

Expanding Rural Power Supply through Rural Electrification in the Republic of Korea (1966–1979)

Introduction

A lack of access to power constrains growth and hampers development (Stern, Burke, and Bruns 2018). To scale up access to electricity and foster development in rural areas, the Republic of Korea and the government-owned company Korea Electricity Power Corporation (KEPCO)¹ carried out the Rural Electrification Project between 1970 and 1979. By extending power supply to rural areas, the project aimed to improve productivity, education, culture, health, hygiene, and overall quality of life in disadvantaged rural communities. The project offered long-term, low-interest loans for the construction of power distribution centers. Significant improvements in quality of life and well-being were shown as the country achieved a 99.8 percent electrification rate by 1987. The project also increased agricultural productivity as well as income in rural areas and greatly contributed to the development of the domestic electricity industry.

Development Challenges

Although commercial electricity was introduced to Korea in 1897, access to electricity remained extremely limited for rural residents of Korea through the 1960s; 88 percent of rural residents did not have electric lights in their homes in 1964 (Yim, Park, and Lee 2012), and more than 2 million rural households still lacked electricity at the end of 1969 (Yim 2017). Because rural communities accounted for more than 60 percent of Korea’s total population at the time, the Korean government launched the Rural Electrification Project to promote economic growth and balanced development across the nation.

Intervention

The core intervention was to expand electrical coverage across the Republic of Korea. Because of continued power shortages since the Korean War,² the country’s electricity supply was restricted and prioritized by service areas and distribution lines. However, following an increase in the stability of the power supply achieved through the first in a series of six five-year Energy Resources Development Plans (1962–1966), the transmission restrictions were lifted in April 1964. The new Park Chung Hee regime (1963–1979) placed a high priority on supplying power throughout the nation to fuel economic growth and industrialization. New laws were enacted under presidential order in December



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기획재정부
Ministry of Economy
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PROJECT DATA

SECTOR:

Energy and Extractives

DEVELOPMENT CHALLENGE:

Rural Electrification (limited access to electricity in rural areas)

DELIVERY CHALLENGES:

Lack of Resources and Planning Capacity; Insufficient Funding; Lack of Financing Mechanism; Stakeholder Engagement; Beneficiary Targeting

COUNTRY:

Republic of Korea

REGION:

East Asia and Pacific

PROJECT DURATION:

1966–1979

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1 Korea Electric Power Corporation (KEPCO) is the largest electric utility company in Korea, responsible for the generation, transmission, transformation, and distribution of electric power and the development of electric power projects. For more information on KEPCO, see the company’s website: <http://www.kepco.co.kr/eng/>.
2 After the Korean War (1950–1953), the supply of the equipment and materials necessary to distribute, not to mention generate, electric power was extremely limited.

1965 to secure budgets for the Rural Electrification Project.³ Yet, even with support from the president, the project required massive costs for construction and faced administrative challenges.

Addressing the Delivery Challenges: Project Design, Beneficiary Targeting, Financing

Providing electricity to residents in regionally and financially disadvantaged areas required higher unit costs for constructing transmission facilities. Higher unit costs and lower profitability compared to service in urban areas, coupled with technical challenges to distribution, left little incentive for private companies to expand rural electrification. The four major delivery challenges, and the government's approach toward each of the challenges, are outlined below.

- **Resources and planning.** Some of the biggest challenges in launching the Rural Electrification Project stemmed from a lack of resources, including technical expertise, experienced staff, and a long-term development plan for any industry. There was no precedent to refer to in drafting the plan for the national Rural Electrification Project and in preparing long-term development plans for the electric power industry. The government requested a construction plan from KEPCO, which sought strategic and managerial advice from consulting agencies outside Korea. Notably, the company received consultation from EBASCO Services Incorporated and Burns & Roe—U.S.-based construction engineering companies in the energy and power industry—to introduce a new voltage system that unified five different systems and eventually cut costs and alleviated the financial burden on customers.
- **Funding, repayment, and resident engagement.** Securing funding for rural electrification was also a primary challenge because financial difficulties in Korea made investment opportunities limited at both the public and the private levels. The Korean government needed to raise funds from both sectors to match the ₩300 million (about US\$1.15 million at the time) in loans it planned to use—₩100 million (about US\$375,000) from the government and ₩200 million (about US\$750,000) from the Industrial Bank of Korea.⁴ The government took measures, such as doubling its interest rate from 15 percent to 30 percent in 1965, to encourage savings from private households and to increase public funds.

In addition to monthly bills for electricity use, the government levied small payments on rural residents to cover part of the construction costs. Because the upfront cost was burdensome for farmers who were low on cash, some residents initially opposed the project. Village leaders played a pivotal role in organizing numerous village meetings to explain the benefits of access to electricity and to persuade the opposing farmers of the benefits of the project. The gap in funding was eventually covered with presidential grants, rewards for outstanding villages, foreign aid specifically for expansion of electrification, and joint funds from residents.⁵

Aside from raising the funds for loans, the project also faced the issue of loan repayment from the rural communities, which faced high unemployment rates and a meager \$50 to \$70 per capita gross domestic product. It was infeasible to expect swift repayment from such communities, and thus the government needed to implement a long-term repayment process. The legislation was designed to require customers to repay for 20 years with a 1-year grace period. However, after noticing difficulties among the rural communities in repaying under such conditions, the process was amended to a 30-year payment period with a 5-year grace period.

- **Scaling up on a limited budget.** The government was aware that the Rural Electrification Project, when fully implemented, would increase the number of households receiving service two- or threefold. Thus, a careful construction strategy was essential to manage such a dramatic increase within KEPCO's strict budget ceiling, which was imposed by government because of low prospects for additional funding from either the public or the private sector at the time. Drawing on consultations with EBASCO Services Incorporated and Burns & Roe, KEPCO implemented a bulk-purchase scheme to import equipment and hire construction companies for the project. This scheme reduced the cost of building the necessary infrastructure in the target areas and, in turn, helped decrease the overall project cost. Furthermore, the coordination process between the domestic and the foreign companies

³ The Rural Electrification Promotion Act (Law No. 1737), established on December 30, 1965, provided the legal basis to implement the Rural Electrification Project in line with the five-year Power Resources Development Plan.

⁴ The Industrial Bank of Korea is a government-owned bank founded in 1961. It provides financial services to small and medium enterprises and various banking products and services such as loans, consulting, and import and export financing services to individuals and corporate customers.

⁵ Korea received foreign aid specifically for expansion of electrification from various institutions, including the Asian Development Bank and the World Bank Group. The promotion campaign was also accelerated by Korean citizens who were encouraged to work abroad and send remittances to their families for savings.

as a consequence of this scheme allowed domestic manufacturers to access the foreign companies' advanced technologies,⁶ which ultimately contributed to the development of the electricity industry in Korea.

- **Prioritizing target areas.** The government had to prioritize which of the target areas would receive electricity service ahead of the others. Aware that residents of each area would suspect they were getting less benefit than neighboring communities for the same repayment burden, the government needed reasonable selection criteria that could bring out national consensus and overall satisfaction among the residents of the target areas. As a result, higher priority was given to areas with factories and relatively larger economies, whereas lower priority was given to small communities with fewer than 30 households.

Lessons Learned

The Rural Electrification Project was a pioneering nationwide project for Korea, expanding the availability of electricity at an unprecedented rate. Although the project initially faced difficulties because of its unprecedented scale, it was successfully and swiftly executed through collective effort from the Korean government, KEPCO, and Korean citizens. Strong political leadership from the government and the village seniors, active participation from the residents of the target areas, and coordination among domestic and international manufacturers in the electricity industry were key to successful implementation of the project. Today, many scholars and historians consider the Rural Electrification Project to have played a pivotal part in creating balanced economic development in Korea during the 1970s, significantly increasing not just rural household income levels but also the overall quality of life in rural villages (van Gevelt 2014). Furthermore, the project substantially contributed to the growth of the domestic electricity industry by exposing it to the advanced technology and knowledge of international manufacturers.

References

- Byrne, J., L. Glover, H. Lee, Y. D. Wang, and J. M. Yu. 2004. "Electricity Reform at a Crossroads: Problems in South Korea's Power Liberalization Strategy." *Pacific Affairs* 77 (3): 493–516.
- Stern, D. I., P. J. Burke, and S. B. Bruns. 2018. "The Impact of Electricity on Economic Development: A Macroeconomic Perspective." *International Review of Environmental and Resource Economics* 12 (1): 85–127.
- van Gevelt, T. 2014. "Rural Electrification and Development in South Korea." *Energy for Sustainable Development* 23: 179–187.
- Yim, H. B. 2017. *How to Expand Rural Area's Power Supply in 1966–1978 through Rural Electrification Project*. Washington, DC: Global Delivery Initiative; Sejong, Korea: KDI School.
- Yim, H. B., M. J. Park, and S. W. Lee. 2012. *Rural Electrification Project for Expansion of Power Supply*. Seoul: Ministry of Strategy and Finance of the Republic of Korea.

⁶ The government encouraged and supported conglomerates such as Hyundai and Daewoo to acquire knowledge about new power plant engineering techniques through collaborative agreements with foreign companies that possessed such knowledge and experience (Byrne et al. 2004).



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