

REToolKit Case Study

Micro-hydro mini-grids and rural electrification in Thailand¹

In the early 1960s only 2% of Thai villages had electricity. The National Energy Authority or NEA was created to be “responsible for the planning, development and utilization of all energy resources in the country”. Among other tasks, the NEA regulated the hundreds of utilities spread across Thailand, as well as built many of the country’s early power plants. Forms of ownership were diverse: there were over 200 separate small cooperative, municipal or privately owned utilities. During the 1960s, new institutional arrangements were in put place that shape and limit rural electrification possibilities today. Many of these decisions reflected the cold war concerns of the day, and the influence of the United States. The Provincial Electricity Authority (PEA) was created as a state owned company with a mandate to electrify all rural areas in the country. The PEA was created under the Ministry of Interior, a competing ministry with the Office of the Prime Minister that housed the NEA. Whereas as the Office of the Prime Minister is largely concerned with planning, The Ministry of Interior has a focus on infrastructure provision such as roads and water supply, as well as internal security. Rural electrification was increasingly seen as a way to win hearts and minds away from socialist ideologies that were ascendant in the region. As such, rural electrification was an integral part of a larger infrastructure package that included roads to facilitate movement of troops to border areas; irrigation and mechanized agriculture to integrate rural communities into the capitalist economy.

At one point in the mid-1960s, it appeared that cooperative ownership was a serious possibility, but one that was defeated by the PEA, when the National Rural Electrification Cooperatives Association (NRECA) was sponsored by USAID to study the feasibility of setting up rural electrification cooperatives in the three North East districts. The NEA supported this plan, but PEA opposed it. PEA wanted scarce state resources to be used instead to support their own efforts to grid-connect rural towns, and PEA was successful in getting the cooperative experiment scrapped.

In the early 1970s, USAID planners conducted a comprehensive rural electrification pre-feasibility study that focused on electrification through grid extension, and the Thai Government officially adopted the study as the rural electrification master plan for the country. By the time the cold war over impetus for this strategy went away, the bureaucratic structure it had created took on a life of its own – politically strong and preoccupied with its own preservation and growth.

The PEA continued to expand, while the NEA declined in importance and lost power. The PEA received concessionary lending by the World Bank and other bilateral and multilateral funding agencies, such that by the year 2000 over 99% of Thai villages were electrified.

Micro-hydroelectric systems continue to be both the source of electricity and village pride for thousands of remote households. Some of the systems have operated as long as

¹ Small is pitiful: Micro-hydroelectricity and the Politics of Rural Electricity Provision in Thailand, Chris Greacen, Ph.D. Candidate, Energy and Resources Group, UC Berkeley USA.

18 years, but there are unresolved challenges stemming from the common pool nature of the resource, and from some engineering shortcomings in the equipment that are (in many cases) resolvable. It is generally only the arrival of the PEA grid that spells the death knell for a microhydro system in a village. It is no surprise that when presented with the opportunity most villagers would choose PEA. From the villager's perspective, subsidized electricity from PEA is a great deal: it is generally stable and essentially maintenance-free.

Community micro-hydro villages make particularly attractive targets for PEA because these so-called "un electrified households" make easy and good customers. They are already accustomed to paying electric bills and own many electrical appliances. The successor agency to the NEA doesn't bother to struggle to save the micro-hydroelectric systems because the bureaucracy is rewarded on the basis of the number of community systems it builds – not on the basis of the number of customers it serves.

The bureaucratic history of rural electrification indicates that PEA electrifies remote micro-hydro villages because it *can*. With the cross subsidy from MEA (which provides electricity to Bangkok) and large government budgets it has little incentive to avoid extending the grid to remote and uneconomic areas. Indeed, electrifying the whole country fulfills its bureaucratic mission and provides work for its staff.

Thai rate payers and tax payers eventually foot the bill for this arrangement, adding to Thailand's significant debt, but the public is far removed from the decisions that they are accountable to pay for. Marginalization creates a vicious circle. Villagers everywhere know about PEA, while few know of the microhydro alternative, or if they do they are aware of its mixed reputation.

There appear to be three important lessons from this case study.

1. Cost of service (or lack of knowledge of the true cost of service) is not always the decision making parameter, maintenance of power and control by a bureaucratic agency is often the controlling influence.
2. "Small is beautiful" is pitiful if it lacks a critical mass of resources. The economic viability of the micro-hydro systems and their acceptance by villages suggest that given a fraction of the resources and opportunities that the grid approach enjoyed, village hydro and community managed decentralized alternatives like it would be at least as viable as the current centralized grid extension. The marginalization of the technology has created a vicious circle that continues to ensure it remains pitiful.
3. Removing barriers such as lack of information and minor policy changes will have little impact unless they are part of a long term strategy to enlighten the entrenched bureaucracies that control the grid. If electricity infrastructure is to be responsive to the public good, it may be necessary to develop approaches to electrical infrastructure planning and development that emphasize transparency, accountability and community participation.