

THE BOTTOM LINE

Too often, electrification programs do not fully exploit the degree to which access to electricity can improve livelihoods. This Live Wire documents the lessons learned from the World Bank–funded Indonesia Rural Electrification projects in the 1990s. The projects used marketing conducted by nongovernmental organizations to increase energy sales, investment in equipment, and productive uses of electricity by rural residents. The projects were innovative in their emphasis on productive use as an explicit goal of rural electrification efforts and in their use of NGOs to achieve results that benefited both the utility and rural residents.



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Raising Rural Productive Uses of Electricity: A Case Study of a Successful Utility–NGO Partnership in Indonesia

What induced Indonesia’s power utility and the World Bank to begin promoting productive uses of electricity as part of a rural electrification program?

The utility sought to expand power sales to fund its ambitious electrification plans; the World Bank wanted to maximize the use of supply infrastructure and the economic benefits of electrification

Before Indonesia’s World Bank–funded Rural Electrification (RE) projects in the 1990s, there had been no efforts to promote productive uses of grid-supplied electricity to rural small businesses—in Indonesia or elsewhere. And although multiple studies around the world had found low levels of productive use of electricity (PUE) among newly connected rural residents, no reports were found of using *marketing* to raise those levels (Wasserman 1983).

To explore the relationship between access to grid power and PUE, the World Bank conducted a pilot project under RE I (1990–94) in three of the fourteen regions of the state-owned national electric power utility, Perusahaan Umum Listrik Negara (PLN). The pilot was later expanded, with adjustments, to cover all PLN regions under RE II (1995–99). By the end of the project, PLN had engaged nongovernmental organizations (NGOs) to help 66,000 enterprises invest Rp. 148 billion in electrical equipment, create 22,000 new jobs, and raise energy consumption by 180 GWh per year (World Bank 2000).

RE I was the World Bank’s first rural electrification project in Indonesia after more than 20 years of lending to the power sector. Its principal objective was to reduce unit distribution costs and increase

cost recovery while increasing household connections (World Bank 1990). For several reasons, the RE I project also seemed a good context for a trial effort to use marketing to promote PUE. For one thing, the topic of rural PUE had not yet received sufficient attention.

The design opportunity was to devise a potentially replicable way to increase PLN’s kWh sales to rural small businesses. The design would be sufficiently flexible to suit the many diverse rural contexts in which PLN operated and PLN’s own technical and administrative limitations; to be adaptable in response to events, performance, and learning; and to benefit PLN and the businesses in a cost-efficient way.

The chief constraint to raising PUE was the paucity of rural productive users and the corresponding low daytime loads that constrained PLN’s revenue. It was not obvious that investments in grid-supplied rural electrification would bring broader economic benefits (box 1).



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Box 1. Does electrification always stimulate productive use of electricity?

Even now, the evidence on the impact of electrification on economic development and poverty reduction is mixed.

In Vietnam, a long-term impact evaluation study of households a decade after electrification found significant economic benefits that exceeded the costs of electrification four-fold (Barnes and others 2009).

Other studies, however, have found less promising evidence (Lenz and others 2017). Several impact evaluations in Rwanda have shown that even several years after electrification, households had not increased use of electric appliances or developed productive uses.

A recent impact evaluation in Kenya (Lee, Miguel, and Wolfram 2020) confirms similar results in Kenya after 18 months of electrification.

Long-term impacts are influenced by factors beyond the availability of electricity, including access to markets and other infrastructure services; access to credit, consumer education, business development support; and adoption of appliances. Therefore, the authors suggest, systematic interventions aimed at stimulating productive use of electricity must be mainstreamed in electrification programs to maximize the benefits of electricity service.

The post-Covid 19 economic recovery provides opportunities to build back better by leveraging electrification programs to improve the life of local communities.

PLN's concern was that it was taking longer than anticipated for rural businesses using diesel motors to change over to grid services, even in communities already enjoying 24-hour service.

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PLN's tariffs and connection charges no doubt discouraged initial connections and greater use of those already installed. The initial payment for connection was high, and no installment options were offered for new business connections or increases in power consumption. Fixed demand charges were a deterrent for seasonal agri-processing businesses and purchasers whose income was linked to agriculture. PLN's technical service quality was unreliable, and customer service was passive, with slow responses to service interruptions, complaints, and requests and no segmentation of staffing and standards for households and businesses.

¹ When queried, headquarters staff could recall few instances of promotional actions such as donor-supported equipment demonstrations, which they regarded as benign but isolated and ineffectual. PLN regional and branch staff could report no instances of having promoted PLN services to rural businesses or of encouraging them to change over from diesel to electric.

How did the pilot take shape?

The partners held consultations to better understand the characteristics of current and potential customers and the reasons behind the slow take-up of grid services

The first step in the pilot was to understand the local socioeconomic context by (i) collecting data on rural customers; (ii) holding discussions with business users and non-users of PLN services, equipment suppliers, PLN field staff, rural bank officials, NGO field workers, and local electrical equipment suppliers; and (iii) observing interactions among PLN staff, customers, community leaders, and others. PLN data resources on load profiles and customer locations and use patterns could potentially be useful for market surveys and for monitoring new connections and changes in usage following promotions. And the Indonesian rural context in which the PUE campaigns would operate had at least minimal amounts of several elements often viewed as success factors in rural enterprise development—credit services, a growing economy, access to markets, improving communications.

Working in deep rural communities, NGO staff traveled by motorbike or walked when visiting households, in contrast to PLN staff, who traveled in vehicles, usually air conditioned.

Design discussions touched on the competitiveness of PLN's pricing, on PLN's reputation for unreliable technical and customer service, and on PLN-imposed frictions and transaction costs, including slow or negative responses to connection applications and reports of requests for extralegal payments by businesses seeking to switch from diesel motors to PLN. Also considered were the availability of finance, equipment, skills, and markets. Understanding these constraints revealed possible market entry points for PLN—chief among them appropriate pricing, better service quality, links with equipment and credit suppliers, and expanded access to markets. PLN field staff expressed an interest in assisting productive users in a personal capacity by providing technical guidance on connecting motors and equipment.

Most rural small businesses were unlicensed, operating without formal credit, family owned, marginally profitable, and home based. In recently electrified rural communities and those identified by PLN as soon to be electrified, businesses had access to roads to regional centers, but not to public phones or phone shops (*wartels*). They typically used manual power or diesel motors, even if they were close to PLN lines. The few that used PLN power in their business also maintained backup generators.

For many small businesses, PLN's subsidized pricing in rural communities was only marginally competitive with diesel motors and gensets. Diesel had a significant installed base, including skills, spares, sales and service, good prices (diesel fuel was also subsidized), a good reputation for supply reliability, and resilient distribution channels.

Among the businesses that appeared near-term possibilities for switching to PLN were carpentry and woodworking; tailoring and dressmaking; home-based weaving businesses using manual power; and some repair services using diesel motors. The most frequently mentioned concern of these businesses was low growth prospects, unreliability in the markets for their products, and the increasing availability of lower priced, higher quality, more varied goods, especially clothing, footwear, and furniture. They were aware of the possibility of switching to PLN and the availability and general pricing of some electric equipment. However, most had concerns about the availability of spares and people with the skills to repair electrical equipment.

What approach came out of the consultations?

The approach adopted was to mount an NGO-led effort to sell PLN services to rural small businesses

Fieldwork helped reveal the potential role of NGOs as channels to promote PLN's grid service.² NGOs in Indonesia's rural communities already had significant operational capabilities and had worked with rural small businesses and the poorest households. Yet before the field visits, Bank and PLN staff had not anticipated the possibility of discussions with NGOs. PLN had no working links with them. However, given their experience in the marketing of nutrition, literacy, prenatal care, savings, and other changes among groups, families, and individuals in rural communities, the NGOs could not be ignored as potential channels for efforts to promote PLN's grid services.

NGO field staff were typically local, multipurpose workers with some secondary education who were skilled in outreach and motivational communications. They were practiced in disseminating information and appeared committed to their development roles. Working in deep rural communities, they traveled by motorbike or walked to visit households, in contrast to PLN staff, who traveled in vehicles, usually air conditioned, and stopped mainly at PLN sites and lines. NGO field staff were linked with established regional or national NGOs, especially in Java, that had staff skilled in basic micro- and small-enterprise development and techniques that would be useful in advising small businesses.

The NGO-led marketing operations would be backed by improvements in PLN's technical and customer services for rural business customers. Although PLN's staff would not be directly promoting productive uses and there would be no permanent in-house PLN rural PUE promotion unit, PLN was willing to improve its service quality and to make minor modifications to be more accessible and valuable to small rural businesses.

The marketing design would be adaptive, relying on the NGOs to continuously adjust their marketing models, making improvements in light of seasonal changes, experience, and new circumstances. The RE I pilot would be a trial of whether outsourced, short-term

² The fieldwork and discussion methods for the PUE pilot drew from the inductive approaches associated with Albert O. Hirschman (1966). Also, while there was no broad baseline knowledge to draw from, specifically on the promotion of electricity for productive uses in rural communities, Brodman's 1982 study of electrification in eight Java villages was a valuable source.

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marketing could spike the adoption rate and increases in PUE, targeting small industrial, commercial, agricultural, and service businesses.

The marketing channel would be NGOs with established credibility and staff capabilities, demonstrated skills in communicating with the smallest businesses in local markets, and, if possible, some background in technology and energy. The campaigns would be time-limited, assuming that innovators and early adopters of PLN services would be able to compete within a relatively short time frame. The information disseminated would cover PLN pricing, connection requirements and availability, the favorable tariff for small industries, and offers of electric motors and equipment at good prices.

Mass radio communications and community meetings would be accompanied by rapid market surveys that would raise awareness and develop the preliminary list of leads. Survey visits would be made to the businesses identified during community meetings to gather initial information on the business and potential PUE, potential interest in grid service, and potential constraints.

Follow-up advisory services for candidates for increased PUE would center on open-ended questioning and discussions of the business situation, using a simple SWOT matrix. A one-page analysis of the financial cost of PLN versus diesel and the possible value added of using PLN service would be performed for interested businesses. Advice would be customized for each business—for example, the lower costs and greater convenience of electricity, higher sales prices, economies of scale that might increase profits, and new business lines. Better quality, shorter fulfillment times, and greater adaptability were also becoming important factors in rural Indonesia, as integration of Indonesian rural producers into global value chains intensified.

The NGOs would help businesses resolve problems with PLN; identify appropriate equipment options, suppliers, and prices, including through demonstrations; and identify equipment suppliers, sources of credit and technical training and support, and potential new buyers and markets. But their immediate operational focus was on selling PLN services in appropriate contexts. The complexities of each village would be different—in leadership, proximity to markets, landholding and crop patterns, and existing non-farm income. The NGOs would need to craft their marketing to fit the specifics of the

individual businesses and their contexts. While all the NGOs would be selling PLN services to businesses, each would devise its own business model for engagement and motivation (for example, visit lengths and follow-ups, scripting, balance between individual and group sessions, and links with credit and equipment suppliers).

For its part, PLN would manage the program, including (i) NGO contracting, supervision, and payments; (ii) selection of villages (generally recently electrified communities); (iii) target setting; (iv) vetting of marketing materials for accuracy; and (v) monitoring of performance and reporting on impact. It would also improve and monitor the reliability and quality of its technical and customer services in the target markets (e.g., advance notification of outages, shorter response times). In addition, PLN would train NGO staff on the technical aspects of electric motors, service limitations, and tariff administration; participate in community and group marketing events; and be available to address questions and bottlenecks that NGOs might encounter.

Implementation would be phased, with each iteration incorporating practice-based improvements. Multiple formal feedback loops would include regular meetings of NGO and PLN field staff, monthly NGO reports to PLN staff, and periodic peer-to-peer meetings among NGOs to exchange experiences and observations.

The Bank had anticipated no major risks for RE I (World Bank, 1990). It turned out that the risks to PUE were considerable. PLN had a passive approach to customers and lacked experience working with NGOs. The incentive structure for staff did not reward increasing rural productive use sales or improving technical and customer service. PLN had no norms for communicating accurate price information to rural businesses. PLN staff were not encouraged to coordinate with other agencies or providers of inputs for rural development. The Bank considered these organizational risks manageable, given PLN's experience with outsourcing, its agreement to assign staff to support the NGO marketing, the alignment of PLN's strategy of in-filling (densification) with increasing PUE in villages already electrified, and the presence of local NGOs with field marketing capabilities well suited to promoting increases in PUE. Also, the established working relationships among Bank and PLN staff provided some comfort that organizational issues could be resolved during implementation.

Until the advent of the global financial crisis, Indonesia had been heralded by the Bank as one of the East Asian miracles. This changed dramatically in 1997–98 with the “strange and sudden death of a Tiger Economy.” The rural home-based businesses and small industries assisted by the project were not as exposed to the currency depreciation induced by the crisis and appeared to have benefited either by becoming more competitive against imported products in their local markets or as subcontractors for export-oriented companies.

Did the flexible approach used in the marketing pilot pay off?

Yes. It permitted adjustments to be made in light of experience

After two years of operating experience, PLN and the Bank found that the pilot marketing efforts in the three RE I regions were relatively successful and decided to expand the efforts to cover all fourteen regions under RE II (1995–99). During the pilot, a total of 15,800 enterprises received guidance, of which 8,409 increased their PUE (Menelaws 2000). Adjustments were made to correct for inefficiencies noted by the NGOs, PLN, and the Bank (World Bank 1995). Those corrections helped the program survive the rigors of the global financial crisis that hit in mid-1997.

Until the advent of the global financial crisis, Indonesia had been heralded by the Bank as one of the East Asian miracles. This changed dramatically in 1997–98 with the “strange and sudden death of a Tiger Economy” (Hill 2000). In 1998, PLN faced a widely reported \$1.05 billion loss (Linebaugh 1998) and became technically insolvent.³ Even under these inauspicious circumstances, the PLN–NGO marketing campaigns for rural PUE continued, largely unhindered, through the end of 1999 and the close of RE II. The rural home-based businesses and small industries were not as exposed as other firms to the currency depreciation induced by the crisis and appeared to have benefited either by becoming more competitive against imported products in their local markets or as subcontractors for export-oriented companies.

The corrections to the marketing campaigns made in response to NGOs, PLN, and the Bank were to shorten and simplify the campaigns, to improve the targeting of businesses and their locations, to streamline advisory and assistance services, and to restructure implementation support. Each of these decisions is described briefly below and detailed in World Bank (1995).

Shorter and simpler marketing campaigns. Multiple factors contributed to delays during RE I—chief among them PLN’s

³ After entering into power purchase agreements with private generators, PLN had become contractually obliged to purchase power at three times the price at which it could sell it, and it was not possible to raise tariffs (Wells 2007). The Bank halted new lending for the power sector in early 1998 and in mid-1998 judged the performance of all ongoing Indonesian power sector projects to be unsatisfactory (World Bank 2000).

inexperience in contracting with NGOs and the inexperience of the Bank’s power sector with promoting PUE or working with NGOs in Indonesia. With a common base of experience on all sides, the RE II marketing campaigns were less hampered by process delays. Critically, PLN contracted a “central NGO” at the outset of RE II to guide and assist the 25 “field NGOs.” As a result, the time required for the NGO marketing campaigns was cut from 18 months for the initial 1993–94 efforts to 12 months for final 1997–98 campaigns.

The mass marketing activities during the RE I campaigns (notices on local radio, printed matter, and other materials for presentation at community meetings) were initially developed by a “small business services” team at PLN headquarters, but NGOs gradually shifted to preparing their own materials and honing their own messages. For RE II, the central NGO produced better and cheaper promotional materials, while the PLN headquarters team shifted to contract processing, data gathering, invoice payments, and report preparation. The surveys administered under RE I gathered considerable household and business data, much of which was not of immediate interest to field-level PLN staff and was time consuming for the NGOs to collect. In the later phases of RE II, survey data was restricted to what was needed to set targets. Even so, data collection, monitoring, and vetting remained time consuming and problematic for the NGOs and PLN.

Better targeting of businesses and locations. In RE I, marketing targeted all small businesses. But NGOs found that changeovers from diesel to PLN presented the principal opportunity for scoring new connections and higher power consumption. The initial rapid market surveys confirmed that most businesses provided supplementary household income and were operated part-time, with the farming calendar often determining the time spent on the business. Many were not candidates for near-term increases in PUE. In addition to promoting the changeover from diesel or manual power sources to grid power, a secondary aim under RE II was to help early adopters purchase necessary electrical equipment and access technical advice. The expectation was that by accelerating early adoptions, the overall diffusion rate would improve.

In some instances, the NGO marketing campaigns during RE I were conducted in villages where PLN was not even able to respond to requests for business connections and power upgrades. The adjustment for RE II was to coordinate and confirm capabilities

It became apparent during the initial RE I campaigns that the NGOs had much more expertise than PLN in marketing, and that they could develop their own campaigns. PLN staff in many branches did not fully commit to supporting the promotions, which, as noted, were presented as an extra task imposed from the utility's headquarters.

before the selection of the campaign communities. Even with the improved coordination, however, there continued during RE II to be instances of delay linked to inadequate PLN capabilities.

Streamlined advisory and assistance services. Under RE I, NGO field workers tried to recruit as many businesses as possible to adopt or increase PUE, often requiring field workers to travel in difficult conditions to reach locations. Multiple return visits to present elaborate business analyses did not significantly increase the adoption rate of businesses that were slow to decide. These findings made it even more important that field workers target their promotional efforts on the group most willing and able to move. The reality was that energy was only a small part of the business picture, and that other factors, notably markets, loomed large in decision making. The advisory messages of the campaigns conducted under RE II were sharper and simpler. The NGOs had become more astute in understanding the value propositions from the perspectives of the businesses. The businesses in the main target segment (existing businesses using diesel motors) were generally most interested in information and tips linked to near-term actions that could bring immediate benefit. As noted, the decision-making of early moving small businesses required only limited information: basic SWOT and payback analyses and information on equipment.

The field workers found that business operators wanted to see equipment in operation before requesting a new connection. These observations were made during visits to other businesses already using the equipment or arranged directly between sellers and buyers. In RE II, NGO staff ceased to arrange demonstrations, instead spending their time advocating for business customers with PLN. Erroneous tariff classifications, delayed connections and installations, and slow responses to inquiries were characteristic of PLN operations in many of the communities, and the NGOs spent considerable time working as the intermediary between PLN and businesses.

Stronger, restructured implementation support. For the RE I pilot marketing, a unit was established at PLN headquarters to select, train, and monitor NGOs. It became apparent during the initial RE I campaigns, however, that the NGOs had much more expertise than PLN in marketing, and that they could develop their own campaigns. PLN training of NGO field workers was inadequate, and there was poor field coordination between the NGOs' recruitment

of businesses for connections and upgrades and the capability and willingness of PLN field staff to follow up on their applications. Also, there was a shared concern that excessive data gathered from businesses was of little use to PLN, onerous for the NGOs to collect, and not linked to the critical sales targets of new connections and increased power sales. Nor was the central management information system able to generate reports useful to PLN regional offices on their oversight of the NGOs. The solution to these problems, as described earlier, was to charge a central NGO with training and supporting the 25 NGOs contracted for the RE II campaigns. This included assisting with their strategic planning, advising on survey techniques to identify and prioritize prospective business candidates for connections and power upgrades, sharing lessons learned on linking with equipment and credit suppliers, and providing standardized marketing materials of high quality. On the data side, the central NGO developed software to help field workers produce simple business plans and payback projections for the businesses.

What issues persisted after these adjustments?

The most serious issue was that PLN's corporate culture was not a good fit with marketing

At the outset, there was no expectation that PLN's corporate culture would be conducive to marketing, and this remained a factor throughout RE I and II. PLN staff in many branches did not fully commit to supporting the promotions, which, as noted, were presented as an extra task imposed from the utility's headquarters. Accordingly, PLN staff failed to resolve bottlenecks, improve tariff administration, or see that marketing was conducted only in villages in which PLN was positioned to respond to connection and upgrade applications. An independent case study commissioned by PLN at the end of the project (Menelaws 2000) cited PLN's corporate culture as the main factor in this weak responsiveness and uneven support for the marketing campaigns. While PLN maintained a positive stance and declared its willingness to be supportive, a more activist utility role in supporting marketing would have brought greater results.

PLN, the NGOs, and the Bank all found monitoring and reporting to be problematic. For the NGOs, this issue was manifest in the time spent in gathering, collating and reporting data.

Pricing was not the major issue; service quality and placement loomed larger. PLN's service was unreliable in rural communities throughout RE I and II, with unannounced outages and voltage fluctuation bedeviling businesses lacking backup diesel generators. PLN did not respond quickly to applications from NGO-recruited businesses for connections and power upgrades, a version of the classic marketing problem of promotion without product.

For PLN, the issue was vetting the accuracy of the NGO-generated reports and the time spent entering and collating data. For the Bank, it was the performance of the management information system, the timeliness and completeness of reports, and, in the case of PUE, the data not being integrated systematically with available load-curve data from the villages. PLN was not interested in impact data, such as business-level employment generation and equipment purchases.⁴ The NGOs, incentivized by their contracts to achieve their key performance results as quickly as possible and then move on to new customers, lacked incentives to track the performance of the “old” customers and collect impact data.

PLN as an entity was dealing with **major governance issues** during the RE I and II years (Wells 2007). This may have raised the costs of the utility's marketing (Waldman 1998) through delays in contracting with NGOs, paying their invoices, connecting new customers, and upgrading service to enable increased PUE. These delays raised the costs to productive users switching from diesel to PLN.

The promotions yielded results. But issues of **pricing and service quality** persisted. As already observed, the pricing of PLN's services in rural communities during RE I and II was only marginally lower than diesel. Other aspects of pricing (e.g., connection charges) could have been adjusted to make PLN more competitive. Even so, pricing was not the major issue; service quality and placement loomed larger. PLN's service was unreliable in rural communities throughout RE I and II, with unannounced outages and voltage fluctuation bedeviling businesses lacking backup diesel generators. PLN did not respond quickly to applications from NGO-recruited businesses for connections and power upgrades, a version of the classic marketing problem of promotion without product. Network design and layout was also a major constraint. The PLN rural networks for village electrification were initially designed to connect government offices and 30 percent of households at the least cost. Additional connections often depended on PLN's implementation of its densification strategies, leaving many businesses unable to obtain a new connection during the campaigns.

⁴ *Ex post* studies using PLN's historical data on penetration rates, productive use connections, power sales, service interruptions, and load curves—all controlling for customer and location variables (e.g., village population, customer distances from the grid, roads and markets, years since electrification, PLN service quality—would have been useful in gaining a better understanding the impact of the intervention. With the pressures of structural adjustment and the financial crisis, PLN chose not to track key PUE take-up rates and results.

PLN, the NGOs, and the Bank judged the marketing during RE I and II a success, but that success was not parlayed into additional efforts or new projects. Typical marketing metrics—such as more rigorous tracking of changes in market share and comparisons with control communities, cost per lead, and cost and revenue per new connection—were not introduced.

Before the campaigns, PLN had had no plan for selling its services to rural businesses. PLN's marketing was a perhaps unique case—until the 2006 rural electrification project in Peru (Finucane, Bogach and Garcia 2012)—of a grid-based rural electrification service marketing its services to rural businesses to achieve increases in sales of power for productive uses.

On the other hand, the marketing task was in many ways quite ordinary. The utility was addressing a challenge familiar in the world of selling services. As the decision to engage in marketing came only after the service lines were installed and pricing fixed, it was necessarily premised on an understanding that purchase decisions are about more than technology, location, and pricing, and that supplying information in targeted, customized, effective ways could motivate higher levels of adoption of grid services by productive users. For that reason, it is surprising that the utility's program of rural business services was not accompanied by the provision of other services or inputs, e.g., credit, access to new markets, technical training, or broad business development services.

Although it provided information on possible applications and opportunities as an element of its business-to-business marketing approach, the utility did not focus sufficiently on specific technologies, markets, or value chains that rural businesses might pursue through the adoption of grid electricity.

The PLN marketing campaigns were pilot efforts by one utility at a particular historical juncture. PLN, with Bank support, intended to expand the marketing into new areas, but the successful efforts ultimately were not extended, in part because the context had changed.

A strong understanding of local socioeconomic dynamics, disparities, and market opportunities should be reflected in the project's design, leveraging readily available information on physical, spatial, and demographic characteristics. The more distant designers are—physically, intellectually, and interactively—from the dynamics of a given market (including its inertia) and from rural businesses' views of risk, the more likely it is that opportunities will be missed and mistakes made.

What lessons were learned?

Much of the “learning” that might be transferable across contexts for projects introducing new services (such as electricity for rural productive users) has become encapsulated in design and management maxims that can hardly be billed as lessons for practitioners. Although much was learned during the projects about reducing the constraint imposed by poor access to information, timely business information is more widely available today than it was then.

So, what suggestions can be offered?

First, **have a strategy**. PLN's experience with rural business services demonstrated that having a marketing strategy can be effective, even as an add-on to a household electrification project.

Second, **make sure your goals are designed in**. If rural PUE and equity are important goals, resources must be dedicated to incorporating those goals into technical and financial structuring—including engineering, layout, sequencing, and pricing (box 2).

Box 2. The building blocks of PUE

- Integrate PUE as a goal in development and electrification plans.
- Ensure that policies and regulations for rural electrification support energy-efficient applications, encourage business formation and growth, promote gender equity, and are pro-poor.
- Ensure that energy-efficient appliances and equipment are available and affordable.
- Open access to finance for small businesses, end users, and providers of energy services.
- Support business development (e.g., by offering skills training).
- Create space for technology and innovation, with a focus on energy sources and delivery mechanisms.
- Link markets and promote partnerships.
- Keep the public informed and aware and engage stakeholders.
- Collect and analyze data (e.g., when assessing value chains and setting investment priorities).

Third, **know your context**. A strong understanding of local socioeconomic dynamics, disparities, and market opportunities should be reflected in the project's design, leveraging readily available information on physical, spatial, and demographic characteristics. The more distant designers are—physically, intellectually, and interactively—from the dynamics of a given market (including its inertia) and from rural businesses' views of risk, the more likely it is that opportunities will be missed and mistakes made. Listening, observing, and striving not to be a “stranger” can trigger awareness of what was not known to be unknown and of unexpected entry points, even if only through serendipity.

Fourth, **adapt**. Operational design on the demand side must be continuously adapted with experience. To be adaptive is a well-established design recommendation, one made more difficult when projects are structured to generate data that will later be packaged as peer-reviewable “knowledge.” But, with rollouts of multi-year projects having many moving parts operating in many contexts, most project managers will rightly assume that hitches will occur, especially in early phases, and adopt an adaptive approach. The Indonesian experience began with a small pilot involving five NGOs before scaling up to 26 NGOs developing and designing a large part of their marketing mix. This created an opportunity for practical experimentation. The success of the campaigns can also be linked to the adaptive approach of enabling each NGO to make experience-based, context-dependent adjustments to improve performance and to comparing performances statistically across multiple locations and over time.

Fifth, **don't ignore the fundamental constraints present in the context**. In this case, PLN's organizational culture was that of a state-owned monopoly rather than an enterprise competing in a difficult market. The Bank, PLN, and the NGOs had not previously worked together. The Bank's contract documents and procedures were not customized to reflect those circumstances. Both PLN's daytime loads and PUE were low, and other key variables (tariffs, physical access, and technical service quality) were largely fixed. The relative success of the campaigns described here was achieved despite these factors, by virtue of a holistic, opportunistic, context-specific design process,

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one with a significant bottom-up thrust that led to the outsourcing of marketing to skilled NGOs. The work that Indonesia's NGOs did in building the PUE ecosystem remains highly relevant for the design and implementation of projects.

The authors thank Sunil Kumar Khosla and Kabir Malik for their valuable review. Series editor Steven Kennedy did an impressive job in distilling this brief from a much longer study. The lead author thanks Juliette Besnard and Raluca Georgiana Golumbeanu for their reviews and for leading this case study through the Bank's internal approval and processes.

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