# Turning on Myanmar's Lights

*Integrated Energy Development Study: Phase Three Fieldwork Initiative*

**Presentation for UT-Chula Workshop**

**KWR International (Asia) Pte. Ltd.**

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# Preliminary Research

Beginning in 2012, initial research on Integrated Energy Development ("IED") was conducted by **KWR International (Asia) Pte. Ltd. ("KWR")** in cooperation with the **University of Tokyo ("UT")** and **Economic Research Institute for ASEAN and East Asia ("ERIA")**.

This work, which served as the energy/electrification contribution for the **Myanmar Comprehensive Development Vision ("MCDV")**, published in 2013, included the identification of data gaps and further evaluation of the environment for IED in Myanmar.

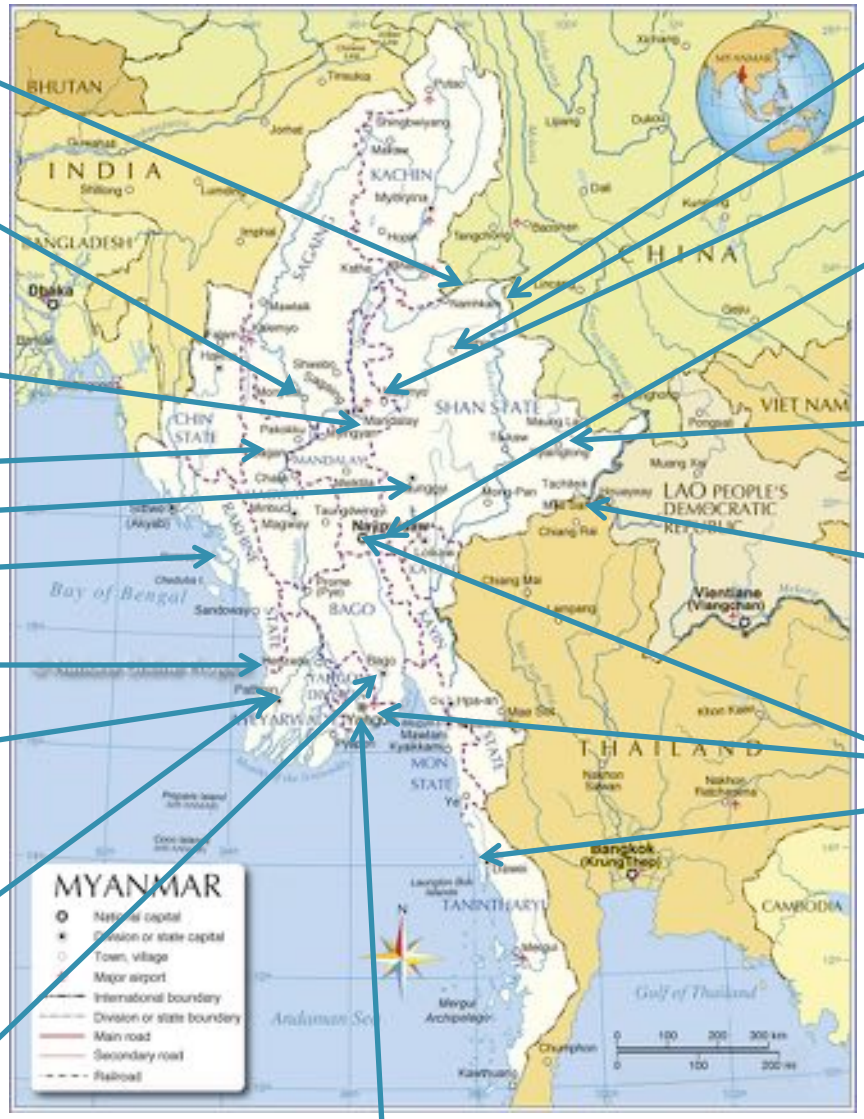
A special emphasis was placed on evaluating prospects in different geographic areas around three themes:

1) **Grid Extension**,

2) **Regional Integration & International Cooperation, and**

3) **Off-Grid Development**.

# Three Phases of Fieldwork included 200+ interviews during visits to:




Muse

Monywa

Mandalay

Bagan/Nyaung-Oo

Taunggyi

Kyaukphyu

Gwa

Pathein

Chaungthar

Bago

Yangon

Laukkai

Lashio

Pyin Oo Lwin

Naypyidaw

Kengtung

Tachileik

Dawei

**Over 100+ additonal meetings and interviews** in **Bangkok, Singapore, Tokyo, US** and other locations

# Phase I: Exploratory fieldwork

**Objectives**

- Comparison of on-the-ground realities with background data and research compiled in 2012 and 2013 for MCDV report
- Further evaluation of current environment for integrated energy development in Myanmar
- Familiarization with, and exposure to, Myanmar's rural environment and refinement of methodology and approaches to conducting fieldwork in Myanmar

# Phase 2: Looking in Depth to Facilitate Rural Electrification

**Objective:** *To develop a more comprehensive understanding of potential rural electrification strategies and technologies in Myanmar through fieldwork visits designed to provide quantitative/qualitative insight into geographical differences, comparative costs and trends, including:*

- **Required Generation:** providing insight into estimated demand through data generated from targeted villages and regions.
- **Cost Estimates**: evaluating comparative costs of different electrification strategies within targeted villages and regions through integration of location-specific data and estimated national assumptions.
- **Village Data:** generating village data to evaluate cost and other potential indicators that can be refined/developed through additional research.
- **Summary Reports:** construction of model/methodology that can generate/ analyze fieldwork data to support evaluation of potential rural electrification strategies and policy approaches to promote integrated energy development in Myanmar.

# Phase 3: Fieldwork

**Objective**

To better understand the dynamics, best practices and potential risks of rural electrification, and to develop a greater understanding of cross-border power arrangements and potential policy responses, additional site visits and research were undertaken with emphasis on Myanmar-China energy relations. Activities undertaken between July-December 2014 include:

- Field visits to Muse and Kokang SAR or other areas near China-Myanmar border, as well as other areas in Shan State, including Lashio, that are heavily influenced by trade with, and investment and immigration from, China

- Meeting with Chief Minister in Taunggyi, capital of Shan State, who controls areas of great interest to China and Thailand for their hydro electricity potential and which are essential for regional energy integration

- Initial research concerning non-governmental organizations and other entities about potential social impact and other "costs" of ongoing and proposed energy projects, including large hydro projects on Thanlwin/Salween River

- Continued engagement with stakeholders and peer review of research and findings

- Participation in meetings on electrification hosted by World Bank and Asian Development Bank

- Training, meetings and workshops on energy issues for Myanmar officials, parliamentarians and practitioners

# Phase 3: Fieldwork Locations

- **Taunggyi**
- **Yay War**
- **Lashio**
- **Laukai**
- **Mauhit**
- **Nan Pak Khar**
- **Muse**
- **Ho Saung**

# Phase 3: Fieldwork Locations

## Taunggyi

- Capital of Shan State and one of Myanmar's largest cities
- Team met with Chief Minister and other key members of the regional government

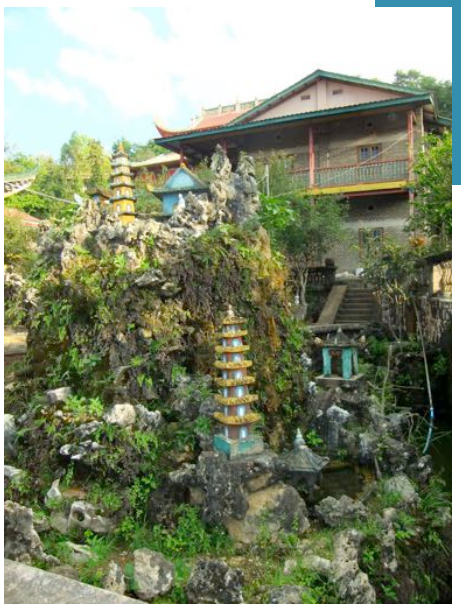
## Yay War

- Relatively poor, agricultural village
- Powered by several micro-hydro turbines run by households
- Aspires to grid connection or greater electrical capacity

# Phase 3: Fieldwork Locations

## Lashio

- Shan State's largest town with rapidly growing population
- Significant influence from China trade and immigration



## Laukai

- Self-administered zone on Myanmar-China border
- Privatized power arrangements not subject to national guidelines
- Impacted by ethnic conflict in surrounding areas

# Phase 3: Fieldwork Locations

## Mauhit

- Small, poor Kachin village located at the end of the national grid
- Electricity is available from church-owned generator and few solar panels
- Received support from World Food Programme

## Nan Pak Khar

- Large agricultural village with small industry (car repair, welding, etc.)
- Formerly off-grid, most wards now receive electricity from China

# Phase 3: Fieldwork Locations

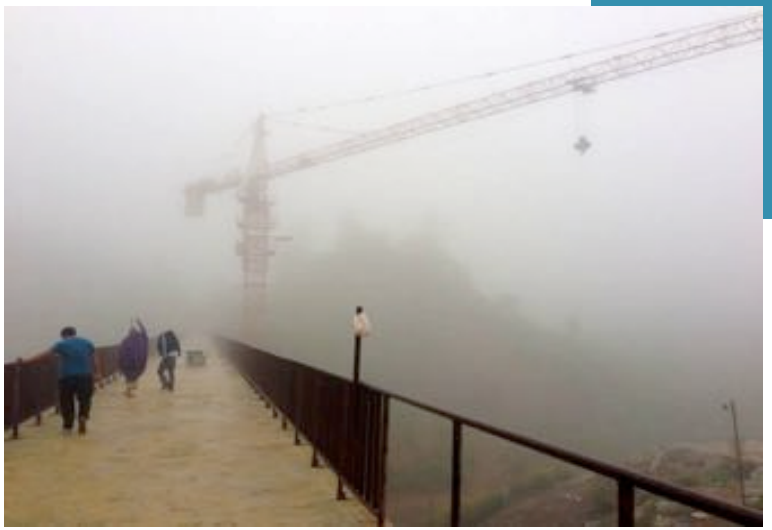
## Muse

- Border town with growing trade and cross-border activity with China
- Site of large-scale luxury development and successful industry
- Benefits from PPP in electricity generation and distribution

## Ho Saung

- Border village near Muse using Chinese power
- Aspires to connect to national grid

# Phase 3: Initial Observations



**Rural Electrification Becomes Less Complex with a Rationale Structure in Place**
Policies on electrification were different in border areas, particularly in the self-administered zones of Kokang. Tariffs were not subject to the government-subsidized rate, meaning private providers were able to generate sufficient returns to hook up villages, replace equipment and scale up capacity. It also took emphasis off of off-grid solutions or home units given the relative ease of grid connection and mini-grid development.

**Electrification Becomes More Feasible when Motivated by Entrepreneur or Developer**
Private involvement in the electricity sector was more widespread in border areas than much of the country. With an incentive to profit from power provision, either due to higher tariffs or the existence of industrial users, private actors have introduced efficiencies and capital investments into MOEP practices.

# Phase 3: Initial Observations

**Stable Power Supply Positively Impacts Industrial and Residential Activity**

A stable supply of power, as was seen along the border – either due to supply from China or functioning public-private relationships – helped local industry develop and increase capacity without concerns over power availability or costs. Households, likewise, benefited from relatively advanced appliances, as well as tools that could provide income-generating opportunities.

**Data Collection and Coordination Remains an Important Challenge to National Planning**

The Team's discussions with regional and self-administered governments underscored the challenges that still exist in data access and collection in Myanmar. One engineer in regional MOEP office confided they had not received enough hands-on training on data collection to provide sufficient data to donors and other international organizations seeking to develop national electrification plans.

# Phase 3: Initial Observations

**Regional Integration Must Carefully Balance Domestic Concerns**

While much emphasis is placed on Myanmar's energy exports to Thailand and China, there is great potential for regional integration to provide long-term benefits to Myanmar. In addition to benefiting from power generated by its more developed neighbors, with the right policy balance, energy sales could help Myanmar fund rural electrification, grid upgrades and other improvements.

**Greater Coordination Needed Between Electrification-Oriented Ministries**

Increased cooperation between electrification-oriented ministries, such as MOEP and MLFRD – the two charged with facilitating rural electrification – would help efforts to improve data collection, prevent duplication of efforts and enhance the ability to coordinate off-grid and grid extension initiatives in a way that would eventually converge.

# Looking Forward: Toward a Comprehensive Framework for Regional Energy Integration - 1

Fieldwork and analysis undertaken by the KWR/UT Team since 2012 has achieved a number of important accomplishments leading toward the development of a more comprehensive assessment of national electricity development and regional integration. These include:

- Development of comprehensive data and information to drive understanding of electrification, rural development and Myanmar's periphery as well as energy relations with its neighbors;
- Identification and examination of key drivers and dynamics of electrification on a village, regional and national level;
- Examination of commonly used technologies, comparative cost factors and regional differences; and
- Improvement in Public-Private dialogue concerning electrification issues.

# Looking Forward: Toward a Comprehensive Framework for Regional Energy Integration - 2

Having completed Background Review and Phase 1-3 Fieldwork, further examination is needed to finalize research and prepare findings that:

- Identify and examine regulatory obstacles to universal electrification;
- Identify and examine social obstacles to universal electrification;
- Identify and examine special projects and cross-border electrification initiatives that do not necessarily follow national guidelines;
- Continue cultivation of contacts and formulation of stakeholder network and mechanism for peer review of research and policy discussion; and
- Discuss and examine policy approaches for Myanmar electrification and regional integration within final report.

# Q&A/Next Steps?

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