ones. When I spoke with a PLN employee in April 2012, he informed me that by the end of 2014 PLN would have electrified all Balinese hamlets.[5] Bali thus seems poised to achieve another milestone in its village electrification program within the very near future.[6]

In this chapter, I argue that the development of Balinese electrical infrastructure went hand-in-hand with the construction of the national television system. The New Order regime installed diesel plants, built sub-stations, and erected electrical poles and lines at the same time as it built a network of television stations, launched a communication satellite, and spread television sets in Balinese villages. The existence and expansion of a national television network helped create demand for electricity in rural areas. So did PLN Denpasar Branch's affordable payment plan. To meet this increasing demand, PLN Eleventh Region together with Bali provincial government ensured that electricity supply to the island was always adequate. In doing so, they had the support of the Soeharto government because it had a program to develop Bali as a premier tourist destination in the country and to use the island as the place for many important

[5] This information was based on my conversations with two village heads of Belong Dauhan and Belong Danginan on 13 April 2012 and my interviews with NS on 2 April 2012 on 12 May 2012. Mr. NS wishes that his name not be readily identified. During our second interview he told me that government through PLN has allocated about Rp 100 billion (about US$ 10 million) fund for Balinese electrification. So he was quite optimistic about the 2014 goal. Nation-wide, PLN in 2007 launched an ambitious plan to achieve a 100 percent electrification ration (ratio of electrified households to the total households) by 2020, to coincide with Indonesia's 75th independence anniversary.

[6] Interviews with NS on 2 April 2012 and on 12 May 2012. In 2011, PLN rolled out a plan to provide electricity in isolated villages in 100 islands in Eastern Indonesia using solar power (http://bisniskeuangan.kompas.com/read/2011/04/09/07431522/Bangun.Listrik.Tenaga.Surya.di.100.Pulau) It is reported that the budget to bring electricity to these 100 islands is about Rp1 trillion, about US$ 100 million or US$ 1 million per island (http://economy.okezone.com/read/2011/03/11/320/433991/redirect). The large fund to electrify the whole Bali seems to be part of this grand plan.

meetings.

Underlying all these factors was the New Order regime's construction and projection to the world of an external identity of Indonesia as a progressive country successfully carrying out its infrastructure and economic development and as a good host and mediator. A well-electrified Bali was an important element in establishing the region as a showcase of Indonesia (*etalase Indonesia*) to the world, an identity that the New Order government imposed on Balinese without much negotiation initially.[7] Many Balinese eventually appropriated this identity and used it to their advantage to ensure that it received the resources from the government to develop the island including building a good and reliable electrical grid.

Indonesia's foreign policy guiding principle mandated the country to perform an active role in establishing a peaceful world order. To play its part, Indonesia under President Sukarno led the nation in a global non-aligned movement by exerting Indonesia's national identity as an unaligned country in the Cold War geopolitical order. This move increased Indonesia's standing internationally, especially among the newly emerging countries of Africa and Asia. The Bandung Conference, held in 1955, was the first successful gathering of the Afro-Asian countries that led to the creation of the Non-Aligned Movement (NAM). President Soeharto's rise to power in 1966, the mass murder of members and sympathizers of the Indonesian Communist Party, and the appointment of US-trained technocrats in his Cabinet placed the New Order government in the United States' camp for the remainder of the Cold War. Internationally, by siding with the United States, the Soeharto government chose an anti-communist ally that could provide balance against China, stop the threat of a Cold War's domino effect in Southeast Asia, and tap international funding for its economic development. Thus, while under Sukarno

[7] Michel Picard and Diana Darling, *Bali: Cultural Tourism and Touristic Culture* (Singapore: Archipelago, 1996), 39.

Indonesia was not aligned with the Cold War two major powers, Indonesia under Soeharto had in effect sided with the United States, even though it still held membership in the NAM.

Because national development was the source of the Soeharto government's legitimacy domestically, it needed an international support in this effort. To ensure that it would receive foreign monies and other assistances, the regime thought that Indonesia's standing in the world must be that of successfully developing country and that it who should actively perform its regional and global part. For the former, the Soeharto government showcased Bali's successful village electrification as an exemplary case of Indonesia's national development and selected the island as a "show-place" for wide-ranging regional and international gatherings.[8] For the latter, Indonesia worked through the Association of the Southeast Asian Nations (ASEAN), a regional political and economic bloc, whose leaders often gathered in Bali. ASEAN's founding member states were non-communist countries. It was only after ASEAN laid the foundation of its membership rules were other nations in the region (including communist ones) admitted as members. Indonesia also performed its active part internationally through the Organization of Petroleum Exporting Countries (OPEC), which it joined in 1962.

As I will elaborate below, the New Order government hosted two important meetings for these organizations in Bali. The first was the gathering of the ASEAN heads of state in 1976 that produced an important treaty for the regional bloc. The second meeting was a the fifty-ninth conference of the OPEC in December 1980 in which Indonesia successfully managed to bring together the representatives of Iraq and Iran (two warring members of OPEC at the time) to the table and produced a consensus of the new crude oil price for the following year. The favorable outcome of these two meetings helped cement Indonesia's status globally. At the same time, it

[8] I borrow the term "show-place" from Adrian Vickers, *Bali, A Paradise Created* (Berkeley, CA: Periplus Editions, Inc., 1989), 181.

also helped channel further resources to develop the island as the New Order regime continued to use it as a place to host many other gatherings. Balinese economic development generally and electrification particularly were carried out with this international audience in mind. This was not, however, necessarily the case in other areas of the country. One implication of these focused electrification endeavors on the island was a neglect of electrification in much of the neighboring regions since they had less importance to the New Order government's constructed image of Indonesia for the outside world.

Even with the attention that Bali received from the New Order regime, not all Balinese necessarily agreed with the way the regime developed the island. In the 1990s Governor Ida Bagus Oka criticized the way development was done in his province. Urging the government to develop Bali instead of to develop *in* Bali, Oka asked the regime to pay more attention to developing people's welfare in rural areas. In this regard, I explore the meanings some Balinese attributed to electricity in the last section of the chapter. To many Balinese villagers, electricity meant from the technology that could power their new electrical appliances (particularly television) into something that could help transform their villages into towns. They did not always use electricity as the government intended them to use it and some had mixed views about the role of electricity in their villages. In sum, their experience with the new technology belies the government's belief and slogan that electricity brought to rural areas would automatically improve people's well being.

Electricity and Televisions

Bali Post, a widely read Indonesian-language newspaper established in 1971 with a motto "*Pengemban—Pengamal—Pancasila*" (the Caretaker—Executor—Pancasila) to show its support

for the New Order regime, contained many articles on various aspects of development on the island including village electrification. The articles *Bali Post* published were a mixture of coverage of the government's national development programs, critical commentaries of them by some Balinese journalists, as well as national and regional politics. Sometimes, electrification news even made a front-page headline such as when Sutami inaugurated a large diesel plant on the island in January 1975.[9] *Bali Post* journalists also often interviewed and quoted leaders of PLN Eleventh Region in their articles. The newspaper, in other words, is a good source to understand how village electrification unfolded on the island throughout the New Order period.

As I was reading Bali Post's 1970s articles, many of them reported how eager Balinese villagers were to get electricity in their households. Setting aside the accuracy of this portrayal for the time being, the articles did not, however, elaborate what exactly drove these villagers' enthusiasm to get their households electrified. The typical assumption was that people needed it for lighting their houses and that the price of oil for kerosene lamp was far more expensive than the price of an electric lamp.[10] Electrical lighting did play a role, but as I will demonstrate, desiring an electric light was not the impetus. Instead, the appetite for powering a television set to watch the national television programs was the motivating factor.

The Republic of Indonesia Television (*Televisi Republik Indonesia, TVRI*) was founded in 1962 when the Sukarno government built the country's first television broadcasting station in Jakarta that year. After a trial broadcast showing the state ceremony on 17 August commemorating the seventeenth anniversary of Indonesian Independence Day, the station broadcasted live the Asian Games being held in Jakarta between 24 August and 12 September of

[9] "Listrik Utk. Rakyat Jangan Hanya Utk Industri & Yg Berada," *Bali Post* 29 January 1975.
[10] Mardjono, the head of Balinese Regional Office of the Ministry of Industry put forth this reason and compared the price of electric lighting (Rp 1200/month) versus using kerosene lamp (Rp 4000/month) in trying to account for the reason Balinese villagers wanted electricity. He was quoted in "Listrik Masuk Desa: Pengaruh Positipnya Pasti Ada," *Bali Post*, 7 December 1977.

the same year. Three years later, the city of Yogyakarta had its own broadcasting station and started its operation on 17 August 1965. Throughout the 1970s TVRI built and commissioned seven additional stations in Medan (28 December 1970), Ujung Pandang, which is now called Makassar (7 December 1972), Balikpapan (22 January 1973), Palembang (31 January 1974), Surabaya (3 March 1978), Denpasar (16 July 1978), and Manado (7 October 1978). At the same time, Indonesia developed a microwave transmission system linking Sumatra, Java, and Bali by erecting link stations to spread TVRI programs. But Indonesia's geography and topography made this effort difficult and expensive, which led the Soeharto government to discontinue building additional link stations on the other islands. This was a case where a country's geography limited the development of one its sociotechnical systems. Instead, President Soeharto decided to purchase a communication satellite from Hughes Aircraft, a United States company, to broadcast TVRI programs across the archipelago.[11]

In July 1976, the *Palapa* satellite, named after an oath taken by a famous fourteenth century Majapahit Kingdom's *mahapatih* (Prime Minister) and military commander named Gajah Mada to unite the archipelago under Majapahit rule, was launched by the United States and TVRI programs went national.[12] Through nationally televised programs, the New Order regime fostered national unity and informed many villagers of its myriad development programs

[11] The Cold War concerns drove the US administration in the 1960s to develop a plan for a global communication system. Hughes Aircraft and AT&T were the two private American companies that developed communication satellites for profit. See Hugh R. Slotten, "Satellite Communications, Globalization, and the Cold War," *Technology and Culture* 43, no. 2 (April 2002), pp. 315-330. For an analysis of the meanings attributed to the Palapa satellite by groups of Indonesian engineers, businessmen, and government bureaucrats who helped develop the network of satellite ground stations and used the satellite discourse for political purposes see Joshua Barker, "Engineers and Political Dreams: Indonesia in the Satellite Age," *Current Anthropology* 46, no. 5 (December, 2005), pp. 703-727.
[12] Philip Kitley, *Television, Nation, and Culture in Indonesia* (Athens, OH: Ohio University Center for International Studies, 2000), 46.

and progress.[13] Although the medium was different, this was akin to the role of vernacular language newspapers in helping instill an emerging national consciousness among different ethnolinguistic groups in the Netherland East Indies and the function of radio in helping Sukarno spread his messages of independence and unity during the Japanese occupation in the archipelago.[14]

Philip Kitley notes in his book on Indonesian television history that the sales of television sets soared after the Palapa launch. From 1975 to 1978, he wrote, "the total number of receivers registered almost tripled (269 percent; from about 400,000 to nearly 2,000,000). The number of receivers registered outside Java rose by at least 133 percent in Sulawesi, and 165 percent in Kalimantan."[15] At that time, the government asked television owners to register their units, so it was relatively easy to track the numbers of television owners. In Bali, the head of TVRI Denpasar reported that there were 9,429 television units registered in the entire island by September 1978.[16] About a year and a half earlier in January 1977, it was estimated that there were only about 5,000 televisions in Bali.[17] Thus, within just one and a half year, the number of TV receivers on the island almost doubled. In the subsequent years it continued to increase with a high rate. A brief *Bali Post* news article on 21 April 1980 quoted the Head of Denpasar Postmaster, Abdul Haq, that the number of registered televisions in Bali by the end of 1979 was 14,861, about a three-fold increase since the early 1977.[18] This number was about 1.18 percent of the total registered televisions in the country; a considerable proportion considering Bali's

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[13] Kitley, *Television, Nation, and Culture in Indonesia*.
[14] Benedict R. O'G Anderson, *Imagined Communities: Reflections on the Origin and Spread of Nationalism*, Revised ed. (London: Verso, 2006); Soekarno and Adams, *Sukarno an Autobiography*, 178.
[15] Kitley, *Television, Nation, and Culture in Indonesia*, 46.
[16] "Berapa Jumlah TV Di Bali," Bali Post 25 September 1978. The TVRI Denpasar Head also said that there were many unregistered televisions in the city and put the number close to 15,000.
[17] "Diperkirakan 5000 TV Sudah Terpasang Di Bali. Proyek TVRI Bali Alami Kelambatan," *Bali Post* 24 January 1977.
[18] "Masih Banyak Pesawat Televisi Belum Terdaftar," *Bali Post* 21 April 1980.

population was 1.67 percent of Indonesia's population at the time.[19]

I found additional evidence of a dramatic increase in television ownership in several editions of the book *Data Bali Membangun* (Data on Bali Developing), published by BAPPEDA, the provincial branch of the National Development Planning Agency (BAPPENAS). Bali's BAPPEDA has been publishing its annual *Data Bali Membangun* since at least 1986.[20] The book is essentially a thick collection of statistical figures covering many areas of development. Tabulated data on agricultural land uses to different types of national and regional projects filled the pages of this book. Included in the data was, of course, the number of registered televisions in Bali from year to year. By the end of 1986, there were 103,577 televisions registered in the island.[21] Seven years later, the number jumped to 108,958.[22] Two years later in 1991 when it was last recorded the total number of registered television was 186,671.[23] The actual number may well be much higher since not everyone was inclined to register their televisions or report the correct number of televisions in their households to evade paying the mandatory monthly dues to TVRI. But between 1977 and 1991, there was about a 21-fold increase in the number of registered televisions in Bali.

The Soeharto government also helped spur demands for television sets in part by handing out many television sets gratis to the villages. Three years after the Palapa satellite was put in its

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[19] "Di Indonesia Ada 14 Juta Radio, 1,25 Juta TV, 1000 Bioskop," *Bali Post* 17 October 1979.
[20] The earliest edition I could find was Data Bali Membangun 1986. But in that edition, some tables contained data up to 4 years earlier.
[21] Bappeda Tingkat I Bali, "Tabel 15.1.7 Banyaknya TV Yang Terdaftar Tahun 1986," in *Data Bali Membangun 1986* (Denpasar: Departemen Dalam Negeri Pemerintah Propinsi Daerah Tingkat I Bali, 1986). To figure out Indonesia's population in 1980, I consulted Indonesia's Central Body of Statistics (Badan Pusat Statistik) website accessible online at: http://www.bps.go.id/tab_sub/view.php?kat=1&tabel=1&daftar=1&id_subyek=12&notab=1
[22] Bappeda Tingkat I Bali, "Tabel 15.6 Banyaknya TV Yang Terdaftar Tahun 1989," in *Data Bali Membangun 1989* (Denpasar: Departemen Dalam Negeri Pemerintah Propinsi Daerah Tingkat I Bali, 1989).
[23] Bappeda Tingkat I Bali, "Tabel 15.6 Jumlah Pesawat TV Yang Terdapat Per Kabupaten, 1991," in *Data Bali Membangun 1991* (Denpasar: Departemen Dalam Negeri Pemerintah Propinsi Daerah Tingkat I Bali, 1991).

geosynchronous orbit, the Department of Information (*Departemen Penerangan*) distributed public television sets to many villages as part of a nation-wide parallel program called Television Enters into Villages (*Televisi Masuk Desa*).[24] Typically one village would receive 1 television set to be put in a public area (usually in front of the village head's office) so that the village residents could watch the programs together. The rationale (or rather, the hope of the government officials) was that villagers would tune in to watch government-produced news about the country's developments so that they would be educated about these nationwide efforts. In mid-August 1980, for example, just a few days before the National Independence Day on 17 August, the Department of Information donated 13 televisions (8 each with its power generator set and 5 without) to 13 villages in the Karangasem District. Karangasem District Head (*Bupati*) Yudayana hoped that village folks would tune in their public televisions to watch the upcoming annual address by Soeharto on 16 August.[25] The *Bali Post* article reported that these gifts were part of the second wave of similar donations from the Soeharto's cabinet ministry. In the following year, at least half a dozen news articles reported that villages in Bali received free public television units from the Department of Information. Four banjars in the District of Bangli each received a 17-inch color television from the regional office of the Department of Information.[26] The District Head of Buleleng channeled 14 Department of Information-donated televisions to villages in his jurisdiction.[27] Badung District Head Dewa Gde Oka travelled to two different villages within a week to give a public TV to the Sedang village and the Belok Sidan

[24] Kitley, *Television, Nation, and Culture in Indonesia*, 56-57. Tempo magazine's edition on 1 September 1979 featured a cover article about this program.
[25] "13 Buah TV Umum Dan 4 Buah Sepeda Motor Diserahkan," *Bali Post* 13 August 1980.
[26] "TV Umum Untuk Empat Banjar Di Kecamatan Bangli," *Bali Post* 19 February 1981.
[27] "Droping Pesawat Televisi Umum Untuk Desa2 Di Buleleng," *Bali Post* 30 July 1981.

village.[28] By August 1981, 43 villages in Gianyar and 48 villages in Badung each had a television for public viewing.[29]

Some of the televisions donated by the Department of Information I mentioned above came with a portable electricity generator to power them. The government knew that it would be meaningless to hand out a public television without the means to power it especially when not all villages had been connected to the grid. But at the same time, the availability of electricity in a village was used as reason to obtain a public television. Youths in the Cabe hamlet unanimously decided to spend Rp 300,000 their banjar received from selling foods in a five-day bazaar to buy a television because they longed to see TVRI entertainment programs. Starting on 6 September 1981, a brand new JVC television unit adorned their hamlet hall (*balai banjar*) for public viewing.[30]

In addition to receiving a free TV or purchasing one, there were two additional socioeconomic factors that contributed to the spread of televisions in Balinese villages. Economically, an exposure to persuasive marketing strategies and an increase in disposable income played a part in the increase of the number of televisions in the villages. Various electronic stores advertised their products on *Bali Post*. A store called Toko Terang (Bright Store) on Gajah Mada Street in Denpasar in December 1980, for example, advertised its German-made "Telefunken" color television. To entice buyers, the store included an additional free electrical appliance with the purchase of their televisions. Buying a 26-inch television would get consumers one box-fan and purchasing a 20-inch type would get buyers a rice cooker.[31]

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[28] "TV Umum Bantuan Deppen Kepada Desa Sedang," *Bali Post* 30 July 1981; "Bupati Badung Serahkan Pesawat TV Umum Di Belok Sidan," *Bali Post* 3 August 1981.
[29] "Bupati Gianyar Serahkan TV Umum," *Bali Post* 21 August 1981; "Bupati Badung Serahkan Pesawat TV Umum Di Belok Sidan," 1981.
[30] "Dari Hasil Bazaar Banjar Cabe Dilengkapi Dengan TV," *Bali Post* 9 September 1981.
[31] This TV ad appeared in *Bali Post*, 19 December, 3; *Bali Post*, 22 December 1980, 5.

Another store, Toko Merlin, promoted its Swedish-made "Luxor" portable color 37-cm television units with a 1-year guarantee that included spare parts.[32] Even though these advertisements were most likely aimed at more well-to-do families who lived in the cities, there was a likely chance that Balinese villagers would be aware of them too since *Bali Post* had entered some villages since mid-1979 and that some villagers regularly traveled to a nearby city or had relatives who lived in urban areas.[33] Bali's tourism-derived rapid economic growth could have played a role as well in the increased ownership of television. In 1972, Balinese per capita income was Rp 31,042. Four years later it rose 2.1 times to Rp 69,686.[34]

Socially, television symbolized modernity. One piece of evidence that some Balinese considered owning a TV tube as crucial a measure of development progress and success is reflected by the following poem by Gde Aryantha Soethama, one of Bali's award-winning literary figures. Soethama's poetry was written to greet a new Balinese Governor Ida Bagus Mantra, published in *Bali Post* on 2 September 1978.[35]

Selamat pagi Pak Gubernur	Good Morning Mr. Governor
Selamat Pagi Pak Gubernur	Good Morning Mr. Governor
Telah tersedia sebuah kursi	A chair is provided
Tumpukan map dan bising dering telpun menunggu.	A pile of maps and the jangling noise of telephones are waiting.
Kami tahu itu semua kau tangani untuk kami,	We know that you'll handle all this for us
Untuk tandusnya bukit Pecatu	So the barren Pecatu hill may become
agar hijau dan banyak ternak bisa merumput di sana.	green and much livestock may graze there.
Untuk Ketewel, Seraya, Nusa Penida dan desa terpencil nun jauh.	For Ketewel, Seraya, Nusa Penida, and distant, isolated villages.
Di mana deru teknologi, televisi super color tinggal angan-angan.	Where the rumbling of technology, super colour television remain a fantasy.

[32] An advertisement about a new TV posted in *Bali Post*, 19 December 1980, 7.
[33] "Koran Masuk Desa, Setelah Delapan Bulan," *Bali Post* 10 February 1980.
[34] "Pendapatan Perkapita Bali Naik 2,1 Kali," *Bali Post* 10 August 1978. In 1978, the average exchange rate was 442 rupiahs to the US dollar.
[35] The poem reproduced here is as it was published on the newspaper. The English translation is taken from I. Nyoman Darma Putra, A Literary Mirror: *Balinese Reflections on Modernity and Identity in the Twentieth Century* (Leiden: KITLV Press, 2011), 311-313.

Agar mereka nikmati serpih dollar dari Sanur, Kuta, dan kelak Nusa Dua.	So that they can benefit from snippets of the Sanur, Kuta, and future Nusa Dua dollars.
Selamat Pagi Pak Gubernur Pasar bertingkat, sampah, traffic light macet dan pelacuran menunggu Pedagang acung menuntut: pariwisata bukan monopoli pemilik artshop. Kaum pendatang, pribumi terdesak dan anak putus sekolah Banjir, lalu jalan pun terukir Kami yakin akan kau selesaikan untuk kami	Good Morning Mr. Governor Multi-storeyed markets, garbage, traffic jams and prostitution are waiting Street-stall owners demand: no monopoly on tourists for artshop owners Visitors, local people are pushed aside and children drop out of school Floods happen, and then the roads are carved up We're confident you'll solve it for us.

Note that Soethama explicitly mentioned *televisi super color* (super color television) in his poem as a specific example of a technology that must not remain only in the dreams of people living in areas such as Ketewel, Seraya, Nusa Penida and other regions. He, like many other Balinese at the time, hoped that the appointment of Ida Bagus Mantra as Bali's new governor would help solve Bali's many problems and develop areas other than the designated tourist destinations in Sanur, Kuta, and Nusa Dua. Other Balinese writers in the late 1970s expressed a similar hope in *Bali Post*. For example, Anak Agung Gde Astawa wrote an article titled "Desa, Arti Strategisnya Dalam Pembangunan Nasional" (Villages, Their Strategic Meaning in National Development), in which he echoed what the New Order regime had said repeatedly about the importance of village as the nation-building unit that must be developed.[36] What is striking about Soethama's poem is his choice of television as a symbol of technological and social equity.

Dian Mayasari, a popular singer in the 1980s, released and titled her 1981 cassette album *Listrik Masuk Desa* after a namesake song (and a government program of the same title) that was

[36] Anak Agung Gde Astawa, "Desa, Arti Strategisnya Dalam Pembangunan Nasional," *Bali Post* 19 October 1978.

included in the album. The song's lyrics go as follows:[37]

Listrik Masuk Desa	Electricity Enters into Villages
Tiada mungkin kulupa pada sawah ladangku	I will not forget my paddy fields and gardens
Begitu indah memancar pesona	So beautiful and captivating
Hari ini desaku tidak seperti dulu	Today my village is not like it used to be
Oh semenjak listrik masuk desaku	Oh ever since electricity entered my village
Kuucapkan terima kasih kepadamu pahlawanku	I thank you my heroes
Yang membuat desaku ceria	Who made my village cheerful
Siaran televisi telah dapat dinikmati	Television programs can now be enjoyed
Menambah maju penduduk desaku	Advancing my village residents
Reff: Listrik Masuk Desa	Electricity Enters into Villages
Petanipun gembira	The farmers are happy
Oh indahnya desaku tercinta	Oh how beautiful my beloved village
Listrik masuk desa	Electricity Enters into Villages
Pembangunan merata	Development spreads evenly
Menyongsong hari hari yang bahagia	To welcome delightful days
Listrik masuk desa	Electricity Enters into Villages
Pembangunan merata	Development spreads evenly
Masyarakat adil makmur sentosa	Just, prosperous, and tranquil society

Two of the lyrics lines mention "Television programs can now be enjoyed / Advancing my village residents" as some of the benefits of electricity in a village. As we can see, in a poem and a song about modernity and electricity respectively, television is mentioned unequivocally as the exemplary technology that would transform society for the better, reflecting it as the one electrical appliance desired by many people.

To many Balinese villagers television provided entertainment and news, a window to the world beyond their villages, and it was one of the two most desired new electrical devices. In a 1981–1982 survey of some recently electrified villages in Bali, Made Arka, an Udayana University economist noted that electric irons and televisions were the two top electrical

[37] Dian Mayasari, "Listrik Masuk Desa,"Akurama Records, 1981. The song "Listrik Masuk Desa," was composed by Johan Alam Bara, music by Akurama Band, keyboard by Iwan JG, drums and percussion by Unggas, bass guitar by Incong Barandale, electric guitar by Joko Sori, and the children background vocalists were provided by Indra Rianto, Ade Arifianto, Sudaryanti, Sugandi, Sutisna, Wawan Sudarmawan, and Sudrajat. The song can be heard on the KITLV digital media library http://media-kitlv.nl/image/a07f1ba4-36f6-8221-f26a-1c6795576880 (accessed on 30 September 2013).

appliances that his respondents owned.[38] Television initially also marked its owner's socioeconomic status as only few people could afford to buy it, further enhancing some villagers' desire to own it. I Made Madi, the former Siakin's village chief in 1995, informed me that out the five early television owners in his village, three that he could recall were himself, an elementary school teacher, and a regular village resident. He did not reveal the socio-economic status of the third owner, but that person was certainly one who could afford an electronic device with a price tag of Rp 240,000, quite a hefty sum for many villagers in 1995.[39] In fact, another Balinese I interviewed recalled that only "a rich villager" who could afford to buy a television back in the old days.[40] In addition, I Made Madi told me that the number of television owners after electricity had entered his village increased "drastically" and by 2012 about a fourth of households in his village had television sets.[41] Sometimes it did not matter that their households did not yet have electricity. I Wayan Jingga's brother in the Subaya Village told me that his household was one of the few that had a TV receiver before electricity was available and it ran using a car battery that needed to be charged periodically for a fee in Singaraja.[42] The same pattern can be found in other villages in East Java. Before electricity entered the Sepuluh Village in Madura in 1979, there were only 40 television sets there; afterwards, there were 100 TV tubes.[43]

Increasing demands of television and electricity in the villages notwithstanding, some Balinese were critical of television programs. Parni Hadi wrote an article that was published in *Bali Post* asking whether "TV Membuat Masyarakat Miskin?" (Does Television Create Poor

[38] Arka, *Pengaruh Listrik Pedesaan*, 28.
[39] In 1995, the average exchange rate was 2116 rupiahs to the US dollar.
[40] Interview with Cokorda Gde Putra on 16 September 2011 in Kintamani, Bali.
[41] Interview with I Made Madi on 28 June 2012 over the phone in Denpasar, Bali.
[42] Interview with Nyoman Budiarta on 17 April 2012 in the Subaya Village, Bali.
[43] Soemardjan et al., *Laporan Penelitian Listrik Masuk Desa*, 113-114.

Society?), in which he argued that the presence of television impoverished people's souls because watching television undermined the cultivation of a culture of reading. Citing an "Intrafest" study from West Germany, he showed that more people above the age of eighteen preferred to watch television programs than to read books. In Indonesia, even though there had not been a similar study done, he argued that it could lead to a worse condition since it was exacerbated by the lack of books and an interest in reading. He wrote,

> The paucity of books and an interest to read made the presence of television, still deemed as a *symbol of social status*, received a great attention from people. […] Entertaining programs are of course needed, but let us not allow TVRI programs make Indonesian society complacent while many problems faced by people who still could not afford televisions are mounting (my emphasis).[44]

In essence Hadi called for TVRI to create and broadcast more educational programs.

A couple months later, *Bali Post* published an article that talked about how female members of the House of Representatives (*Dewan Perwakilan Rakyat, DPR*) argued that TVRI's advertisements promoted consumptive behaviors and highlighted unnecessary opulence.[45] In his 1981/1982 fiscal year budget speech President Soeharto declared that TVRI advertisements would be abolished starting on 1 April 1981.[46] But this did not seem to dampen villagers' desire to own televisions.

Having (and the desire to have) televisions motivated people in rural areas to have reliable source electricity to power TV sets. In a 1980 report prepared by sociologists of the University of Indonesia, there is a story about one village where the people there were disappointed because the diesel generator set that used to power their public television broke down. One village resident turned his dissatisfaction into a determination to bring electricity to

[44] Parni Hadi, "TV Membuat Masyarakat Miskin?" *Bali Post* 8 August 1980.
[45] "Ibu2 Anggota DPR-RI: Iklan TVRI Konsumtif Belaka & Tonjolkan Kemewahan," *Bali Post* 8 January 1981.
[46] "PPPI Pahami Kebijaksanaan Pemerintah Tentang Periklanan Di TVRI," *Bali Post*, 12 January 1981.

his village. He used his position as a member of his district's legislative council to call on his fellow villagers to demand that a PLN power line be extended to their village, which was eventually successful.[47] Likewise in Bali, increasing demand for electricity in the villages went hand in hand with an increase desire to own a television set. On the island, the responsible organization that brought power lines to the countryside was the PLN Denpasar Branch (*PLN Cabang Denpasar*), a division of PLN Eleventh Region. It is to a story of this company that I now turn.

PLN Denpasar Branch and the "Village Electrification Package"

PLN Denpasar Branch has a history of being a semi-autonomous utility company in the region led by a succession of engineers. The "branch" office existed long before Sukarno formed PLN in 1965. NV Electriciteit Maatschappij Bali and Lombok (NV Embalom) was founded in 1927 as a subsidiary company of NV Algemeene Nederlandsch-Indische Electriciteit Maatschappij (NV ANIEM). Its office was located in Banjar Gemeh, which still stands today and is now part of PLN Eleventh Region's branch offices in Bali. When Sukarno nationalized Dutch utility companies in the late 1950s, NV Embalom became a Denpasar branch of PLN Ninth Exploitation, headquartered in Surabaya, East Java.

On 4 May 1965, PLN created its Eighth Exploitation office in Bali, headed by Sutrisno Oerip. This office incorporated the already existing PLN Denpasar Branch into its organization. In 1974, PLN Eighth Exploitation changed its name to PLN Eleventh Exploitation and in 1976 it became PLN Eleventh Region (*PLN Wilayah XI*).[48] PLN Denpasar Branch and another branch that would be created in Singaraja later in 1994 would have several "twigs" (*PLN Ranting*)

[47] Soemardjan et al., *Laporan Penelitian Listrik Masuk Desa*, 50.
[48] PT PLN (Persero) Distribusi Bali, *Desa Wisata Energi Nusa Penida-Bali* (Denpasar, Bali: PT PLN (Persero) Distribusi Bali, 2009), iv.

spread throughout Bali. PLN Denpasar's branch history as an independent division allowed PLN Denpasar Branch, particularly under the leadership of B.M. Akwan who managed it for ten years (1974 - 1984), to be an active and resourceful organization. Akwan's boss Sutrisno Oerip played an equally important role. As did Oerip's successor Haroen, who led PLN Eleventh Region for ten years (1979 - 1989).

In January 1975, Sutami inaugurated a diesel power plant in Pesanggaran, Denpasar, Bali. *Pusat Listrik Tenaga Diesel* or PLTD Pesanggaran would become the biggest diesel plant in the country in the early 1980s when additional generators were later added to the plant. Balinese welcomed the news excitedly. *Bali Post* featured a front-page article with a headline that read "Electricity for the People, not Just for Industries or the Wealthy."[49] Sutami was quoted by *Bali Post* to say, "We will ensure that the electrical infrastructure we build will be for our prosperity, particularly in the countryside. We will endeavor so that people can pay in installments to get electricity if they cannot [pay in full at once]."[50] Sutami's call was well received by Balinese because it encapsulated the rationale of the New Order regime of bringing electricity to the countryside, which was to improve the welfare of the people who lived there, and reflected the fifth Pancasila principle to provide social justice for all Indonesians.

Managers of the PLN Denpasar Branch took up Sutami's promise seriously and it made sure that more Balinese villagers could afford to get wired than before. To do so, PLN Denpasar came up with an innovative payment scheme that allowed low-income villagers afford electricity installation in their houses. In November 1976 PLN Denpasar Branch introduced what was called a "Village Electrification Package" (*Paket Kelistrikan Desa*, *PKD*) to villagers who lived within a 10-kilometer radius of any of the eight Balinese Districts' capitals so that they could

[49] "Listrik Utk. Rakyat Jangan Hanya Utk Industri & Yg Berada," *Bali Post* 29 January 1975.
[50] Ibid.

become PLN customers. This package was really a payment installment plan for customers to get an electrical connection in their households. Whereas before, a prospective customer had to pay using 3 installments with 50 percent down payment, with PKD they only needed to pay as little as 30 percent of the electrical connection fee, which at that time was Rp 132,010, with the remaining balance payable in nine monthly installments.[51] PLN Denpasar claimed that this package deal was the first of its kind in Indonesia.[52] The package allowed new subscribers to get a maximum power of 450 VA and 5 lighting points in their households.[53] This payment plan finally got Sutami's attention and almost two years after the Pesanggaran plant commenced operation, Sutami formally launched it in Bali in December 1976 in the Kemenuh village, one of several villages located within a 10 km radius of Gianyar, the capital of the Gianyar District.[54]

PKD proved to be key to getting many rural dwellers motivated to obtain electricity and many signed up for the plan. To most Balinese villagers, particularly residents whose villages were located close to the PLN grid, this "package" was a way to get electricity cheaply and quickly. What they needed to do was to register their names with their village chiefs who would later forward the list to the PLN Denpasar Branch office. The role of Balinese village chiefs in getting the word out about PKD was crucial. B.M. Akwan, the head of PLN Denpasar Branch in the mid-1970s wrote in a 1978 paper:

> In Bali, the village chiefs always play an important factor in religious ceremonies and in the government programs and in development. Village chiefs are people who are

[51] B. M. Akwan, "Makalah Di Lokakarya Listrik Pedesaan Ketiga" in *Lokakarya Listrik Pedesaan Ketiga* Jakarta: Perusahaan Umum Listrik Negara, 1978, unpublished report; PLN Wilayah XI, "Kelistrikan Pulau Bali" Denpasar: PLN Wilayah XI, 1983, unpublished report. In 1976, the average exchange rate was 415 rupiahs to the US dollar. See for example, National Rural Electric Cooperative Association, *Rural Electrification for Indonesia Report of the NRECA Study Team,* 56-57.
[52] "Pertama Di Indonesia," *Bali Post* 11 November 1976.
[53] Voltage-ampere (VA) is a unit of apparent power in electrical circuit. Only in direct current is VA equals to Watt, another unit of power. It is not exactly the same for alternating circuit. In this context, residents would know if they could run a particular electrical appliance given the maximum VA rating. PLN used this to size electrical wires.
[54] "Menteri Sutami Akan Resmikan 'Package Kelistrikan Desa'," *Bali Post*, 25 November 1976.

> respected by people in their villages, and have wide influence. Looking at these positive aspects village chiefs have on the villagers, in this case we enroll them in the planning and coordination with PLN Eleventh Region and PLN Denpasar Branch. Of course, we did this after we settled issues such as buying villagers' lands to erect electrical poles and compensating them for their plants [that we had to cut] with the local District Head. We would then first distribute letters to the village chiefs around Denpasar, Tabanan, Gianyar, Bangli, and Klungkung, letting them know to create a plan for their respective villages about the electricity that is needed for households and home industries. The request must be made collectively with a minimal of 40-50 prospective subscribers in one village, which is coordinated by their village chief.[55]

Initially, PKD prioritized villages that were located close to or along the electrical lines that PLN has built or was building. The main lines were constructed from Denpasar to Ubud, Kapal, Kediri, Batuan and Sukawati.[56] All of these areas are located on the southern part of Bali, which was a topographical advantage since the landscape there is mostly flat (see figure 7). Much of the island's center is covered with mountainous range of various elevations, and the highest peak, Mount Agung, is located in the east. PLN Eleventh Region simultaneously installed diesel power plants in other district capitals as it was building power lines spreading out from Denpasar to the nearby regions. Negara, the capital of the Jembrana District, received three stand-alone diesel generators with a total capacity of 1.2 MW in June 1977. Some of the first villages to be electrified in that district were Mendoyo, Tegal Cangkring, Poh Santen, Sebual and Pergung, all located close to Negara and lie along the gentle slope of the western part of the island. This meant that some villages were prioritized over others. Karangasem District Chief at the time, AA Gde Karang had to meet directly with Sutami in Jakarta to request that a line be built to his district. District Head Karang needed to do this because there were already 25 villages in his area that requested electricity. He felt that he was compelled to meet a higher-up

[55] B.M. Akwan, *Makalah Di Lokakarya Listrik Pedesaan Ketiga* (Jakarta: Perusahaan Umum Listrik Negara, 1978), 4.
[56] "PLN Sedang Garap Penyebaran Listrik Ke Pedesaan," *Bali Post* 25 June 1975.

person to ensure that PLN construct a line to Karangasem.[57] Also in 1977, PKD was offered to villagers within a 5-kilometer radius of Singaraja in North Bali. Again the priorities were to electrify villages that lie along the existing distribution line. The first phase was to connect a few villages to the east of the city all the way to Kubutambahan.[58]

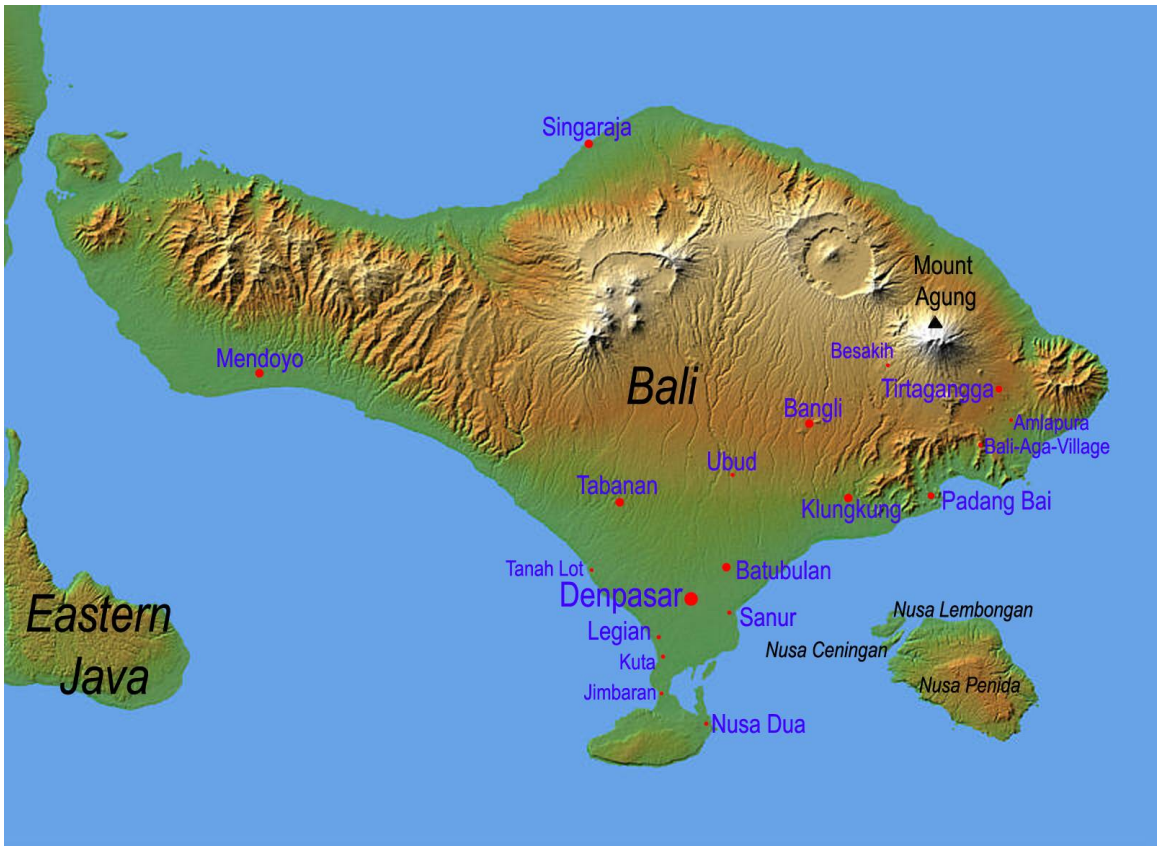

Figure 7 - Topographical Map of Bali[59]

PKD and the role of village heads who actively encouraged their fellow village folks to get electricity proved to be a successful strategy. By the end of March 1977, PLN Eleventh Region received 65 requests with a potential number of up to 3,188 subscribers, about 0.01 percent of the entire population at the time. However, PLN reported that it had only managed to process 10 out of the 65 requests with a total of 501 new subscribers (Table 1).

[57] "Listrik Dari Sanggaran Ke Karangasem," *Bali Post* 27 January 1977.
[58] "Paket Kelistrikan Desa Di Buleleng," *Bali Post* 2 February 1977.
[59] http://www.fivestarindonesia.com/bali-map.jpg (accessed on 15 January 2012).

Table 1 - Total Number of PKD Subscribers by 31 March 1977[60]

No.	Village Name	Number of Subscribers	Electrical Power (VA)	Total PKD Cost (Rp)	Amount paid (Rp)
1	Kemenuh	70	31500	Rp 9,238,000.00	Rp 3,350,790.00
2	Lukluk	68	30600	Rp 8,969,930.00	Rp 3,219,800.00
3	Anggunan	28	12600	Rp 3,693,580.00	Rp 1,120,000.00
4	Dalung	58	26100	Rp 7,675,930.00	Rp 2,577,800.00
5	Abianbasekapal	59	26550	Rp 7,785,890.00	Rp 2,280,000.00
6	Keramas	55	24750	Rp 7,279,900.00	Rp 2,160,000.00
7	Padangsambean	59	26550	Rp 7,788,590.00	Rp 2,320,000.00
8	Kerobokan	48	21600	Rp 6,335,130.00	Rp 1,680,000.00
9	Singapadu	39	17550	Rp 5,141,640.00	Rp 1,520,000.00
10	Kapal Selatan	17	7650	Rp 2,244,170.00	Rp 640,000.00
	Total	501	225450	Rp 66,152,760.00	Rp 20,868,390.00

So effective was this payment plan, in late November 1977 Sutrisno Oerip, head of PLN Eleventh Region, hoped quite optimistically that by the end of 1980 all villages in Bali would be electrified.[61] Perhaps he was very enthusiastic because an important event (the first of many similar future events) would be held in Bali in early December of that year, which was the second workshop on village electrification, funded by the World Bank and attended by representatives of all PLN regions in Indonesia as well as delegates from USAID and the US National Rural Electrification Cooperative Association (NRECA).[62] Denpasar was selected as a venue because PLN deemed Bali to be successful in the implementation of its Village Electrification Package. The PLN Headquarters later decided to implement PKD in other areas in Indonesia and PLN Main Director at the time Suryono acknowledged this innovative idea in March 1979 when he congratulated, thanked, and promoted Sutrisno Oerip who had served for fourteen years as the head of PLN Eleventh Region in Bali to a new position in Jakarta.[63]

[60] Akwan, *Makalah Di Lokakarya Listrik Pedesaan Ketiga*, 12.
[61] "Perlu Diteliti Efek Sampingan Listrik Masuk Desa," *Bali Post*, 22 November 1977.
[62] "Seminar Listrik Pedesaan: Percepat Langkah Pelaksanaan Kelistrikan Desa," *Bali Post*, 6 December 1977.
[63] "PLN Harus Mampu Menggali Dana Investasi, " *Bali Post* 26 March 1979.

In the following year PLN Denpasar Branch received an accolade when it was named the best PLN branch in Indonesia by the PLN Board of Directors in Jakarta. In addition to developing PKD, the branch managed to collect electric bills from customers smoothly, reduced kilowatt losses, and successfully converted the electrical system in the province from 110 volts to 220 volts.[64] PLN decided to change the electrical potential difference from 110 volts to 220 volts to overcome a drop in electric pressure at the ends of many of its low-voltage power lines. This was to ensure that users would get enough electric potential in their households. A nation-wide effort to change this started in 1974, which was the beginning of the second PELITA.[65] In Bali, the new voltage was introduced in Denpasar in April 1975.[66] By March 1979, PLN Eleventh Region claimed that Denpasar was "the first city in Indonesia to have made the switch from 100 volts to 220 volts," highlighting its accomplishment.[67] Other cities in Indonesia took part and completed this project at different times. The city of Malang in East Java, for example, only started doing this in 1986 simultaneously with revamping and expanding its transmission network by changing all of its 6 kV power lines to 20 kV.[68]

PLN's Java-Madura-Bali Bali Grid

Up until April 1987, PLN's regional grids on Java were segregated. PLN branches in West Java, Central Java, East Java, and Jakarta had each built and operated its network independently from one another. When the New Order government decided to build large-scale non-oil power plants on various locations on Java starting in the early 1980s, PLN managers initiated the construction of an extra high voltage (500 kV) transmission connecting these four

[64] "Mekanisme Kerja PLN Cabang Denpasar Terbaik Di Indonesia," *Bali Post*, 10 January 1980.
[65] "Listrik Utk. Rakyat Jangan Hanya Utk Industri & Yg Berada," *Bali Post*, 29 January 1975.
[66] "Tegangan Listrik 220 Volt Mulai Masuk Kota Denpasar," *Bali Post*, 19 April 1975.
[67] "PLN Harus Mampu Menggali Dana Investasi," *Bali Post* 26 March 1979.
[68] "Tegangan Listrik di Malang Akan Diubah Menjadi 220 Volt," *Surabaya Post*, 30 April 1986.

separate networks. The first phase of the ambitious project started on 3 February 1983 in the Paniis Village. On that day, PLN Chief Sardjono commenced the construction of the Suralaya—Bandung—Cirebon—Ungaran line in a small ceremony. A picture accompanying the *Berita PLN* article shows that Sardjono was tightening a nut on a transmission tower. When completed the power line would span 741 kilometers supported by 1470 towers. The government funded the construction project using the World Bank's and the Asia Development Bank's loans as well as the state and PLN's budget.[69]

About two years later on 29 April 1985 Sardjono again presided over a small ceremony marking the start of the second phase of the project: a power line from Ungaran in Central Java to Krian in East Java. This time, Sardjono's symbolic gesture initiating the project was to pour a spade of concrete into the foundation of Tower 392, one of several hundreds that would be erected to support the high-voltage transmission cables.[70] PLN also linked Madura, an island off the coast of East Java with an 8-km underwater 150 kV transmission cable. In late March 1987 Minister Subroto visited the province to inaugurate the operation of the underwater cable and 37 newly electrified villages.[71] By 16 April 1987, all of Java's regional networks had been united in one integrated grid. PLN Power Research Institute Director Artono Arismunandar's call to transmit electricity using high-voltage power line almost ten years earlier had finally been realized.[72]

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[69] "Sistem Transmisi Tegangan Ekstra Tinggi Pertama di ASEAN, Kedua di Asia setelah Jepang," *Berita PLN*, February 1983, 46.
[70] "Peletakan Batu Pertama Pondasi Tower Untuk Jalur Transmisi 500 kV Ungaran-Krian," *Berita PLN*, April 1985, 20-21.
[71] "Menteri Pertambangan & Energi Subroto Meresmikan Listrik Masuk Desa & Kabel Laut Jawa-Madura di Jatim," *Berita PLN*, April 1987, 12-13, 20.
[72] Dr. Arismunandar recommended that Indonesia build a high-voltage transmission line to economically transmit and distribute electricity in the country. He made this suggestion in a speech delivered on the occasion of his appointment as full professor in the Faculty of Engineering of the University of Indonesia on 22 November 1977. His speech was titled "Energi dan Tenaga Listrik Tegangan Tinggi Sebagai

Berita PLN framed this huge technical undertaking indirectly in terms of Indonesia's external identity. It claimed that this project was the first of its kind in the ASEAN region and the second one in Asia after Japan.[73] To be able to claim such a thing was a big deal for Indonesia. It helped put the country on the global map technologically. In an earlier instance, when Indonesia bought the Palapa Satellite and paid to put it on the earth's orbit, the country was the third nation on earth to have owned a communication satellite. Later version of the satellite (Palapa D), launched by the United States in 2009, covers not just the Indonesian archipelago but also the entire ASEAN region.[74] The technological breakthrough of linking all of Java with the high-voltage power line placed Indonesia one step ahead technologically among its Southeast Asian peers. Through this project the New Order Indonesia projected an identity as a developing country with a notable infrastructural achievement that it could be proud of.

Meanwhile in Bali, in the mid-1980s, the Indonesian government's Department of Mining and Energy signed a contract with Fichtner Consulting Engineers (a West German technical consultant) and PT Indra Karya (a local construction firm) to standardize rural electrification construction. At the time, standards for power lines construction varied widely in several regions in the country. East Java had its own construction standard. So did West Java and Central Java.[75] The variations in technical standard were driven by how the infrastructure was built and which foreign government funded it. Thus, for example, Central Java's standard followed the American standard that funded seven electrical coop projects in the late 1970s.

For a year, a PLN Eleventh Region engineer (and one of my informants) worked with

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Sarana Peningkatan dan Pemerataan Kesejahteraan Rakyat (Energy and High Voltage Electricity as a Way to Improve and Equalize People's Welfare)." The speech was published in *Berita PLN* January 1978, 9-23.

[73] "Sistem Transmisi Tegangan Ekstra Tinggi Pertama di ASEAN, Kedua di Asia setelah Jepang," *Berita PLN*, February 1983, 46.

[74] http://www.palapasat.com/history.php (accessed July 23, 2014)

[75] Interview with Made Artha in Denpasar, Bali on 21 December 2012.

Fichtner to produce a construction design handbook. He recounted that he travelled throughout Bali to inspect the existing power lines and produced many engineering drawings.[76] The handbook consisted of engineering drawings of the major components of distribution power lines: electrical poles, tension support cables, load break switches, pole-mounted transformers, as well as various assembly drawings and sheets of pole schedule materials both for low voltage and high voltage overhead line (OHL) constructions. When the *Fichtner Construction Design Hand Book* was published in 1987, my informant told me that the existing transmission lines that had been built were pulled down and rebuilt again. All the poles, isolators, cross-arms, cables that did not meet the handbook standard were thrown out.[77]

When I spoke with another former PLN Eleventh Region's field engineer, he mentioned that one value of the handbook was its ease of use, even easier than the current National Construction Standard.[78] In this case, the Fichtner Handbook served as a "boundary object" or a shared entity among different social groups as a way to connect and communicate with each other. In this case, Fichtner Handbook was a boundary object for the surveyors, material procurement people, PLN engineers, and local contractors.[79] The handbook became a bible for village electrification construction in Bali and was later adopted by the PLN Headquarters in Jakarta as the national standard. Bali became the place where this technical knowledge was drawn up and produced.

As rural electricity demand in Bali increased rapidly, PLN Headquarters mapped out an ambitious goal to connect Bali's electrical grid with that of Java using underwater cables across

[76] Interview with NS on 12 May 2012 in Denpasar, Bali. My informant wished that his name not be readily identified.
[77] Interview with NS on 20 December 2012 in Denpasar, Bali.
[78] Interview with Nyoman Sudara on 7 January 2013 in Denpasar, Bali.
[79] Susan Leigh Star and James R. Griesemer, "Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39," *Social Studies of Science*, Vol. 19, No. 3. (Aug., 1989): 387-420.

the Bali Strait. The Soeharto government thought that Bali could now be linked to Java's sophisticated grid to meet soaring demand and provide reliable electricity supply. One of the reasons was that the government had designated Bali as "Indonesia's Tourism Center in the Middle Region," though it thought the extra supply could also be used for households and industry.[80] PLN's plan was to connect Java with Bali first and then in the longer term Bali with Lombok, Flores, and other islands in the two Nusa Tenggara provinces. Initially PLN predicted that the interconnection system would be in place by 1986 at the latest.[81] But the two 5-km long cables (each delivering 100 MW) from Java did not start to channel electricity until May of 1989.[82] The delay was caused in large part by the need to survey the best route to lay the cables on the bed of the Bali Strait. Additionally, PLN's previous experience laying underwater cable between Java and Madura could not be replicated due to different cable designs. The Java-Madura cable was designed to be connected on site (site joint) while the cable between Java and Bali was joined in the factory (manufacturer's joint).[83] See table 2 for the technical specifications of the two cable designs. With these two underwater cables, Bali's, Madura's, and Java's electrical grids were linked in one massive interconnected system (figure 8).

Table 2 - Technical Specifications of Java-Madura and Java-Bali Underwater Cables[84]

Item	Unit	Java-Madura	Java-Bali
Cable Maker	-	BICC	Fukurawa
Rated Voltage	kV	150	150
Type	-	oil-filled	oil-filled
Frequency	Hz	50	50
Number of core	-	3	3

[80] "Meskipun Masih Menggunakan Diesel, Potensi Alam Lainnya Akan Dikembangkan di Bali," *Berita PLN* February 1984, 14-15.
[81] Ibid., Also see "Dalam Sebuah Interkoneksi Selambat2nya 1986 Jaringan Listrik Jawa-Bali," *Bali Post* 18 April 1981.
[82] "Menteri Pert"ambangan Dan Energi Resmikan Kabel Laut Jawa-Bali," *Berita PLN*, August 1989, 3-8.
[83] "Kabel Laut," *Berita PLN*, June 1987, 3-7, 30.
[84] Ibid., 4.

Capacity/Circuit	MAV	120	120
Conductor:			
Material	-	copper	copper
Cross section	mm2	300	300
Shape	-	circular stranded	compacted circular
Diameter	mm	22.7	20.8
Thickness of Screen	-	Metaliset paper	Carbon paper tape
Insulation material	-	paper	kraft paper (pulp)
Insulation Thickness	mm	12.15	10.4
Oil Duct:			
Material	-	Aluminum	Galvanized steel tape
Diameter	0	18	19
Binder	-	CWT tape	Copper woven fabric tape
Reinforcement		Non ferrous metal	Stainless Steel
Anti Corrosion Cover			
Material	-	Extruded Poly	Extruded Poly
Thickness	mm	3.6	4
Bedding		Hem Tape	Rubber
Armor	-	Galvanized Steel	Galvanized Steel
Serving	-	HD Poly	Polyprefeh yarn
Overall Diameter	mm	149.3	138
Weight in Air	kg/m	54.6	49.4
Weight in Water	kg/m	36.6	34.5
Maximum DC Resistance	Ohm/km	0.0601	0.0601
Electrostatic Cap Insulation	F/km	280	287
Control/Communication		Audio	Integrated Cable

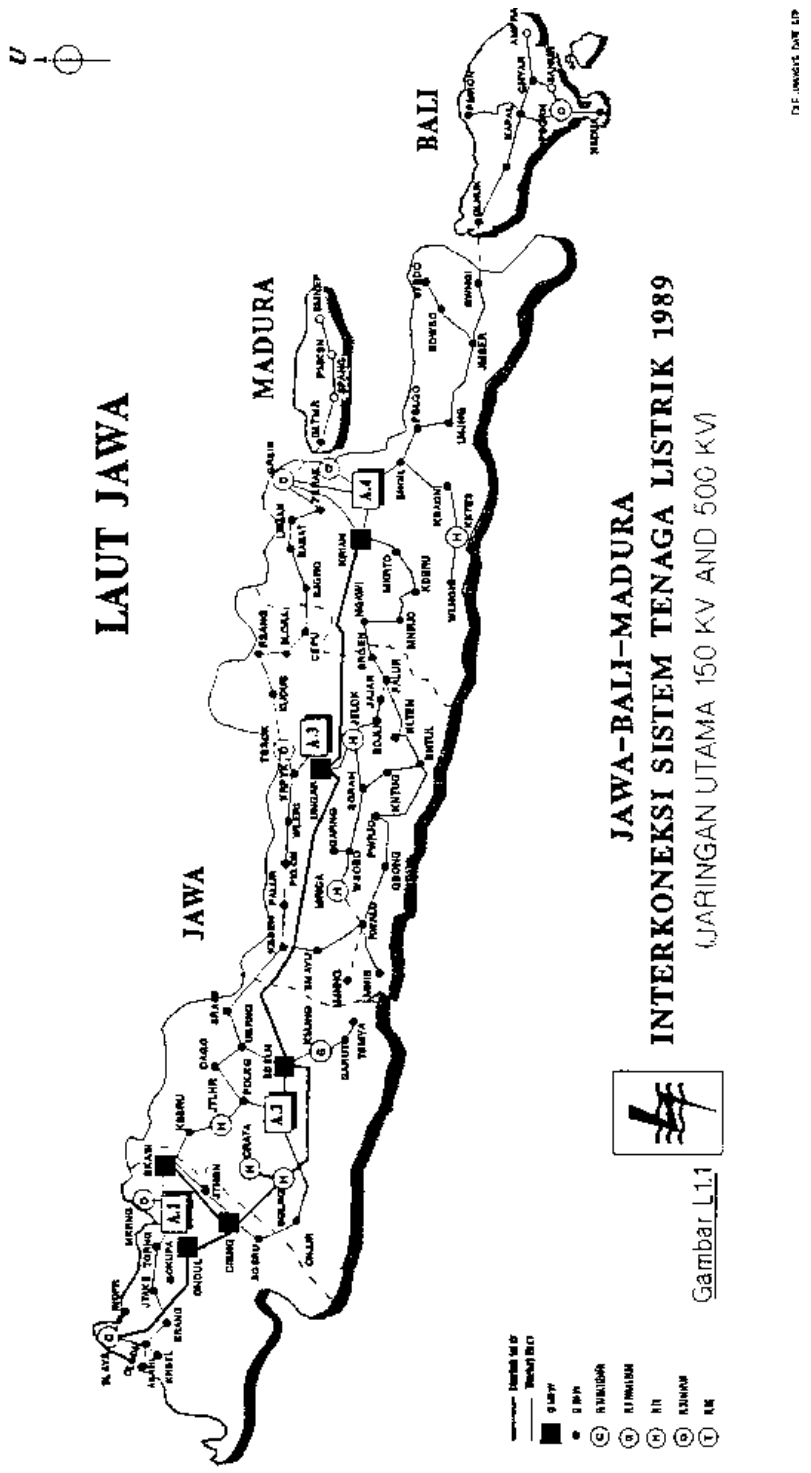

Figure 8 - Java-Madura-Bali Interconnected Transmission System in 1989[85]

[85] Perusahaan Umum Listrik Negara, "Program Pelaksanaan Pembangunan Repelita V Sistem Kelistrikan Jawa-Bali Dalam Rangka Peningkatan Pemasaran, Efisiensi, Mutu & Keadilan dan Pelayanan," September 1989, unpublished report.

External National Identity and Balinese Electrification

Bali has long enjoyed a status as an international tourist destination since the Dutch colonial period. When the Dutch finally conquered the island in 1908, they were so enthralled by the Balinese culture that they decided to preserve this culture from the intrusion and impact of capitalism and decided to make Bali "a living museum."[86] But successive foreigners, most of them tourists but also artists and anthropologists, have made Bali known to the world and created a long-lasting image of Bali as an "island paradise" in the 1920s and 1930s.[87] Sukarno, whose mother was Balinese, continued to promote the island as a place for tourism and used it to welcome his foreign guests "from Nehru to Robert Kennedy to Ho Chi Minh."[88] During the New Order period Soeharto started to systematically develop the island as a "show window of Indonesia" using Bali's image as a "paradise."[89] A late 1980 advertisement for the Bali Beach Hotel, for example, claimed, "Paradise hasn't changed for thousands of years—except to get better."[90] The paradise image masked Bali's long history of political violence, detailed excellently by Geoffrey Robinson in his book *The Dark Side of Paradise* (1995).

As far as Balinese electrification is concerned, as early as 1969, the head of PLN Eleventh Region Soetrisno Oerip recommended a power grid expansion to anticipate the increasing demand of electricity in areas outside Bali's "international zone" (an area designated

[86] Robert Pringle, *A Short History of Bali: Indonesia's Hindu Realm* (Crows Nest, N.S.W.: Allen & Unwin, 2004), 112.
[87] Vickers, *Bali, A Paradise Created*, 3. The image of Bali as a paradise was constructed relatively recently. Bali had a different unpleasant image; i.e. "Savage Bali" in the eyes of the westerners who visited the island from the end of the sixteenth century until the early twentieth century. In his book Vickers detailed the changing image of Bali produced both by foreigners and Balinese alike from the seventeenth up to the late twentieth centuries.
[88] Vickers, *Bali, A Paradise Created*, 181.
[89] Picard and Darling, *Bali: Cultural Tourism and Touristic Culture*, 39.
[90] Quoted in Vickers, *Bali, A Paradise Created*, 192.

for tourism mainly in the Badung District) to places such as Tuban and Kuta (see figure 7).[91] Kuta Beach and Nusa Dua would later be designated as tourist enclaves and consequently were developed and electrified ahead of other areas of the island. PLN also ensured that there was an adequate electricity supply to the Ngurah Rai airport in Tuban, which started its international service on 10 August 1966 and further expanded to accommodate more passengers in the late 1960s and early 1970s.

The New Order government's promotion of Bali as the country's leading vacation destination for foreigners influenced how the island was initially electrified. But another factor that motivated the New Order regime to spread electricity more widely in the area was Bali's selection as a venue to hold regional and international gatherings. Small parts of Bali had already been electrified using a diesel plant that NV EBALOM installed in the colonial period. Additionally, as I noted above there were a few areas that had been lit. By early 1974 there were six villages that had been illuminated using independent electrical generator.[92] The first village to have electricity was the Celuk Village in the Gianyar District where its inhabitants collected a fund to buy and build a micro hydro plant in 1956.[93] But it was Bali's selection as a venue for the Pacific Asia Travel Association (PATA) Workshop in March 1974 that propelled the efforts to supply more electricity to the island.

The New Order regime sponsored the international tourist convention to explore the tourism potential of the island. It was at this meeting that the initial plans to further develop Bali were drawn up.[94] The workshop garnered much attention and support from the regime that it

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[91] Soetrisno Oerip, "Perkembangan Kelistrikan International Zone Bali" (Denpasar: PLN Exploitasi VIII 1969).
[92] Arka, *Pengaruh Listrik Pedesaan,* 4.
[93] Made Suarsa, "Celuk Menyongsong Lomba Desa I: Dikagumi Bung Hatta, Desa Berlistrik Pertama Di Bali Dengan Swadaya Warganya. Tahun 1956 Sudah Bebas Buta Huruf," *Bali Post*, 29 April 1980.
[94] Vickers, *Bali, A Paradise Created*, 188.

gave PLN the funding to expand the island's electrical infrastructure. Two additional diesel generators (3 MW each) would be added to Bali's existing Pesanggaran power station (4 MW). PLN Eleventh Region promised that before the meeting, electricity supply in Denpasar would reach 10 MW and that the city will be bathed in light.[95] This initial expansion would later help spread electricity to the surrounding countryside and helped shape, albeit unintentionally, another area as a touristic spot. For example, Ubud, a mountainous region in central Bali known for its gorgeous rice terraces, flourished as a travel destination for backpackers after it was electrified in 1976.[96]

In addition to the 1974 PATA Workshop, Bali has accommodated a number of important cultural, technical, political, recreational meetings and contests (table 3). This is not a complete list of gatherings held in Bali, but it gives a sense just how important Bali has been for Indonesia as a host country and the New Order's constructed and projected image to the outside world since the mid-1970s.

Table 3 - Regional and International Meetings Held in Bali[97]

Time	Event
March 1974	Pacific Asia Travel Association (PATA) Workshop
February 1976	The First summit of the Association of Southeast Asian Nations (ASEAN)
May 1976	The Forty Seventh meeting of the Conference of the Organization of the Petroleum Exporting Countries (OPEC)
January 1979	The Second Electricity Price Seminar
June 1980	An International Surfing Contest
September 1980	Meeting of ASEAN Economic Ministers for Industry and Energy Cooperation
December 1980	The Fifty Ninth Meeting of the Conference of the OPEC
January 1981	The Third International Austronesian Linguistic Conference
September 1981	The Sixth Asian Association on National Languages Conference
November 1983	The Second ASEAN Rural and Urban Electrification Meeting
April 1984	The First Working Group Meeting on Electric Future of ASEAN Countries

[95] "Sebelum Pata Lisrik Mencapai 10.000 Kw," *Bali Post*, 21 November 1973.
[96] Picard and Darling, *Bali: Cultural Tourism and Touristic Culture*, 86. For an excellent account of the development of Balinese rice terraces and their *subak* irrigation system, see Lansing, *Perfect Order*.
[97] Sources of these meetings include *Bali Post*, *Berita PLN*, *Pertambangan dan Energi*, and I Nyoman Darma Putra's *Literary Mirror*, Leiden: KITLV Press, 2011.

November 1986	The Twelfth ASEAN Cooperation on Petroleum (Ascope) Meeting
1990	A World Trade Organization Meeting
1991	The Fortieth PATA Meeting
1991	An International Conference and Festival of Ramayana
November 1991	The Seventh ASEAN Electric Power Information Centre (EPIC) meeting
1992	An International Conference on Asia Pacific Lawyers
May 1992	A Meeting of Ministers of Non-Aligned Countries
1994	The Tenth Convention of International Apparel Federation
November 1994	The Ninety-Seventh Meeting of the Conference of the OPEC
November 1995	Nineteenth Asian Advertising Congress (AdAsia)
1996	The Twelfth meeting of the Heads of ASEAN Power Utilities & Authorities (HAPUA)
2003	The International Literary Biennale
2007	The United Nations For Climate Change Conference

As we can see in the table above, Bali has hosted the Association of Southeast Nations (ASEAN) gatherings several times. Five Southeast Asian countries (Malaysia, Indonesia, the Philippines, Singapore, and Thailand) founded the regional politico-economic bloc in 1967. A year earlier Indonesia had acknowledged the newly created state of Singapore and resolved its earlier confrontation with Malaysia, which paved the way for ASEAN's establishment. ASEAN's first summit meeting in Bali nine years later in 1976 produced one of ASEAN's important documents. Dubbed the "Treaty of Amity and Cooperation in Southeast Asia," it aimed to promote peace, friendly relationships, and cooperation among the Southeast Asian peoples. Other Southeast Asian nations that would later become new ASEAN members had to agree to the treaty prior to or when they joined the organization.

To Indonesia, ASEAN would prove to be a crucial basis of its foreign policy not only regionally, but also internationally. A year after the summit Adam Malik, Indonesia's then foreign minister, wrote an essay entitled "*Sepuluh Tahun Politik Luar Negeri Orba*" (Ten Years of New Order's Foreign Policy) in which he stressed the role and importance of ASEAN as the cornerstone of the country's international relations. He recounted the initial hurdles at uniting the five founding members of ASEAN shortly after its initial founding in 1967. But they finally

came to an agreement to cooperate with one another and this long effort culminated in the Bali Summit. Malik wrote, "[the 1976 Treaty] was a rebuttal to the perceptions of many countries that ASEAN [as a regional bloc] could not develop well because there were many differences among its members. The accepted Bali result accounted for something in Asia."[98] Indonesia's successful hosting of the ASEAN's first summit squared with Indonesia's national identity as a nation that prefers to reach a consensus (Pancasila's Fourth Principle) and to promote world peace (Pancasila's Second Principle). The regional bloc gave Indonesia confidence to intervene in world affairs. Two years after the summit, Vietnam invaded Cambodia and ASEAN was suddenly confronted by its first regional crisis. Through its connection with Vietnam's military and political leaders and its clout within ASEAN, Indonesia took the lead in resolving the conflict, which ended in 1991, and won international praise for its leadership.[99]

Even though ASEAN established a permanent Secretariat in Jakarta, many subsequent ASEAN gatherings including the ones related to electricity were held in Denpasar. Balinese electrification development was on average more advanced than in any other regions in Indonesia at that time and PLN wanted to showcase this achievement as a host. For example, after the Second Meeting on ASEAN Rural and Urban Electrification in November 1983, PLN officials took the conference guests on a tour to visit a few diesel power stations, PLN Eleventh Region's main office, and a micro hydropower plant in Amlapura.[100] Though not specifically reported, a similar activity was likely to occur when Denpasar played host to the Seventh Meeting of the Electric Power Information Centre ASEAN Power Utilities/Authorities in November 1991 and the twelfth meeting of the Heads of ASEAN Power Utilities & Authorities (HAPUA) in 1996. The 1996 HAPUA meeting produced five important agreements, one of

[98] Adam Malik, "Sepuluh Tahun Politik Luar Negeri Orba," *Majalah Bulanan Korpri*, February 1977, 11.
[99] See Ricklefs, *A History of Modern Indonesia since C. 1200*, 383.
[100] "Pertemuan Kelistrikan Desa ASEAN II di Bali," *Berita PLN*, February 1984, 20.

which was to "strengthen the ASEAN electrical transmission to realize the ASEAN Power Grid."[101]

Another international organization that Indonesia joined was the Organization of Petroleum Exporting Countries (OPEC). OPEC was founded in 1960 by five oil-rich states (Iran, Iraq, Kuwait, Saudi Arabia and Venezuela) that wanted more control and say on how their natural resources should be produced and sold. Prior to the OPEC's establishment, powerful multinational corporations that operated in these countries were in charge of the entire operation from exploration, production, and marketing. When these corporations dropped the oil price in 1959 twice without first consulting their host countries, the five founding members decided to take action and founded OPEC. Initially they were only concerned about stabilizing oil price so they could reap the fair benefit from the sell of their oil. As more oil-rich developing countries joined the organization, OPEC shifted into becoming a cartel. In 1975, OPEC's heads of states gathered in Algiers, Algeria and produced the organizations' first "Solemn Declaration," in which it emphasized broader cooperation with other nations in order to create a "new international economic order."[102] OPEC's declaration led to the meetings between "Third World" and industrialized countries in Paris between 1975 and 1997, which came to be known as the North and South Dialogue.[103] Indonesia's membership in OPEC was thus crucial and facilitated the country to exert its role on the global stage.

An opportunity to play a leading role within OPEC came to Indonesia in 1980. To set uniform oil policies (oil price and production limit), OPEC members met twice or three times a year. That year, Indonesia had been selected to host the organization's fifty-ninth conference in

[101] "Kunjungan Kerja Dirut PT PLN (Persero) di Wilayah XI," *Berita PLN* January 1996, 26. The ASEAN Power Grid is an ambitious region-wide interconnected electrical infrastructure that would become one of ASEAN's goals in the twenty-first century.
[102] "OPEC Sekilas Pandang," *Pertambangan dan Energi*, No. 6, 1980, 11.
[103] Ibid.

December. Three months before the meeting, Iraq and Iran entered into a war. The warring member states threatened to cancel the meeting altogether by refusing to attend, confirming a belief among many countries that OPEC could not hold together as a coherent and unified organization. Three days before the meeting, James Tanner, a *Wall Street Journal* reporter even expressed doubt if anything would come out of the conference. Writing "More than the price of oil is at stake," he stressed, "it will be the first real test of whether OPEC can still function as an organization."[104]

OPEC's unity mattered not just to its members for also to other developing countries who received OPEC's fund and oil. In fact, Tanner also wrote in the same piece that the breakup of OPEC would not benefit oil consumers at all. OPEC provided a stable oil price and prevented it to go up in an unpredictable manner. Because much was at stake OPEC oil ministers pressed ahead with the Bali Conference.[105] The Indonesian government worked hard to make the meeting happen. Subroto lobbied his counterparts and managed to persuade Iran and Iraq to send their delegations even though Iran up until the last minute had not made up its mind. The main issue for Iran was that its Minister of Oil Mohammad Javad Tonguyan had been kidnapped by Iraq. When Iran finally agreed to attend, Indonesia acted as mediator literally and symbolically. President Soeharto in his opening speech called for peaceful and speedy resolution of the conflict between the two OPEC members.[106] In the conference seating arrangement, the Indonesian delegation sat between Iran's and Iraq's.[107] The meeting turned out to be successful and OPEC came to an agreement on a number of points. In its press release it says that that it approved its

[104] James Tanner, "War Polarizes OPEC on the Eve of Conference," *Wall Street Journal*, 12 December 1980.
[105] Ibid.
[106] Soeharto, "Pidato Presiden Pada Pembukaan Sidang OPEC Ke-59 Di Denpasar Bali," *Pertambangan dan Energi* No. 6, 1980, 15-18.
[107] "Bali, Pulau Inspirasi Bagi OPEC," *Pertambangan dan Energi* No. 6, 1980, 5-7.

1981 budget, elected Subroto as its next conference president, and would set its crude oil price for the following year at US$32 per barrel.[108] Indonesia received the world's attention for successfully holding an OPEC meeting despite the sharp internal conflict. It projected to the world that Indonesia managed to foreground its consensus building strategy (*musyawarah*) in time of need.

Subroto's persuasion skill was not the only factor at play. Knowing that the meeting would get a wide international coverage, the Indonesian government wanted to make sure that it could accommodate all reporters with a state of the art pressroom. To do this, the government contracted a local electrical firm (PT Sigma Tirta) to install a 15-km communication cable. In an interview between a *Bali Post* journalist and the head of the firm, it was revealed that according to the initial contract, the firm had until 24 December to finish its job. But when the word was out that the conference would definitely be held, the firm was asked to rush the completion of its contract. PT Sigma Tirta finished it on 8 December, a week ahead of the conference and 16 days before its initial due date. Things did not go as smoothly as planned, however. At one point, the firm employees had to wait for 10 days for the last supply of cable to arrive from Jakarta. On 3 December the shipment finally arrived and for 5 days the firm's employees worked day and night to install the remaining 6-km cables and other equipment along a road with heavy traffic. PT Sigma Tirta's head W. Sjafrin was very thankful that his company completed the job well because at stake was not just his company's reputation, but also indirectly Indonesia, internationally.[109]

PLN, likewise, tried hard to make sure that electricity supply to the Pertamina Cottages Hotel in Kuta, where the conference was held, went uninterrupted. At the PLN Bali's library in

[108] "OPEC Press Release No. 15/1980," in *Pertambangan dan Energi* No. 6, 1980, 23.
[109] Ipong C., "Di Balik Sukses Konprensi OPEC ke-59 di Bali," *Bali Post*, 24 December 1980.

Denpasar, I came across a number of small booklets (all with a red cover) with a title that begins with the phrase "*Pengamanan Penyaluran Aliran Listrik* (The Secure Transmission of Electricity)" followed by the document number, the phrase "Dalam Rangka (In the Occassion Of)," and the name of the important event. The one booklet copy I brought home with me was for a special gathering in which President Soeharto was to open the Nineteenth Asian Advertising Congress (AdAsia) in which some 15,000 delegates from 18 countries met at the Sheraton Nusa Indah Hotel in November 1995.[110] The report specified the team members and logistics involved, schedules of activities, as well as the designated places and power stations that need to be secured. Although I did not find one for the December 1980 meeting, it was very likely that PLN produced the same document and took actions to guard electricity supply to the meeting venue given the importance of the OPEC conference.

Words about Bali as a "paradise" or at least a place in Indonesia well equipped to host an international gathering seemed to be one of the main considerations for President Reagan who decided to stop over on the island in late April 1986 on his way to Tokyo to attend the economic summit of seven industrialized countries (G7) in early May 1986 (see figure 9). Moreover, the US president seemed to choose to visit Indonesia for two additional reasons. First, Reagan wanted to redeem an earlier cancelled meeting to the region. In November 1983 during his first official tour to Asia with a scheduled visit to Manila, Jakarta, and Seoul from Tokyo, Reagan had to cancel his trip to South Korea and Southeast Asia upon learning that the Filipino opposition leader Senator Benigno Aquino was assassinated. When Reagan finally had a chance to revisit the region again in 1986 he chose Indonesia (Bali) knowing that the country was politically and

[110] PT. PLN (Persero) Wilayah XI, Cabang Denpasar, "Pengamanan Penyaluran Aliran Listrik No: 14/XI/1995 Dalam Rangka Kedatangan Presiden Republik Indonesia Meresmikan Pembukaan Kongres Periklanan Asia Ke XIX Tahun 1995 Di Hotel Sheraton Nusa Indah Bali (Tanggal 6 Nopember 1995)," unpublished report.

economically the "center of gravity" of ASEAN.[111] This way, Reagan could get Indonesia to round up ASEAN member countries to meet with him on this visit and ask for their input ahead of the G7 meeting. Second, Reagan wanted to reduce the political fallout after the United States bombed Libya in mid-April in retaliation to the bombing of a nightclub in West Berlin on 5 April 1986. The choice to visit Indonesia, the largest Muslim-majority country in the world (a national identity Indonesia was aware of and acknowledged but rarely used it to exert its role politically on the global stage),[112] was to dismiss the perception that the United States was against Islam. Moreover, Indonesia and Malaysia were not the only two ASEAN countries that protested US action, but also Thailand that had sent workers to Libya.[113] Thailand used its membership in the UN Security Council to rebuke US action.[114]

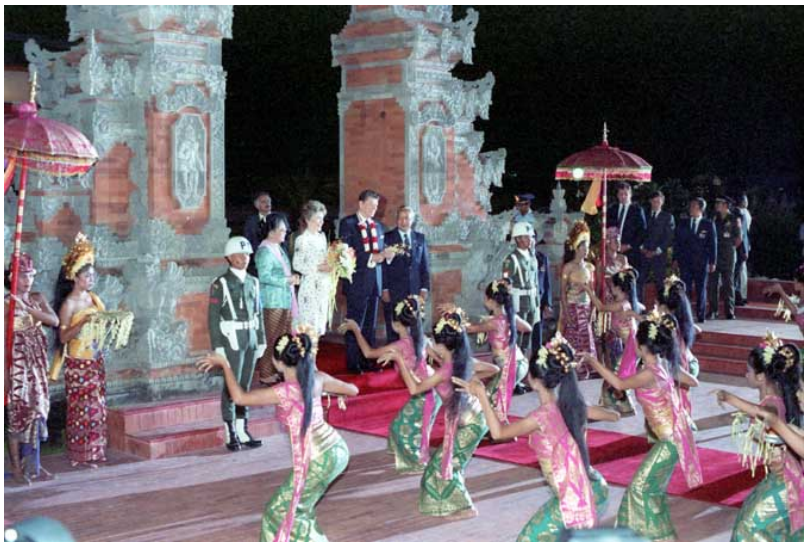

Figure 9 - President Reagan, Nancy Reagan, President Soeharto, and Mrs. Soeharto at an Arrival Ceremony in Bali, Indonesia[115]

[111] Harun Alsagoff, "Mencari Makna Kunjungan Reagan," *Surabaya Post*, 29 April 1986.
[112] Although Indonesia is a member of the Organisation of Islamic Cooperation (OIC), it never hosted an Islamic summit in the country.
[113] Ibid.
[114] David Hess, "Problems Face Reagan In Asia Visit," *The Philadelphia Inquirer*, 29 April 1986.
[115] http://www.reagan.utexas.edu/archives/photographs/large/C34567-9.jpg (accessed on 23 July 2014).

The New Order government seized this opportunity to show the world that it had a clout in helping shape the agenda of the Tokyo Summit by inviting ASEAN foreign ministers to Bali before Reagan's visit. They were also gathered to celebrate the tenth anniversary of the Bali summit and to discuss the venue for the upcoming ASEAN summit in 1987. President Reagan arrived in Bali on 29 April 1986. The US president stayed for four days with an agenda to meet with President Soeharto in a private one-on-one meeting and the ASEAN foreign ministers as a group. The US State Secretary George Schultz who was among the top ranking officials accompanying Reagan also planned to meet with the ASEAN foreign ministers individually. Reagan's visit drew worldwide attention as is typical of a prominent world leader. Around 600 foreign and domestic journalists came to Bali to cover Reagan's visit, the largest contingent of reporters to have visited Indonesia. One Indonesian security official was quoted in *Bali Post* to say, "Bali had never seen this many journalists before even though it had been the venue of international gatherings."[116]

To prepare for this important informal gathering, the New Order regime renovated the hotel where the Bali Summit was held, repaired streetlights along the main road from the Ngurah Rai airport to Nusa Dua, installed communication equipment (telephone, facsimile, and telex) with international connection, and beefed up security.[117] At the hotel where President Reagan would stay, a special driveway was built to allow him to go straight to his hotel room without going through the main lobby. The operations manager of the hotel informed a foreign reporter, "the hotel would install bulletproof glass in the presidential suite, which includes two bedrooms, a lounge, study, dining room, kitchen, and a private swimming pool with direct access to the new

[116] "Bunga Rampai Kunjungan Reagan di Bali (Mobil Antipeluru Didaratkan)," *Bali Post*, 29 April 1986.
[117] Ibid.

beach," which was made to look nicer earlier.[118]

According to the Indonesian government's perspective, widely covered by its national press, the meeting between the six ASEAN foreign ministers (by this time Brunei who joined in 1984 also participated) and President Reagan went well. ASEAN put forth two main recommendations to President Reagan for him to bring to the G7 summit: to request the industrialized countries to eliminate trade protection for goods that ASEAN and other developing countries produced and exported as well as to ask the United States to normalize its relation with Vietnam in support of ASEAN's attempt to resolve the Cambodian issue.[119] Out of this meeting Indonesia signed two important agreements with the United States. The first one was the accord to eliminate double taxation for trade conducted in Indonesia, which to the Indonesian government meant that the United States implicitly agreed to Indonesia's territorial claim of the Archipelagic World View. Paul Wolfowitz, the US Ambassador to Indonesia at the time, however, declined to acknowledge that this agreement was the United States' official recognition of the Archipelagic World View, claiming that the pact was just about taxation.[120] To date the United States has signed but not ratified the United Nations Convention on the Law of the Sea (UNCLOS).[121] The second agreement was to allow Garuda Indonesia, the country's flag carrier, to establish a direct flight to Los Angeles from Denpasar, effectively revising an earlier air transportation agreement between the two countries.[122] The Indonesian government hoped that Garuda's new flight route would bring in more Americans to visit Indonesia in the future, raising more recognition of the country in the United States. The New Order government also asked for

[118] Reuters, "Indonesian hotel prepares 'Bali Hi' for Reagan's visit," *The Christian Science Monitor*, 9 April 1986.
[119] "Presiden AS ke Tokyo Bawa Masukan dan Meninggalkan Sejumlah Janji," *Kompas*, 3 May 1986.
[120] Ibid.
[121] Kristina Wong and Sean Lengell, "DeMint: Law of the Sea Treaty now dead," *The Washington Times*, 16 July 2012.
[122] Ibid.

a number of other requests, foremost was to ask the United States to prioritize the launching of the Palapa B2 satellite (a backup satellite for Palapa B1, which would expire in 1990) using unmanned US rocket after the suspension of the shuttle program following the Challenger disaster, which the United States agreed.[123] But when the news of the explosion of the unmanned Delta rocket broke just two days after Reagan left Bali, the initial agreement was thrown in limbo.[124]

The rocket deal was not the only thing that disappointed the Indonesian government about the meeting in Bali. Many other developing countries had placed too much hope on the Tokyo Summit. Besides the representatives of ASEAN countries who managed to meet directly with President Reagan to convey their aspirations, some Latin American countries through the Cartegena Group and members of the Organization of African Unity had requested that their foremost concerns (eliminating trade barrier and reducing the burden of foreign financial aid) be addressed in the economic summit. The two organizations had sent a letter to the Japanese Prime Minister Nakasone who sought to make the summit a special one by obtaining input from countries outside the elite group. But in the end, the G7's main focus was on antiterrorism (a special win for the United States) and the Chernobyl nuclear accident. As far as the economic concerns of the developing nations, the G7 Summit's communiqué asked them to readjust their political economy along the lines that have been set by the industrialized nations in order to receive more financial aid and foreign direct investment.[125] The New Order government had anticipated this discouraging outcome. On 6 May, it issued the Sixth May Policy Packet that aimed among other things to encourage private companies to invest and to increase the country's

[123] Ibid.
[124] "Setelah Musibah Delta, Nasib Peluncuran Palapa Belum Pasti," *Surabaya Post*, 7 May 1986.
[125] "KTT Tokyo Kurang dari Apa yang Diharapkan RI," *Kompas*, 10 May 1986; Roeslan Abdulgani, "Jangan 'Nggege Mongso' Terhadap Hasil KTT Ekonomi Tokyo," *Surabaya Post*, 13 May 1986.

export of non-oil and gas goods.[126]

Despite the disappointing outcome of the G7 Summit for developing countries, Bali's repeated selection as the place in Indonesia for holding regional and international meetings gave an important leverage for Bali's governors to demand that the island's electrification development be given special priority. In 1991, the Junior Cabinet Secretary Minister Saadilah Mursjid inaugurated several electrified villages in Bali. What was interesting about the event was then Governor Oka's comment during the ceremony. *Bali Post* quoted him as saying, "the presence of electricity in Bali is strategic because it can help stimulate other sectors such as tourism and small-scale industries." More importantly, he continued, "Bali is often visited [by foreign dignitaries] and hosted international events. Electricity was tied to the nation's image. We would feel uncomfortable when during an international event is being held, all of a sudden electricity goes out [sic]."[127] Governor Oka's words seemed to act as a mandate for PLN Eleventh Region to ensure that Bali's electrification was to be built reliably.

By early 1992, Bali enjoyed the status as a region with a high rate of electrification ratio, which is the number of electrified households over total households. *Berita PLN* reported that Bali at that time had achieved a 53 percent ratio, much higher than the national average at the time (33 percent). As a comparison, for all of the Eleventh Region's area of coverage, the ratio was 27 percent. Out of 960 villages electrified in the four provinces, more than half (about 500 villages) was in Bali. And out of 500,000 customers, 300,000 were located in Bali. Perhaps because of these achievements, PLN Eleventh Region was awarded a new building in 1992.[128]

The PLN Eleventh Region thought the attention it received was warranted. This was

[126]"Dikeluarkan Paket Kebijaksanaan 6 Mei," *Surabaya Post*, 7 May 1986.
[127] "Menmud Saadilah Mursjid: Kelistrikan Tak Boleh Henti Jika Ingin Maju Dan Modern," *Bali Post*, 21 December 1991.
[128] "Serah Terima Jabatan Pemimpin PLN Wilayah Dan Distribusi," *Berita PLN*, February 1992, 13-17.

shown clearly on the cover of the first edition of the region's internal magazine *Pelangi Nusra*, published in late 1993. A magazine reporter interviewed PLN's head, Dr. Zuhal, while he was attending an Executive Assembly Meeting of World Energy Council in Nusa Dua. He was quoted to say, "Our face to the outside world is PLN Eleventh Region. Therefore, PLN Eleventh Region's reliability was of paramount importance to project a positive image to the international communities and we need to maintain and increase its reliability and services."[129] Zuhal declined to admit that other regions in Nusa Tenggara were being neglected. Instead he politely said that other regions needed to be more energy independent, without pointing to the fact that Bali received a significant portion of its electrical power from Java.

Bali was solidly put on the map as a region with special privileges when it came to building an electrical infrastructure. Yet, its special status was at the expense of other regions. Not only were other areas in the nearby Nusa Tenggara provinces largely neglected (they had little importance to Indonesia or to Indonesia's image to the outside world), but village electrification programs in most other areas in Indonesia were simply ignored. By the end of 1995, a few months after Bali electrified all of its villages, PLN reported that in PLN Eleventh Region's areas of operation: 444 out of 505 villages in West Nusa Tenggara (88%), 392 out of 1626 villages in East Nusa Tenggara (24%), and 83 out of 442 villages (19%) in former East Timor had only been electrified.[130]

Balinese Views of Electricity

Many New Order government officials in the 1970s and 1980s reasoned that since about eighty percent of Indonesians lived in the villages (many still do today although the percentage is

[129] "Dr. Ir. Zuhal, 'Wajah Kita Di mata Orang Lain adalah PLN Wilayah XI'," *Pelangi Nusra,* October-December 1993, 8-9.
[130] *PLN Statistics 1995*, Table 28: Number of Villages and Customers of Rural Electrification, 29.

not as high), the development of rural areas was a national priority. The New Order regime considered that electricity brought to the villages would increase the villagers' welfare, educate them, and discourage them from migrating to cities provided that electricity would be used for productive purposes, meaning to use electricity to generate a household income.[131] Government officials, journalists, and various authors believed in these positive impacts electricity would have on villagers' lives that they often encouraged villagers to not merely consume electricity but also to create a home-based industry such as craft or art stores.

But when many electricity subscribers in the countryside "failed" to use electricity productively (i.e. to generate income from the use of electricity) or when any of the stated goals failed to materialize, some authors blamed it on the lack of training or lack of productive use of electricity. Ida Bagus Ngurah Adhi, one of *Bali Post*'s regular contributing writers in the 1970s, asked an important question in July 1977, "Have we prepared villages to receive electricity?"[132] He lamented on electricity's failure to increase the economic conditions of villagers as evidenced by their simple uses to light their houses or *Balai Banjar*. Adhi argued that bringing electricity to the villages was not enough to stimulate economic growth. A more important aspect of the village electrification project was to invest in the villagers themselves, educating them on how to become village entrepreneurs. Only by using electricity productively, Adhi contended, could some of the stated goals of village electrification, such as increasing the welfare of village folks, reducing urbanization, and stimulating the rural economy, could be achieved.

New Order studies on the "impact" of electricity in the villages were abundant but most

[131] For example, Anak Agung Gde Astawa mentioned this in his article "Desa, Arti Strategisnya Dalam Pembangunan Nasional," *Bali Post*, 19 October 1978.
[132] Ngurah I. B. Adhi, "Sudahkan Desa Dipersiapkan Untuk Menerima Listrik? (Bag 1)," *Bali Post*, 15 July 1977. The same goals were also put forth by J. J. Rumondor in his article "Program Perum Listrik Negara Untuk Perlistrikan Desa," and by some of PLN leaders in "Pembangunan Kelistrikan di Indonesia," *Berita PLN* May 1979, 15.

of these studies ignored some of the important meanings villagers attributed to electricity. Indonesian Center of Statistical Bureau (BPS), the leading agency that carried out and published survey data on the impact of village electrification, wrote that the aim of their surveys was to learn how electricity affected villagers' socioeconomic lives. Accordingly, their survey questionnaires and data were tailored to gather information on things such as the percentages of households with and without electricity, the educational levels of people surveyed, socioeconomic activities before and after the introduction of electricity, the number of electrical devices villagers owned after they received electricity, average uses of electricity per household, levels of customer satisfaction with electricity service they received, and other similar criteria.[133] BPS's discussion of its survey results, consequently, focuses on the changes in percentage on the economic activities of these villagers.

During my fieldwork, I sought to find out what meanings rural folks attach to electricity. Some Balinese I spoke with emphasized the "city" part of electricity, i.e. they viewed electricity as a means to transform their hamlets to become like a city or aspire to lives like those of city dwellers. My interview with a Bunut village chief whose village was about to get electricity soon in mid-2012 attests to this idea. When asked about why his fellow villagers wanted electricity, he replied, "So that our village can be well-lit like a city, in addition to wanting to buy a few electrical appliances."[134] His view mirrors the government's early perception of electricity. In a report on village electrification, University of Indonesia social scientists note that the Indonesian

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[133] See Biro Pusat Statistik, *Dampak Listrik Masuk Desa Dan Perusahaan Listrik Non PLN Propinsi Jawa Tengah 1982* (Jakarta, Indonesia: Biro Pusat Statistik, 1983); Biro Pusat Statistik, *Dampak Listrik Masuk Desa Dan Perusahaan Listrik Non PLN Propinsi Sumatera Utara Dan Sulawesi Selatan* (Jakarta, Indonesia: Biro Pusat Statistik, 1984); Biro Pusat Statistik, *Dampak Listrik Masuk Desa Dan Perusahaan Listrik Non PLN Propinsi: Jawa Barat, D.I. Yogyakarta, Dan Jawa Timur 1983* (Jakarta, Indonesia: Biro Pusat Statistik, 1985); Biro Pusat Statistik, *Dampak Listrik Masuk Desa 1987* (The Impact of Village Electrification 1987) (Jakarta: Biro Pusat Statistik,1987).

[134] Interview with Wayan Karben on 27 April 2012 in the Bunut Village, Bali. He did not mention what type of electrical appliances but I did observe there was television receiver in his house.

Center of Statistical Bureau (BPS) used electricity as an indicator to distinguish a "town" from a "village" in their 1961 and 1971 censuses, a measure used by the United Nations agencies as well.[135] They also wrote that Central Java, East Java, and North Sulawesi villagers who were impatient to receive PLN's electricity built their own generators. Their initiative was driven in general to create living conditions like those in the city, i.e. well-lit houses, stores, and recreational facilities at night and the ability to power radio and television in their houses.[136] Implicit in the villagers' desire to turn their villages into bright-lit towns was the assumption that all the amenities that a brightly lit city offers would also be available when their village was electrified. But when job opportunities did not increase or access to schools was still limited because of their village remote location even after their village had been lit, many village youths decided to migrate to cities to find these opportunities. Ironically, television programs helped encourage them to seek jobs outside their villages in nearby towns, in effect stimulating urbanization. Subaya's former village chief pointed out to me a shift of living pattern among his fellow villagers after more electric-powered television sets were acquired. Whereas before electricity most villagers stayed all their lives in their village, with the advent of television, more residents in his village have come to know the outside world and decided to migrate to cities to earn a living.[137]

A similar unintended consequence occurred with electricity and education. One of the government's aspirations was to use electricity and television to teach villagers and it did so by offering a variety of educational programs alongside news and entertainment. But in a 1979 survey showed that villagers who watched television and listened to radios preferred to watch

[135] Soemardjan et al., *Laporan Penelitian Listrik Masuk Desa*, 22-23.
[136] Soemardjan et al., *Laporan Penelitian Listrik Masuk Desa*, 49-50.
[137] Interview with I Wayan Jingga on 13 June 2012 in the Subaya Village, Bali.

entertainment programs followed by news and educational programs.[138] For example, the University of Indonesia social scientists reported that villagers in Sepuluh Village, Madura, East Java, preferred to watch religious programs such as Qur'an recitation, religious sermons, and Malay Dangdut orchestra (there were two Malay Dangdut orchestras in this village). They did not like to watch news bulletins at all. In fact, they would leave the public television area when a news program started.[139] My interview with I Wayan Jingga of the Subaya village confirms this. After electricity entered his village in the mid-1990s, Jingga recalled that the TV programs most watched by the villagers were those produced by private TV broadcasting stations such as RCTI and ANTV that offered a variety of entertainment programs to attract a large number of audiences for commercial purposes. Their parabola antenna could receive television programs from other countries such as Malaysia, Singapore, and Australia but because of the language barrier, they preferred to watch Indonesian television programs.[140] Made Asmara, a Siakin's resident who was interviewed by *Suluh Dewata* in 2004 lamented the negative effect of television in his village. He said that television prime-time programs in the evening distracted children from studying. He was quoted to say, "This of course cannot be controlled by PLN that provides electricity, but if there is no electricity, they will not watch TV."[141]

This is not to say that children did not benefit at all from electricity. Asmara also admitted in the same interview that children could now study until late at night and his fellow villagers no longer needed to go to a nearby city to buy food essentials. In general, he thought

[138] A survey that the Directorate General of Radio, Television, and Film reported in 1979 showed that the first priority those polled was to listen and watch entertainment programs, followed by news, and finally educational programs. "Di Indonesia Ada 14 Juta Radio, 1,25 Juta TV, 1000 Bioskop," *Bali Post* 17 October 1979.
[139] Soemardjan et al., *Laporan Penelitian Listrik Masuk Desa*, 113-114.
[140] Interview with I Wayan Jingga on 13 June 2012 in the Subaya Village, Bali.
[141] "Menjadikan Listrik Untuk Kehidupan Yang Lebih Baik," *Suluh Dewata*, May/June 2004, 5.

that the village atmosphere was livelier than before there was electricity.[142] And some villagers did build home-based and other small industries and many youths are employed there. But the generalization that officials often made in public about the "benefits" of village electrification and putting television in villages simplified the reality on the ground.

Balinese today regard electricity as a basic need like water that needs to be provided to them reliably and cheaply. For example, I Gusti Alit Putra, a writer and editor of *Bali Post*, writes, "In this global era, electricity has become a vital need of society and it needs to be readily available."[143] Putra made this statement in support of a plan to deliver an additional electrical power to Bali from Java using ultra high voltage above-the-ground transmission lines called the "Bali Crossing." The plan would add an additional 3,000 MW of power in Bali and is said to safely meet Bali's electricity demand for the next 25 years.[144] The chairperson of Commission B of Balinese Legislative Assembly in Badung Putu Parwata also lent his support of the plan when he was quoted by Bali Post in December 2009.[145] People whose villages have not received electricity such as the ones I met in April 2012 know that they want the technology to arrive there soon. At the same time, many people in Bali, including those in the villages, hope that Bali's development, particularly Bali's electrical infrastructure is not just directed for tourism or for promoting Indonesia overseas.[146] Governor Ida Bagus Oka coined a famous phrase that captures the essence of this aspiration. In the 1990s he urged investors "to develop Bali not to develop in Bali" ("*membangun 'Bali' bukan membangun 'di Bali'*").[147] Oka's phrase criticized

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[142] Ibid.
[143] I. Gusti Alit Putra, "Mengatasi 'Black Out' Lewat 'Bali Crossing," *Bali Post*, 24 October 2009.
[144] I. Ketut Ari Teja, "Megaproyek Listrik Bali Crossing Yang Saat Ini Sudah Proses Tender Tower Tertinggi Di Dunia, Lahannya Seluas Lapangan Bola," *Bali Post*, 8 June 2011.
[145] "Listrik Jadi Kebutuhan Primer," *Bali Post*, 23 December 2009.
[146] "Hindarkan Bali Gelap Harus Mandiri Pasokan Listrik," *Bali Post*, 19 October 2009.
[147] Oka's phrase can be found in Wayan Supartha and Ida Bagus Oka, *Sepuluh Tahun Bersama I.B. Oka* (Denpasar: Persatuan Wartawan Indonesia Cabang Bali, 1998), 60.

the New Order development efforts that in general paid much more attention to erect buildings and other edifices than really to improve the lot of poor villagers.[148] The political scientist Donald Emmerson captures this sentiment well. The New Order's narrow interpretation of development (*pembangunan*), he argues, was mainly to build (*bangun*) physical structures. But the Indonesian word "bangun" also means "to wake up" or, as Emmerson writes, "figuratively, to enable millions of individuals to improve their lives through heightened awareness. The latter task is not merely to concentrate value for growth, but to enable people to share in its benefits, and thus to ensure development of a broad popular base."[149] Ariel Heryanto traces the genealogy of the word *pembangunan* and reveals that its meaning was historically contingent and shifted from when it was first used in the 1930s among Indonesian intellectuals who participated in the debate called *Polemik Kebudayaan* (Cultural Polemics). Sutan Takdir Alisjahbana, one of the leading voices in the debate, used the word *pembangoenan* to mean nation-building. A better word, Heryanto suggested, was "kebangunan" (revival) instead of "pembangunan" to capture the process of improving people's condition.[150]

Conclusion

As I have discussed, the development of Balinese electrical infrastructure was driven by the development of the national television infrastructure in parallel and that the motivations to build these two systems were tied to a desire to create and project a narrative of an external identity to the international audience. This identity narrative allowed Balinese provincial

[148] For a similar criticism on the New Order's narrow definition of development, see Lyn Parker, *From Subjects to Citizens: Balinese Villagers in the Indonesian Nation-State* (Copenhagen: NIAS, 2003), 142.
[149] Donald K. Emmerson, "The Bureaucracy in Political Context: Weakness in Strength," in *Political Power and Communications in Indonesia*, eds. Karl D. Jackson and Lucian W. Pye (Berkeley and Los Angeles: University of California Press, 1978), 116.
[150] Ariel Heryanto and Nancy Lutz, "The Development of 'Development'," *Indonesia* 46 (1988), 1-24.

government and PLN Eleventh Region to get the resources they asked to develop the island and as a result its electrical infrastructure was more advanced than in many other regions in the country. Bali's island-wide grid was successfully connected using underwater cables to the integrated Java-Madura electrical transmission system by 1989. Subsequently PLN Eleventh Region succeeded in expanding its power lines to rural areas so that all of Balinese villages were connected to PLN grid by August 1995.

The role of Denpasar as a location for a number of ASEAN, OPEC, and other gatherings attests to the importance of Bali to Indonesia as a showplace to perform an act of a modernizing nation. The more economically developed province allowed Indonesia to showcase its development programs to the outside world by hosting and showing foreign delegates what Indonesia had accomplished and let the New Order regime to exert its role as an important representative of the developing world. The international and regional trusts placed on Indonesia were reflected, for example, when after his stint as a cabinet minister, Subroto was unanimously elected as the Secretary General of the OPEC for two consecutive terms (1988 to 1994) and when Indonesia brought together ASEAN representatives to meet and give input to President Reagan ahead of the 1986 G7 Summit.

Examples of these endeavors (some more successful than others) helped put Indonesia on the global map, important identity work for a country trying to establish its part in international relations. Additionally, in the New Order period, highly charged issues that also drew international attention in negative light such as Indonesia's occupation of East Timor (it made into the news in foreign press prior to Reagan's visit),[151] marred Indonesia's commitment "to

[151] See for example, David Hess, "Problems Face Reagan In Asia Visit," *The Philadelphia Inquirer*, 29 April 1986. The U.S. Congress also tried to raise this issue by writing a letter to President Reagan on the eve of his visit to Bali. The letter along with another earlier letter that was written to Secretary of State

abolish colonialism from the face of the earth," as its 1945 Constitution declares. To counter this notion, the Soeharto government tried hard to construct and project Indonesia's external national identity as a benign nation devoted to development projects and committed to helping other developing countries achieve their development goals. Thus to the New Order regime, Bali seemed to be an ideal case (and place) to showcase this commitment. The tradition of selecting Bali as a venue for international gatherings continues to this day. Indonesia recently hosted the Nineteenth Conference of the Electricity Power Supply Industry in mid-October 2012, and the Asia-Pacific Economic Cooperation (APEC) CEO Summit in October 2013.

Balinese views of electricity, although some mirrored those of the government, did not always translate to the government's expected uses and outcome. One unintended consequence was that it helped urbanization instead of prevented it. Throughout the years, Balinese perception of electricity has shifted from a mark of modernity and progress to become something necessary and vital for people's livelihoods. For Balinese the main drive to demand electricity in the villages changed from wanting a new technology (television) to make their hamlets to look like well-lit towns. Nowadays, the majority of Balinese deem electricity just like piped water as basic necessity that must be made available to them widely and inexpensively.

George Shultz and signed 21 U.S. senators are reproduced in "The United Nations and East Timor," *Indonesia*, No. 42 (Oct., 1986), 129-142.

CHAPTER 6

CONCLUSION

The entanglement of electricity, technological development, national identity, and politics has a long history in the Indonesian archipelago. Different regimes in the colonial and post-independence periods employed electrical power in ways that were more complex than simply to illuminate dark areas. Electricity as a new form of energy technology that was developed in the nineteenth century found certain uses, symbols, and meanings in Indonesia's history. Tracing the development of Indonesia's electrical infrastructure helps shine light on the country's political and social histories.

The Dutch colonial regime lit the coasts of the Netherlands East Indies to make safer passageways for marine ships and to ultimately control this vast equatorial island chain. It later illuminated the landscapes to offer conveniences for the colony's urban inhabitants and its entrepreneurs. Both the Dutch colonial government and the Dutch private companies constructed a power system infrastructure that facilitated the exploitation and transportation of the natural resources in the colony. They also electrified towns to enable commerce and shipping. The House of Orange of the Royal Netherlands also used electrical power to symbolize its power and to project an image of its enlightened ruler, which was exemplified by brightly illuminated colonial buildings and residences that marked momentous celebrations of the Queen Wilhelmina's reign in the colony.

The introduction of electricity and other technologies in the late colonial period helped spur nationalism and engender an idea of modernity among the colonial population. When the Japanese military arrived in Indonesia in 1942, Sukarno seized the moment to get many of his fellow countrymen trained as managers, soldiers, and engineers under the Japanese tutelage.

Many acquired the knowledge and know-how to run a country that Sukarno and Mohammad Hatta declared into existence on 17 August 1945.

Soon after Indonesia's proclamation of independence, gas and electricity workers who saw the crucial role of how these infrastructures would play for the new republic's nation-building effort seized all Dutch utility companies. President Sukarno established the Gas and Electricity Agency on 27 October 1945, the date of which, fifteen years later was established as the National Gas and Electricity Day. After Indonesia's declaration of independence, a revolutionary war and rounds of negotiations with the Dutch government followed. Finally in December 1949 the Dutch acknowledged Indonesia's sovereignty. A year later Kobarsjih, the labor activist who with Adam Malik reported to President Sukarno the capture of Dutch utilities in October 1945, filed a motion in parliament to nationalize all of Dutch utility companies. The process took a few years, as some members of the Indonesian government did not want to immediately grab all of the Dutch private companies. They preferred to wait for the expiration of the companies' business licenses. In 1957 the issue of West Papua became a huge bone of contention and accelerated the process of nationalization. By 1958 all of Dutch electric companies had been nationalized. In October 1960 Sukarno delivered a speech commemorating the fifteenth National Gas and Electricity Day and spelled out his vision of modernity involving electricity. Claiming that socialism would not be possible without electricity, Sukarno equated an electrified nation with his envisioned sociopolitical order.

In 1966 Soeharto rose to power in the wake of a "countercoup." He then banned the Indonesian Communist Party, persecuted its members and many other alleged left-leaning individuals, restored "order," isolated Sukarno, and was appointed president by the parliament in March 1968. Calling his new rule the "New Order" period, he swiftly set about to economically

develop the country by forming a cabinet filled with military men and US-trained economists. Soeharto also repaired relations with the West and Malaysia, reinstated Indonesia's membership in the United Nations, and supported the creation of the (initially non-communist) regional bloc ASEAN. In the New Order period, electricity was entangled with Soeharto's programs of national development, the state ideology, national identities, as well as domestic and international politics.

Electricity, National Development, Pancasila, and Dual National Identities

President Soeharto, who claimed in his autobiography to have deep roots in the village, admitted that he paid a great deal of attention to village development.[1] As a consequence he felt compelled to uplift the socioeconomic conditions of Indonesia's villagers who constituted the majority of the population at the time. He did so by coming up and implementing many programs to try to improve the welfare of the villagers. The New Order regime believed that electricity would serve as a means to achieve equity and prosperity in rural areas (i.e. the technology would transform many villages into *swasembada* villages). Consequently, it put PLN, the state electricity company, in charge to generate, transmit, and distribute electricity. PLN became the dominant institution even though other groups (local governments, individuals, cooperatives, private companies) were invited into and took part in the electricity sector. The company designed and developed a diesel power system to help the New Order government project an internal national identity of a nation continually working hard to achieve a national goal based on Pancasila and the 1945 Constitution and to persuade people to support this regime politically. During the general elections the Soeharto government asked people in the rural areas

[1] In chapter 2 of his autobiography Soeharto talks about having this root in the village. For his admission about his great attention to village development, see Soeharto et al., Soeharto, 400.

to vote for its political party GOLKAR who successfully built an image of a party that "developed" the villages. At the same time, PLN designed and developed a grid system to construct a parallel image of Indonesia using Bali to project it to the world to show that in the business of "development" Indonesia achieved some notable success. This identity work helped put Indonesia on the global stage and allowed it to play its role advancing its national, regional (through ASEAN), and global (through OPEC) interests.

As I have shown, bringing electricity to the villages became Soeharto's leading village improvement program. While other programs to bring "stuff" to the villages either ended or dwindled, the program to electrify villages became a leading, persistent, and politically meaningful program to the Soeharto government. By the time of Soeharto's downfall in 1998, the regime had built a number of large-scale power plants on Java, an integrated three-island transmission system, transformed PLN into a semi-private company, installed hundreds of diesel power stations, electrified thousands of villages, and connected all of the villages in Bali to the grid.

At the same time, however, by 1998 many villages in the outlying and remote regions (including those in the "outermost islands") were left in the dark, one electric cooperative went bankrupt, the government's oil subsidy and control of electricity prices nearly crippled PLN during the 1997 financial crisis, and attempts to entice private companies had not fared as well as the regime had hoped. Prior to the Asian financial crisis, PLN had signed 27 contracts with independent power producers. But when the crisis hit the country PLN found it unable to honor those contracts not only because electricity demand decreased sharply, but also the "take-or-pay clause" of the contracts held PLN captive since it required PLN to purchase electricity it no

longer was able to sell.[2] In 1998 PLN moved to renegotiate its electricity price agreement with PT Paiton Energy Company (PEC). After four years, both parties finally reached a deal.[3] One implication of the financial crisis was that there was less private investment in the electricity sector than the government wanted just when the country needed more energy to support its economic growth in the post-Soeharto period. As a result, when electricity demand skyrocketed, PLN was unable to supply electricity to its customers. Another unexpected outcome of Soeharto's village electrification was that it promoted urbanization instead of averted it. Currently a little more than half of Indonesians live in the cities than in the countryside.

Soeharto's upbringing, which was steeped in Javanese philosophy, and training and career in the military, influenced how Soeharto saw the world. He found the state ideology Pancasila most compatible with his worldview and subsequently insisted that other Indonesians interpret its principles more or less the same way he did. Using Pancasila, Soeharto created an internal identity of a post-independence society aiming to achieve a non-Western modernity. He enrolled high level bureaucrats, state employees, schoolchildren, and college students in this vision by "educating" them in the Pancasila principles through mandatory Pancasila courses. In this regard, Pancasila proved to be quite effective both in uniting Indonesia's diverse societies and in largely moving them toward accomplishing the one goal that the New Order government often repeated: to get to the "takeoff" stage in order to finally create a just and prosperous society. Many social groups in Indonesia worked with a Pancasila frame of mind. It became an ideology of not just the state but also the nation. To the New Order regime, Indonesia's answer

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[2] Xun Wu and Priyambudi Sulistiyanto, "Independent Power Producer (IPP) in Indonesia and the Philippines," in *De-Regulation and its Discontents: Rewriting the Rules in Asia*, eds. M. Ramesh and Michael Howlett (Cheltenham, UK; Northampton, MA: 2006), pp. 109-123.

[3] A'an Suryana, "Government, PT Paiton Reach Power Deal," *The Jakarta Post*5 July, 2002. Also available online: http://www.thejakartapost.com/news/2002/07/05/government-pt-paiton-reach-power-deal.html (accessed on June 29, 2014).

to its development challenges was to be found in Pancasila, whose principles guided the nation in achieving the national goal.

Imposing a uniform interpretation of Pancasila, however, had its costs. Many Indonesians were compelled to think within a rigid Pancasila framework that left little room for other critical interpretations of the five principles. To the New Order regime, the first principle meant that citizens must embrace one of the five state-sanctioned religions (Islam, Catholicism, Christianity, Buddhism, and Hindu) marginalizing many groups who adhered to different beliefs. While the New Order regime tried hard to achieve "Just and Civilized Humanity" on the global stage, it turned a blind eye to the uncivilized treatments of some groups in Aceh, East Timor, and Irian Jaya. The regime suppressed dissent violently in these regions using military means. The third principle of "Indonesian Unity" was typically translated as Indonesian uniformity as exemplified by the imposition of identical village administrative structure across the archipelago. The fourth principle of democracy by consensus came to mean suppression of dissenting voices both in the parliament and on the streets as in the case of labeling villagers who opposed a large dam construction "communists." Finally, "Social Justice for Indonesians" was not always used as the guiding principle of the New Order development programs as illustrated by rising inequality in the villages (even the ones that received electricity) and by development inequality among and within regions in the country.

Towards the end of Soeharto's rule, Pancasila had turned into an empty slogan wrought with negative connotations and an undesirable implication; that if you were not a Pancasila supporter, then you could potentially became an enemy of the state. It was immediately abandoned following Soeharto's resignation in 1998. And when the post-Soeharto Indonesia held

its first general elections in 1999, political parties of all stripes embraced different ideologies, though none claimed communism as its party's platform.

To ensure Bali's capital Denpasar and the surrounding areas stayed lit whenever Indonesia hosted an important regional or international meeting, which in turn proved crucial in the New Order regime's effort to create and project an external national identity and play its part in global politics, the Soeharto government designed and built the needed electrical infrastructure. In 1989, it connected Bali with reliable electricity supply from large power plants in Java. For almost every important gathering, PLN Eleventh Region leaders formed a task force to ensure the electrical generators and power lines worked seamlessly. It would create a protocol to "secure" electrical generators and transmission lines, provide backup mobile electrical generator units, and assign personnel various tasks in this important mission.[4] PLN upper echelons thought that it would be an embarrassment to Indonesia if during one of these meetings the lights went out.

When I was in Bali in July 2012, I experienced an incident that illuminated the inner workings of a sociotechnical system that ensure Bali's electrical power stayed on or at least minimized the time of a power outage. While attending a second-day session of an "international conference" called "Bali in Global Asia: Between Modernization and Heritage Formation," sponsored by a consortium of four organizations (the Royal Netherlands Institute of Southeast Asian and Caribbean Studies (KITLV), International Institutes of Asian Studies, University of Göttingen in Germany, and Universitas Udayana in Bali), the lights in the building where the

[4] PLN Cabang Denpasar, *Pengamanan Penyaluran Aliran Listrik no: 14/XI/1995 Dalam Rangka Kedatangan Presiden Republik Indonesia Meresmikan Pembukaan Kongres Periklanan Asia Ke XIX Tahun 1995 Di Hotel Sheraton Nusa Indah Bali Tanggal 6 Nopember 1995* (Denpasar, Bali: PT PLN (Persero) Wilayah XI Cabang Denpasar, 1995).

conference was held went out.[5] This happened, coincidentally, as I was briefly introducing my research project and myself before asking a question to one of the panelists. Since many presenters used power point and relied on visual aids for their talk, the outage inconvenienced the panelists. The power failure started at 9:35 am on Tuesday 17 July, but less than an hour later at 10:30 am the lights went back up. The panel's chair expressed relief when the room was lit again.[6]

During lunch the next day on 18 July 2014, one of the organizers confided to me that he was able to restore power because he knew someone at PLN.[7] I learned the details of what happened the next day when I visited the headquarters of PLN Distribusi Bali (PLN Bali Distribution) for my archival research. Mr. Ketut Widana, one of the employees there who worked in the Public Relations Office, told me that one of the organizers of the conference, a Balinese professor at Udayana University, repeatedly contacted him on Tuesday when the lights went out requesting that the power be restored soon. Mr. Widana then contacted a technical maintenance team to bring a spare portable generator to the Udayana's Graduate School building where the event was held and to supply backup electricity there. Mr. Widana panicked at first because he received multiple short messaging services (SMS) from the Udayana University professor. Fortunately, he told me, that he had good relations with PLN *Yantek* (*Pelayanan Teknik*) or PLN's Technical Services people so that he was immediately able to find a working solution. Mr. Widana told me that there was a scheduled outage for maintenance that day and that PLN had informed the University. He confirmed this by asking one his subordinates who produced a copy of the letter to him. But it appeared the letter got stuck in the University's

[5] The conference was held in part to celebrate the fiftieth anniversary of Universitas Udayana, the largest and oldest state university in the province. http://iias.nl/event/bali-in-global-asia
[6] Field Notes 17 July 2012.
[7] Field Notes 18 July 2012.

administration office somewhere. Mr. Widana told me that the Balinese Udayana professor thanked him profusely for bringing back electrical power to the conference venue.[8]

Even though in the story above PLN did not "guard" electricity supply for the "Bali in Global Asia" conference, the fact that the conference organizer managed to minimize the effect of a power outage through his personal connection showed the clout he had in arranging an important academic meeting. To most of the conference participants, the incident may have appeared as a minor inconvenience. To the Indonesian organizers, however, the stake was not only about the successful completion of the meeting, but also Indonesia's reputation among the conference attendees. Even so, there was one conference participant who told me that the incidence "was embarrassing!"[9]

Nonetheless, the various gatherings held in Bali helped put New Order Indonesia on the global map. The first meeting of ASEAN Heads of State that produced the Treaty of Amity and Cooperation in Southeast Asia proved crucial as Indonesia navigated the regional (and also global) political arena. ASEAN held many meetings in Bali and one of them included on the topic of electricity. The Heads of ASEAN Power Utilities & Authorities who met in Bali in 1996 produced an agreement that aimed to connect the whole of Southeast Asia using one mammoth interconnected grid, lending credence to a technology of power to empower a regional political and economic bloc. The project is ongoing and faces challenges not just technically, but also culturally and politically. But the desire to unite even more diverse geographies, societies, and political entities using electricity seems to persist.[10] The New Order government did not seem to

[8] Conversation with Ketut Widana on 19 July 2012.
[9] Field Notes 17 July 2012.
[10] For the European case, see Vincent Lagendijk, *Electrifying Europe: The Power of Europe in the Construction of Electricity Networks* (Amsterdam: Aksant, 2008).

have a problem with this larger regional identity vis-à-vis its national identity, mainly because the regional bloc had helped its role on the global stage.

The New Order regime's national development agenda was not just a rationale by which the state made people legible by categorizing their villages into three seemingly convenient categories, to discipline citizens by ensuring their loyalty to the regime, or to make them socioeconomics subjects of government's benefits, but also to treat them as (largely passive) political subjects that it could both coerce and persuade to support the regime to stay in power.[11] In the name of "development" the Soeharto government also tried to sell an idea of modernity that it purported to be in line with Indonesia's traditional values, encapsulated in Pancasila. It employed technologies to create a distinct national identity among the populace as a developing nation laboring hard and playing catch-up with the developed world. But the New Order government added a special qualification to achieving what seemed to be the end point of a teleological narrative of the history of nations. According to its proponents, indeed Indonesia wanted to become a developed nation too, but in the New Order government's imagination, it wanted to transform Indonesia into a just and prosperous *Pancasila* nation.

The Soeharto government's ideals were undoubtedly valuable. President Soeharto himself wanted many good things for the nation. But as Adam Schwarz has argued, Soeharto believed in what he called "performance legitimacy," or securing his legitimacy to rule by showing how hard he worked to develop Indonesia economically.[12] In this regard, Nurcholis Madjid has argued that Soeharto suffered from what he termed "verbalism—a personal belief

[11] The idea of making society legible to improve their conditions can be found in James C. Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition have Failed* (New Haven: Yale University Press, 1998).
[12] Adam Schwarz, *A Nation in Waiting: Indonesia's Search for Stability*, Second ed. (St. Leonards, N.S.W.: Allen & Unwin, 1999), 41.

that he felt that he has done it because he has said it often."[13] Soeharto did indeed say and repeat many good aspects about his vision of a modernized Indonesia, Pancasila, and the path he wanted Indonesia to take to reach to the place of his envisioned modernity. But his understanding of "development" as largely constructing the built environment, achieving and maintaining a few macroeconomic indicators, imposing narrow interpretations of the Pancasila principles, and intolerance for dissenting voices have undermined the intentions of some good programs his government instituted.

As I have explained, Soeharto's Village Electrification program has a complex history and mixed results. It has been influenced by the New Order's national development agenda, by a desire to achieve a Pancasila-based national goal and identity, by electoral politics, and by an aspiration to play an active role in international politics. These factors, in turn, shaped the landscapes and waterscapes of Indonesia with technological artifacts of wires, poles, high-voltage transmission lines, towers, substations, underwater cables, PLN offices, power plants of varying types and scales, and solar home systems.

The New Order Regime's Legacies

The legacies of the New Order regime in Indonesia continue to influence Indonesia in the post-Soeharto era today. The village as a nation-building unit still figures prominently in economic and electrical infrastructure development. In 2001 President Megawati Sukarnoputri, Sukarno's eldest daughter, created a new ministry called *Kementerian Negara Percepatan Pembangunan Kawasan Timur Indonesia* (State Ministry for the Accelerated Development in Eastern Indonesia), indicating government's complicity in producing uneven development. The task of this ministry was to accelerate the development of the regions that the Soeharto

[13] Nurcholish Madjid, *Indonesia Kita* (Jakarta: Gramedia Pustaka Utama, 2004), 96.

government largely neglected, mostly in eastern Indonesia. In 2009, President Susilo Bambang Yudhoyono (well known as President SBY in the country) renamed this ministry, elevated its status as a cabinet department, and called it the *Kementerian Pembangunan Daerah Tertinggal* (Ministry of Development of Left Behind Regions) focusing on accelerating development in many underdeveloped areas in the entire archipelago. In 2008, these so-called "left-behind villages" constituted 45 percent of about 71,000 villages in the country.[14]

In line with the goal of developing Indonesia's villages, in 2007 President SBY instituted a program called *Desa Mandiri Energi* or DME (Energy Self-Sufficient Village) in the Tanjungharjo Village in Central Java. A mockup of this village can be seen in the country's Electricity and New Energy Museum (*Museum Listrik dan Energy Baru*) located on the outskirts of Jakarta (see figure 10). DME was part of the country's energy diversification strategy at the level of the village. The goals of the program echoed the goals of the New Order regime's Village Electrification program, which were to, "create job opportunities, to decrease unemployment and poverty through productive activities using the energy, increase villagers' disposable income and goods manufactured in the country in order to reduce urbanization from the villages to cities."[15]

[14] Darmono et al., *Mineral Dan Energi Kekayaan Bangsa*, 501.
[15] Darmono et al., *Mineral Dan Energi Kekayaan Bangsa*, 499.

Figure 10 - A Mockup of a DME Village[16]

The DME program was initially conceived to establish energy independent villages so that they will no longer rely too much on kerosene as fuel for both lighting and cooking. Related to this, the Yudhoyono government introduced a new term *bahan bakar nabati* or BBN (biofuel) to distinguish it from *bahan bakar minyak* or BBM (fossil fuels). The Yudhoyono government envisioned two types of energy independent villages: one that runs on biofuel produced locally from a range of plants such as sugar cane or jatropha curcas and another one that runs on readily available renewable energy found in the area (e.g. sun, water, wind, and biogas). The Department of Energy and Mineral Resources (the successor of the Department of Mining and Energy) reported that by 2008, there were 424 DME villages, 138 of which used biofuel renewable energy sources and the remaining 286 used non-biofuel non-renewable energy sources such as water, solar, biogas, and wind.[17] The number or at least the seemingly high count of DME villages masked some negative effects of the program. In one West Javanese village, this program did not help improve the socioeconomic conditions of the villagers there. The program actually destroyed the villagers' hope of economic improvement and commercial success when

[16] Photo taken by the author on 10 July 2013.
[17] Darmono et al., *Mineral Dan Energi Kekayaan Bangsa*, 501.

they planted jatropha curcas to answer President SBY's 2006 biofuel initiative meant to relieve the country's mounting energy crisis in the mid-2000s. The farmers who have harvested a great supply of jatropha curcas seeds were later asked to use them themselves in an effort to make their village a DME village. But they did not have the adequate infrastructure needed to process the seeds, which led them to abandon the effort.[18]

In Bali, PLN Eleventh Region became PT PLN (Persero) Distribusi Bali in 2002.[19] At the time a Balinese named Ngurah Adnyana was leading this PLN branch. Adnyana came up with an initiative to use his company as a demonstration unit (*unit percontohan*) to transform PLN into a "world-class company" (*perusahaan kelas dunia*) by delivering top-notch electrical service in the island.[20] Adnyana chronicled this effort in a book he co-wrote and published in 2008.[21] In the same year, a news article in *Bisnis Bali*, a newspaper devoted to economic and business activities in the island, quoted PLN Bali's Public Relations Officer I Wayan Redika who explained that the reason PLN Bali was chosen by PLN Head Office in Jakarta as a "show-window of PLN" was that "the percentage of electrical services [indicators] in Bali is the highest in Indonesia."[22]

Just a month earlier in December 2007, Bali held the biggest international event Indonesia hosted to date: the United Nations Framework Convention on Climate Change (UNFCCC). The meeting garnered world attention as 10,000 people representing 180 countries

[18] Sulfikar Amir, Ida Nurlaila and Sonny Yuliar, "Cultivating Energy, Reducing Poverty: Biofuel Development in an Indonesian Village," *Perspectives on Global Development and Technology* 7, no. 2 (2008), 113-132.
[19] Decision of the PLN Board of Directors No. 120.K/010/DIR/2002 issued on 27 August 2002.
[20] "Menuju Pelayanan Kelas Dunia," *Suluh Dewata*, July/August, 2003, 15.
[21] Ngurah Adnyana and Hot Martua Bakara, *Menapak Perusahaan Kelas Dunia: Proses Perjalanan PLN Bali 2000-2006* (Denpasar: PT PLN (Persero) Distribusi Bali, 2007).
[22] "30 Banjar Diusulkan Dilistriki," *Bisnis Bali14* January 2008.

met in Bali to discuss one of the most pressing challenges the world has seen in recent decades.[23] The gathering produced what was called the "Bali Road Map" a commitment to reaching an agreement to tackle global climate change in the subsequent meeting to take place in Copenhagen in December 2009. As part of the meeting preparation, in the preceding years, the Indonesian government and PLN rushed the construction of a wind farm atop the hills in Nusa Penida, an island southeast of Bali. The logistics of building a mini wind farm (*PLT Bayu*) was challenging, as there was no bridge for land transportation or a harbor big enough for the so-called Roll-On and Roll-off (Roro) ferry to carry the materials. To transport components of the wind turbine weighing 20 tons, Umartono the project manager of this undertaking, had to use two fisherman's boats tied together to ship the turbine parts across the narrow strait between Bali and the Nusa Penida. He eventually managed to install 5 wind turbines at the Puncak Mundi area (Nusa Penida's highest peaks) and the government awarded him a Dharma Karya Award as a token of appreciation.[24] PLN later added four additional wind turbines. The wind farm was part of the Nusa Penida Renewable Energy Park that the SBY government setup mainly to showcase it to the UNFCCC meeting participants. The park included wind turbines, solar panels, jatropha curcas plantation, bio oil processing, biogas reactor, and other facilities (see figure 11). I first visited the "Park" in the summer of 2008. When I went and revisited Nusa Penida again in the summer of 2012, the "Park" seemed to no longer exist; at least the big sign has disappeared.

[23] http://unfccc.int/meetings/bali_dec_2007/meeting/6319.php
[24] "Umartono 'Terdampar' Menggeluti PLT Bayu," *Suluh Dewata*, December 2007, 21.

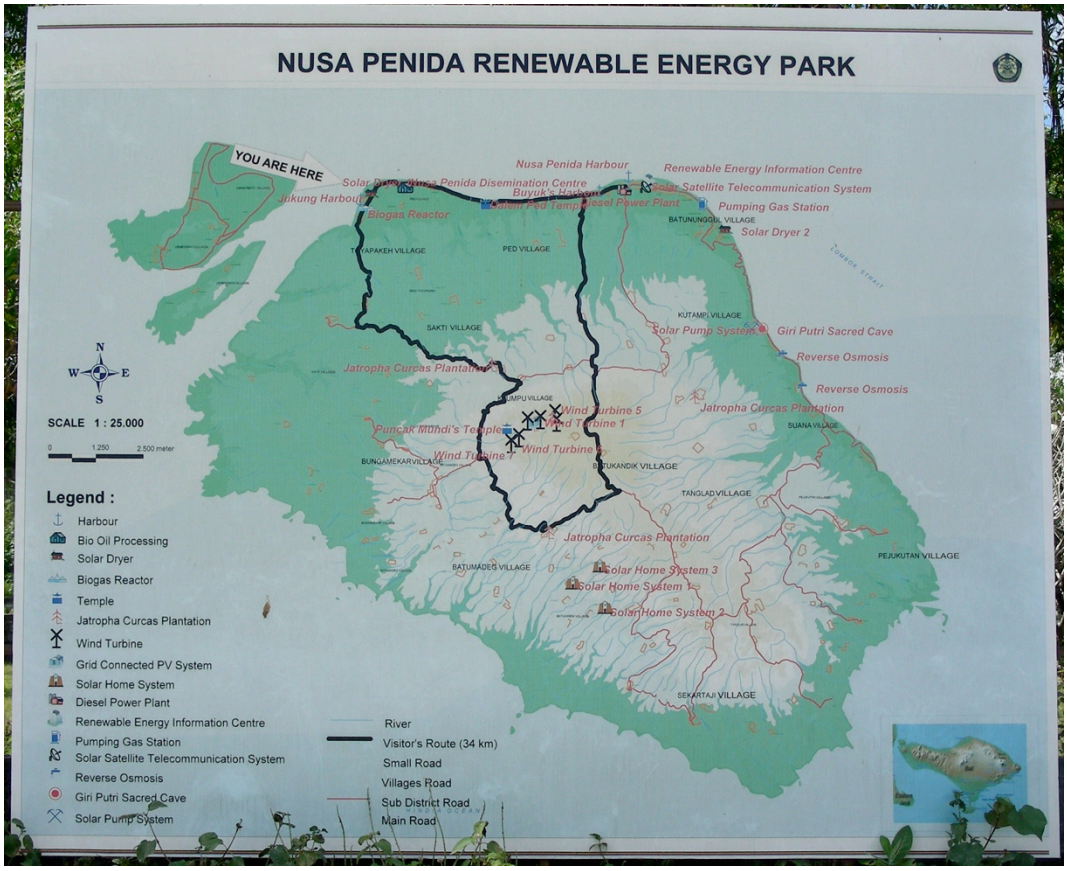

Figure 11 - A Map of the Nusa Penida Renewable Energy Park[25]

It appeared that after the UNFCCC gathering was over, the SBY government did not continue the operation and upkeep of these wind turbines. In fact, early on PLN wanted to relinquish the responsibility of running and maintaining wind turbines by transferring over the wind farm to the local government of the District Klungkung and an assigned cooperative to operate it.[26] The reason that PLN Bali did not want to own the wind farm, Mr. Adnyana told me in an interview, was because the infrastructure cost too much for the return in investment. The total cost of the wind farm was Rp 4 billion (US$ 400,000) producing only a total of 80 kW of electrical power or the same as producing US$ 5,000 per watt of electricity. Plus the asset would depreciate quickly. Mr. Adnyana said, "It's like owning a Kijang [a popular mid-range Toyota

[25] Photo taken by the author on 18 June 2008.
[26] "Ditandatangani, Kesepakatan Jual-Beli Listrik PLTB," *Bali Post* 14 April 2007.

SUV in Indonesia] with the cost of a Mercy [Mercedes Benz car]."[27] He also added, "PLN [agreed] to buy the electricity from the cooperative priced at Rp 700/kWh. The revenue would be split into three: 60 percent for the cooperative to run and maintain the wind turbines, 20 percent for the local government, and 20 percent for CSR [Corporate Social Responsibility] such as health coverage and education for the people there."[28] Mr. Adnyana felt that PLN Bali's responsibility as a company regulating the distribution of electricity in the island is to just do that: distribute electricity generated by other entities. He also added a technical reason that did not come up in the news articles about this wind farm. He said the utility factor of the wind turbines was only 20 percent because the wind condition there is not even and consistent.[29]

When I spoke with Mr. Nyoman Sudara, a PLN employee at the Nusa Penida diesel station, he told me that only three out of nine wind turbines installed were still running.[30] It turned out that PLN Bali still owned those three wind turbines. Mr. Kadek Suryana, the head of the *Koperasi Surya Sejahtera* (Prosperous Sun Cooperative), which is the cooperative tasked to run the wind turbines, informed me that out of the six other turbines that the Cooperative owned, three had big technical problems that required the replacement of costly spare parts and the other three were shut down so as not to disturb people who live nearby because they made a loud noise when run.[31] Additionally, other technological artifacts of the Nusa Penida Renewable Park were either dismantled or not developed further.

STS, Southeast Asian Studies, and Patrimonial Technopolitics

[27] Interview with Ngurah Adnyana on 22 February 2012 in Jakarta.
[28] Interview with Ngurah Adnyana on 22 February 2012 in Jakarta.
[29] Interview with Ngurah Adnyana on 22 February 2012 in Jakarta.
[30] Interview with Nyoman Sudara on 17 May 2012 in Nusa Penida.
[31] Interview with Kadek Suryana on 17 May 2012 in Nusa Penida.

The contributions of my dissertation project are threefold. First, my work intersects with and brings closer together two disciplines: STS and Southeast Asian studies. I focus on a geographic region largely left out of STS scholarship (Indonesia and Southeast Asia broadly) and study a less examined topic in Southeast Asian studies (history and sociology of technology). Although there is abundant scholarship produced on Indonesia, the studies have been mainly generated by disciplines such as anthropology, linguistics, ethnomusicology, history, political science (government), art history, development sociology, and economics.[32] Scholarly works generated in these disciplines, though valuable, have for the most part either relegate science and technology to the background of their narratives or touch on only one aspect of the sociotechnical system. Drawing on this existing scholarship and employing STS analytical frameworks (examining technology in its broader social, cultural, and political contexts), conceptual tools (sociotechnical system and technopolitics), and methods (a combination of archival research, interviews, and ethnography) I bring technology to the forefront of my story. By technology here I do not just mean hard objects such as electrical wires and poles, but all the relevant components of the sociotechnical system that include people, organizations, scientific knowledge, technical knowhow, work practices, laws, and ideology. Additionally, there has been a growing body of STS scholarship on Indonesia (and other Southeast Asian countries) produced not only by anthropologists and historians, but also by scholars trained in STS. Building on this burgeoning scholarship, my work adds materiality to the sociocultural and political history of

[32] At Cornell University, for example, each of the first six disciplines I mention is currently (and has been for quite some time) represented by an Indonesianist. A new faculty member in the Department of City and Regional Planning whose work in part has been carried out in Indonesia was recently hired. H.W. Arndt, a late Australian National University scholar, founded the refereed journal *Bulletin of Indonesian Economic Studies* (BIES) in 1965.

Indonesia by showing how electricity figured prominently in the discourses and practices of national development, national identities, and domestic and global politics.[33]

Studying technoscientific projects in Indonesia or for that matter in any other Southeast Asian countries matters because it can help us get a broader picture and better understanding of technological development and meaning making in our increasingly global and interdependent technological culture. Technoscientific artifacts were not merely conceived, invented, produced, developed, and transferred from one place to another, but also used, reconfigured, given (different) meanings, shaped (individually and globally), as well as employed by technological regimes to achieve various ends. It is for this reason that one STS scholar Warwick Anderson has called for reorienting STS toward Southeast Asia to explore the possible synthesis of science and technology studies with area studies and postcolonial studies.[34] Moreover, as another STS scholar Gregory Clancey has pointed out, even though historically there has not been a strong research agenda about "technology" and "Asia" in the humanities and social sciences, greater interest in this subject has sprung up in the last few years.[35] In this regard my work contributes to the snowball effect of producing critical humanistic and social scientific studies of technology in Asia. My dissertation shows that in narrating technology stories, technology storytellers need not always focus on the origins or future orientations of technology but also the historical processes

[33] For examples, in my dissertation I have drawn on the works of Sulfikar Amir, Joshua Barker, Suzanne Moon, and Rudolf Mrázek.
[34] Warwick Anderson, "Re-Orienting STS: Emergent Studies of Science, Technology, and Medicine in Southeast Asia," *East Asian Science, Technology and Society: An International Journal* 3, no. 2 (2009), 163-171.
[35] Gregory Clancey, "Dangerous, Disruptive, or Irrelevant?: History (of Technology) as an Acquired Taste in Asia," *East Asian Science, Technology and Society: An International Journal* 6, no. 2 (2012), 243-247.

by which the technology is selected, adopted, modified, expanded, and used within the context of changing social, cultural, and political factors.[36]

Second, my work engages in a recent conversation about "Asia as method in science and technology studies."[37] What Warwick Anderson means by this is to study technoscience in Asia while simultaneously interrogating the idea of Asia as a geographic category in order to develop "STS theories of broad applicability. …This implies an Asia that is good to think with, and to think from, rather than a fixed, hegemonic geographical region or essential civilizational entity—Asia as method, not Asia as self-evident cultural value."[38] Consequently, Anderson adds, there is no need to divide the STS body of knowledge between Euro-American STS or Asian STS and to deny the former or embrace the latter. Rather both can be treated as cultural resources from which we can draw to do our studies. In fact, Anderson even writes, "Asia as method is not a recipe book—indeed, I admit it may not even be a 'method'. It is a local mode of operating on technoscience, a form of life still inchoate, a critical body of work that will fill out with time."[39] In this regard, I draw from existing STS conceptual frameworks and build on them when I examine a technological development in Indonesia in the hope to fill this critical body of scholarship. My study illustrates that technological development in an Asian post-independence nation can produce narratives of dual (instead of just single) national identities while these identities in turn shaped the design and development of the country's electrical infrastructure. As I have highlighted, technologies mediate the relationship between "developed" and "developing" countries in complicated ways. The relationship is not just about technological transfer or technical aid in a sense of bringing First World expertise and artifacts to the Third World, but

[36] Clancey, "Dangerous, Disruptive, or Irrelevant?"
[37] Warwick Anderson, "Asia as Method in Science and Technology Studies," *East Asian Science, Technology and Society: An International Journal* 6, no. 4 (2012), 445-451.
[38] Anderson, "Asia as Method," 448.
[39] Anderson, "Asia as Method," 449.

also about what the receiving countries thought about and did with those technologies in the social, political, and economic contexts of Indonesia.

For a "developing Pancasila nation" that still relied on industrialized countries for its technological development, maintaining a good relation with and exerting influence on key global players such as the United States was imperative. Although in 1976 Indonesia became the first developing country to own a satellite communication system, it depended on the United States to produce subsequent satellite models and to launch them. We saw an example of Indonesia's request to the United States to launch the Palapa B2 satellite during President Reagan's visit to Bali in 1986. Likewise, when the New Order regime decided to electrify its villages using mostly diesel power stations, it did so using imported diesel generators and money from foreign donors. These efforts, however, did not stop New Order Indonesia from using these technologies to represent its national identity. Using scattered diesel plants, it established an internal national identity of a developing nation vigorously moving towards a distinctive national goal on a development path charted in Rostow's *The Stages of Economic Growth* (1960). The New Order regime used this identity to get acquiescence from the Indonesian population and helped Soeharto stay in power for over three decades. Not everyone agreed with Indonesia's national goal or the path the New Order government was taking, but their dissent was suppressed in the name of national development and political stability. Internationally, Indonesia's standing and reputation on the world stage must be such as to allow it to continually exert its role regionally and globally. One of the important ways the New Order Indonesia chose to put the country on the global map was by being a good and successful host to high-level important conferences in a place where it could showcase its modernization efforts. The New Order's Java-Madura-Bali interconnected system, which was also built with foreign technical expertise

and financial aid, allowed Bali to receive an adequate supply of electricity, part of a vital infrastructure built on the island to make the place suitable for Indonesia to project its external national identity.

Third, my concept of patrimonial technopolitics builds on the STS literature on technology and politics and adds a new understanding of how technology enacts and embodies political means in a patrimonial state. Patrimonialism, a political science concept that had its origin in Weber's theory of bureaucracy, gained wide appeal among political scientists in the seventies when it was used in "a variety of attempts to explain both national integration and mass mobilization."[40] This led the political scientist Robin Theobald to critically examine the concept and to suggest, "there are vital links between the phenomenon of patrimonialism and broader socioeconomic factors," i.e. the function of bureaucracy in a patrimonial state depends less on state revenue from collected taxes than on the distribution of benefices to key members of the ruling elite and state income from other means (usually export of the country's natural resources). The New Order state, as some scholars have argued, exhibited these patrimonial characteristics and the announcement of Soeharto as the "Father of Development" cemented this attribute. As I have argued in this dissertation, this patrimonial feature of the New Order regime shaped its village electrification program and politics as well as the design and development of Indonesia's electrical infrastructure, all of which were carried out by PLN. Electricity was vital to the regime's national development and electrifying villages was especially an important program to develop the rural areas, deemed by the regime as the backbone of national development. As a result, electricity was distributed to the populace by the state as a kind of gift of development in return for the population's support for the regime. Electricity also allowed the New Order regime to develop one area exclusively to make it a place for the regime to showcase

[40] Theobald, "Patrimonialism," 548.

its development efforts and play politics regionally and globally. Since in patrimonialism personal authority matters more than personal qualifications and this relationship between the ruler and the ruled as Theobald asserted, "is by no means absent from modern industrial societies," there could potentially be instances of patrimonial technopolitics in both the industrialized and industrializing nations.[41] Additionally, as my study illustrates, a state institution could enact different forms of patrimonial technopolitics, employing different designs of technology to enact and embody different types of politics. In Indonesia, PLN was able to do this because it emerged and developed into a huge and somewhat decentralized state-owned electricity company that designed, built, run, and maintained networks of power system in a sprawling archipelago.

[41] Ibid., 549.

APPENDIX A

List of Oral History Interviews:

Interview with Peter McCawley on 10 October 2011 in Jakarta.
Interview with Bagoes Moerdijantoro on 5 March 2012 in Jakarta.
Interview with Agus Sugiono on 14 March 2012 in Jakarta.
Interview with Djiteng Marsudi on 17 February 2012 in Jakarta.
Interview with IBGMP on 25 May 2012 in Denpasar, Bali.
Interview with Djiteng Marsudi on 10 February 2012, Jakarta.
Interview with NS on 2 April 2012 in Denpasar, Bali.
Interview with NS on 12 May 2012 in Denpasar, Bali.
Interview with Cokorda Gde Putra on 16 September 2011 in Kintamani, Bali.
Interview with Made Madi on 28 June 2012 over the phone in Denpasar, Bali.
Interview with Nyoman Budiarta on 17 April 2012 in the Subaya Village, Bali.
Interview with Nyoman Sudara on 7 January 2013 in Denpasar, Bali.
Interview with Wayan Karben on 27 April 2012 in the Bunut Village, Bali.
Interview with I Wayan Jingga on 13 June 2012 in the Subaya Village, Bali.
Interview with Ngurah Adnyana on 22 February 2012 in Jakarta.
Interview with Nyoman Sudara on 17 May 2012 in Nusa Penida.
Interview with Kadek Suryana on 17 May 2012 in Nusa Penida.
Interview with Made Artha in Denpasar, Bali on 21 December 2012.

APPENDIX B

Archives and Libraries

A. In Indonesia:
   a. Arsip Nasional Republik Indonesia (ANRI) in Jakarta.
   b. Perpustakaan PT. PLN (Persero) Distribusi Bali in Denpasar.
   c. Badan Perpustakaan dan Arsip Provinsi Bali in Denpasar.
   d. Perpustakaan Kementerian Energi dan Sumber Daya Mineral (ESDM) in Jakarta.
   e. Perpustakan Ditjen Ketenagalistrikan Kementerian ESDM in Jakarta.
   f. Perpustakaan BAPPENAS in Jakarta.
   g. Perpustakaan BPPT in Jakarta.
   h. Perpustakaan Nasional Republik Indonesia (PNRI) in Jakarta.
   i. Perpustakaan Pusat Penelitian and Pengembangan PLN in Jakarta.
   j. Badan Perpustakaan dan Arsip Daerah DKI Jakarta.
   k. Perpustakaan PT lndonesia Power in Denpasar.
   l. Perpustakaan Kantor BAPPEDA Bali in Denpasar.
   m. Perpustakaan Dinas Kebudayaan Pemerintah Provinsi Bali in Denpasar.
   n. Perpustakaan Museum Listrik dan Energi Baru in Jakarta.
   o. Perpustakaan Museum Minyak dan Gas Taman in Jakarta.
   p. Perpustakaan Pascasarjana Universitas Udayana in Denpasar.
   q. Perpustakaan Fakultas Teknik Universitas Udayana in Denpasar.
   r. Perpustakaan Fakultas Ekonomi Universitas Udayana in Denpasar.
   s. Perpustakaan Bank Indonesia in Denpasar.

B. In the United States:
   a. Cornell University's Kroch Library
   b. United States Agency for International Development Archive (https://dec.usaid.gov/dec/home/Default.aspx)
   c. The World Bank Documents & Reports (http://documents.worldbank.org/curated/en/home)
   d. The Library of Congress
   e. Images From the Reagan Library Archives (http://www.reaganlibrary.gov/archives/photographs)

C. In the Netherlands:
   a. KITLV Library

A List of Periodicals, Newspapers, and Magazines Consulted:

A. Periodicals:
   Energi & Listrik

B. Newspapers:
   Kompas
   Bali Post
   Surabaya Post

Bisnis Bali
Lampung Post
Suara NTB

C. Magazines
Berita PLN
Pertambangan & Energi
Majalah Bulanan KORPRI
Pelangi Nusra
Suluh Dewata
Listrik Indonesia
Warta PLN 8

Institutional Reports and Yearbooks

A. PLN Publications and Reports:

Perusahaan Umum Listrik Negara. 1976. *PLN 1975/76*. Jakarta: Perusahaan Umum Listrik Negara (PLN).

———. 1990. *PLN Statistics 1989/1990*. Jakarta: Information and Statistics Subdivision of PLN Head Office.

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———. 1996. *PLN Statistics 1995*. Jakarta: Evaluation Analysis & Information System Division of PLN Head Office.

B. Handbooks:
Perusahaan Umum Listrik Negara. 1987. Fichtner Construction Design Hand Book, Engineers Services For Distribution System Extension Denpasar – Bali Project. Contract No.: PJ058/PST/86. Financing Support: Asian Development Bank Loan Agreement No. 674—INO. Fichtner Consulting Engineers In Association with PT Indra Karya Consulting Engineers, Denpasar – Bali.

Division of Commerce of the Department of Agriculture, Industry, and Commerce. 1930. *Handbook of the Netherlands East Indies*. Batavia, Java: Printed by G. Kolff & Co.

———. 1920. *Handbook of the Netherlands East-Indies*. Batavia, Java: Printed by G. Kolff & Co.

APPENDIX C

Titles of PLN Internal Magazines

- *Berita PLN*

Published by the PLN Headquarters between March 1977 and July 2000.

- *Fokus*

Published by the PLN Headquarters since August 2000.

- *Media PLN Wilayah Xl*

Published by the PLN Eleventh Region

Three issues published: no. 1 (21 October 1986), no. 2 (2 March 1987), no. 3 (3 May 1990).

- *Pelangi Nusra*

Published by the PLN Eleventh Region between October/November 1993 and October 1997.

- *Info Nusra*

Published by the PLN Business Unit Bali, NTB, & NTT between June 2000 and Sep/Dec 2002.

- *Suluh Dewata*

Published by the PLN Bali Distribution between Feb 2003 and Sep 2010.

- *Bungong Jaroe*

Published by the PLN First Region since January 1994

- *Volta*

Published the PLN Second Region since 1993

- *Suluah Nagari*

Published by the PLN West Sumatra since 2007

- *lnfo Musi*

Published by the PLN South Sumatra, Jambi, and Bengkulu Region since January 2006

- *Sang Bumi Ruwa Juai* (Saburai)

Published by PLN Lampung Region

- *Warta Serumpun Sebalai*

Published by PLN Bangka Belitung Region

- *Nuansa Balerang*

Published by the PLN Batam Special Region

- *Cahaya*

Published by the PLN Jakarta and Tangerang Region

- *Elektrika*

Published by the PLN West Java and Yogyakarta Distribution

- *lnfodis*

Published by the PLN East Java Distribution

- *Warta PLN 8*

Published by the PLN South and Southeast Sulawesi Region

- *Terang Suluttenggo*

Published by the PLN North and Central Sulawesi and Gorontalo Region

- *Tabaos*

Published by the PLN Maluku and North Maluku Region

- *Buletin Cenderawasih*

Published by the PLN Papua Region

- *Pjiar*

Published by the PLN Third Region

- *Buletin PLN Wilayah IV*

Published by the PLN Fourth Region

- *Sinar Khatulistiwa*

Published by the PLN Fifth Region

- *Buletin Jukung*

Published by the PLN Sixth Region

- *Varia Elektrika*

Published by the PLN Seventh Region

- *Suluh Etam*

Published by the PLN East Kalimantan Region

- *Kilau Borneo*

Published by the PLN South and Central Kalimantan Region

- *Pijar Khatulistiwa (Pikhat)*

Published by the PLN West Kalimantan Region

- *Cahaya Flobamora*

Published by the PLN East Nusa Tenggara Region

- *Menahtandur*

Published by the PLN West Nusa Tenggara Region

- *Energi & Listrik*

Published by the PLN Power Research Institute

- *lnfo PJB*

Published by the PLN Subsidiary PT PJB I

- *lnfo PJB ll*

Published by the PLN Subsidiary PT PJB II

- *lndonesia Power*

Published by the PLN Subdiary PT Indonesia Power (formerly PT PJB I)

- *Pinisi Sulawesi*

Published by the PLN Sulawesi Generation and Transmission Master Project

- *HorasJalaGabe*

Published by the PLN North Sumatra and Aceh Generation and Transmission Master Project (PLN Pikitiring Sumut dan Aceh)

- *Karimata*

Published by the PLN Kalimantan Generation and Transmission Master Project (PLN Pikitiring Kalimantan)

- *Buletin Mentari*

Published by the PLN West Sumatra and Riau Generation and Transmission Master Project (PLN Pikitiring Sumbar dan Riau)

- *Visi Pikitiring Jatim & Nusra*

Published by the PLN East Java and Nusa Tenggara Generation and Transmission Master Project (PLN Pikitiring Jatim dan Nusra)

- *Termal*

Published by the PLN West Java and Jakarta Thermal Generation Master Project (PLN Pikitterm Jabar dan Jaya)

- *Warta Piring Jabar Jaya*

Published by the PLN West Java and Jakarta Transmission Master Project (PLN Piring Jabar dan Jaya)

- *lnformasi Pikit Jabar Jaya*

Published by the PLN West Java and Jakarta Generation (PLN Pikit Jabar dan Jaya)

- *Floeksi*

Published by the PLN Load Dispatching and Transmission Center Java and Bali (PLN P3B Jawa

dan Bali)

- *Buletin Enjiniring*

Published by the PLN Center for Engineering Services (PLN PPE)

- *Buletin Pusdiklat*

Published by the PLN Center for Education and Training (PLN Pusdiklat)

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