

REPUBLIC OF THE UNION OF MYANMAR

Myanmar National Electrification Project  
Preliminary Poverty and Social Impact Assessment to Inform Environmental and  
Social Management Framework

**DRAFT**  
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## ABBREVIATIONS AND ACRONYMS

ABC	Aerial Bundled Cable
ACSR	Aluminium Conductor Steel Reinforced
ACTED	Agency for Technical Cooperation and Development
ADB	Asian Development Bank
ASEAN	Association of Southeast Asian Nations
CBO	Community-Based Organisation
CERC	Contingency Emergency Response Component
CHN	Chin
CPF	Country Partnership Framework
CSO	Civil Society Organisation
CSR	Corporate Social Responsibility
DC	Direct Current
DEP	Department of Electric Power
DFID	Department for International Development
DP	Development Partner
DPG	Development Partner Group
DPWC	Development Partners Working Committee
DRD	Department of Rural Development
EAOs	Ethnic Armed Organisations
EAG	Ethnic Armed Group
EAP	East Asia Pacific
EI	Earth Institute
EITI	Extractive Industries Transparency Initiative
EMR	Enlightened Myanmar Research
ENG	English
ESE	Electricity Supply Enterprise
ESMF	Environmental and Social Management Framework
FAO	Food and Agriculture Organisation
FGD	Focus Group Discussion
FPIC	Free Prior and Informed Consent
FY	Financial Year
GAD	General Administration Department
GDP	Gross Domestic Product
GRS	Grievance Redress System
GWh	Gigawatt Hour
HDBC	Hard Drawn Bare Copper
HDI	Human Development Index
HH	Household
HP	Hewlett-Packard
HP	Horse Power
HV	High Voltage
ICG	International Crisis Group
ICT	Information and Communications Technology
IDA	International Development Assistance
IEC	Information, Education and Communication
IFC	International Finance Corporation
IFI	International Financial Institution
IHLCA	The Integrated Household Living Conditions Assessment
ILO	International Labour Organisation

INGO	International Non Government Organisation
IPP	Independent Power Producers
JICA	Japan International Cooperation Agency
KfW	Kreditanstalt Für Wiederaufbau (German Development Bank)
KII	Key Informant Interview
KV	kilovolt
KVA	Kilo volt amp
Km	kilometre
KWh	Kilowatt hour
LIFT	Livelihoods and Food Security Trust Fund
LSMS	Living Standards Measurement Study
LV	Low Voltage
M	Metre
MDY	Mandalay
MEPE	Myanmar Electric Power Enterprise
MLFRD	Ministry of Livestock, Fisheries and Rural Development
MMR	Myanmar
MoBA	Ministry of Border Areas
MoE	Ministry of Energy
MoECAF	Ministry of Environmental Conservation and Forestry
MoEP	Ministry of Electric Power
MoH	Ministry of Health
MoI	Ministry of Industry
MoST	Ministry of Science and Technology
MoU	Memorandum of Understanding
MP	Minister of Parliament
MPSI	Myanmar Peace Support Initiative
MSIM	Marie Stopes International
MV	Medium Voltage
MW	Megawatt
MWCDF	Myanmar Women and Child Development Foundation
NEEC	National Electrification Executive Committee
NEMP	National Electricity Master Plan
NEP	National Electrification Plan
NGO	Non Government Organisation
OBA	Output Based Aid
OECD	Organisation for Economic Co-operation and Development
OP	Operational Policy
PAD	Project Appraisal Document
PDSG	Peace Donor Support Group
PMO	Project/Program Management Office
PSIA	Poverty and Social Impacts Analysis
PV	Solar Photovoltaic
QSEM	Qualitative Socio-Economic Monitoring
RoW	Right of Way
REAM	Renewable Energy Association Myanmar
SA	Social Assessment
SAE	Sub-Assistant Engineer
SCD	Systematic Country Diagnostic
SD	Social Development Team
SDC	Swiss Development Cooperation
SMEs	Small and Medium Sized Enterprises

SMI	Sustainable Marketplace Initiative
SRE	Self-Reliant Electrification
STW	Sittwe
SU	Supplementary Understanding
SWIA	Sector-Wide Impact Assessment
TA	Technical Assistance
TBC	The Border Consortium
TED	Township Electricity Department
TNI	Transnational Institute
ToR	Terms of Reference
TV	Television
TWh	Terawatt Hour
UK	United Kingdom
UMFCCI	Union of Myanmar Federation of Chambers of Commerce and Industry
UN	United Nations
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFPA	United Nations Fund for Population Activities
UNHCR	United Nations High Commissioner for Refugees
UNOHCHR	Office of the High Commissioner for Human Rights
US	United States
USAID	United States Agency for International Development
VA	Village Administrators
VEC	Village Electricity Committee
WB	World Bank
WBG	World Bank Group
YECO	Yangon Institute of Economics
YESB	Yangon Electricity Supply Board
YGN	Yangon

## 1. EXECUTIVE SUMMARY

To support institutional and policy reforms in the energy sector, the World Bank has financed a Poverty and Social Impact Assessment (PSIA) to support the Government of the Union of Myanmar prepare the Myanmar National Electrification Plan (NEP) and to inform the National Electrification Project (the Project) as well as ongoing Technical Assistance provided under the World Bank-financed Myanmar Electricity Power Project (MEPP). The PSIA has stakeholder consultations and an assessment of potential social impacts and risks for the Project.

**The PSIA is intended to support these initiatives** by providing information on: (i) the institutional context where the development and implementation of the NEP takes place; (ii) energy and electricity consumption patterns with a focus on energy poverty; (iii) perception of affordability of electricity connections and recurrent charges - with a particular focus on the new tariffs introduced in April 2014 and how these have affected different groups of consumers; and (iv) consumers' perspectives on the quality of services and understanding of pricing. The PSIA used a mixed methods approach and included a quantitative and a qualitative module to collect information on the issues outlined above.<sup>1</sup>

**In parallel with the PSIA an assessment of potential social impacts and risks were undertaken during January – March 2015 in accordance with the World Bank safeguard policies (OP 4.01, 4.10 and 4.12) and to inform the Project's Environmental and Social Management Framework (ESMF).** This work was led by an international consultant based in Yangon working with MoEP and DRD Social Safeguards counterparts, and with guidance from the World Bank.

**Consultations with a large number of stakeholders through key informant interviews, focus group discussions and formal consultations were held during the PSIA and ESMF preparation.** Stakeholders included representatives from the private sector, government at state, district, and township levels, civil society organizations (international, national and local), ethnic minority organizations, and local communities. The PSIA and project consultations included ethnic minority communities in Chin, Shan, Mon, Rakhine, and Kayin States.

**The PSIA was implemented in a context where Government announcements of tariff increases in November 2013 met with significant opposition and protests on the part of citizens. Electricity tariffs for retail customers were adjusted in April 2014<sup>2</sup>.** The analysis included quantitative and qualitative modules. The PSIA drew on the results of a “deep-dive” into the 2009 IHLCA data focusing on access to electricity, reliability of supply and affordability. A background paper (forthcoming) by Kozel and Kim is currently being finalized and will include an overview of the methodology. In addition, qualitative analysis was conducted in two phases (Phase I, in February/March 2014 and Phase II – in February/March 2015)<sup>3</sup>. The analysis built on the ongoing research program of the

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<sup>1</sup> The quantitative analysis based on 2009 Living Standards Survey (IHLCA) will be presented in a forthcoming paper by Kozel and Kim

<sup>2</sup> Previously tariffs had been adjusted in January 2012 following significant devaluation of the Myanmar kyat

<sup>3</sup> Analysis of PSIA Phase II data is currently ongoing to inform the Technical Assistance components of MEPP and the National Electrification Project.

Livelihoods and Food Security Trust Fund (LIFT): Qualitative Socio-Economic Monitoring (QSEM) implemented for the World Bank by the Enlightened Myanmar Research (EMR).

**The selection of field sites took into account the importance of understanding the different contexts, conditions of access to electricity and perceptions of consumers in rural and in urban areas.** For rural areas, a sub-set of 13 the 56 QSEM villages were targeted to collect information from areas with different types of access to electricity in different Regions/States and “agro-ecological zones” in Phase I. And a total of 13 villages were covered during Phase II of the analysis, of which 11 were new sites.<sup>4</sup>

**Data collection in rural areas** included a total of 108 FGD and 78 KII (and short questionnaires on energy consumption) for Phase I<sup>5</sup> and a total of 89 FGDs and 42 KIIs for Phase II. In addition, a short questionnaire was used to assess affordability and financing gap in accessing the government grid connection with a total of 35 rural households interviewed by per site (a total of 525 interviews conducted).

**In urban center 300 KIIs and 6 FGDs<sup>6</sup> were conducted in the main urban centers of Yangon and Mandalay as well as in the capital of Chin State (Hakha) under Phase I. An additional 315 household interviews were conducted in urban areas** to assess affordability and financing gap in accessing the government grid connection.<sup>7</sup>

### *Barriers to access and main uses of electricity*

**The IHLCA data indicates that overall, 28% of households in Myanmar were connected to the public grid in 2010 with marked differences between rural and urban areas: 77% of urban households were connected to the grid compared to only 10 percent of rural households.** An additional 15% reported they purchased electricity from private suppliers (9% of urban households, 18% of rural households). Another 5% indicated they used communal or had a private generator, and 7% reported using batteries for lighting. Overall, the IHLCA data indicates that there were substantial gaps in access to reliable electricity and that households, and communities and households developed innovative alternatives to secure access to electricity albeit without ensuring reliable supply.

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<sup>4</sup> Two of the three villages with access to the Government grid identified in Phase I were also covered to collect additional information on the community organization approach followed.

<sup>5</sup> Eight FGDs conducted per site with: (i) village leaders (1 FGD), (ii) different livelihood groups (FGD 2 to 6); (iii) electricity committee (FGD 7); and (iv) women (FGD 8 to assess whether there were any relevant difference in terms of perception of quality of services or barriers to access and affordability by gender). In addition, six KIIs were conducted per site, two with each of the main socio-economic categories as defined by the villagers (better off, middle quintile and vulnerable households).

<sup>6</sup> KII were the preferred means of data collection in urban areas.

<sup>7</sup> Key Informant Interviews (KIIs) were the preferred means of data collection with 25 KIIs conducted per site (five in each of the four wards selected to exemplify different In addition, FGDs were conducted with Electricity Committees in Industrial Zones and Township Electricity Departments where relevant. Urban areas were purposefully selected to collect information from: (i) areas where negative feedback to the announcement of new electricity tariffs in November 2013 had been the strongest (Yangon and Mandalay); and (ii) smaller urban areas where access to electricity remains limited and challenges with the quality of supply are an important issue (Hakha was selected as it exemplifies some of the challenges common in a number of state capitals).



**Overall, households with public connections were much more likely to live in urban areas and were wealthier than households with private or communal connections.** Access to electricity was highly correlated with income. Better off households were much more likely to use electricity (particularly the public grid) than poorer households.

**According to the IHLCA data, households connected to the public grid reported spending 1.4% of total expenditures on electricity, and the share of spending was fairly constant across the income distribution (for poor as well as rich households).** Households accessing electricity from private suppliers reported spending 2.2% of total consumer expenditures on electricity, which was also constant across the income distribution. Low spending is the result of modes tariffs and a generous lifeline tariff cut-off, coupled with low electricity consumption. A substantial number of (public electricity) households in Myanmar consume below the lifeline tariff (currently set at 100 KWh/month): in urban areas, 30% of households consumed 50 KWh/month or less, and 66% consumed 100 KWh/month or less. In rural areas, 53% of households consumed 50 KWh/month or less, and 88% consumed 100 KWh/month or less. Overall, current tariffs are moderate and electricity remains affordable to those who currently have access.

**Importantly not all households within electrified villages and wards were themselves connected to electricity services.** Electrification rates for urban wards/rural villages were substantially higher than electrification rates for individual households. According to the IHLCA, 41% of wards or villages were connected to the public grid, 13% reported communal electricity sources, and 50% had households that used electricity from a private supplier. Overall, 78% of urban wards and rural villages had some type of electricity supply available (viz. public, private, or communal). In 40% of electrified wards/villages, nearly all households were electrified. But private connection rates were highly variable in the remaining 60% of wards/villages.

**Very few households had electricity available 24/7. Surprisingly, there was no strong relationship between the reliability of the supply of electricity (measured in average hours available/day) and household income.** Households connected to the public grid reported an average availability of 12 hours/day, households connected to private suppliers reported an average availability of 10-11 hours/day.

**IHLCA tabulations, augmented by some additional simulations, do not suggest that electricity affordability is currently a concern for households currently connected to electricity services in Myanmar.** It is important to understand this finding in a context where better off households are currently much more likely than poorer households to be connected to the grid. In addition, this finding was not reflected in the qualitative analysis and warrants additional study. Qualitative analysis further indicated that in rural areas, electricity committees and private companies do charge rates significantly above those set by MoEP. Further analysis will be particularly relevant as the NEP plans a steep increase in the number

of households to be covered by electricity services and an outreach to poor and marginalized households currently not connected.

*Barriers to Access in rural and urban areas*

**The “Self-Reliant Electrification Approach” (SRE) currently in place through which communities raise their own funds to connect to the Government’s electricity grid provides no financial support to communities. Access to electricity in rural areas is limited, therefore, by the current coverage of the grid but also by the fact that villages must cover the costs of the connection from the main “transmission” line to the village itself.**

**Limited technical support is provided by the township departments of the electricity companies responsible for overseeing the SRE and there is little regulation of the role of electricity committees that oversee SRE at village level.** Composition and selection of electricity committee members, their functions and roles, segregation of duties, procedures for financial management and procurement, disclosure of information, community mobilization and planning procedures as well as the rates for be charged are left to the discretion of the committees themselves. This creates a number of organizational and governance challenges and often results in electricity tariffs significantly above those set by government. Given the limited external support available for SRE, social cohesion, social capital and quality of leadership at village level play a key role in determining the village’s chances to access the Government’s electricity service.

**Within villages connected to the grid (or with access to electricity through community initiatives), a significant proportion of the population (middle and lower income households) remain without access.** The fees associated with connecting the village to the grid are unaffordable for these households. In addition, the research team noted that poor households are excluded right from the planning stages – as village leaders/elites assume their inability to pay and do not invite them for discussions. While there were no instances noted (in the areas visited) of particular groups being denied access to electricity based on other social factors (ethnicity, political or religious affiliation for example) poorer villages and households are systematically being excluded due to their inability to pay for the connection.<sup>8</sup> No instances of cross-subsidization were observed (where the village itself put in place a mechanism to facilitate access to poorer households).

**Social capital at village level also plays a key role in determining access to electricity given the importance of ‘self-organizing’ in rural areas.** The Self-Reliant approach to electrification means that in addition to village wealth, the quality of leadership and the village’s overall connections with township and regional ESE offices play a determining part. Accessing information about the procedures was very reliant on personal connections across all sites visited. The ability of the village

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<sup>8</sup> In this regard it is important to note that qualitative analysis was undertaken in 13 villages only and that further work will be conducted under the PSIA Phase II to understand possible social dimensions of exclusion within villages with greater depth.

electricity committee to mobilize the community (or more precisely the better-off sections of the community) is a determining factor for success.

**A more detailed analysis of the functioning of Village Electricity Committees (VECs) was undertaken under Phase II of the PSIA.** The structure, function and governance of VECs in villages with access to the Government electricity grid varied significantly across sites. As noted during Phase I of the PSIA, the SRE approach provides limited guidance on VEC operations and township level Electricity Departments do not have the human resources, technical or financial capacity to provide oversight to VEC operations.

**All VEC in targeted villages had close linkages to local government and administration, with Village Administrators (VA) being systematically involved in the establishment and functioning of the committee.** Village Administrators were members of the VEC in all but one instance. Religious leaders and wealthier households within the community were less systematically involved but often played an influential/determining role in linking villages with contractors and/or influential local or national government figures who can significantly accelerate the process of connection to the electricity service by fast-tracking applications, providing access to discretionary funding, facilitating access to loans and technical assistance. (Please see Table x below for an overview of VEC composition and functioning).

**Village Electricity Committee structure, reporting arrangements and linkages with the broader community is largely left up to the village administration.** In six of the eight villages with connection to the Government grid covered in PSIA Phase II, there was no regular reporting to participating households and the broader community on physical and financial progress with implementation. The majority of the VECs (seven of the eight VECs covered) included a dedicated accountant and reported maintaining regular records of all financial transactions, available for consultation by participating households and the broader community. In six of the eight cases, however, there was limited awareness on the part of the broader community of the costs of SREs, of process for selecting contractors and calculating maintenance costs and of the fact that records were indeed available for consultation.

**The exclusion of poor and marginalized households noted during PSIA Phase I was confirmed by the analysis carried out under Phase II.** None of the VECs in the targeted villages included participation by poor households given the nature of the SRE and lack of guidance for targeted support for poor households. All VECs in the study areas made a decision early on in the process about the households who could/could not afford to buy into the scheme. Given the high, those who can afford to contribute to the connection were invariably the better off households. Even in those villages with high levels of social cohesion/social capita there was no discussion/system in place to cross-subsidize the participation of poor households.

**In addition, women were systematically excluded from participating in the VECs, with the exception of one village in the sample.** In all other instances, women were not considered eligible for participation. Where communities had suggested their inclusion, the Township Electricity Department requested their names

be removed from the list as the duties of VECs members were considered to be “too much responsibility for women” and may require them to work in the evenings. One village in Chin state (#1) includes one woman in the VEC. This was attributed by informants to the training received by the Village Administration on gender through an externally funded (INGO supported) intervention on water resource management. The training stressed the importance of women’s involvement/leadership in the planning process of community-based interventions.

**There was no significant variation noted in terms of social inclusion and community participation across regions/ethnic groups in sample villages, although one case was observed.** Elite capture of the process and limited communication with the community was the overall trend observed. The PSIA Phase II villages included two mixed villages (Village 17 in Mon and Village 6 in Shan). In the Mon case, the village is made up of Palong (20%), Burma (45%) and Kayin (35%) farmers with all groups being represented in the VEC and in the planning of village electrification. Burma and Kayin tended to dominate local government institutions which did not affect the distribution of benefits from the electricity scheme. There was no ethnic dimension to the exclusion of poor households in this case. What determined household ability to access electricity was exclusively household income. In the case of Village 6 in Shan electricity was provided by a large private company (hydro). The village is predominantly Shan with a minority (20%) Palong households. Livelihoods and household welfare tend to be divided along ethnic lines with Palong households living the outskirts of the village and being predominantly landless farmers and daily laborers. Palong households were therefore at an economic disadvantage in terms of joining the electricity service. In this case, the private company, linked to the village administration (Shan dominated), provided better conditions of access for Shan households – namely initial credit and the ability to pay connection fees in instalments. No such flexibility was provided to Palong households with the result that all those in the village currently excluded from accessing electricity are Palong.

**Barriers to access (inability to connect to the service) were less relevant in the main urban centers but significant for smaller cities (Hakha) and for informal settlers in poorer wards (Yangon and Mandalay).** Overall access was not the key concern in the major urban centers of Yangon and Mandalay and issues of quality of service and affordability were more frequently highlighted by respondents across all wards visited. There were, however, noteworthy issues of access particularly by informal settlers in Yangon (namely in the poorer ward visited, YGN-3)<sup>9</sup>. While the costs of the connection were indicated as a barrier to access by a small minority the most commonly mentioned reason for using these “better than nothing at all” services in Yangon was the inability to secure the necessary documentation (including household and land registration as well as approval of the application by the ward leader) to apply for a connection.

**Informal connections to small-scale local providers of electricity (using diesel generators) were observed across all cities and were particularly important in Hakha.** This was noted given the limitations of the coverage by

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<sup>9</sup> Informal settlers in Yangon (YGN 3) are not included in wards records and therefore not officially “counted” in data on access to electricity (please see Table 9)

government-provided electricity services (only a few hours every other day). In Mandalay, all neighborhoods visited had connections to electricity provided by similar small-scale operators. This was conveyed as a “back-up” option given the widespread black-outs experienced until recently in the city. In Yangon the research team found a different scenario where only the poorest groups (informal settlers) relied on the services of these small local private providers given their inability to access the grid as highlighted above.

**The cost of connections for households and industrial/commercial consumers varied across sites but did not constitute a barrier for the majority of respondents in urban areas as it did in rural areas.** However, as noted above, the poorest and marginalized households in low income wards could not afford the connection fee and used informal electricity providers instead. In addition, interviews conducted with households from the wealthiest quintiles and businesses in Industrial zones in Mandalay and Yangon indicated that a significant portion of the connection cost had been shouldered by the households and/or by businesses themselves at the time of establishment.

#### *Uses and quality of the service*

**The qualitative analysis indicated that uses of electricity were very consistent across research sites in rural areas. Household use was primarily for lighting and TV across all sites visited.** For lower middle income households (among those with an electricity connection) lighting was often the only use found. Diesel was the primary source of energy for livelihood activities for the vast majority of households and small businesses interviewed. Overall, the cost of diesel (and fluctuations in cost) were a significant constraint to their profitability and there was high demand among rural Small and Medium Enterprises (SMEs) for grid-based electricity services.

**While current usage of electricity was limited, households across all rural research sites (with and without access to the Government grid) highlighted the importance of an electricity connection to “be linked up to the outside world”** particularly through a TV. There was a sense in village with no electricity connections that they were left behind in terms of the “modernization” process (particularly where better-off villages in the vicinity were connected to the grid). Furthermore, there was high demand for more reliable electricity services so children could study at night and electricity could be used for livelihood activities (in the areas visited this consisted of pottery making in the evenings, lighting in small village shops and more generally agricultural activities given the very high perceived cost of diesel).

**Agricultural tasks for large/medium/small farmer were systematically carried out with diesel generators.** These were owned for large/medium farmers and rented out for small farmers. Better off households, in villages with reliable electricity supply, used electricity for water pumping and limited irrigation. In the areas surveyed, fishermen mainly relied on diesel generators for productive activities (i.e for lighting to sort fish in the evenings).

##### 1.1.1 Quality of the service in rural areas

Types of Sources	Villages	Regularity	Capacity
Grid Connection (Government or Private Provider)	Village 1 (Magway)- Grid	Regular access- 24 hours (black-outs very rare)	Good capacity (regular household uses – lighting and TV as well as water pumps)
	Village-3 (Chin) - Hydro	One day out of three	Good enough for lighting and TV
	Village-2 (Shan-N) Grid	Regular access- 24 hours (black-outs very rare)	Good capacity (regular household uses – lighting and TV as well as water pumps)
	Village-5 (Shan-E) - Hydro	Regular access- 24 hours (black-outs very rare)	Good capacity (regular household uses – lighting and TV as well as water pumps)
Community Initiatives	Village-4 (Chin) - Hydro	2 hours daily	Lighting and TV only
	Village-7 (MDY) – Generator	2 hours daily	Limited capacity lighting only
Household re- distribution/small businesses using diesel generators	Village-6 (Magway) -Village Monastery generator	2 hours daily	Lighting and TV only
	Village-8 (Rakhine)- Household redistribution	2 hours daily	Lighting and TV only
	Village-9 (Rakhine) - Household re-distribution	2 hours daily	Lighting and TV only

**Unlike in rural areas, uses at household level in urban areas varied more markedly across wards/income groups and cities.** Urban households with generally better access to reliable electricity used significantly more appliances. Beyond lighting and TV, electricity was commonly used to run refrigerators, stoves, kettles and rice-cookers. Air-conditioning was an important use among higher income households and found exceptionally only in middle-income households. The use of electricity for cooking was observed in better-off wards but was much less prevalent in middle-income neighborhoods and non-existent in the poorer wards. Issues of quality of service were stressed in poorer wards more strongly (across all three cities) both in terms of the availability, reliability of the supply and speed/cost of repairs.

**With the exception of Hakha, which has significant limitations in the actual availability of service, respondents in Yangon were the most critical regarding the quality of the service** (particularly in the middle-income ward visited). In Mandalay the overall perception across sites was that privatization had improved the quality of service and customer relations. There were some variations, within cities in terms of quality of service with poorer wards highlighting more power fluctuations and difficulties in getting repairs done. Interestingly, better off households reported good service for repairs with no informal charges. These were more frequently mentioned in middle income wards. Poorer households tended not to call the service provider (as this would take too long) but instead to call upon private electricians (sometimes employed by the electricity companies but doing these small repair jobs “on the side” for additional income).

## Uses of electricity and perception of quality in urban areas

Location	Uses	Perception of Quality
<b>Poorer Wards</b>		
CHN- 3	Mostly lighting with firewood used for cooking and heating	Limited availability - 3 hours/day during 5 days a week
MDY- 3	Lighting and TV	Fluctuation in capacity throughout the day, issues noted with maintenance and charges covered by the community (frequent weather related damage).
YGN- 3	Lighting and TV with charcoal used for cooking. A very limited number of respondents (2 of 25) had small appliances (kettle, rice-cooker)	24 hours supply but limitations in terms of capacity (water pumping only possible during the day for example). For repairs, households contacted electricians privately and paid them directly.
<b>Middle Income Wards</b>		
CHN- 2	Lighting and TV with very limited appliance use. Charcoal used for cooking and heating	Limited availability - 3 hours/day during 5 days a week
MDY- 2	Lighting, TV, limited use of appliance (fans rather than air-conditioning). Hot plates used for cooking	Limited capacity for 1 or 3 hours during cooking time in the evening but overall good supply and few blackouts. Improvements in quality of service also noted with privatization. Some informal charges reportedly collected for repairs
YGN- 2	Lighting, TV, basic appliances including stoves, kettles, rice cookers, refrigerators and simple washing machines. Electricity used for cooking with more limited use of charcoal for the households interviewed	Limited capacity during cooking hours (10 am to 12 pm). Repairs are relatively quick but informal charges collected
<b>Better-off Wards</b>		
CHN- 1	Lighting, TV and limited appliance use. Cooking and heating done with charcoal. Use of private generators to complement limited government services	Limited availability - 3 hours/day during 5 days a week.
MDY- 1	Lighting, TV appliances air-conditioning and cooking	Some issues with capacity and occasional black-outs (weather related damage). Noted improvements in service after privatization (particularly for maintenance and customer service). Repairs were conducted quickly and no informal charges were reported although "tips" were provided
YGN- 1	Lighting (including security lighting/garden lighting), full range of appliances including air-conditioning and cooking	24 hours and good capacity. Repairs were conducted quickly and no informal charges collected although "tips" were provided

### Affordability of the new tariffs: perceptions

#### *In rural areas*

**In rural areas, there was an overall lack of knowledge on the part of households about the electricity tariffs charged by Government and the increase taking effect in April<sup>10</sup> 2014.** Across all 13 villages visited, only a very limited number respondents had heard about the tariff increases. These were: (i) the members of the Electricity Committees at village level and; (ii) occasionally small business owners who had heard the announcements on TV.

**Standard government rates were applied only in two of the four villages where electricity services were provided either by government or a private company (per kWh/hour).** In the other two sites, tariffs collected were much higher

<sup>10</sup> It is important to note that field work in rural areas was conducted in March 2014. This was following the announcement of the increase in rates but before the tariffs were reflected in the new bills.

than government rates at 200 Kyats/kWh and 50 Kyats/kWh and were set by the electricity committee. As noted earlier, the functioning of the electricity committee is largely unregulated and while these committees are responsible for the maintenance of the village's system there is no guidance provided on what amounts to charge for the service. In addition, the level of detail provided in the bill does not allow households to fully understand the tariffs, additional meter rental charges or other maintenance charges that may be added. Overall, where social capital was high and there was trust between the electricity committee and the villagers the amounts charged were not questioned. Governance challenges did emerge as highlighted in the case of Village 3 (Box 3).

#### Rates and additional charges (Government and Private Companies in Rural areas)

Service Provider	Villages	Tariffs	Additional Charges	Monthly charges (kyats)
Government-provided Electricity	Village 1 (Magway)	Government rates for both domestic use and businesses	Regular monthly charges: 500 kyats for meter maintenance, 300 kyats for village electricity committee, and 300-500 kyats for "units lost" between village main meter and individual household meters. Occasional charges: 1,000 kyats for maintenance when larger repairs were required	2,000 to 17,500
	Village-3 (Chin)	Government rates for both domestic use and businesses (small hydro)	Regular monthly charges: 200 kyats contribution for collecting/paying bills at township office	3,000 to 8,000
	Village-2 (Shan)	50 kyats/KWh (the rate set by the village electricity committee)	Regular monthly charges: 500 kyats for meter maintenance	3,000 to 25,000
Private Company (Hydro)	Village 5 (Shan)	200 kyats/KWh	None	4,000 to 14,000



Rates charged by community-based schemes and small businesses re-distributing electricity

Service Provider	Villages and type of service	Rates charged
Community Initiatives	Village-4 (Chin) - hydro	16 baskets of maze per household as an annual contribution (very poor quality of service noted)
	Village-7 (MDY) – diesel generator	1500 Kyat/month for lighting and 1000 kyats/month for TV
Households redistribution of electricity (diesel generators)	Village-6 (Magway)	1000 Kyat/month for lighting and 1500 kyat/month for TV
	Village-8 (Rakhine)	3000 kyats/month for Lighting and 1500 kyats/month for TV
	Village-9 (Rakhine)	3000 kyats/month for lighting and 6000 kyats for TV

**When assessing affordability of the rates currently practiced in rural areas it is important to consider the perspectives of three groups:**

- i. **Overall, for those with access to either Government/Private Company Services or more informal (community schemes or small businesses), payments were considered affordable.** Consumption was overall low (primarily for lighting and TV as noted above) and respondents in rural areas were: (i) not concerned about the upcoming tariff increases; (ii) were not planning to further reduce electricity consumption. In terms of coping strategies, landless/land poor households did, however, occasionally resort to late payments (no more than 1 month for grid connection or additional few days for community initiatives/household re-distribution) or to borrowing from neighbors for monthly electricity payments (for a short period of time and without incurring any interest – the rationale being that they would be able to reciprocate the favor at a later date). Value for money considerations were frequently brought up by respondents when discussing affordability of tariffs, with grid-based services usually considered reasonably priced by those with access.
- ii. **Participants in FGD, Key Informants (in villages 4, 7, 8 and 9) without access to reliable electricity supply also referred to the fact that the service received was “expensive” given the poor quality.** They expressed a keen interest in access the Government grid (should the connection to the village be affordable) as it would result in “savings” (lower rates for a better service than what they current have access to).
- iii. **Importantly, the poorer groups in the rural areas visited (as defined by the villagers themselves) considered they could not afford to pay electricity charges even for the minimum lighting in the evenings.** These groups were not currently connected to the grid (in villages 1,2 and 6) or to community initiatives/small businesses providing a few hours of electricity in the evenings (for villages 4,5,7,8 and 9). The discussion about affordability of rates currently being charged in rural areas (across the different types service providers –

formal or informal), needs to be understood in a context where: (i) the poorest villages in the study sample do not have access to the government grid or electricity provided by private companies; (ii) the most vulnerable households within the communities do not have to electricity (and use candles, kerosene lamps for lighting).

**Currently this group considers the connection costs to the home and the lowest rates charged by small-scale suppliers (typically 1500 kyats/month for lighting in the evening) unaffordable.** As the NEP rolls-out and grid connections are extended subsidizing access by these groups in terms of connections to village and home as well as subsidizing tariffs to allow access to electricity will be key.

*In urban areas*

**Analysis in urban areas was conducted in April and May 2014 once new tariffs were already in place and the first bill with the increases had been paid by households.** Compared to rural areas, there was a generally good understanding of the new tariffs charged and greater clarity in terms of the different charges that make up the electricity bill.

*1.1.2 Monthly bill comparison and increase percentage of tariff in different groups*

Wealth Quintile	Average Usage (units kWh)	Previous monthly bill (average)	Current monthly bill (average)	Estimated increase %
Well-off	1,443	50,500	70,00	38
Medium	282	9,800	11,500	17
Poorer	138	4,900	5,000	marginal changes

**Given the limited supply of electricity in Hakha (number of hours/day), the city was in an exceptional situation in that the increase in rates were not considered relevant for all respondents across wards (including the poorest).** There were high expectations regarding the expansion of Government electricity services. A common concern for better off/middle income households and small businesses in Hakha was the high cost of fuel for diesel generators. There was significant hope that improved access to electricity would eventually result in savings. As in rural areas, the use of solar panels as an alternative to diesel (for lighting) was frequently observed for households that were able to afford the upfront investment. Overall rates charged were considered affordable although respondents resented having to pay “maintenance fees” for meters 500 kyats/meter/month (in fact meter rental fees) as they reported receiving “no maintenance services”.

**The situation was significantly different in Yangon and Mandalay where particular segments of participants in the study reported being “very affected” by the increase, namely middle-income households and some categories of SMEs.** As noted earlier it is important to highlight that the findings reported here focus on households and businesses perceptions of impact. In the case of middle-income wards, where feedback on tariffs was strongly negative, there were, in fact, no negative coping strategies reported. Respondents in this case linked their dissatisfaction with the tariff increases with the lack of improvements in the quality of services.

*Feedback from poor and marginalized households*

**Pre-existing difficulties to pay were noted for the most vulnerable households interviewed, although this segment of interviewees did not see their electricity tariff increase.** Households considered vulnerable/marginalized within the poorer wards themselves reported challenges with making monthly electricity payments (both for grid connection and for small scale distributors). Overall, the main coping strategies noted were delays in payment and borrowing from neighbors. Borrowing was done without interest charged but with the idea that the favor will be reciprocated if needed, indicating significantly high levels of social cohesion/social capital in these wards. Payments were never more than a month late for grid connection and a few days late for small-scale providers.

**As noted earlier, in a small number of cases (among on the households interviewed) the cost of the connection to the household was a barrier for the poor in urban areas.** This was true in wards where the government service does not yet provide full coverage and connection to some blocks in the ward may require a significant investment. Respondents in this category in Mandalay<sup>11</sup> use the services of informal providers instead. They indicated that given the opportunity to connect they would prefer to pay government tariffs considered overall affordable and as better value for money if the cost of connection could be subsidized.

*Respondents in middle class wards*

**Respondents in middle class ward had mostly moderate overall increases but had strong negative feedback on the additional cost particularly in Yangon.** These participants in the study highlighted that increases in tariffs were not accompanied by improvements in the quality of the service. Given the level of consumption/types of uses, this segment of respondents reported it would be difficult for them to further reduce electricity consumption. The most frequently mentioned savings item was to reduce air-conditioning use<sup>12</sup> and switching off lights during the day. No significant delays in bill payment, instance of borrowing money or reduction of other types of expenditure were however, reported.

**Significant increases were noted for the better-off households (particularly in Yangon) and savings were planned to cope with new rates.** The items households indicated they would most likely cut were: (i) lighting in garden/security lights; (ii) air-conditioning; (iii) lighting during the day/unused rooms. While there was negative feedback on the increases, this was less strong than in middle-class areas with an overall sense that electricity supply was of good quality.

*Small and Medium Enterprises (SMEs) in Yangon and Mandalay*

**The study covered three groups of SMEs in Yangon and Mandalay, defined in terms of their electricity consumption.** Feedback on the tariff increases

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<sup>11</sup> As in Chin respondents saw little value in getting a connection to the grid given the limited supply

<sup>12</sup> For a minority of households in the middle-income wards covered

and coping strategies adopted varied depending on the new tariff band in which they now found themselves in.

### 1.1.3 Different types of businesses surveyed (Yangon and Mandalay)

Cities	Number of SMEs by consumption (Units kWh)		
	1-500	501-10,000	10,001-20,000
Yangon	8	17	0
Mandalay	13	10	2
Total	21	27	2

**Very small, family run businesses and business requiring unskilled labor reported not being affected by changes in tariffs.** These made up a significant proportion of the businesses surveyed and included small-scale food production and packaging companies and mechanics. Overall the rates were considered affordable and no particular negative coping strategies were observed among this group.

**Medium-sized businesses (in the second and third group) were the most affected among those surveyed<sup>13</sup>.** The second group of businesses includes mold making, printing and purified water companies, now required to pay 25 additional kyats per unit (or 30% increase in relation to the previous tariff structure). These businesses consider themselves hard hit by the increases particularly as they have to shoulder the additional electricity costs together with diesel costs. Generators are still needed to address gaps in electricity supply (fluctuations in capacity and brief black-outs). The third group of businesses was found only in the Mandalay industrial zone surveyed. These were two smelting businesses (iron rods and construction materials), which fell under the second tariff block with an additional 50 kyats to be paid per unit (i.e two-thirds increase in their bill compared to the previous tariff). Using generators for these businesses is extremely expensive and they rely heavily on the grid connection having invested significantly in setting up the necessary infrastructure in the Industrial Zone.

**The most common coping strategy reported was to increase prices for the consumer when this was possible** (in some instances pre-existing contract commitments meant that businesses incurred losses). Medium businesses in the second group coped by laying off some staff, reducing production and no longer holding stocks (i.e producing only when they had a specific order). Larger businesses in the third group reported that they had some time to prepare (around three months) and find cheaper suppliers and re-negotiate prices and in spite of a higher increase where in a comparatively better situation.

**However, even among the second group of businesses (most affected) feedback focused on improvement in quality of service rather than in reduction of the tariffs.** The main recommendation made by all the three groups was to reduce power fluctuations, increase voltage capacity and ensure a 24-hour steady supply.

<sup>13</sup> It's important to note that the analysis did not cover individual discussions with large-scale companies although the Myanmar Chamber of Commerce and the Management Committee of Industrial Zones in Mandalay and Yangon were consulted on the overall quality of the electricity supply and on their perspectives regarding tariff increases.

With these conditions met, business owners would be able to drastically reduce their expenditures with diesel, which were considered more burdensome than electricity prices. Overall 85% of businesses interviewed regularly use generators (100% of those in Chin).

### *Grievances regarding electricity services*

**The analysis of Grievance Redress Systems (GRS) in PSIA Phases I and II indicated that the presence and use of GRS for government electricity services was extremely rare in rural areas although more present/used in the urban areas visited.** For the roll-out of NEP there is limited capacity in the current system to effectively handle grievances. Those respondents that indicated having reached out to service providers did so in urban areas and for issues of service maintenance and billing. In spite of the lack of clarity often mentioned by respondents during the study regarding the financial management of the SRE by the VEC there were no instances where villages/participating households had lodged a grievance with either the VEC or Village or Township Administration.

**Of the eight sites in rural areas, only one VEC (Village 17 in Mon) had established a dedicated GRS system to receive queries and complaints.** The other seven villages with access to government electricity services in the sample did not have systems in place and issues regarding billing and service were informally resolved through the VEC and VA. No significant disputes or tensions over the provision of electricity were observed in the targeted sites.

**Confirming the trend observed during the Phase I of the PSIA, in villages with access to government respondents were on the whole satisfied with the quality of the service provided electricity.** However, issues with slow repairs and low capacity of the power supply were noted in four of the eight sites. FGD discussions with women in particular indicated a strong demand for better capacity services to reduce time/money spent on collecting/purchasing firewood for cooking. In addition, households had queries on billing in two of the rural sites visited where maintenance/operation charges collected were unclear. The division of units “lost” (difference in charges from village meter and individual household meters) was unclear in these cases. While levels of social capital/trust were overall high (and there was an overall perception that the VEC was charging the correct amount) consumers did fully understand the rationale behind the additional amounts collected.

**In the new urban areas visited under PSIA Phase II there was more widespread awareness of how to reach the service provider with request for information, maintenance and queries about bills.** Numbers for TED were provided in bills in Thaton although not in Sittwe. In Sittwe, the TED was in the process of disseminating the new information/complaints hotline and had printed new pamphlets. Complaints were mostly related to errors with bills and were either communicated directly to the township or through bill collectors. There was an overall perception among households interviewed that these were acted upon (with errors in bills adjusted in the next month’s bill) although with some delays.

## Overview of complaints/grievances and channels for resolution

Village/Ward Name	Access to Electricity	Complaints/feedback	Channel for uptake/resolution
<b>Rural Areas</b>			
Village 1 (Chin)	Government (Hydro)	Poor quality/availability of service	Widespread acknowledgement that there is no immediate solution to the issue (would require accessing additional source/strong interest in developing mini-hydro)
Village 3 (Magway)	Government Grid	Enquiries on billing	Questions addressed to the VEC
Village 15(Kayin)	Government Grid	Low capacity and unable to cook, issues with billing and malfunctioning meters	Complaints addressed to the Village Administrator for further discussion with township
Village 17 (Mon)	Government Grid	None on electricity supply but village based CBO voicing complaints about the cost of the electricity connection and corruption at VEC level (investigated by township that found no issues with management)  Palong households have difficulties understanding bills (language barrier)	VEC has GRS uptake channels for questions on billing and repairs with no significant complaints noted. Issues raised by CBO directly with township, ESE and media (NPT)
Village 19 (Ayeyarwady)	Government Grid	Poor quality/frequent cuts	
Village 21(Rakhine)	Government Grid Connection through military camp	Frequent maintenance issues (seasonal because of rains)	Complaints addressed to the Village Administrator for further discussion with township
Village 6 (Shan)	Private Company (Hydro)	Palong households connected have difficulties in understanding bills (language barrier)	
Village 23(Mandalay)	Government Grid	Supply insufficient for cooking and costly. There are no individual meters and all households pay the same 5,000 kyats amount irrespective of real consumption	Addressed to VEC and Village Administration. Installation of individual meters is being considered.
Village 24(Mandalay)	Government Grid	Supply insufficient for cooking.	Complaints addressed to the Village Administrator for further discussion with township. Overall perception that there is no immediate solution to the capacity/power fluctuation issues.
<b>Urban areas</b>			
Thaton	Government grid	Concerns by households in the low-income ward about the cost of connection (kyats 50,000) that will no longer be provided free of charge (after the initial phase of connections that benefited part of the ward)	There is an overall perception that funds are no longer available at township level and that interested households will have to raise their funds for the connection. Concerns queries are channeled through ward leader to the Township Electricity Department.
Sittwe	Government grid (2014 connection)	None noted during PSIA Phase II	The focus on Sittwe among respondents in all three wards is on the improvement (or expected improvement) and reduction in costs with electricity bills brought about by the connection/planned connection to the grid

### Potential Social Impacts and Risks of the Project

**The Bank's Indigenous Peoples (OP 4.10) and Involuntary Resettlement (OP 4.12) safeguard policies are triggered to the Project.** The Project is country-wide and covers all States and Regions; ethnic minorities covered by OP 4.10 are present in most areas of Myanmar, but concentrated in the Kayah, Kayin, Kachin, Chin, Mon, Rakhine, and Shan States. Ethnic minority communities would benefit from project activities through improved access to electricity including in many

remote areas currently not covered by the grid and with few off-grid electrification schemes. Along with other beneficiaries, ethnic minorities will benefit from: reduced costs of electricity for households (e.g. by reducing connection costs); enhanced well-being by providing electricity for lighting in houses and streets, telecommunications and entertainment; improved cooking practices and indoor environment (through reduced use of charcoal and firewood for cooking); and enhanced income-generation opportunities. To maximize developmental impacts the Project's grid component will prioritize connections for health clinics and schools, particularly in poor and vulnerable areas, and the off-grid component will directly benefit the poor and vulnerable households by targeting those who reside outside the reach of the power grid. The Project is also expected to improve the participation of community members in decision-making concerning electricity and strengthen the capacity of Village Electrification Committees.

**The Project, however, also presents risks and challenges, particularly in terms of ensuring that ethnic minorities participate in and benefit from project investments.** Investing in electrification in conflict or post-conflict areas where ethnic minority organizations provide parallel social services and community infrastructure also poses risks that require a good consultation and project management approach. The PSIA finds that rural villages are most often partially electrified commonly due to some villagers' lack of ability to fund the costs of the initial connection. The high connection costs has also led to significant debts for some villages. Without measures to address such constraints, project support may weaken the social cohesion within a community, particularly in villages with mixed ethnicity and/or with households having moved to the village because of conflict or natural calamities.

**Construction and operations activities associated with the Project may present possible triggers for grievances or conflict.** Particular triggers may include: the use of companies and/or labourers sourced from a different ethnic group and from outside the area of project implementation; inadequate stakeholder consultation and engagement, including in local languages and with insufficient advance notice and consultation; lack of awareness of land use and ownership structures within the community; low awareness of the cultural value of community forests; and community safety concerns, especially of women and children.

**Limited, if any, land acquisition is expected as the type of investments supported by the Project generally have small footprints, normally follow existing right-of-way and have some flexibility in terms of specific location to avoid land acquisition.** However, some land acquisition or loss of assets such as trees and standing crops, cannot be ruled out, for instance in relation to expansion of existing and construction of new Medium Voltage (MV) substations, construction of new MV lines, Low Voltage (LV) lines, and off-grid investments such as mini-hydro systems. The PSIA and social assessment found that there are seldom accurate records of what constitutes "common village land" used for infrastructure purposes and while voluntary land donations are practiced these are rarely documented.

**Since specific project sites will not be identified during project preparation, specific safeguard impacts cannot be determined until project implementation. An ESMF has been prepared to screen for and address any safeguard issues for specific investments and subprojects.** The ESMF includes an

Indigenous Peoples Planning Framework and a Resettlement Policy Framework (RPF) to address OP 4.10 and 4.12 requirements respectively, including provisions for preparing site-specific Resettlement Plans and Indigenous Peoples Plans when needed (see VI and Annex 3 for more details). The RPF includes a protocol for voluntary land donations.

## Conclusions and Recommendations

### *In rural areas*

**The SRE approach currently in place allocates no funding to subsidize feasibility studies and technical assistance or hardware at community level meaning that currently only the better off villages and better off households within those villages are able to access government electricity services<sup>14</sup>.** The limited guidance provided on the community mobilization and planning process for SRE seems to have resulted in a systematic exclusion of poor households within communities with access to government electricity. The research team did not find instance of the participation on the part of these households in planning or discussions on cost and access. Community planning is led by the electricity committee whose members are nominated among formal and traditional leaders. Information is not widely shared with the community and no instances of community-level subsidizing of access by poor households were observed across research sites. No instances were observed of community members being excluded on the basis of ethnic or religious identity. However, this area of enquiry may warrant further analysis in a subsequent phase of the PSIA requiring different sampling/site selection than that currently used by QSEM.

**Similarly, the lack of regulation of electricity committee functions (including rate setting) resulted in some instances in the application of tariffs well above those set by MoEP (50 kyats/kWh and 200 kyats kWh).** Consumers of government services in rural areas also pay additional maintenance charges to do with the upkeep of the connections and collection of payments. In addition, it is important to note that rural households have a limited understanding of the bills (which are frequently not itemized). Payments tend to be made regularly where there is strong social capital and trust in village leadership and the electricity committee. No negative feedback was received by the research team on these higher rates charged.

**Given the profile of households with access to government electricity services in rural areas (overall the better off groups in the sites covered) and the limited uses of electricity, no negative feedback was received from current users on the updated tariffs** (where these were practiced). The majority of these households use electricity for lighting and TV in the evenings and would not be affected by tariff increases. Overall, government services are considered good value for money when compared to informal providers or community-based initiatives using small-scale hydro or diesel generators.

**Subsidizing the cost of connections to the villages and to individual households within these villages would be an important element of the NEP roll-**

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<sup>14</sup> Among villages within reach of the grid.



**out to ensure more equitable access to the service in rural areas.** Beyond the cost of connection to the village, once the latter is established, the additional costs of connecting individual households acted as a second barrier for low income households.

**Further regulation of the functioning of the electricity committees and the provision of technical assistance including a focus on community participation, good governance and social accountability would be an equally important element.** Beyond the regulation of tariff setting in rural areas, the functioning of the electricity committees and their oversight would benefit from strengthening under NEP (if these committees are expected to play an ongoing role in rural areas for the implementation of interim mini-grid solutions). Challenges with governance and instances of lack of transparency in financial management were observed by the research team. Overall, the quality of leadership and social cohesion at village level currently play the determining role in the absence of external regulation and support. The same SRE process can lead to very different outcomes as noted by the research team fully depending on the local context (i.e. currently regulations are not adding much additional value in terms of quality of the process).

**Across all sites visited<sup>15</sup> a minority of poor and marginalized households, not connected to the grid at the time of the study, could not afford the cost of the basic services of informal providers** (Kyats 1000 to 1500/month for lighting in the evenings). Extending access to electricity to this group under NEP would require subsidizing the cost of overall connections, connections to the households but also the introduction of further subsidized tariffs.

#### *In urban areas*

As noted above, the cost of access was not the key concern in urban areas, where the option of SRE is of course not viable. **There was high demand for electricity services in Hakha and an overall sense that access to electricity using the new tariffs would significantly reduce households' expenditure on energy.** Currently, the purchase of fuel is considered a heavy burden on households and small businesses in Hakha.

**For the urban centers of Yangon and Mandalay the cost of household connections in poorer wards where the government service does not yet have full coverage was a significant barrier to access for low income households.** In additional informal settlers in Yangon (1,000 households in YGN 3) could not access the grid as they were unable to obtain the necessary documentation to apply for the connection. There was strong demand for the service among these household who considered government service better value for money when compared to informal providers. A small number of households interviewed in Yangon (4 of 25 in the poorer ward, YGN 3) also indicated that they could not afford the payment of regular charges and therefore relied on informal service providers opting for daily payments.

**Overall there was strong negative feedback among middle-income households and small businesses in Yangon and Mandalay regarding the new**

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<sup>15</sup> With the exception of the villages in Shan state which were exceptionally well off

**tariffs.** Households in urban areas were well informed about the new rates and had a good understanding of the different charges in their electricity bill. For middle-income households feedback was related to the lack of improvements noted in service rather than with overall inability to pay. Respondents indicated they would implement some saving measures but no negative coping strategies or delays with payments were observed. Adverse impacts were noted among SMEs in both of these urban areas with medium businesses laying off staff and reducing production. Importantly, lack of quality of the electricity service and the need to rely on diesel generators with associated costs was the main complaint of this particular group.

**As with rural areas, subsidizing connections to the home in poor wards would seem important for a more equitable NEP roll-out.** Regularizing and simplifying requirements for applications/connections in informal settlements would equally be key. As with the rural poor and marginalized households a closer analysis of the energy consumption among this group would be important for the design of life-line tariffs. With current tariffs already being unaffordable there is a risk that this vulnerable group will be left out of the electrification process.

**Improvement in quality, reliability and repair services will be essential particularly if further increases in rates are expected to be put in place.** Communication with consumers, feedback and grievance redress mechanisms are virtually non-existent and information tends to flow based on personal connections.

#### *Social Impacts, Risks and Safeguards*

**To mitigate potential risk of equity, transparency and accountability, it will be critical for the Project to embrace a broad-based and inclusive community-based planning process, to have a sound and nuanced understanding of the community context ahead of subproject implementation at village level, and to integrate a conflict-screening process in the ESMF.** Targeting and sequencing of project activities, both grid and off-grid, underpinned by a transparent and broadly communicated rationale will be important. Furthermore, it will be critical for the Project to implement a conflict-sensitive approach underpinned by thoughtfully designed, inclusive and well-executed consultation and engagement strategies. Regular and transparent monitoring, including third party monitoring with community involvement, can play a valuable role in managing perceptions of transparency and accountability.

**Providing electricity services and infrastructure within a diverse cultural and linguistic context such as Myanmar will require specific consideration for project design and the ESMF.** This includes language use and preparation of consultation and engagement materials that effectively communicate with potential project beneficiaries and other stakeholders who are not literate in Bamar; participatory monitoring and evaluation activities; and engagement with ethnic minority representatives at village, district, regional/state and national levels.

**While Project activities mainly have minor safeguard impacts and risks, the Project should be prepared and implemented in such a way that they minimize any potentially negative social and environmental impacts.** Natural resources and the environment are key to the cultural identity of ethnic minorities and

play a significant role in their livelihoods, and potential impacts and risks on community forest and streams should be identified, avoided, minimized or mitigated through the screening and safeguard procedures of the ESMF. The ESMF should also identify criteria for site selection that take into consideration potential risks for landslide, flooding or medium to long m impacts from climate change.

**Site-specific project activities (subprojects) should provide consistent documentation regarding land acquisition or loss of assets, including for any voluntary land donations that may be implemented.** Currently documentation of such arrangements is highly variable across sites and often lacking, and there is very limited experience implementing World Bank safeguard policies, including for involuntary resettlement.

**Capacity building is needed for implementing agencies and relevant parties (e.g. private sector, Village Electrification Committees and community members), including concerning safeguards.**

## 2 Introduction and Context

### 2.1 Description of the proposed National Electrification Project (NEP)

The proposed Myanmar National Electrification Project (the Project), funded by the World Bank through a loan of US\$ 300 million and implemented by the Ministry of Electric Power (MoEP) and the Ministry of Livestock, Fisheries and Rural Development (MLFRD), will aim to: *help increase access to electricity in Myanmar.*

The expected results of the Project include:

- New household connections in urban and rural areas; with priority provided for health clinics and schools, particularly in poor and vulnerable areas;
- Coordinated, sector-wide institutional framework for electrification; and
- Strengthened institutional capacity of implementing agencies.

The proposed grid roll-out program is intended to not only improve the well-being of the population by better lighting, telecommunications and entertainment, but also enable income generation opportunities and enhanced productivity. It proposes to prioritise connections for health clinics and schools to maximise developmental impacts.

The project will also include an off-grid pre-electrification program, targeting those who live outside the coverage of the power grid and are expected to receive grid-based electricity services more than 10 years after the first phase of the Project.

It is expected that programmatic engagement will comprise three phases, with the first phase covering 2015-2019. In addition to working with the public sector and private sector investors, the joint World Bank Group (WBG) energy team will work closely with all development partners (DPs) active in the power sector (Asian Development Bank, Japan International Cooperation Agency, KfW, the UK Department for International Development, Norway, Australia, others). The NEP will be designed as an open platform that DPs can use in supporting electrification in Myanmar. Such a coordinated, sector-wide approach is considered the most effective in delivering benefits of electrification and working together with the GoM, DPs and the private sector towards the twin goals of reducing extreme poverty and increasing shared prosperity in Myanmar.

#### 2.1.1 Overview of Project Components

##### **Component 1: Grid rollout [up to US\$ 300 million].**

The grid component will support the purchase of equipment to extend distribution networks currently operated by the Yangon Electricity Supply Board (YESB) and Electricity Supply Enterprise (ESE) and connect communities identified in the National Electrification Plan as closest to the existing national grid and thus on the least-cost path for the grid rollout.

This component will include purchase of equipment to:

- Expand existing Medium Voltage (MV) substations and construct new MV substations;
- Construct new or rehabilitate existing MV lines, Low Voltage (LV) lines and MV/LV transformers; and
- Connect households with service lines and meters.

MOEP Project Management Office manages this component, working closely with ESE, YESB and other partners.

International Development Assistance (IDA) funding will finance procurement of goods (transformers, poles, conductors, cables, meters and auxiliary equipment), which ESE and YESB will be responsible to install. The International Finance Corporation (IFC) may support private sector participation in installation, in a manner to be determined.

***Component 2: Off-grid pre-electrification [IDA US\$ 80 million].***

The off-grid component will target those communities located outside the reach of the existing national grid or unlikely to receive grid-based access in the next 10 years. This component will be based on application of mini-grids and household energy systems, including solar photovoltaic (PV) systems, mini-hydropower (not expected to exceed one megawatt), wind, diesel and hybrid systems (e.g. diesel/solar). MLFRD is responsible for off-grid rural electrification through its national and sub-national Department for Rural Development (DRD) offices.

***Component 3: Capacity building and technical assistance [IDA US\$ 20 million].***

This component will provide Technical Assistance (TA), capacity building and advisory support to Government agencies at all institutional levels (union, state/ region, and district) involved in electrification planning and implementation, technical design, economic and financial analysis, environmental and social impact management, monitoring and evaluation, as well as procurement and financial management.

For the grid component, TA is expected to support development of:

- design standards;
- technical specifications and standard procurement packages;
- project design for the balance of the project;
- project management and implementation support including the management of safeguards compliance; and
- extensive training and capacity building on all planning, engineering and commercial aspects.

For the off-grid component, TA is expected to support development of:

- technical and financial support to local technical advisors who operate at district or township level assisting villages with technology choice decisions, pre-feasibility studies, and project oversight;
- support for feasibility studies and business plans for village mini-grids;
- technical and business development support for companies that manufacture, install, and maintain renewable energy systems;
- support to DRD on technical specifications, procurement documents and bid evaluations, project management and implementation, including the management of safeguards compliance;
- assistance to the financial sector to adopt/adapt mechanisms for consumer and supplier financing
- extensive training and capacity building on all planning, regulatory, policy, engineering and commercial aspects.

***Component 4: Contingent Emergency Response [US\$ 0 million].***

The objective of this “zero component” is to allow a rapid reallocation of IDA credit proceeds from other components to provide emergency recovery and reconstruction support following an adverse natural disaster event. This component would finance public and private sector expenditure on a positive list of goods and/or specific works, goods, services and emergency operation costs required for Myanmar’s emergency recovery. A Contingency Emergency Response Component (CERC) Operational Manual will apply to this component, detailing financial management, procurement, safeguard and any other necessary implementation arrangements.

## 2.1.2 Overview of National Electrification Plan Implementation Strategy

The Project supports the Myanmar National Electrification Plan (NEP) developed by GoM. The NEP is expected to connect around 7.2 million homes over the 2015-2030 period. For the Bank-financed Project it is considered feasible to implement about 1.7 million additional grid connections during the 2015-19 financial years (FYs) and about 125,000 total mini-grid and off-grid household connections (including permanent and estimated pre-electrification connections).

### 2.1.2.1 Grid Rollout Strategy

The initial phases of grid construction will reach communities that are closely spaced and nearer to the existing electricity grid, where less MV line is needed per household. Later phases will reach remote, rural communities where the MV per household (HH) cost is much higher.

The NEP plans the grid roll-out as a sequence of grid extensions, starting with lower cost areas where electricity demand is dense, such as urban, peri-urban and nearby rural areas, and extending gradually towards higher cost areas where demand is typically less dense, such as remote locations where communities are smaller and more distant from each other.

Grid roll-out has been planned in five phases, each representing approximately 20 per cent of the full MV line extension, as shown in Table 1.

**TABLE 1: METRICS FOR FIVE PHASE NATIONAL GRID ROLL-OUT PLAN**

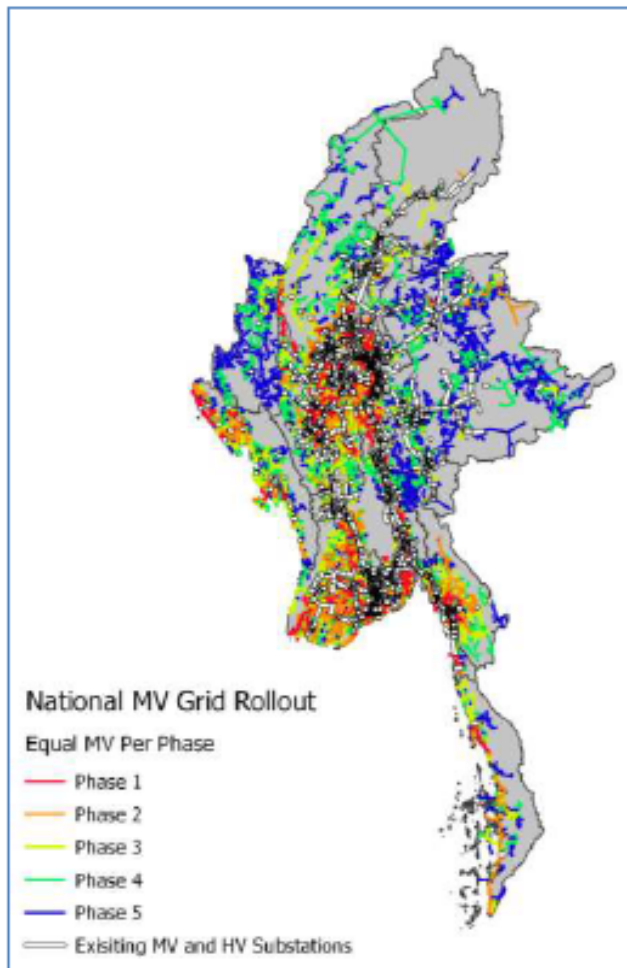
**Table 3: Metrics for five phase national grid roll-out plan.**

Phase	Number of Households Connected	Total New MV Line Installed km	Per HH Cost of Phase USD	MV Line Installed per HH m
1	3,510,000	12,300	\$700	4
2	1,750,000	12,300	\$770	7
3	1,100,000	12,300	\$850	11
4	615,000	12,300	\$1,030	20
5	234,000	12,300	\$1,710	53
<b>Total</b>	<b>7,220,000</b>	<b>61,700</b>		
<b>Average</b>	<b>1,440,000</b>	<b>12,300</b>	<b>\$800</b>	<b>9</b>

Source: Earth Institute, August 2014, Myanmar NEP: Least-Cost Geospatial Electrification Planning Results p. 27

The map below shows that in a five phase grid roll-out plan, it is most cost-effective to first electrify lowland regions, such as Mandalay, Ayerawady, and Mon, where

populations are dense and the grid is nearby (red and orange lines). Highland states such as Chin, Shan, Kachin, and Kayah are designated for later phases of grid roll-out (green and blue lines) because populations are less dense, communities are smaller and widely spaced, and grid extension costs are higher.



**Figure 11: Grid "roll-out" in five phases for Myanmar**

The national electrification program is expected to connect around 7.2 million homes over the 2015-2030 period, of which more than 99 per cent will be through electricity grid extension. Very rarely (one per cent of the time or less), mini-grid systems (in this case, village or town-scale systems) and off-grid systems (solar home systems) are recommended, typically for the smallest and most remote communities, predominantly in Chin, Kachin, Shan and other mountainous and border areas.

**FIGURE 1: NATIONAL MV GRID ROLLOUT**

*Source: Earth Institute, August 2014, Myanmar NEP: Least-Cost Geospatial Electrification Planning Results p. 26*

Earth Institute's assessment of the total number of connections required to electrify Myanmar's entire population by 2030 is summarised in Table 2 below.

**TABLE 2: TOTAL TARGET CONNECTIONS BY STATE AND TYPE**

**Table 3.1: Total Target Connections by State and Type over the Entire Program**

No	State/Region	Total Grid Connections	Total Mini-grid Connections	Total Off-grid Connections	Total Connections
1	Ayerawady	1,092,296	32	9	1,092,337
2	Bago	686,085	160	-	686,245
3	Chin	119,524	701	1,114	121,339
4	Kachin	115,467	703	425	116,595
5	Kayah	26,952	224	21	27,197
6	Kayin	379,450	287	26	379,763
7	Magway	788,685	203	72	788,960
8	Mandalay	723,874	22	38	723,934
9	Mon	256,452	1,221	21	257,694
10	Naypitaw	98,221	-	-	98,221
11	Rankhine	969,539	725	151	970,415
12	Sagaing	908,747	1,366	275	910,388
13	Shan	505,394	2,625	2,241	510,260
14	Thaninthayri	322,853	2,611	75	325,539
15	Yangon	207,752	-	8	207,760
<b>Total</b>		<b>7,201,291</b>	<b>10,880</b>	<b>4,476</b>	<b>7,216,647</b>

Source: EI

Source: Castalia Strategic Advisors, August 2014, Myanmar NEP Roadmap and Investment Prospectus. Draft Final Road Map and Investment Prospectus p.13.

### 2.1.2.2 Off-Grid Pre-electrification Strategy

For the communities that are recommended for non-grid systems over the long term, the size of the community plays an important role in determining which should be mini-grid or off-grid. Initial thinking for the off-grid or *pre-electrification* program is that solar home systems may be appropriate for smaller villages (<50 households) and mini-grids for larger villages (>50 households). The Project considers that solar home systems could provide 75-175 kWh/yr for lighting/phones/TV and would cost around USD\$400-500 per household. Mini-grids could be solar, hybrid, diesel or micro-hydro. They would likely generate 200-250 kWh/yr and could be used for lighting/technology/TV, fan small fridge. The estimated cost per household is US\$1,400. Potentially, mini-grids could be integrated to the grid later, if built to grid standard.

Pre-electrification would target about 3,250 small settlements (those with fewer than 50 HHs or 95,000 households in total), most likely with solar home systems, and about 1,650 larger settlements (155,000 households in total), which are better suited for mini-grids. In total, the pre-electrification program would serve nearly 5,000 communities with a total of around 250,000 households. Figure 2 below shows the geographic areas that would be targeted for pre-electrification.



## FIGURE 2: GEOGRAPHIC AREAS TO BE TARGETED FOR PRE-ELECTRIFICATION

*"Pre-electrification": Geography and Quantitative Analysis*

Figure 13 below shows the geographic areas that would be targeted for pre-electrification.

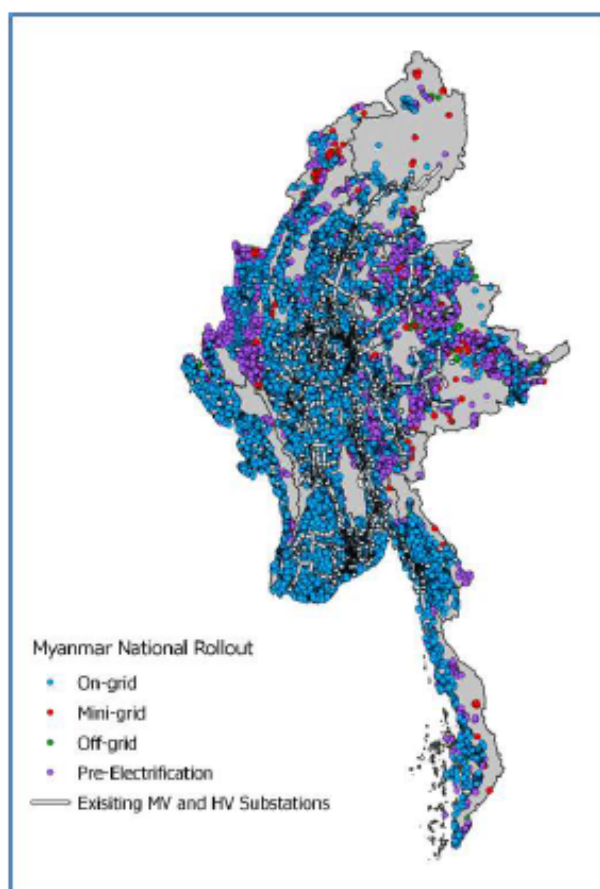


Figure 13: Locations proposed for grid and for "pre-electrification"

Source: Earth Institute, August 2014, Myanmar NEP: Least-Cost Geospatial Electrification Planning Results p. 30

The Project's off-grid program will lay the foundation for large-scale deployment of high quality, competitively priced, off-grid electricity services, through increasingly commercial market-based approaches. Over five years, it will target provision of services to about 475,000 households in the remote, less accessible villages in the Chin, Kachin, Kayah, Kayin, Shan, Tanintharyi and Sagaing states/regions.

The off-grid program intends to offer consumer choice in line with their willingness and ability to pay and the level of electricity services they seek. It comprises four sub-components: Mini-grids; Solar home systems; Public institutions; and Technical assistance/program management. Mini-grids are defined as including community micro-hydropower projects, as well as other technologies such as biomass, biogas, solar and wind). Hybrid systems that include a backup diesel generator are also eligible.

The off-grid component will contribute USD\$20 million for electrification of public institutions (schools, clinics, religious buildings, street lighting) for villages in the target off-grid electrification areas. The program expects to reach the following targets, based on initial assumptions. *Note: these are subject to further data validation and are thus subject to change during project implementation.*

### TABLE 3: EXPECTED RESULTS OF THE OFF-GRID PRE-ELECTRIFICATION COMPONENT

No. Households served by mini-grids	31,000
No. Households served by solar home systems	461,000
No. Public institutions (schools, clinics, religious buildings) served	11,000
No. Public lighting (street lights)	19,000

### 2.1.3 The Roadmap to 100 per cent Electrification

At present, Myanmar has about 2.3 million residential electricity connections. Depending on assumptions on household size, this implies that less than 30 per cent of the population has access to electricity. Schools, clinics, and businesses in rural areas also have limited access. Currently, approximately 190,000 additional households gain access to electricity every year. At this rate, it would take almost 40 years to achieve full electrification.

An initial comprehensive geospatial plan for the roll-out of electrification estimates that over 90 per cent of the total new connections will be grid-based. While the electrification program will evolve dynamically, the initial plan envisages the least cost roll-out of the grid, alongside the development of mini-grid and off-grid solar home solutions. Additionally, approximately 250,000 connections using “pre-electrification” solutions such as temporary mini grids or off grid solar home systems will be viable for households who can expect to be connected to the grid at the very end of the roll-out program.

In all, approximately 7.2 million household connections will be required in the next 16 years to fulfill the vision of universal electrification by 2030. Subject to the successful implementation of this plan, Myanmar can be expected to achieve approximately 47 per cent electrification by 2020, 76 per cent electrification by 2025, and 100 per cent by 2030.

## 2.2 World Bank Social Safeguards Policies and ESMF

The proposed Project triggers the following World Bank policies: Environmental Assessment (OP 4.01); Natural Habitats (OP 4.04); Physical Cultural Resources (OP 4.11); Involuntary Resettlement (OP 4.12) and Indigenous Peoples (OP 4.10). The World Bank has identified the Project as Category B as per OP/BP 4.01, as the safeguard impacts of the type of subprojects supported are site-specific, few are irreversible and mitigation measures can be designed to minimize and mitigate impacts during project implementation.

Since actual selection of subprojects—specific investment sites—will not be made until during project implementation the actual safeguards impacts cannot be identified and mitigated until during implementation. An Environmental and Social Management Framework (ESMF) will therefore be the instrument to be prepared by World Bank appraisal of the Project. The ESMF will provide procedures and provisions to address safeguard issues for specific subprojects during implementation of the Project. Key policies are described below.

### 2.2.1 Environmental Assessment OP/BP 4.01

The project will invest substantially in grid roll-out through the purchase of equipment including for MV-substations (expansion of existing substations and to be built), MV/LV transformers, MV and LV lines, household connections, meters, and off-grid systems including solar PV systems, mini-hydropower, wind, diesel and hybrid systems.

The implementation stage of the Project will include the design of sub-projects based on approved application for sub-projects. All sub-projects and equipment purchases will be determined during project implementation.

In addition to sub-projects that are implemented by ESE and YESB, it is expected that part of the sub-projects' investments to be funded by the Project will be implemented by private investors / operators and local communities.

Given this, an Environmental and Social Management Framework (ESMF) will be developed for the NEP that will identify and include procedures for screening, impact assessments, planning, implementation and monitoring that differentiates for the various categories of implementing entities.

It is envisaged that all project-funded activities, including the sub-projects that are implemented by private parties, will be fully compliant with the World Bank Safeguard Policies.

### **2.2.2 Indigenous Peoples OP/BP 4.10**

The project is expected to be country-wide and cover all States and Regions, including areas with ethnic minorities. Ethnic minorities in Myanmar live mainly, however not exclusively, in the seven States (Kayah, Kayin, Kachin, Chin, Mon, Rakhine, and Shan). Ethnic minority communities would benefit from project activities. However, the project also presents risks and challenges concerning ethnic minorities, particularly in terms of ensuring that they will receive appropriate benefits. Investing in distribution networks and off-grid electrification in conflict or post-conflict areas where ethnic minority organizations provide parallel social services and community infrastructure also poses risks that require a good consultation and project management approach.

Since specific project sites will not be identified during project preparation, an Indigenous Peoples Planning Framework will be prepared as part of the ESMF to provide guidance on the screening and planning process for sub-projects, including requirements for site-specific social assessment and consultations and the preparation of site-specific Indigenous Peoples Plans to address particular issues concerning ethnic minorities.

### **2.2.3 Involuntary Resettlement OP/BP4.12**

It is not possible to rule out that some sub-projects would involve involuntary resettlement in the form of land acquisition or loss of other assets. The project will finance distribution networks, including expansion of existing Medium Voltage (MV) substations and construction of new MV substations, (ii) construction of new MV lines, Low Voltage (LV) lines and MV/LV transformers.

These investments have a minimal footprint, normally follow existing right-of-way and have some flexibility in terms of specific location to avoid land acquisition or loss of property. However, some land acquisition or loss of assets may be needed for some sub-projects, particularly in cases where new substations will be financed. Off-grid investments, such as mini-hydro systems may also have minor impacts.

A Resettlement Policy Framework will be prepared as part of the ESMF to provide guidance on the screening and planning process for sub-projects concerning involuntary resettlement impacts and will include a protocol for voluntary land donations.

## 2.3 Electricity sector, including by regions and population groups

### 2.3.1 Overview of Myanmar's Energy Status and Consumption

Myanmar's energy consumption is among the lowest in the world and its electrification rate is the lowest amongst Association of Southeast Asian Nations (ASEAN) countries.

About 70 per cent of the population has no access to grid-based electricity services, and the consumption per capita is 160 kilowatt hours (kWh) per annum – 20 times less than the world average. Only about 16 per cent of rural households have access to grid-based electricity. Off-grid schemes are rare and typically provide high cost, low reliability power service for a few hours per day. Also, access to modern fuels for cooking (such as Liquefied Petroleum Gas) is limited to urban areas. Consequently, traditional biomass (fuelwood and animal dung) is widely used and accounts for about two-thirds of Myanmar's primary energy consumption.

Significant differences exist in electrification rates between income groups and across the states of Myanmar. The existing national electrical power grid has limited geographical scope and is mainly confined to the central basin. While major cities are connected to power supplies, most rural areas have little or no access or infrastructure to support it. Electrification rates fall below 10 per cent in some rural areas.<sup>16</sup> On average, it is estimated that wealthier districts receive an average of six hours of power per day as compared to one hour for poorer districts.<sup>17</sup> Those who do have access to electricity still face constraints in their usage experiencing frequent power outages due mainly to the deterioration of power generation facilities, shortage of fuel gas and limited output of hydropower stations.<sup>18</sup> Figure 3 below shows the electrification rates by state/region in 2013.

**FIGURE 3: ELECTRIFICATION RATES THROUGHOUT MYANMAR, 2013 (PER CENT)**

State/Region	per cent	Proportion (per cent) of Population living in Urban Area*
Yangon	78	70.1
Kayah	46	25.3
Mandalay	40	34.8
Nay Pyi Taw	39	32.5
Mon	35	27.8
Shan (South)	33	24 (total)
Kachin	28	35.9
Bago (East)	28	22 (total)
Sagaing	25	17.1
Shan (North)	23	24 (total)
Bago (West)	23	22 (total)
Magway	18	15.1

<sup>16</sup> <http://www.adb.org/publications/myanmar-unlocking-potential>, accessed 24 February 2015

<sup>17</sup> *ibid.*

<sup>18</sup> <http://www.jica.go.jp/myanmar/english/office/topics/press140628.html>, accessed 24 February 2015

Chin	17	20.9
Shan (East)	16	24 (total)
Rakhine	16	16.9
Ayeyarwaddy	11	14.1
Tanintharyi	9	24
Kayin	6	21.9

Source: Ministry of Electric Power (per 2014 ADB Myanmar Unlocking Potential Report).

\*Column from Provisional results of 2014 Census, Ministry of Population and Immigration

### 2.3.2 Overview of Electricity Usage within Myanmar

The largest end-use of electricity within Myanmar is for domestic use although figures vary in estimation. An assessment study of the energy sector by the Asian Development Bank (ADB) in 2012 estimated that households accounted for approximately 42 per cent of total end use in 2011, followed by industry at 36 per cent and commerce at 20 per cent.<sup>19</sup> However other statistics estimate that households receive up to as much as three-quarters of the national energy supply (76 per cent) followed by industry (8.3 per cent) and agriculture (2 per cent).<sup>20</sup>

In April 2014, electricity tariffs for retail customers were adjusted. The new system introduced three tariff blocks for residential, small and medium-sized customers:

- (i) less than 100 kWh at 35 kyats;
- (ii) from 101 to 200 kWh at 40 kyats; and
- (iii) more than 201 kWh at 50 kyats.

For industrial and large customers, there are six tariff blocks with a tariff range of 75-150 kyats/kWh. Effectively, residential, small and medium-sized customers are cross-subsidised by industrial and large commercial customers since their new tariffs (35-50 kyats/kWh) are below the average cost of supply.

Forms of traditional biomass provide the bulk of Myanmar's primary energy supply with estimates in 2012 showing it accounted for 75 per cent, followed by gas (10 per cent) and crude oil (6 per cent).<sup>21</sup> Amongst the rural population in particular, a significant biomass-centred energy architecture exists, sustained by fuelwood, charcoal, agriculture residue and animal waste. Of the total biomass-sourced energy, over 90 per cent is fuel wood, most of which is harvested from natural forests posing a threat to environmental sustainability.<sup>22</sup> The annual consumption of fuelwood per household is estimated to be about 2.5 cubic tonnes for rural households and 1.4 cubic tonnes for urban residents.<sup>23</sup> The potential annual yield of wood fuel is up to 19.12 million cubic tonnes.<sup>24</sup>

### 2.3.3 Energy Sector Institutional and Regulatory Framework

The energy sector institutional and regulatory framework is fragmented, particularly in rural electrification.

<sup>19</sup> <http://www.adb.org/documents/myanmar-energy-sector-initial-assessment>, accessed 25 February 2015

<sup>20</sup> <http://adb.org/sites/default/files/pub/2013/new-energy-architecture-mya.pdf>, accessed 25 February 2015

<sup>21</sup> <http://www.nationmultimedia.com/aec/Myanmar-plans-41-new-power-plants-in-15-years-30246754.html>, accessed 01 March 2015

<sup>22</sup> *ibid.*

<sup>23</sup> <http://www.adb.org/documents/myanmar-energy-sector-initial-assessment>, accessed 25 February 2015

<sup>24</sup> <http://www.adb.org/sites/default/files/linked-documents/cobp-mya-2015-2017-ssa-01.pdf>, accessed 25 February 2015

### 2.3.3.1 Overall Energy Sector

Several ministries are responsible for activities in the energy sector, with the Ministry of Energy (MoE) serving as the focal point for overall energy policy, and the Ministry of Electric Power (MoEP) as lead agency for power sector development. The Myanmar Electric Power Enterprise (MEPE) is responsible for gas-fired power generation, operates the high-voltage power grid and acts as the single-buyer of electricity and power market operator. Yangon Electricity Supply Board (YESB) and Electricity Supply Enterprise (ESE) are responsible for distribution networks in the greater Yangon area and the rest of the country, respectively.

In addition to the national (Union level) ministries, each state (7) and region (7) has a state/ regional energy ministry responsible for the planning and implementation of power projects on its territory. Recently, the Government has decided to transfer the electrification budget to the state/ regional ministries, as a part of the broader decentralisation process underway. It also recently reduced the role of ESE and YESB to primary distribution (medium voltage) and opened up secondary distribution (low voltage) for private sector participation including through village cooperatives and direct private investment.

### 2.3.3.2 Rural Electrification

The Ministry of Industry (MoI) under the GoM has (previously) had the overall responsibility of providing electricity to off-grid areas in the country.<sup>25</sup> Solar energy has been provided by MoI in a few off-grid villages to generate electricity for street lighting, home lighting and for community infrastructure such as schools, healthcare centres and monasteries. As of 2013, MOI had installed solar home systems in 152 villages, solar mini-grid in one village and had distributed solar lanterns in 543 villages across the country.<sup>26</sup>

In addition to off-grid micro-hydro, solar, biogas, and biomass installations, about 39 off-grid villages have also been electrified by various government ministries using diesel generators. The Department of Rural Development (DRD), which was formerly within the Ministry of Border Areas (MoBA), has been carrying out rural infrastructure development activities in the country, including the deployment of small-scale rural energy systems such as pico- and micro-hydro sites, solar photovoltaic mini-grids, solar lanterns, and solar home systems.<sup>27</sup>

The Ministry of Science and Technology (MoST), has built community-based and family-sized fixed dome-type biogas digester plants in nearly 200 villages, mainly in the central region (Mandalay, Sagaing, and Magway divisions), for cooking, lighting and other electricity purposes

The government has recently assigned MFLRD the responsibility for providing rural infrastructure, which includes rural energy access.<sup>28</sup> Within MLFRD, DRD is now responsible for off-grid electrification in rural areas.

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<sup>25</sup> <http://www.adb.org/sites/default/files/project-document/79567/47128-001-cp.pdf>, accessed 03 Mar 2015

<sup>26</sup> *ibid.*

<sup>27</sup> <http://www.adb.org/sites/default/files/project-document/80867/47128-001-tar.pdf>, accessed 01 Mar 2015

<sup>28</sup> *ibid.*

## 2.4 Overview: Myanmar's demographic and socio-economic characteristics

### 2.4.1 Location, Population Density and Composition

Myanmar is the largest country in mainland Southeast Asia with a land area of about 654,000 square kilometers (km). It is located between China, India, and Thailand, with more than 2,800 miles of coastline. This geographic advantage, and the country's endowed natural resources leaves it well positioned to resume its traditional role as a regional trading hub and key supplier of minerals, natural gas and electric power.

Myanmar has one of the lowest population densities in the region. Provisional results of the Government's 2014 Census indicate that the total population of Myanmar is close to 51.5 million people. Females represent the majority of the population (51.8 per cent) compared to males (48.2 per cent). Over 70 per cent of the population lives in rural areas, with 29.6 per cent living in Ward (urban areas) throughout the country.<sup>29</sup>

Although complete 2014 Census results have not yet been released, statistics from 2012 reveal a predominantly young population. Children aged 0 to 14 constituted 32 per cent of the total population and young people aged 10-24 years accounted for nearly 30 per cent of the population, while people 60 years and above constituted only nine per cent.<sup>30</sup>

The provisional census results indicate that there are 10,889,348 households in Myanmar. On average, 4.4 people live in each household, which is consistent across both urban and rural areas.

### 2.4.2 Myanmar's States and Regions

Under the 2008 Constitution, the Union of the Republic of Myanmar is organised into seven States and seven Regions (formerly known as Divisions), six Self-Administered Zones and Self-Administered Divisions and one union territory containing the capital Nay Pyi Taw and surrounding townships.

The largest population resides in the three regions of Yangon (14.3 per cent), Ayeyawady (12 per cent) and Mandalay (11.95 per cent). They account for about 38.3 per cent of the total population. The least populated states/regions are Nay Pyi Taw (2.25 per cent), Chin (0.93 per cent) and Kayah (0.56 per cent). Together, they constitute only 3.7 per cent of the entire population.<sup>31</sup>

#### MAP 1: MAP OF MYANMAR STATES AND REGIONS

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<sup>29</sup> [http://unstats.un.org/unsd/demographic/sources/census/2010\\_phc/Myanmar/MMR-2014-08-28-provres.pdf](http://unstats.un.org/unsd/demographic/sources/census/2010_phc/Myanmar/MMR-2014-08-28-provres.pdf), accessed 4 March 2015

<sup>30</sup> [http://countryoffice.unfpa.org/myanmar/2009/11/11/1545/country\\_profile/](http://countryoffice.unfpa.org/myanmar/2009/11/11/1545/country_profile/) accessed 05 March 2015

<sup>31</sup> [http://countryoffice.unfpa.org/myanmar/drive/Census\\_Provisional\\_Results\\_2014\\_ENG.pdf](http://countryoffice.unfpa.org/myanmar/drive/Census_Provisional_Results_2014_ENG.pdf), accessed 4 March 2015





Source: UNFPA, 2014, Summary of Provisional Results, The Population and Housing Census of Myanmar

### 2.4.3 Political and Economic Context

Myanmar has a multiparty democratic system with two national legislative chambers, the 440-seat *Pyithu Hluttaw* (People's Assembly, the lower house) and the 224-seat *Amyotha Hluttaw* (Nationalities Assembly, the upper house). In both parliamentary chambers, a quarter of seats are reserved for the military, while the other members are directly elected. Three key ministerial posts - interior, defence and border affairs - must also be held by serving generals.

Since 2011, Myanmar has launched major political and economic reforms aimed at increasing openness, empowerment, and inclusion. The past years have seen a dramatic increase of political and civil liberties and a significant reduction in armed conflict. At the same time, new tensions and challenges have emerged. Despite such setbacks, the coming years offer opportunities to further deepen reforms, including in the 2015 parliamentary elections.



Overall, macro-economic performance has strengthened, with growth at 8.3 percent in 2013 (up from an average of 5.1 per cent between 2005 and 2010), inflation down to 5.7 per cent in 2013/14 (from 22 per cent in 2008/09), and external debt down to 19.2 per cent of Gross Domestic Product (GDP) in 2013/14 (from 37.7 per cent in 2008/09).

#### 2.4.4 Socio-Economic Characteristics

##### 2.4.4.1 Cultural, Ethnic and Religious Diversity

Myanmar's ethnic minorities make up an estimated 30 – 40 per cent of the population, and ethnic states occupy around 57 per cent of the total land area along most of the country's international borders.<sup>32</sup>

The Government recognises 135 separate ethnic groups referred to within the Constitution as “national races”. Major groups include Burman/Bamar, Shan, Karen/Kayin, Kachin, Chin, Rakhine, Mon and Kayah. The largest ethnic group is the Bamar (Burmese) people comprising about two-thirds of the population and who reside predominantly in the central and delta (seven) regions. Other ethnic minorities account for about one third of the population and live mainly within the seven states (although not exclusively). The official population estimates of the main ethnic minority groups are roughly: Shan (9 per cent), Kayin/Karen (7 per cent), Rakhine (4.5 per cent), Chin (2 per cent), Mon (2 per cent), Kachin (1.4 per cent), and Kayah (1 per cent).<sup>33</sup>

Political boundaries in Myanmar are to some extent organised according to ethnic demographics. Seven States are named after seven large ethnic minority groups – namely, Kachin, Kayah, Kayin, Chin, Mon, Rakhine, and Shan States. The Bamar are the dominant ethnic group, especially in the seven Regions (Sagaing, Magwe, Tanintharyi, Mandalay, Yangon, Ayeyarwady, and Bago).

Aside from the 14 States and Regions, there are five self-administered zones: Naga (Sagaing Region); Danu (Shan State); Pa-O (Shan State); Pa Laung (Shan State); and Kokang (Shan State). There is also one self-administered division: Wa (Shan State). These six self-administered sub-national units are recognised in the 2008 Constitution (section 56) and are the result of earlier ceasefire agreements. Each self-administered unit is run by a Leading Body, which has at least 10 members and includes State or Region *Hluttaw* members and other members nominated by the Commander-in-Chief.<sup>34</sup>

This diversity creates variation in traditional norms and power structures, ranging from a system of small principalities in Shan and Kayah States to the tribal systems of the Kachin. The country is undergoing a process of profound transformation, which has significant implications for local governance structures at township and village level.

The Constitution provides equal rights to the various ethnic groups included in the national races and a number of laws and regulations aim to preserve their cultures and

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<sup>32</sup> <http://www.tni.org/sites/www.tni.org/files/download/accesdenied-briefing11.pdf>, accessed 09 March 2015.

<sup>33</sup> Republic of the Union of Myanmar, Directorate of Water Resources and Improvement of River Systems, *Myanmar Ayeyarwady Integrated River Basin Management Project Final Environmental and Social Management Framework*.

<sup>34</sup> Adam Smith International in partnership with Myanmar Development Resources Institute (MDRI), 2015, *Institutional and Regulatory Assessment of the Extractive Industries in Myanmar* p. 60.

traditions.<sup>35</sup> Myanmar national law sets out rights of ethnic nationalities to representation in State parliament.<sup>36</sup>

However, all of the main ethnic minority group areas have experienced various levels of—including separatist rebellions—since 1962, due to perceptions of ethnic discrimination and Burman domination. The dominance of ethnic armed groups has affected traditional structures. Armed ethnic groups have established systems of administration separate either to the Government system or to the traditional systems. Most of the ethnic armed groups have signed ceasefire agreements with the Government and the past years have seen a significant reduction in armed conflict. There has been progress in peace talks between the Government and ethnic armed groups through leadership meetings, starting in late 2013, but a National Ceasefire Accord (NCA) has not yet been realised.<sup>37</sup> Nonetheless, the country is undergoing a process of profound transformation, including but not limited to the peace process, which has significant implications for local governance structures at township and village level.

Although a large majority of the population practices Buddhism, other religions are also present within Myanmar; mainly Christianity, Islam, and Hinduism. Some estimates list the proportion of Buddhists at 90 per cent, while other sources estimate 80 per cent. Other major religions as estimated by the Pew Research Center are: 7.8 per cent Christians, 5.8 per cent folk religions, 4 per cent Muslims, and 1.8 per cent Hindus.<sup>38</sup>

#### **2.4.4.2 Internally Displaced People, Migrants and Post-Disaster Communities**

There are a number of internally displaced populations within Myanmar, particularly in Kachin, Rakhine and Shan states due to civil and military conflicts. Given their displacement it is possible that they may not be identified in population statistics.

A 2014 survey by The Border Consortium (TBC)<sup>39</sup> estimated that there were at least 110,000 IDPs spread across 23 townships (222 village tracts) in southeast Myanmar.<sup>40</sup> In December 2014, TBC verified 110,094 refugees living in refugee camps.<sup>41</sup> In addition, it is estimated that about 140,000 Muslims in Rakhine State<sup>42</sup> are displaced due to conflict, and a further 100,000 people in Kachin and northern Shan States.<sup>43</sup>

Post-disaster communities are prevalent in the Delta region and along the western coastline of Myanmar, which is particularly vulnerable to natural disasters, such as

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<sup>35</sup>Republic of the Union of Myanmar, Ministry of Health, *Myanmar Essential Health Services Access Project Community Engagement Planning Framework*

<sup>36</sup><http://www.myanmar-responsiblebusiness.org/pdf/SWIA/Oil-Gas/11-Ethnic-Minorities-Indigenous-Peoples.pdf>, accessed 09 March 2015

<sup>37</sup><http://documents.worldbank.org/curated/en/2014/11/23025474/myanmar-systematic-country-diagnostic-ending-poverty-boosting-shared-prosperity-time-transition>, accessed 04 March 2015

<sup>38</sup>Ministry of Health, Republic of the Union of Myanmar. 2014, *Myanmar Essential Health Services Access Project Community Engagement Planning Framework*,

<sup>39</sup> TBC is a non-profit, non-governmental organisation, is an alliance of partners working together with displaced and conflict-affected people of Burma/Myanmar to address humanitarian needs and to support community-driven solutions in pursuit of peace and development.

<sup>40</sup> The Border Consortium, 2015, *The Border Consortium Programme Report July – December 2014* p.5

<sup>41</sup> *ibid.*

<sup>42</sup> Many Muslims in Rakhine self-identify as *Rohingya*.

<sup>43</sup> See, e.g., OCHA Humanitarian Bulletin, 1-31 March 2015, [http://reliefweb.int/sites/reliefweb.int/files/resources/Bulletin\\_Humanitarian\\_OCHA\\_Mar2015.pdf](http://reliefweb.int/sites/reliefweb.int/files/resources/Bulletin_Humanitarian_OCHA_Mar2015.pdf)

Cyclone Nargis in 2008, which impacted 2.4 million of the population and caused over 138,000 deaths.<sup>44</sup>

#### **2.4.4.3 Health and Education**

Among ASEAN countries, Myanmar has the lowest life expectancy and the second-highest rate of infant and child mortality.

More than a third of children under five years of age in Myanmar are reported to be stunted while about 23 per cent are underweight and suffer from malnutrition. Housing indicators also suggest that standards of living in Myanmar lag behind the region with survey analysis indicating that only about half of the households in Myanmar live in houses that have durable roofing, compared to more than 80 per cent in neighbouring countries. In education, while primary net enrollment rates have improved over the past two decades, enrollment rates drop from 87 per cent in primary school to 58 per cent and 32 per cent for middle and high school, respectively.<sup>45</sup>

Limited access to infrastructure is a significant contributor to a lack of basic health and education services and for economic development. The rural electrification rate is very low; almost half of the roads are not passable during the monsoon rainy season; and railways are old and rudimentary, with few repairs since their construction in the late 19th century.<sup>46</sup>

#### **2.4.4.4 Poverty**

Despite its potential, Myanmar is one of the poorest countries in Southeast Asia. On the UNDP Human Development Index (HDI), Myanmar is positioned 150 out of 187 countries and territories. Its HDI value of 0.524 in 2013 places it below the average of 0.703 for other countries in East Asia and the Pacific.<sup>47</sup>

In 2013/14, the country's Gross Domestic Product (GDP) was US\$56.8 billion. With a population of 51.4 million, its per capita GDP was US\$1,105 compared to US\$5,779 in Thailand and US\$1,911 in Vietnam. Absolute poverty in Myanmar is estimated to have been between 25.6 and 37.5 per cent in 2010, with 76 per cent of Myanmar's poor living in rural areas and depending primarily on agriculture.<sup>48</sup>

Poverty rates vary across geographical zones, with poverty highest in many areas affected by conflict and the coastal zone (53.1 per cent, including 77 per cent in Rakhine State) and the Hills Zone (40.9 per cent), and lowest in the Dry Zone (29.5 per cent). Due to population density, the incidence of poverty is concentrated also in Myanmar's farming heartland of the Delta and in the Dry Zone. These two zones are home to 64 per cent of the country's poor. Urban poverty at 34.6 per cent is relatively higher than expected. At the time of the 2010 Agricultural Census, 15 per cent of farming households were headed by women; who farm plots that are on average 17 per cent smaller than those of male-headed households. Eighty per cent of female-headed

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<sup>44</sup> <http://www.acted.org/en/myanmar>, accessed 08 March 2015

<sup>45</sup> *ibid*

<sup>46</sup> *ibid*

<sup>47</sup> [http://hdr.undp.org/sites/all/themes/hdr\\_theme/country-notes/MMR.pdf](http://hdr.undp.org/sites/all/themes/hdr_theme/country-notes/MMR.pdf), accessed 06 March 2015

<sup>48</sup> Estimates of the poverty rate depend on the methodology for measuring poverty. The range of estimates between 25.6 and 37.5 percent reflects differences in the consumption basket (inclusion of expenditures on health and durable goods), assumptions about the income equivalence for the food calorie intake for adults, and the consideration of spatial differentials in the cost of living.

farming households (or 12 per cent of all farming households) are not able to produce enough food to meet household consumption requirements.

#### **2.4.4.5 Availability and Accessibility of Information**

The GoM has introduced media freedoms and transparency. Beginning in December 2012, the Government has issued licenses for 26 new daily newspapers, along with over 200 weekly news journals. Increased freedoms and better access to information have facilitated greater citizen engagement. Access to information has improved both due to increases in media freedoms and largely unfettered access to social media sites as well as liberalisation, for example, in the telecommunications sector, with prices of SIM cards falling from US\$250 in 2012 to US\$1.5 by 2015.

Myanmar's mobile phone penetration reached 10 per cent in 2012-13 while 2013/2014 saw a penetration of 27 per cent. The Ministry of Telecommunications and Information Technology has stated that it seeks to raise the mobile phone penetration rate in Myanmar to 80 per cent during the fiscal year 2015-16, and grow the number of internet users to 50 per cent during the same period.<sup>49</sup>

### **3 Methodology for PSIA and Social Assessment**

To support institutional and policy reforms in the energy sector, the World Bank has supported a Poverty and Social Impact Assessment (PSIA) to inform the Project as well as the World Bank-financed Myanmar Electricity Power Enterprise project. The PSIA has been combined with a social assessment and preliminary consultation process to assess potential social impacts and risks for the proposed National Electrification Project.

The PSIA was undertaken in two phases. Phase I was implemented between February and June 2014 and phase II between January and March 2015<sup>50</sup>. The PSIA is intended to support this process by providing information on: (i) the institutional context where the development and implementation of the NEP takes place; (ii) energy and electricity consumption patterns with a focus on energy poverty; (iii) main barriers to access to electricity in urban and rural areas; (iv) perception of affordability of electricity connections and recurrent charges - with a particular focus on the new tariffs introduced in April 2014 and how these have affected different groups of consumers; and (v) consumers' perspectives on the quality of services and understanding of pricing.

**The PSIA has two complementary modules and uses a mixed methods approach as follows:**

- **Qualitative module consisting of primary data collection in selected rural and urban areas** (through a series of focus group discussions, key informant interviews and a short household questionnaire) to collect information on: (i) access and

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<sup>49</sup> Mobile Internet Users in Myanmar Exceeds 2.6 Million by Allan T. Rasmussen <http://www.yozzo.com/news-and-information/mvno-mobile-operator-s/mobile-internet-users-in-myanmar-exceeds-2-6-million>, accessed 22 March 2015

<sup>50</sup> Finding presented here for PSIA Phase II and are based on preliminary field reports and data carried out in March 2015. More detailed analysis of the data collected will continue in April and May and final consolidated PSIA report integrating the findings from both phases is expected to be released in August 2015.

barriers to access to electricity with a particular focus on initial cost of electricity connection; (ii) uses of energy, uses of electricity as well as demand for electricity in areas where access is limited; (iii) perception of affordability of tariffs in use; (iv) perceptions of quality of the electricity service received; (iv) coping strategies with a particular focus on vulnerable households. (Additional details on the key questions for the qualitative module are included in Table 4 below).

- **Quantitative analysis on overall energy/electricity consumption patterns and distributional impacts of the new tariffs** (with a particular focus on the lowest socio-economic quintiles) using the 2009/10 Living Standards Survey undertaken by the Myanmar Central Statistical Office.

**TABLE 4: KEY RESEARCH QUESTIONS FOR PSIA QUALITATIVE MODULE (PHASES I AND II)**

Themes	Key questions	Data collection Phase
Energy and Electricity Consumption	Sources of energy (what is consumed - portion of electricity, role of other sources)  Uses (household use versus livelihood use – including agricultural activities) and demand	PSIA Phases I and II
Access the electricity: strategies for access and barriers	What is the process of obtaining connection to the village/urban ward  Focus on participation of vulnerable/poor households and ethnic minority groups  Detailed functioning of electricity committee (membership, terms of reference, management of accounts and governance, information sharing practices, linkages with township, provincial ESE and village administration)  Flow of information with/across villages and networks used for organising SREs (do they have an ethnic or religious dimension), in cluster of villages in “mixed areas”. What groups may be left out?  Rates charged, information provided and understanding of charges on the part of households  Barriers to access: costs of connection to the village, cost of connection to the home, affordability of regular tariffs and gaps  Process for determining the location of infrastructure and, when needed, land acquisition, voluntary land donations and compensation arrangements	PSIA Phase I  PSIA Phase II  PSIA Phase II  PSIA Phase II  PSIA Phase I and II  PSIA Phase I and II (Phase II included a short questionnaire – still being analysed)  PSIA Phase II
Payment and coping strategies	Ability to pay: affordability of electricity connections and tariffs and barriers to access for poor and marginalised groups  Coping with high expenditure on energy (focus on electricity) : (i) shifting to other sources?; (ii) reduction in energy consumption; (iii) approaches used to reduce energy consumption – if this is an option); (iv) other coping strategies (including borrowing or reducing consumption in other areas – negative coping strategies)  Support available: (i) social assistance – particularly	PSIA Phase I and II  PSIA Phase II and II

Themes	Key questions	Data collection Phase
	through informal networks and community institutions and local leaders vs state programs that may provide support)	
Quality of the service and communication with service providers	<p>Reliability of energy services (hours of service, interruptions) and variations by energy provider (<i>Particular attention will be paid to understanding the quality and reliability of the national electricity supply vs that of private suppliers</i>)</p> <p>Feedback on service providers performance: access to the service, (including understanding any “informal fees” that may be charged), handling of complaints, responsiveness to consumer needs and gaps</p> <p>Understanding of pricing on the part of consumers, discussion of recent changes in prices and feedback on potential increases. (<i>Particular attention will be paid to understanding the quality and reliability of the national electricity supply vs that of private suppliers</i>)</p> <p>Understanding grievance resolution mechanisms at village and ward level (for service delivery in general – role of community leaders, government officials)</p>	<p>PSIA Phase I and II</p> <p>PSIA Phase I and II</p> <p>PSIA Phase I and II</p> <p>PSIA Phase II</p>

**The PSIA Phase I was implemented in a context where Government announcements of tariff increases in November 2013 met with significant opposition and protests on the part of citizens in main urban centers of Yangon and Mandalay.** The analysis undertaken focused, therefore, on understanding how possible changes in tariffs could impact the welfare of consumers (with a focus on the poorest<sup>51</sup>). This was undertaken through quantitative analysis coupled with the collection of information on citizens’ perspectives on current tariffs and quality of service that can inform the design of adequate/effective subsidies as well as communication/feedback mechanisms between MoEP, utility companies and consumers.

**Phase II of the analysis sought to provide a more complete picture of the issues above by collecting data in additional States. It also sought to deepen the understanding of the critical issues identified in Phase I.** These included: (i) key barriers to accessing electricity, namely the cost of connection to the villages and the cost of the initial connection to the home; (ii) village and ward-level self-organisation approaches and potential risk of exclusion of poor and marginalised households and of generating inter or intra village tensions/conflict over the distribution of resources; (iii) processes followed to determine the location of electricity infrastructure (including land acquisition and donation) and (iv) mechanisms in place to lodge and resolve complaints and disputes at local level; (v) quantifying the “affordability gap” and providing households’ perception of the adequate level of subsidies needed to support their connection to Government electricity services; and (vi) areas for priority capacity strengthening of the Department of Electricity Services at township level.

<sup>51</sup> For purposes of the qualitative analysis: (i) a social mapping exercise was undertaken in rural areas to identify poor and marginalized households as defined by the communities themselves.; and (ii) in urban areas the research team purposefully selected a low income ward per city to collect the perspectives of poor households (four wards were covered for each city). A similar social mapping exercise was conducted for urban areas to identify poor and marginalized groups.



### 3.1.1 Qualitative Module: Selection of Research Sites and Informants<sup>52</sup>

The qualitative analysis undertaken under Phase I drew on the ongoing research program of the Livelihoods and Food Security Trust Fund (LIFT): Qualitative Socio-Economic Monitoring (QSEM) implemented for the WB by the Enlightened Myanmar Research (EMR) consultancy firm. The selection of field sites took into account the importance of understanding the different contexts, conditions of access to electricity and perceptions of consumers in **rural and in urban** areas. Focus Group Discussion (FGD), Key Informant Interviews (KIIs) and household questionnaires were field tested and adjusted based on the feedback from respondents.

For rural areas, a sub-set of 13 of the 56 QSEM villages were targeted under Phase 1 to collect information from areas with different types of access to electricity in different Regions/States and “agro-ecological zones” (as outlined in Table 5).

Following the same approach, 15 villages were targeted for PSIA Phase II (12 new villages as well as three villages initially covered under Phase I). The selection of sites was guided by the need to look at villages with access to Government services and those with access to community initiatives, and to collect more in-depth information on the different self-organising practices of the communities. Two of the three villages with access to the Government grid identified in Phase I were also covered to collect additional information on the community organisation approach followed. The third such village (Village 2 in Shan) was initially included in the fieldwork plan but was not accessible to the research team at the time of data collection (insecurity/conflict).

**TABLE 5: RURAL SITES FOR QUALITATIVE ANALYSIS (A TOTAL OF 13 VILLAGES) – PHASE I**

Region/State	Access to Electricity			
	Government Service	Private Company	Community initiative or SMEs(hh. selling electricity)	Individual connections only (solar panels or generators)
Chin	Village 1 - (Hydro)		Village 4 - (Hydro)	
Mandalay			Village 7 - (Generator)	Villages 10 and 11
Ayeyarwady				Villages 12 and 13
Magway	Village 3 - (Grid)		Village 5 - (Generator)	
Shan	Village 2 - (Grid)	Village 6 - (Hydro)		
Rakhine			Villages 8 & 9 – (Generator)	

**TABLE 6: RURAL SITES FOR QUALITATIVE ANALYSIS (A TOTAL OF 15 VILLAGES) – PHASE II**

Region/State	Access to Electricity		
	Government Service	Private Company	Community initiative or SMEs (hh. selling electricity)

<sup>52</sup> An overview of the methodology used for the IHLCA 2009 analysis will be outlined in the forthcoming paper by Kozel and Kim

Chin	Village 1 [ <b>maintained from Phase I</b> ] (Hydro)		Village 14 (Community Hydro)
Magway	Village 3 -[ <b>maintained from Phase I</b> ] (Grid)		
Kayin	Village 15 (Grid)		Village 16 (Diesel Generator)
Mon	Village 17 (Grid)		Village 18 (Diesel Generator)
Ayeyarwady	Village 19 (Grid)		Village 20 (Diesel Generator)
Rakhine	Village 21 (Grid)		Village 22 (Diesel Generator)
Shan	*	Village 6 (hydro) [ <b>maintained from Phase I</b> ]	
Mandalay	Village 23 and 24 (Grid)		Village 25 (Diesel Generator)

### 3.1.2 Data collection in rural areas

**For Phase I - A total of 108 FGD and 78 KII (and short questionnaires on energy consumption) were undertaken in rural areas.** Eight FGDs were conducted per site with: (i) village leaders (1 FGD), (ii) different livelihood groups (FGD 2 to 6); (iii) electricity committee (FGD 7); and (iv) women (FGD 8 to assess whether there were any relevant differences in terms of perception of quality of services or barriers to access and affordability by gender). In addition, six KIIs were conducted per site, two with each of the main socio-economic categories as defined by the villagers (better off, middle quintile and vulnerable households).

**For Phase II – A total of 89 FGDs and 42 KIIs were conducted in rural areas.** In addition, a short questionnaire was used to assess affordability and the financing gap in accessing the government grid connection with a total of 35 rural households interviewed per site (a total of 525 interviews conducted).

**For Phase I, 300 KIIs and 6 FGDs<sup>53</sup> were conducted in the main urban centers of Yangon and Mandalay as well as in the capital of Chin State (Hakha).** KIIs were the preferred means of data collection with 25 KIIs conducted per site (five in each of the four wards selected to exemplify different socio-economic conditions). In addition, FGDs were conducted with Electricity Committees in Industrial Zones and Township Electricity Departments where relevant. Urban areas were purposefully selected to collect information from: (i) areas where negative feedback to the announcement of new electricity tariffs in November 2013 had been the strongest (Yangon and Mandalay); and (ii) smaller urban areas where access to electricity remains limited and challenges with the quality of supply are an important issue (Hakha was selected as it exemplifies some of the challenges common in a number of state capitals).

**During Phase II, an additional 315 household interviews were conducted in urban areas** to assess affordability and the financing gap in accessing the government grid connection with a total of 35 rural households interviewed per site. Household level data was collected in nine additional urban wards (three wards in Sittwe and three wards in Thaton). In addition, a total of 24 KIIs were conducted across these wards with

<sup>53</sup> KII were the preferred means of data collection in urban areas.



ward leaders (four interviews) and vulnerable households (24 interviews) to collect more in depth information about barriers to access, quality of service and coping strategies.

**Finally, a series of interviews and consultations were held with key Government agencies, private sector stakeholders and civil society organisations.** These were particularly important to provide the research team with an understanding of the overall institutional context for NEP implementation and to collect private sector and civil society perspectives on the introduction of the new tariffs and the quality of the electricity service. A total of 12 KIIs and 10 FGDs were held in Nay Pyi Taw, Mandalay and Yangon with a diverse group of stakeholders.

### 3.2 Supplemental assessment of potential social impacts and risks

During January – March 2015, a supplementary assessment was undertaken of potential social impacts and risks, to inform the development of the Environmental and Social Management Framework (ESMF) for the Project. This work was led by an international consultant based in Yangon working with MoEP and DRD Social Safeguards counterparts, and with guidance from the World Bank.

The methodology for the supplemental assessment of potential social impacts and risks was as follows:

- i. *Document review process* - to review key documentation previously prepared to inform the development of the Project;
- ii. *Stakeholder identification and research process* - to identify key informants and civil society organisations (CSOs); in particular CSOs with a specific focus on ethnic minorities, land and renewable energy. Stakeholder selection was informed by PSIA stakeholder engagement activities that had already been undertaken.
- iii. *Site Research* - with key informants and MoEP and DRD Social Safeguards counterparts, to inform the selection of sites for the proposed field research.
- iv. *Consultative Discussions* - with key informants and CSOs to:
  - a. obtain insights into the perceived social impacts of the National Electrification Project and the application of social safeguards by other development partners working in the energy sector; and
  - b. source current information in regards to land, conflict and ethnic minority considerations that would need to be addressed in the ESMF.

These discussions were also used to identify key documentation for review.

- v. *Field Research* - a 14-day field visit was undertaken to northern Chin State and southern Shan State with MoEP and DRD social safeguards counterparts. The primary purpose of this travel was to meet stakeholders and undertake site reviews of key infrastructure similar to that likely to be included in the Project's grid and off-grid rollout activities. A secondary purpose was to commence the process of raising awareness within the MoEP and DRD of WB social safeguards focus areas and requirements.

As part of the field research, KIIs and group discussions were held:

- a. with government (state, district, township) representatives from ESE, DRD and the General Administration Department (GAD) in northern Chin State (Falam, Hakha) and southern Shan State (Taunggyi, Yatsauk);

- b. in eight villages (four per state)– generally with village heads, village electrification committees and groups of villagers;
- c. with a limited number of:
  - i. CSOs/community leaders in Kalembo, Falam and Taunggyi; and
  - ii. companies experienced in providing micro-hydro and/or solar home systems services to villages.

In addition to this, some key informant discussions were held with:

- organisations currently providing off-grid renewable energy services, at the WBG Off-Grid Workshop held in Nay Pyi Taw on 28-29 January 2015; and
- CSO representatives at the Project's Public Meeting on 30 January 2015.

Broadly, the supplemental assessment of potential social impacts and risks focused on identifying and understanding perceived social risks associated with the social safeguard policies triggered by the Project, particularly OP 4.10 on Indigenous Peoples.

During the field visit, potential social impacts and risks associated with the below research themes were explored:

1. Social impact management, associated with:
  - a. Infrastructure development, including social constraints parameters;
  - b. Land acquisition/ compensation/resettlement.
  - c. Environmental impacts linked with primary and ancillary infrastructure including its construction, operation, maintenance, monitoring.
  - d. Source of electricity for grid/off-grid.
  - e. Social cohesion.
2. Social benefit creation, associated with:
  - a. Improved access to education, health, business opportunities (improved agricultural productivity, home businesses), other.
  - b. Local business opportunities associated with infrastructure development (construction and operations);
3. Consultation and engagement processes, associated with:
  - a. Site identification, planning and selection;
  - b. Construction, operation and monitoring phases.
  - c. Monitoring and supervisory activities;
  - d. Complaints management.
4. Linkages to maximise social benefits, associated with:
  - a. Telecommunications rollout and related social investment and programming, including related innovations in mobile banking etc.
  - b. Potential for integrated planning at state/region and township level (grid and off-grid) with education, health, agriculture, other relevant ministries.

### 3.3 Stakeholder Consultations

#### 3.3.1 Overview

As described above, the methodology for stakeholder consultations was a combination of key informant interviews, small group/focus group interviews and group discussions.

Over the period 19 January to 23 March 2015, consultative discussions with stakeholders were undertaken in Yangon and Nay Pyi Taw, (northern) Chin State and (southern) Shan State with a broad range of organisations spanning international organisations, private sector representatives, government (state, district, township), civil society organisations (international, national and local) and communities.

In Yangon, the focus was consultation with key informants, international organisations, telecommunications companies, (primarily) national civil society organisations (CSOs), particularly those with a focus on ethnic minorities, land and gender, and key not for profit organisations with a focus on business and social responsibility. In total, 26 meetings were held; 22 with organisations and four with key informants.<sup>54</sup>

In Nay Pyi Taw, brief key informant discussions were held with organisations working in Myanmar in the provision and/or support of off-grid renewable energy services, in particular the Renewable Energy Association Myanmar (REAM). These were held alongside the NEP Off-Grid Forum.

In northern Chin state (Falam, Hakha), consultation discussions were held with government officials (state, district, township), community leaders and civil society representatives, and with villages (village leaders, village electrification committees, and villagers). Some women’s focus groups were held. A similar range of stakeholders was consulted in Southern Shan State (Taunggyi, Yatsauk). Chin, Shan, Pa-O and Danu speakers joined the field research team, as needed, to assist in facilitating meaningful engagement at village level. Table 7 below summarises stakeholder consultative activities undertaken in Yangon.

**TABLE 7: CONSULTATIONS CONDUCTED FOR SUPPLEMENTARY ASSESSMENT**

City	Development Partners & International Organisations	Non-Government Organisations	Private Sector Organisations	Civil Society Groups/ Foundations	Key Informants
Yangon	JICA ADB (skype) International Labour Organisation (ILO)	Myanmar Centre for Responsible Business (MCRB) Myanmar Coalition on	Telenor Ooredoo	Promoting Indigenous and Nature Together (POINT) Paung Ku Land In Our	Ashley South, Myanmar Peace Support Initiative (MPSI)

<sup>54</sup> A number of additional meetings with CSOs and key informants were scheduled and/or were proposed but were not able to proceed due to the limited availability of the CSO/key informant within the timeframe available for consultative discussions. Organisations contacted included the Transnational Institute (TNI), Myanmar Development Resource Institute (MDRI) – Centre for Economic and Social Development (CESD), General Electric, ECODEV, Mon Women Organisation, Metta Foundation, Shalom, Equality Myanmar and Maw Htun. Efforts were also made to engage with the Land Core Group (via Paung Ku) in a roundtable on land issues, and 88 Generation. The International NGO (INGO) Forum was contacted to enable outreach to INGOs working and/or interested in the energy sector.

City	Development Partners & International Organisations	Non-Government Organisations	Private Sector Organisations	Civil Society Groups/ Foundations	Key Informants
		AIDS (now focused on Social Responsibility) Agency for Technical Cooperation and Development (ACTED)		Hands (LioH) Kachin Peace Network Gender Development Initiative (GDI) Gender Equality Network (GEN) Myanmar Alliance for Transparency and Accountability (MATA) Local Resource Centre (LRC) Karen Women's Empowerment Group (KWEG)/ Karen Human Rights Group (KHRG)/Karen Environmental and Social Action Network (KESAN) Thoolei Foundation Human Rights and Defenders Organisation Youth Circle	Paul Donowitz, ADB Consultation and Participation Specialist Vicky Bowman, Director, MCRB Jared Bissinger, Myanmar Specialist

Table 8 summarises stakeholder consultative activities during field research activities in northern Chin and Southern Shan States, and infrastructure viewed.

**TABLE 8: CONSULTATIONS IN CHIN AND SHAN STATES**

Location	Government Stakeholders	Villages	Community Leaders/Civil Society Organisations/ Companies	Infrastructure Viewed
<b>Kalemyo</b>	N/A	N/A	Chinland Natural Resources Watch Group (MATA member)	N/A
<b>Falam</b>	ESE, GAD, DRD (Township)	1. <u>Par Te Village</u> <ul style="list-style-type: none"> <li>▪ Village Head</li> <li>▪ Villagers</li> </ul>	Chin Institute of Social Science Chin Think Tank Falam	Par Te and Lum Bang have hydro mini grid, with power derived

Location	Government Stakeholders	Villages	Community Leaders/Civil Society Organisations/ Companies	Infrastructure Viewed
	Level) Vaar Mini-Hydropower Plant: ESE personnel.	<ul style="list-style-type: none"> <li>▪ VEC Members</li> </ul> 2. <u>Lum Bang</u> <ul style="list-style-type: none"> <li>▪ Village Head</li> <li>▪ Villagers</li> <li>▪ VEC Members</li> </ul> 3. <u>Man Kheng</u> <ul style="list-style-type: none"> <li>▪ Village Head</li> <li>▪ VEC Members</li> <li>▪ Women's Group</li> </ul>	Falam Town Elders Falam Baptist Church Chin Christian Institute of Theology (CCIT) Falam Municipal Office Falam Youth Fellowship	from Ngasitvar govt mini hydro plant. Both have infrastructure: 11/0.4kV, 50 kVA Transformer. Man Kheng has self-reliant electrification (SRE) – 10 kW Gen. Micro-hydro generator. At Vaar: 1 MW Off-grid Ngasitvar Mini-Hydropower Plant
<b>Hakha</b>	GAD, ESE, DRD (Township Level) DRD, ESE (State Level) Laivar Mini-Hydropower Plant: ESE personnel	1. <u>Niralun</u> <ul style="list-style-type: none"> <li>▪ Village Head</li> </ul>	<i>Despite efforts, these meetings were not able to be organised during the field research period.</i>	SRE-20 KW Mini-Hydropower Plant 80 KVA Diesel Generator 66/11 kV, 5 MVA Transformer substation. 66,33,11,0.4 kV lines 600 KW off-grid Laivar mini hydropower plant
<b>Taunggyi</b>	GAD, DRD, ESE (Township Level) ESE (State Level)	1. <u>Kaung Nane</u> <ul style="list-style-type: none"> <li>▪ Village Head</li> <li>▪ VEC Members</li> <li>▪ Women's Group</li> </ul> 2. <u>Sa Ke</u> <ul style="list-style-type: none"> <li>▪ Village Head</li> <li>▪ Villagers</li> </ul> 3. <u>Hti Wall</u> <ul style="list-style-type: none"> <li>▪ Village Leaders</li> </ul>	Township Development Supporting Committee (5) Karuna Myanmar Social Services New Generation Shan State (MATA member)	Kaung Nane was recently connected to the national grid. Has 33/11 kV, 10 MVA Transformer. In Pin Shey has no access to power.
<b>Yatsouk</b>	GAD, DRD, ESE (Township Level) & Elder, Municipal Committee Yatsauk Substation: ESE personnel	1. <u>Pin Phyt</u> <ul style="list-style-type: none"> <li>▪ Village Head</li> <li>▪ VEC Members</li> <li>▪ Villagers</li> </ul> 2. <u>Tha Pyay Gong</u> <ul style="list-style-type: none"> <li>▪ Village Head</li> </ul>	N/A	Pin Phyt was recently connected to the national grid. Has 33/11 kV, 5 MVA Transformer and possibly another 5MVA to come. Thapyagone has DRD Budget

Location	Government Stakeholders	Villages	Community Leaders/Civil Society Organisations/ Companies	Infrastructure Viewed
		<ul style="list-style-type: none"> <li>▪ VEC Members</li> <li>▪ Men's Group</li> <li>▪ Women's Group</li> <li>3. <u>Kya Inn &amp; Ma Gyee Gong</u></li> <li>▪ Villagers</li> </ul>		<p>Pico-Hydro – 10 kW.</p> <p>Some parts of Kya Inn &amp; Ma Gyee Gong were recently connected to the grid.</p>

## 4 Quantitative Analysis

### 4.1 Energy and electricity consumption patterns and affordability

The IHLCA data indicates that overall, 28 per cent of households in Myanmar were connected to the public grid in 2010 with marked differences between rural and urban areas: 77 per cent of urban households were connected to the grid compared to only 10 per cent of rural households. An additional 15 per cent reported they purchased electricity from private suppliers (9 per cent of urban households, 18 per cent of rural households). Another 5 per cent indicated they used communal or had a private generator, and 7 per cent reported using batteries for lighting. Overall, the IHLCA data indicates that there were substantial gaps in access to reliable electricity and that households, and communities and households, developed innovative alternatives to secure access to electricity albeit without ensuring reliable supply.

Overall, households with public connections were much more likely to live in urban areas and were wealthier than households with private or communal connections. Access to electricity was highly correlated with income. Better off households were much more likely to use electricity (particularly the public grid) than poorer households.

According to the IHLCA data, households connected to the public grid reported spending 1.4 per cent of total expenditures on electricity, and the share of spending was fairly constant across the income distribution (for poor as well as rich households).

Households accessing electricity from private suppliers reported spending 2.2 per cent of total consumer expenditures on electricity, which was also constant across the income distribution. Low spending is the result of modes tariffs and a generous lifeline tariff cut-off, coupled with low electricity consumption. A substantial number of (public electricity) households in Myanmar consume below the lifeline tariff (currently set at 100 KWh/month): in urban areas, 30 per cent of households consumed 50 KWh/month or less, and 66 per cent consumed 100 KWh/month or less. In rural areas, 53 per cent of households consumed 50 KWh/month or less, and 88 per cent consumed 100 KWh/month or less. Overall, current tariffs are moderate and electricity remains affordable to those who currently have access.

Importantly not all households within electrified villages and wards were themselves connected to electricity services. Electrification rates for urban wards/rural villages

were substantially higher than electrification rates for individual households. According to the IHLCA, 41 per cent of wards or villages were connected to the public grid, 13 per cent reported communal electricity sources, and 50 per cent had households that used electricity from a private supplier. Overall, 78 per cent of urban wards and rural villages had some type of electricity supply available (viz. public, private, or communal). In 40 per cent of electrified wards/villages, nearly all households were electrified. But private connection rates were highly variable in the remaining 60 per cent of wards/villages.

Very few households had electricity available 24/7. Surprisingly, there was no strong relationship between the reliability of the supply of electricity (measured in average hours available/day) and household income. Households connected to the public grid reported an average availability of 12 hours/day, households connected to private suppliers reported an average availability of 10-11 hours/day

IHLCA tabulations, augmented by some additional simulations, do not suggest that electricity affordability is currently a concern for households that are currently connected to electricity services in Myanmar. It is important to understand this finding in a context where better off households are currently much more likely than poorer households to be connected to the grid. In addition, this finding was not reflected in the qualitative analysis and warrants additional study. Qualitative analysis further indicated that in rural areas, electricity committees and private companies do charge rates significantly above those set by MoEP. Further analysis will be particularly relevant as the NEP plans a steep increase in the number of households to be covered by electricity services and an outreach to poor and marginalized households currently not connected.

## 5 Qualitative Analysis

### 5.1 Use of electricity and quality of the service

**The qualitative analysis indicated that uses of electricity were very consistent across research sites in rural areas. Household use was primarily for lighting and TV across all sites visited.** For lower middle income households (among those with an electricity connection) lighting was often the only use found. Diesel was the primary source of energy for livelihood activities for the vast majority of households and small businesses interviewed. Overall, the cost of diesel (and fluctuations in cost) were a significant constraint to their profitability and there was high demand among rural Small and Medium Enterprises (SMEs) for grid-based electricity services.

**While current usage of electricity was limited, households across all rural research sites (with and without access to the Government grid) highlighted the importance of an electricity connection to “be linked up to the outside world”** particularly through a TV. There was a sense in village with no electricity connections that they were left behind in terms of the “modernization” process (particularly where better-off villages in the vicinity were connected to the grid). Furthermore, there was high demand for more reliable electricity services so children could study at night and electricity could be used for livelihood activities (in the areas visited this consisted of

pottery making in the evenings, lighting in small village shops and more generally agricultural activities given the very high perceived cost of diesel).

**Agricultural tasks for large/medium/small farmer were systematically carried out with diesel generators.** These were owned for large/medium farmers and rented out for small farmers. Better off households, in villages with reliable electricity supply, used electricity for water pumping and limited irrigation. In the areas surveyed, fishermen mainly relied on diesel generators for productive activities (i.e for lighting to sort fish in the evenings).

Table 9 Quality of the service in rural areas

Types of Sources	Villages	Regularity	Capacity
Grid Connection (Government or Private Provider)	Village 1 (Magway)- Grid	Regular access- 24 hours (black-outs very rare)	Good capacity (regular household uses –lighting and TV as well as water pumps)
	Village-3 (Chin) - Hydro	One day out of three	Good enough for lighting and TV
	Village-2 (Shan-N) Grid	Regular access- 24 hours (black-outs very rare)	Good capacity (regular household uses –lighting and TV as well as water pumps)
	Village-5 (Shan-E) - Hydro	Regular access- 24 hours (black-outs very rare)	Good capacity (regular household uses –lighting and TV as well as water pumps)
Community Initiatives	Village-4 (Chin) - Hydro	2 hours daily	Lighting and TV only
	Village-7 (MDY) – Generator	2 hours daily	Limited capacity lighting only
Household re-distribution/small businesses using diesel generators	Village-6 (Magway) - Village Monastery generator	2 hours daily	Lighting and TV only
	Village-8 (Rakhine)- Household redistribution	2 hours daily	Lighting and TV only
	Village-9 (Rakhine) - Household re-distribution	2 hours daily	Lighting and TV only

**Unlike in rural areas, uses at household level in urban areas varied more markedly across wards/income groups and cities.** Urban households with generally better access to reliable electricity used significantly more appliances. Beyond lighting and TV, electricity was commonly used to run refrigerators, stoves, kettles and rice-cookers. Air-conditioning was an important use among higher income households and found exceptionally only in middle-income households. The use of electricity for cooking was observed in better-off wards but was much less prevalent in middle-income neighborhoods and non-existent in the poorer wards. Issues of quality of service were stressed in poorer wards more strongly (across all three cities) both in terms of the availability, reliability of the supply and speed/cost of repairs.

**With the exception of Hakha, which has significant limitations in the actual availability of service, respondents in Yangon were the most critical**



**regarding the quality of the service** (particularly in the middle-income ward visited). In Mandalay the overall perception across sites was that privatization had improved the quality of service and customer relations. There were some variations, within cities in terms of quality of service with poorer wards highlighting more power fluctuations and difficulties in getting repairs done. Interestingly, better off households reported good service for repairs with no informal charges. These were more frequently mentioned in middle income wards. Poorer households tended not to call the service provider (as this would take too long) but instead to call upon private electricians (sometimes employed by the electricity companies but doing these small repair jobs “on the side” for additional income).

Table 10 Uses of electricity and perception of quality in urban areas

Location	Uses	Perception of Quality
<b>Poorer Wards</b>		
CHN- 3	Mostly lighting with firewood used for cooking and heating	Limited availability - 3 hours/day during 5 days a week
MDY- 3	Lighting and TV	Fluctuation in capacity throughout the day, issues noted with maintenance and charges covered by the community (frequent weather related damage).
YGN- 3	Lighting and TV with charcoal used for cooking. A very limited number of respondents (2 of 25) had small appliances (kettle, rice-cooker)	24 hours supply but limitations in terms of capacity (water pumping only possible during the day for example). For repairs, households contacted electricians privately and paid them directly.
<b>Middle Income Wards</b>		
CHN- 2	Lighting and TV with very limited appliance use. Charcoal used for cooking and heating	Limited availability - 3 hours/day during 5 days a week
MDY- 2	Lighting, TV, limited use of appliance (fans rather than air-conditioning). Hot plates used for cooking	Limited capacity for 1 or 3 hours during cooking time in the evening but overall good supply and few blackouts. Improvements in quality of service also noted with privatization. Some informal charges reportedly collected for repairs
YGN- 2	Lighting, TV, basic appliances including stoves, kettles, rice cookers, refrigerators and simple washing machines. Electricity used for cooking with more limited use of charcoal for the households interviewed	Limited capacity during cooking hours (10 am to 12 pm). Repairs are relatively quick but informal charges collected
<b>Better-off Wards</b>		
CHN- 1	Lighting, TV and limited appliance use. Cooking and heating done with charcoal. Use of private generators to complement limited government services	Limited availability - 3 hours/day during 5 days a week.
MDY- 1	Lighting, TV appliances air-conditioning and cooking	Some issues with capacity and occasional black-outs (weather related damage). Noted improvements in service after privatization (particularly for maintenance and customer service). Repairs were conducted quickly and no informal charges were reported although “tips” were provided

YGN- 1	Lighting (including security lighting/garden lighting), full range of appliances including air-conditioning and cooking	24 hours and good capacity. Repairs were conducted quickly and no informal charges collected although “tips” were provided
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## 5.2 Barriers to access

### 5.2.1 In Rural Areas

**The analysis of data collected both during PSIA Phase I and II indicated that access to electricity in rural areas is limited by the current coverage of the grid but also by the fact that villages must cover the costs of the connection from the main “transmission” line to the village itself following the Self-Reliant approach to electrification (Box 1).** All eight villages with access to the government electricity grid were located immediately beside the main road, transmission lines, beside a sub-station or in the case of village 21 in Rakhine close to a military camp from which access to the electricity grid was extended (Table 1). However, of the remaining seven villages targeted under PSIA Phase II without access to the Government grid, four were similarly located within close proximity of the transmission lines. While proximity to the grid plays an obviously important role in determining access to electricity, the affordability of the connection to the village (for which villages are required to raise their own funds) plays an equally determining part.

**As noted during PSIA Phase I, it is the high cost of the initial connection to the government electricity grid that constitutes the biggest obstacle to access from both village and for middle-income and poor households within the targeted villages.** Of the eight villages targeted in the study those with access to electricity provided by Government services/private company were: (i) provided with access/village connection free of charge by government or by the private company supplying electricity; (ii) in the case of Village 6 in Shan were exceptionally well-off<sup>55</sup> and able to raise the necessary funds from households; or (iii) contracted heavy debt to be able to cover the cost of connection (Villages 23 and 24 in Mandalay). Respondents in the remaining villages systematically highlighted the cost to the households of establishing this initial connection as the key obstacle for their lack of access. The perception that government subsidies for these connections were not available (or were granted only in very exceptional circumstances) was reported systematically across research sites.

**Similar to what was observed during PSIA Phase I, political connections of the village administration, the linkages between religious leaders and the township and/or private contractors were key in securing additional resources as well as providing guidance and support to navigate the complex SRE process.** Villages in the sample that did not have these informal connections [those with access only through private providers tended to be unsuccessful in their application, reporting lack of response from township department and particular a lack of funds for the initial investment needed. The initiative of the local administration, traditional and religious leaders and well off households and their ability to mobilize their informal networks and connections were key factors in the success of village SRE. Significantly, visits to

<sup>55</sup> Research team observation highlighted the quality of housing construction, infrastructure and related it to the source of income of the village/migration.

rural areas by high level government officials (as noted during Phase I) often coincided with the allocation of discretionary funds for electrification. This was noted in three of the eight villages covered by PSIA Phase II. Without these formal sources of support or informal connections (including township endorsed contractors) respondents reported that their application would not receive the necessary attention and the response to their request would “take too long”.

**TABLE 11: PSIA PHASE II – LOCATION OF VILLAGES IN RELATION TO THE ELECTRICITY GRID**

Village Name	Access to Electricity	Distance from Grid	Socio-Economic Status (defined by villagers)
Village 1 (Chin)	Government (Hydro)	3 miles	Poor
Village 14 (Chin)	Community (Hydro)	30 miles	Poor
Village 3 (Magway)	Government Grid	7 miles	Medium
Village 15(Kayin)	Government Grid	4 miles	Medium
Village 16 (Kayin)	Community Initiative	30 miles	Medium
Village 17 (Mon)	Government Grid	½ mile	Medium
Village 18 (Mon)	Community Initiative	7 miles	Poor
Village 19 (Ayeyarwady)	Government Grid	3 miles	Medium
Village 20 (Ayeyarwady)	Community Initiative	8.3 miles	Poor
Village 21(Rakhine)	Government Grid Connection through military camp	12 miles	Poor
Village 22 (Rakhine)	Community Initiative	13 miles	Poor
Village 6 (Shan)	Private Company (Hydro)	-	Rich
Village 23(Mandalay)	Government Grid	3/4 miles	Poor
Village 24(Mandalay)	Government Grid	1 mile	Medium
Village 25 (Mandalay)	Community Initiative	1 miles	Poor

**TABLE 12: PSIA PHASE II – COST OF CONNECTION TO HOUSEHOLDS IN VILLAGES CONNECTED TO THE ELECTRICITY GRID**

Village Name	Access to Electricity	Year	Cost of Connection to the village (amount per household)	Cost of connection to home (kyat)
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Village 1 (Chin)	Government Service (Hydro)	2003	None – Connection provided by Government with additional support from private donor	3,500
Village 3 (Magway)	Government Grid	1990	None - The original cost of the connection in 1990 was covered by Government. Households paid 200,000 kyats/household for maintenance ( in 2013)	4,500
Village 15 (Kayin)	Government Grid	2008	Between 600,000 to 800,000 Lakh	35000
Village 16 (Mon)	Government Grid	2011	Between 500,000 to 700,000 Lakh	Between 20000-35000
Village 19 (Aycyarwady)	Government Grid	2012	96, 000	1lahk-4lahk
Village 21 (Rakhine)	Government Grid	2014	150,000-350,000	Complete
Village 6 (Shan)	Private Company (Hydro)	2012	350,000-500,000 per household	complete
Village 23 (Mandala)	Government Grid	1993	20,000 per household	10000
Village 24 (Mandalay)	Government Grid	2014	33,0000 per household	150,000

#### Box 1:Self-Reliant Electrification

**The Self-Reliant Electrification (SRE) approach, put in place in 2000,<sup>56</sup> consists of granting access to the Government’s electricity grid to village(s) and ward(s) who self-organize to raise the necessary funding from community contributions.** The technical requirements for the infrastructure is laid out in the “12-point Document”<sup>57</sup> issued by MoEP (Please refer to Annex 2 for additional details). The document requires that an Electricity Committee be established at village level to oversee fundraising and construction efforts. It acts as contract with between the utility companies and the Village Electricity Committee certifying that construction standards have been adhered to and that the committee will be responsible for the maintenance of the connection.

**There is a great deal of flexibility in the way in which the communities organize themselves and the in the specific steps to process their application.** It is important to note that while the Electricity Committee is responsible for raising the funds, overseeing construction and maintenance, little is mandated by MoEP in terms of: (i) selection of committee members; (ii) Terms of Reference or roles of different members (including segregation of duties for financial management and procurement); (iii) community planning and mobilization process; (iv) basis for calculating tariffs and maintenance charges to be collected. In addition, communities are not required to mobilize the full amount needed for construction before the start of the works and some conduct construction in phases over a number of years. Decisions about these key issues are left to the communities themselves which introduces a lot of variation in the approach followed and results in use of the tariffs that are often well above those set by Government.

**Overall, village leaders (formal such as village administrators or traditional and religious leaders) approach the township or regional level department of Electric Supply Enterprise or Yangon Electric Supply Board (YESB) for information.** Among respondents, well connected individuals in the community often used personal relationships to obtain information directly from regional offices (considered a more reliable source of information that

<sup>56</sup> Interestingly, respondents at township level gave different start dates for the initiative between 2000 and 2005

<sup>57</sup> Source: ESE Department, office 53, Nay Pyi Taw

the township offices) to learn about key steps and general cost estimates. This is followed by a discussion of the information received and next steps among community leaders only. It is important to note that the lack of a requirement for information sharing with the broader community in the 12 point document means that decisions about electrification are usually made by a small group of village leaders and tend to exclude the poorer households in the village from the onset. This was the case across all sites visited with the exception of Village 6 in Shan, which as noted earlier was exceptionally well off.

**Depending on the degree of interest (and social capital) of the village or ward, the formal Electricity Committee will be set up. It is usually made up for two members per village, which are nominated among village leaders.** Electrification Plans in the areas visited tended to cover clusters of villages so as to divide the cost. The committee does sometimes include the Village Administrator but not necessarily so<sup>58</sup>. There is no established limit to the number of committee members and or mandated functions (for example in one of villages visited the committee was made up of 15 members).

**Technical support provided by the township offices of electricity companies is focused on the review and approval of proposals and technical designs developed independently by the villages. No financial support is provided to the Electricity Committee for either the planning or construction steps. The committee is responsible for sourcing the technical support needed for construction.** Township staff will, however, provide initial cost estimates and assessment of the feasibility of the electrification plan. The township office will also certify the compliance of the works with the construction standards before the access to the grid is finally granted. The committee will therefore prepare and submit the electrification plan to the township office, who reviews it and endorses it for approval at Regional level. This approval gives the community the green light to proceed with construction. A similar process is followed for the certification of “readiness to connect” at the end of construction. An inspection is conducted by the township office and approval granted by the Regional Office to initiate the connection.

**According to the ESE, self-reliant electrification has been more encouraged in recent years and the procedure for application simplified.** The technical requirements laid out in the 12 Point Document have been streamlined (from 72, to 24 and finally to 12 required tasks). Approval of community applications and certification of compliance is now reviewed at Regional rather than Central/Ministerial level. In spite of the simplification of procedures, based on feedback from the respondents, establishing connections can take a number of years (three on average in the areas visited including construction of infrastructure by the community).

**TABLE 13: EXTERNAL SUPPORT FOR ELECTRIFICATION PROCESS**

Village Name	Source external/informal support for SRE.
Village 1(Chin)	UNDP funded – water resource management intervention
Village 3 (Magway)	Community business owners reaching out to ESE in Yangon
Village 15 (Kayin)	Support provided by Township Department of Electricity
Village 17 (Mon)	Support provided by Township Department of Electricity
Village 19 (Ayeeyarwady)	Visit by Minister triggers electrification process. Linkages with district administration fast-tracked application, approval and funding.

<sup>58</sup> It is common that clusters of village apply for the connection together.

Village 21 (Rakhine)	Informal linkages with the military to access grid/connection to military camp
Village 23 (Mandalay)	Visit by Minister triggers electrification process
Village 24 (Mandalay)	Visit by Minister triggers electrification process

Box 2: The cost of connection to the grid remains the key barrier in rural areas

### Cost of connection to the grid remains the main barrier even in accessible villages

Village 10 is a village with 73 households located in the dry zone of Mandalay region. The village is located three miles away from main road and within easy reach of the national electricity grid. A new village administrator was elected in early 2013 keenly interested in connecting the village to the Government electricity grid. In early 2014, he was informed (together with other administrators from nearby areas) by the head monk in the adjacent village about the procedures under the “Self-Reliant Electrification Plan”. The monk shared the first-hand information he obtained from the Mandalay Regional Department of Electricity Supply Enterprise (ESE). According to the information received, the village could set up its connection to the grid, in collaboration with neighboring communities, if they had at least 1500 potentially interested households. While there was no minimum requirement set in terms of interested households, this number of households was recommended based on cost-effectiveness considerations. This minimum number of households was considered to make the scheme affordable for the village.

The total cost estimated by the ESE Department was around 500 million kyats for the connection of all seven villages in the area. Thus, the monk suggested a collective effort by neighboring villages (including Village 10), with each contributing an equal amount of 60 million kyats. Each village would pay the same overall amount, which was considered more equitable although wealthier households within villages would contribute more if needed. The discussion about the potential cost of electrification took place among a relatively small number of community leaders. Given this initial budget, each household in Village 10 would need to contribute around 800,000 Kyats. Village leaders did not include poorer households in the planning and discussions as it was assumed they would not be able to afford the connection charges.

However, only 10 of the 73 households in the village could afford to buy into the connection scheme. The information about the Village Self-reliant Electrification Plan put village leaders, both traditional and formal, in a difficult situation by raising community expectations about the possibility of access to electricity. In spite of high demand for electricity in their village and the nearby area, village leaders will be unable to implement the scheme without additional government support. Currently, there is no access to electricity in Village 10 (including through community initiatives using diesel generators).

In two of the new villages covered by Phase II of the PSIA, the research team noted that SRE had resulted in significant debts for the village. This had resulted from a combination of factors, including an under-estimation of the total cost of the investment required to complete the works. Construction work was stopped in both instances as villages ran out of funds for completion and the Village Administration borrowed for the remaining amount as outlined below. Particularly difficult agricultural seasons in the Mandalay dry-zone of the last few years made the re-payment of the debts increasingly difficult with the VEC and VA taking on additional informal loans and selling assets (including land) to be able to make loan payments.



**TABLE 14: VILLAGES IN MANDALAY CONTRACTING DEBTS TO FINANCE SRE**

Village Name	Access to Electricity	Source of funds	Coping
Village 23 (Mandalay)	Government Grid	Loan with contractor	Lessing livestock, Village Administrator advancing funds for loan payment
Village 24 (Mandalay)	Government Grid	Loan from Agricultural Bank	Selling assets (including land). Village Administrator borrowing further from relatives and connections in Yangon

### 5.3 Village Electrification Committees

**Social capital at village level also plays a key role in determining access to electricity given the importance of ‘self-organizing’ in rural areas.** The Self-Reliant approach to electrification outlined above means that in addition to village wealth, the quality of leadership and the village’s overall connections with township and regional ESE offices play a determining part. Accessing information about the procedures was very reliant on personal connections across all sites visited. The ability of the village electricity committee to mobilize the community (or more precisely the better-off sections of the community) is a determining factor for success. The experience of Village 3 in Magway illustrates some of the challenges in self-organizing that may pose a further barrier to access.

**A more detailed analysis of the functioning of Village Electricity Committees (VECs) was undertaken under Phase II of the PSIA.** The structure, function and governance of VECs in villages with access to the Government electricity grid varied significantly across sites. As noted during Phase I of the PSIA, the SRE approach provides limited guidance on VEC operations and township level Electricity Departments do not have the human resources, technical or financial capacity to provide oversight to VEC operations.

**All VEC in targeted villages had close linkages to local government and administration, with Village Administrators (VA) being systematically involved in the establishment and functioning of the committee.** Village Administrators were members of the VEC in all but one instance. Religious leaders and wealthier households within the community were less systematically involved but often played an influential/determining role in linking villages with contractors and/or influential local or national government figures who can significantly accelerate the process of connection to the electricity service by fast-tracking applications, providing access to discretionary funding, facilitating access to loans and technical assistance. (Please see Table x below for an overview of VEC composition and functioning).

**Village Electricity Committee structure, reporting arrangements and linkages with the broader community is largely left up to the village administration.** This was true even in the two cases where the broader community or the smaller number of households participating in the electrification scheme elected the VEC members (in Village 23, Mandalay and Village 16, Mon). Village Electricity Committee decision making was in all instances heavily influenced by village elites (traditional and religious leaders) as well as the wealthier households who often initiate the pooling of funds for

the electricity connection. Feedback meetings to the full community were noted only in one instance (Village 23 in Mandalay). Significantly, Village 23 received support for community development activities from an International NGO with a focus on water resource management. Participatory processes put in place for water resource management were followed for the establishment and functioning of the VEC. In all other instances, VEC meetings took place among VEC members only to discuss funding, technical matters, the roll-out of the electricity scheme as well as operation and maintenance. The broader group of participating households (as opposed to the full community) was regularly consulted in one instance only, receiving regular updates on the VEC progress and accounts.

**In six of the eight villages with connection to the Government grid covered in PSIA Phase II, there was no regular reporting to participating households and the broader community on physical and financial progress with implementation.** The majority of the VECs (seven of the eight VECs covered) included a dedicated accountant and reported maintaining regular records of all financial transactions, available for consultation by participating households and the broader community. In six of the eight cases, however, there was limited awareness on the part of the broader community of the costs of SREs, of process for selecting contractors and calculating maintenance costs and of the fact that records were indeed available for consultation.

**The exclusion of poor and marginalized households noted during PSIA Phase I was confirmed by the analysis carried out under Phase II.** None of the VECs in the targeted villages included participation by poor households given the nature of the SRE and lack of guidance for targeted support for poor households. All VECs in the study areas made a decision early on in the process about the households who could/could not afford to buy into the scheme. Given the high, those who can afford to contribute to the connection were invariably the better off households. Even in those villages with high levels of social cohesion/social capita there was no discussion/system in place to cross-subsidize the participation of poor households.

**In addition, women were systematically excluded from participating in the VECs, with the exception of Village 1 in Chin.** In all other instances, women were not considered eligible for participation. Where communities had suggested their inclusion (notably in Village 17 in Mon and Village 15 in Kayin), the Township Electricity Department requested their names be removed from the list as the duties of VEC members were considered to be “too much responsibility for women” and may require them to work in the evenings. The inclusion of a female member in the Chin VEC was attributed by informants to the training received by the Village Administration on gender through an externally funded (INGO supported) intervention on water resource management. The training stressed the importance of women’s involvement/leadership in the planning process of community-based interventions.

**There was no significant variation noted in terms of social inclusion and community participation across regions/ethnic groups in sample villages.** Elite capture of the process and limited communication with the community was the overall trend observed. The PSIA Phase II villages included two mixed villages (Village 17 in Mon and Village 6 in Shan). In the Mon case, the village is made up of Palong (20 per cent), Burma (45 per cent) and Kayin (35 per cent) farmers with all groups being



represented in the VEC and in the planning of village electrification. Burma and Kayin tended to dominate local government institutions which did not affect the distribution of benefits from the electricity scheme. There was no ethnic dimension to the exclusion of poor households in this case. What determined household ability to access electricity was exclusively household income. In the case of Village 6 in Shan electricity was provided by a large private company (hydro). The village is predominantly Shan with a minority (20 per cent) Palong households. Livelihoods and household welfare tend to be divided along ethnic lines with Palong households living the outskirts of the village and being predominantly landless farmers and daily laborers. Palong households were therefore at an economic disadvantage in terms of joining the electricity service. Importantly, however, in this case, the private company, linked to the village administration (Shan dominated), provided better conditions of access for Shan households – namely initial credit and the ability to pay connection fees in instalments. No such flexibility was provided to Palong households with the result that all those in the village currently excluded from accessing electricity are Palong.

*Box 3: Even in the best run VECs observed there is a very high level of elite capture*

**Village 17 in Mon constitutes the best example in the sample villages of a well-run electricity committee** in terms of: (i) selection of VEC members through an election process and periodic rotation of the committee members, (ii) representation of the different ethnic groups present in the village in the committee; (iii) an open process to receive and address grievances; (iv) good linkages with the township electricity department and efforts to train village members on operation and maintenance of the electricity scheme; (v) clear billing and explanation of charges to participating households. Record keeping and accounting on the electrification scheme was maintained by two dedicated committee members with two additional representatives being made responsible for auditing the VEC accounts. The limited involvement of the broader community, the absence of measures to plan for the inclusion of poor households (through cross-subsidization, credit, payment in instalments) continued to be observed reflecting the heavy financial burden involved in connecting even the better off village households and the lack of township level guidance/financial support to extend the connections to low income households within the village. Secondly, the practice of not sharing the VEC accounts with the broader community and the heavy influence of traditional leaders in VEC decision-making were equally observed in this instance. Key decisions continue to be made by village leaders and then shared with participating households for their information. According to VEC members bi-monthly meetings would be the venue for households to voice any concerns, which constitutes a best practice among VEC in study villages. Decisions are never, however, put to a vote and participating household consulted prior to decisions being made by the committee which limits the opportunity for alternative options to be considered. Participating households were considered unlikely to be able/feel confident to contradict traditional village leaders in these meetings.

### 5.3.1 Technical capacity and role of the VEC in operation and maintenance

The technical capacity of VECs as rated by informants themselves was overall low with only two villages reporting being satisfied with the quality of VEC work on maintenance. Overall, VECs systematically reported technical and financial issues with the planning and implementation of village schemes with seven of the eight villages covered by government services reporting having to halt electrification works for a period of time

as financial estimates were not accurate, works went over budget and there was a temporary shortage of funds. In four cases, this resulted in villages having to borrow for the completion of works from the contractor, businesses owners at village or township level or from informal lenders known to the village administration. In several cases, initial works completed were found by the township electricity department not to be of good quality, resulting in additional expenses to the VEC as poles and/or hiring initially installed had to be replaced. These examples further reflect the Township Electricity Department lack of human and financial resources to closely oversee SRE and provide the hands-on technical support required. The timing of inspections is such that in three examples noted above the variation between specifications/design and actual implementation of works were only picked up once construction was significantly advanced.

Secondly, while in four of the eight VECs in the study sample, the township electricity department was responsible for the overall maintenance of the scheme, funding was not available at township level for major repairs. This meant that villages were required to fund these costs themselves without having planned/budget for eventual maintenance and repair costs. None of the village regularly collected user fees that may help them offset these costs. Large unforeseen costs with maintenance in two instances further contributed to village and household debt. In one instance funds were borrowed from the contractor that had initially set up the scheme. Across all sites, the relationship with contractors hired to implement the scheme and the procurement process were unclear [based on recommendations, connections with the village administration and/or influential business owners in the community or township].

**TABLE 14: VEC INVOLVEMENT IN OPERATION AND MAINTENANCE**

Village Name	Village reporting shortage of funds during installation	Village reporting poor quality of initial works	VEC technical capacity for O&M	VEC involvement in O&M
Village 1(Chin)	no	no	Rated good by community but a number of issues noted with quality of service	Two community members trained for small repairs (external fund – UNDP)
Village 3 (Magway)	yes	yes	None	Township department performs maintenance
Village 15 (Kayin)	yes	no	None	Performed by external contractor
Village 17 (Mon)	yes	no	Rated good for operation and maintenance	Two community members being trained for small repairs
Village 19 (Ayeerwady)	yes	no	None	Township department performs maintenance
Village 21 (Rakhine)	yes	no	None	Township department performs maintenance
Village 23 (Mandalay)	yes	yes	None	Two community members being trained for small repairs
Village 24 (Mandalay)	yes	yes	None	Township department performs maintenance

#### 5.4 Box 4: Governance Challenges in Self-Organizing

In 2011, through its three retail distributors of fertilizer in Village 3, the Agro Products company provided the village with all necessary materials for basic access to electricity through a community-managed diesel generator. The company has good “business relations” with villagers who all purchased their fertilizers through these three retailers. This was indicated as their main motivation for providing support according to respondents.

To oversee the implementation of the initiative and operation and maintenance of the scheme, an Electricity Committee with 15 members was formed. The committee was made responsible for the collection of electricity payments, purchasing diesel, and the regular maintenance of the generator. Committee members included the retailers who initiated the process and a number of the beneficiary households. The division of labor among committee members was unclear. Respondents could not provide a clear picture of the breakdown in roles indicating rather that all members “helped with the setting up of the generator”. The committee’s organization efforts focused on collecting the necessary contribution to connect individual households (5,000 to 20,000 kyats depending on their location). Initially 50 of the 328 households in the village were covered by the scheme.

Within 3 months of setting up the initial connection further households were interested in joining the scheme (bringing the number of connected households to 128 in total). Households who were initially skeptical saw the advantages of the electricity connection as the scheme became functional and were interested in joining. Monthly electricity charges were set at 1500 Kyats per household (covering lighting with a 2-foot fluorescent lamp) and another 1000 kyats charged for TV/household. The generator functioned in the evenings between 6 and 10 pm. The tariffs were considered relatively cheaper than the rates set by other private distributors in near-by villages where 2500 kyats were charged for the lighting and another 2000 kyats for TV.

Challenges began with the maintenance and operation as initial materials used seemed to be of poor quality, according to the villagers, and the wiring required frequent repairing. The committee faced difficulties in managing income and expenditures and increased the tariff by 500 kyats each for lighting and TV. Dissatisfaction also grew among community members with the financial management by the committee. The overall budget for maintenance, and fuel was unclear and there was a great deal of resentment over the fact that the 15 members of the committee were exempt from paying electricity charges. Only 80 households remained part of the community scheme in 2012 while others quit due to the poor quality of the service and lack of transparency in financial management. Finally, the committee stopped the service after one year of distribution with a loss of 400,000 Kyats in uncollected electricity bills in 2013.

**TABLE 15: VEC COMPOSITION IN VILLAGES WITH ACCESS TO THE GOVERNMENT GRID**

Village Name	Access to Electricity	Year	Participants	Composition	Selection process	Committee Meetings	Meetings with community
Village 1(Chin)	Government Hydro	2003	5	Village elders, traditional leaders and village administrator	Self-appointment	Ad hoc	Ad hoc
Village 3 (Magway)	Government Grid	1990	18	Religious leader, village	Self-appointm	Ad hoc	None – with

				elders, traditional leaders, wealthier households and village administrator	ent		participating households
Village 15 (Kayin)	Government Grid	2008	41	Religious leader, village elders, traditional leaders, wealthier households	Self-appointm ent /Appointment by religious leader	Ad hoc	None
Village 17 (Mon)	Government Grid	2011	14	Village elders and traditional leaders, farmers <b>from different ethnic groups represented in the village</b>	Initially self-appointed, now elected	Every 2 months	None-every 2 months with participating households
Village 19 (Ayeyarwady)	Government Grid	2012	15	Village administrator, Village Development Support Committee Chairperson, wealthy households (contributing to the establishment of the scheme)	Self-appointed	Ad hoc	None
Village 21 (Rakhine)	Government Grid	2014	3	“10 household” leaders	Appointed by VA	Ad hoc	None
Village 23 (Mandalay)	Government Grid	2014	12	Religious leader, village elders, traditional leaders, wealthier households and village administrator	Elected in community meeting	Ad hoc	Ad hoc for set-up phase
Village 24 (Mandalay)	Government Grid	1993	No longer functioning	Religious leader, village elders, traditional leaders, wealthier households and village administrator	Self-appointed	Ad hoc	None

**A significant proportion of households in nearly all villages visited remain without access to electricity (irrespective of the source of the electricity service).** Affordability of connection charges for individual households is an important barrier for the extremely poor/vulnerable. For villages with access to government services this is related, as noted above, to the fact that villages have to finance the cost of connection. Not only poorer villages but also poorer households within those villages are at a disadvantage – with vulnerable groups not being able to contribute to the cost of the initial connection and being left out. As noted above, in the villages covered by PSIA II, the research team did find one instance of exclusion based on ethnicity/lack of connections with the politically dominant group in the village (Village 6). Interviews with vulnerable households across research sites (in PSIA Phases I and II) support the conclusion that exclusion is primarily based on ability to pay in sample village (rural areas). However, there is a significant risk that without specific guidance in SREs on the equitable distribution of benefits, exclusion based on ethnicity/religious affiliation may take place in mixed villages as observed in PSIA Phase II.

**The analysis carried out under PSIA Phase II indicated overall strong demand for a connection to the government service in villages with access to the grid.** Those who cannot afford to buy into village schemes for grid connections, small hydro or community-managed diesel generators usually rely on candles and kerosene as well as small rechargeable batteries for lighting. Overall, monthly expenses on candles and kerosene were around 5,000 -6,000 kyats more expensive or of equivalent value to neighbours’ electricity bills. As noted earlier, the main barrier was the overall cost of connection that was unaffordable for these households. Across targeted villages, respondents systematically recommended subsidies for the connection and/or the ability to pay in instalments.

**There was, however, a small minority of the ultra-poor in the villages covered by PSIA Phase II (similar to what was found in Phase I) who had difficulties. An interesting finding of PSIA Phase II was that female-headed, elderly headed households in villages with high levels of out migration (particularly in Shan, Mon, Mandalay, Rakhine) were excluded from participating in village electrification schemes given the requirement for household labor contribution,** which these households could not provide. This is an important feature to keep in mind in the SRE process as out-migration and left-behind households is an increasing trend (particularly in the Mandalay dry-zone). Also significantly, a sub-set of these villages in Rakhine, Mandalay and Shan reported low demand for electricity services. This was explained by respondents by the fact the household’s main income earner was no longer living in the village and household members left behind did not consider the electricity service essential.

**TABLE 16: ACCESS TO ELECTRICITY SERVICES WITHIN VILLAGES (RURAL AREAS)**

Villages	Total HH	HH with Access	Coverage per cent
Coverage in villages with access to Government Services			
Village-1 (Chin – Hydro)	17	17	100

Village-2 (Shan)	55	35	64
Village 3 (Magway)	400	169	42
Village 15 (Kayin)	320	250	78
Village 17 (Mon)	86	40	47
Village 19 (Ayeyarwady)	174	120	69
Village 21 (Rakhine)	108	25	23
Village 23 (Mandalay)	190	75	39
Village 24 (Mandalay)	150	123	82
Coverage in villages with access to Private Sector Providers			
Village 6 (Shan- Hydro)	115	109	95
Coverage in villages with access through community initiatives			
Village-4 (Chin) - Hydro	65	25	38
Village-5 (Magway) - generator	298	200	67
Village 14 (Chin) - Hydro	65	25	38
Village 16 (Kayin) – Diesel Generator	105	50	48
Village 18 (Mon)	190	20	11
Village 20 (Ayeyarwady)	818	47	6
Coverage in villages access provided by SMEs (households in the village through diesel generators)			
Village-7 (MDY)	328	127	39
Village-8 (Rakhine)	126	55	44
Village-9 (Rakhine)	105	53	50
Village 22 (Rakhine)	130	36	28
Village 25 (Mandalay)	68	25	37

#### Box 5: In villages connected to the grid often only the better-off were given access

In 2009, Village 2 in Shan State, located just beside the main Mandalay-Lashio road, started its “self-reliant village electrification plan” in cooperation with other five villages. The village electricity committee was formed in 2009 with two representatives from each village in this case the village administrator and an influential businessman. The latter took the initiative to contact the regional ESE Department for information on the application process and overall cost. 800 households across all six villages indicated their interest in participating in the scheme. It is important to note that as in the case of other villages the poorest households did not participate in these discussions, it was assumed that they would not be able to afford the connection and they were, therefore, excluded from planning discussions from the onset. Once the information on potentially interested households was available, the electricity committee approached the township office of ESE and learned of the estimated cost. The amount required to participate in the scheme meant that around 570 households (across all villages) had to quit as they could not afford the individual household contribution. This in turn represented an additional financial burden for those who remained interested in implementing the “Self-Reliant Electrification Plan” with the household contribution amounting to 1.06 million kyats. The committee collected the agreed upon contributions as the works progressed with the total amount collected from each household totaling up to 1.06 million kyats. In 2014, only 35 of 55 households in Village 2 were covered by the connection. The rest of the households in the village could not afford the cost of

the connection This means that currently low-middle income as well as poor and marginalized groups in the village (land-less farmers and daily laborers) remain excluded from access to the electricity grid.

For those areas where electricity is provided through community initiatives or by households “selling electricity” from their home generators two groups tend not to be covered by the schemes: (a) well-off households who can afford their own generators or solar panels and therefore access a more reliable electricity supply; and (b) the extremely poor and vulnerable households who cannot afford the cost of the individual connections to the household (usually covering the cost of cable extensions/posts – please see Table 6 for an overview) and/or who are reluctant to commit to paying to regular monthly or weekly charges. Overall connection to these services is considered affordable by lower-middle income households and considered a “better than nothing” alternative in areas where the possibility of a more stable connection to the grid is considered unlikely in the near future.

**TABLE 17: COST OF HOUSEHOLD CONNECTION FOR COMMUNITY-BASED INITIATIVES AND SMALL ELECTRICITY RE-DISTRIBUTION BUSINESSES**

Type of access	Villages-types of services	Cost of connection to the home (Kyats)
Community Managed Schemes	Village-7 (MDY) - Generator	5,000
	Village-4 (Chin) Hydro	5,500
Redistribution by village households (Diesel generators)	Village-5 (Magway)	3,600
	Village-8 (Rakhine)	3,000-3,500
	Village-9 (Rakhine)	3,000-3,500

#### Box 6: Electricity Re-distributing Business in Rakhine

Lin Lin has been running a small business selling electricity to his neighbors. His village is located only three miles away from one of the main transportation road in the township, but there is no easy access to the national grid and the likelihood that the village will get access to electricity is still remote.

When Lin Lin first bought 7-HP generator in 2013, he intended to use for his own home. Private distribution of electricity (small-scale) had started in the village 20 years ago and there were active providers at the time. However, he could not afford to use the generator every day given the high cost of diesel. He therefore negotiated with two or three household nearby to share the electricity supply and the diesel costs. Later, more households became interested in connecting to his generator and he finally set up his small business. Currently, 14 households are connected.

The current charges are 100 kyats per day for a 2-foot fluorescent light, 200 kyats for using a portable DVD player, and 450 kyats for using TV. But, he allows small light offerings for Buddha free of charge. His service includes the cost of connection from the generator to the home and covers 3 hours of electricity/day from 6:30 pm to 9:30 pm. He collects the payment every day as a monthly plan is not suitable for most households who are daily wage earners and whose income can be unpredictable. His profit margin is small as he earns 2,800 Kyats per day and the cost of



diesel every day is about 1,800 kyats and spends a further 1,500 kyats per month for maintenance. He sees his business more as a “*merit-making undertaking*”.

Solar panels play an important role in villages with no access to the grid/no community initiatives for energy provision. They are often perceived by villagers as very advantageous given the high cost of diesel, although a significant upfront investment is required. In addition, the availability of solar panels in the local markets in different locations of Myanmar (especially in dry Zone) is a significant factors making solar an option being considered across all sites without access to the government grid for individual access to electricity. A preference for solar power was noted across all such sites by middle income and better off households (mainly for home lighting and entertainment purposes). Smaller size solar panels were considered an attractive option for lower income households as suppliers expanded into rural markets and provided flexible purchase options (including payments in installments and loans).

#### Box 7: Distribution of solar panels

**Distribution of home solar electrification packages by the Department of Rural Development (DRD) was also observed in research sites as part of the government recent poverty reduction policy.** In one of the study sites (Village 12 in dry zone), solar panels were recently distributed to every households in the village .Village 12 has no access to the national grid, though it is located 3 miles away from the main transportation road and grid. In February 2013, the Minister of Transport visited the district and organized a meeting with village administrators to inform them about village electrification plans in line with the national poverty reduction policy. He suggested that local authorities seek to obtain the connection to the national grid through the “Self-reliant Village Electrification Plan”. Local authorities clarified that the estimated cost for the village would be around 60 million kyats. Consequently, the Village 12 administrator openly let the minister know that his village would not be able to afford this amount.

It is understood at the township level that the issue was brought to the attention of the Department of Rural Development (DRD) following the Transport Minister’s visit. One month later, through the township Department of Rural Development, all 96 households in the village received sets of home solar panels.<sup>59</sup>

Currently (approximately a year after distribution) two of the households reported that their panels were not functioning. Overall there have been no complaints about the quality of the panels but households need additional guidance on how to use the inverters as the system is occasionally overloaded.

## 5.5 Grievance Redress and Dispute Resolution

### 5.5.1.1.1 Grievances regarding electricity services

**The analysis of Grievance Redress Systems (GRS) in PSIA Phases I and II indicated that the presence and use of GRS for government electricity services was extremely rare in rural areas although more present/used in the urban areas visited.** For consideration in relation to the roll-out of the Project, there is limited capacity in the current system to effectively handle grievances. Those respondents that

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<sup>59</sup> Each consisting of a 60-watt solar panel, a 65-Volt battery, a 300-watt inverter (as well as light bulbs).



indicated having reached out to service providers did so in urban areas and for issues of service maintenance and billing. In spite of the lack of clarity often mentioned by respondents during the study regarding financial management of SRE by the VEC, there were no instances where villages/participating households had lodged a grievance with either the VEC or Village or Township Administration.

**Of the eight sites in rural areas, only one VEC (Village 17 in Mon) had established a dedicated GRS system to receive queries and complaints.** The village was exceptional and had set up the system to deal with a number of concerns raised by a CBO based in the village tract concerned with the high cost of SRE to the village and demanding that the service be provided/subsidised by ESE or that alternative solutions (including solar energy) be sought. The other seven villages in the sample with access to government electricity services did not have systems in place, and issues regarding billing and service were informally resolved through the VEC and VA. No significant disputes or tensions over the provision of electricity were observed in the targeted sites.

**Confirming the trend observed during the Phase I of the PSIA, in villages with access to government services, respondents were on the whole satisfied with the quality of the electricity service provided** – with the exception of village 1 in Chin - when compared the earlier informal providers (in terms of the quality, regular charges as well as safety of the connection). However, issues with slow repairs and low capacity of the power supply were noted in four of the eight sites. FGD discussions with women in particular indicated a strong demand for better capacity services to reduce time/money spent on collecting/purchasing firewood for cooking. In addition, households had queries on billing in two of the rural sites visited where maintenance/operation charges collected were unclear. The division of units “lost” (difference in charges from village meter and individual household meters) was unclear in these cases. While levels of social capital/trust were overall high (and there was an overall perception that the VEC was charging the correct amount) consumers did not fully understand the rationale behind the additional amounts collected.

**In rural areas, only two of the villages were provided with bills with the Township Electricity Department’s (TED) phone number to receive requests for information/complaints.** In all other sites, when the TED was provided the complaints “hot line” number was not included/printed. The usual channel to receive information on bills/maintenance is therefore the Village Administrator (and in the case of Mon and Kayin sites, the traditional leaders as well) who call TED on behalf of the villagers to resolve the issues raised.

**In the new urban areas visited under PSIA Phase II there was more widespread awareness of how to reach the service provider with request for information, maintenance and queries about bills.** Numbers for TED were provided in bills in Thaton although not in Sittwe. In Sittwe, the TED was in the process of disseminating the new information/complaints hotline and had printed new pamphlets. Complaints were mostly related to errors with bills and were either communicated directly to the township or through bill collectors. There was an overall perception among households interviewed that these were acted upon (with errors in bills adjusted in the next month’s bill) although with some delays.

**Table 18: Overview of complaints/grievances and channels for resolution**

Village/Ward Name	Access to Electricity	Complaints/feedback	Channel for uptake/resolution
<b>Rural Areas</b>			
Village 1 (Chin)	Government (Hydro)	Poor quality/availability of service	Widespread acknowledgement that there is no immediate solution to the issue (would require accessing additional source/strong interest in developing mini-hydro)
Village 3 (Magway)	Government Grid	Enquiries on billing	Questions addressed to the VEC
Village 15(Kayin)	Government Grid	Low capacity and unable to cook, issues with billing and malfunctioning meters	Complaints addressed to the Village Administrator for further discussion with township
Village 17 (Mon)	Government Grid	None on electricity supply but village based CBO voicing complaints about the cost of the electricity connection and corruption at VEC level (investigated by township that found no issues with management)  Palong households have difficulties understanding bills (language barrier)	VEC has GRS uptake channels for questions on billing and repairs with no significant complaints noted. Issues raised by CBO directly with township, ESE and media (NPT)
Village 19 (Ayeyarwady)	Government Grid	Poor quality/frequent cuts	
Village 21(Rakhine)	Government Grid Connection through military camp	Frequent maintenance issues (seasonal because of rains)	Complaints addressed to the Village Administrator for further discussion with township
Village 6 (Shan)	Private Company (Hydro)	Palong households connected have difficulties in understanding bills (language barrier)	
Village 23(Mandalay)	Government Grid	Supply insufficient for cooking and costly. There are no individual meters and all households pay the same 5,000 kyats amount irrespective of real consumption	Addressed to VEC and Village Administration. Installation of individual meters is being considered.
Village 24(Mandalay)	Government Grid	Supply insufficient for cooking.	Complaints addressed to the Village Administrator for further discussion with township. Overall perception that there is no immediate solution to the capacity/power fluctuation issues.
<b>Urban areas</b>			
Thaton	Government grid	Concerns by households in the low-income ward about the cost of connection (kyats 50,000) that will not longer be provided free of charge (after the initial phase of connections that benefited part of the ward)	There is an overall perception that funds are no longer available at township level and that interested households will have to raise their funds for the connection. Concerns queries are channeled through ward leader to the Township Electricity Department.
Sittwe	Government grid (2014 connection)	None noted during PSIA Phase II	The focus among respondents in all three wards in Sittwe is on the improvement (or expected improvement) and reduction in costs with electricity bills brought about by the connection/planned connection to the grid

#### 5.5.1.1.1.2 *Broader dispute resolution mechanisms*

**Overall, social capital in the rural areas visited was considered strong with traditional and/or religious leaders influential and able to solve the vast majority of complaints and disputes between neighbors.** Disputes over land, resources tended to be resolved at village level and if necessary elevated to the village track level. The research team found no instances of inter-village issues in which the township involvement was requested (in sample villages). Within visited wards social cohesion was overall strong and no relevant social tensions were noted. Disputes on location of the poles were easily resolved through a negotiation process with the involvement of the Township Electricity Department.

**Conflict and some post-conflict areas are likely to be affected and may receive inferior or no electricity services and may affect the NEP and the Project.** In the Kayin and Mon villages the research team noted the presence of armed groups (located in the surrounding area but maintaining close links to the villages). Key informants indicated that armed groups in the area were supportive of basic service provision by Government although the situation/support given to Government activity was known to shift/have shifted frequently in the recent past. In the period preceding the field work no opposition had been made to the extension of government electricity services. Armed groups continue to play an influential role in the areas visited in the two States and occasionally approaching the village administration to request for funding.

High levels of social tension were noted in Sittwe overall with violent episodes against religious minorities and a recent wave of protest against the issuance of “White Cards” to ethnic/religious minorities. The research team identified a single ward where Muslim residents remain in the city, but armed to ensure their own private security. Township level officials indicated that livelihood/income generating activities for these groups have become increasingly difficult as has the outreach of services (bill collection, vaccination for example recently carried out under armed escort). Many areas have no access to services which leads to growing marginalization. Service provision (including expansion of the grid/off-grid solutions and other basic services provided by government are extremely challenging/and interventions in these areas are extremely reduced. Continued conflict in certain areas is likely to affect the objectives of the NEP and may affect the roll-out plans for the Project.

## 6 Social Impacts and Risks

### 6.1 Potential benefits and opportunities from proposed NEP activities

There are significant potential benefits and opportunities associated with the proposed Project. These span the following areas, amongst others:

- Improvements in the availability and reliability of electricity supply, including for vulnerable groups that have previously been excluded from access;
- Economic and livelihood opportunities created;
- Training, capacity building and employment;
- Improved health and education and general wellbeing;

- Women's empowerment;
- Environmental Management;
- Community safety.

Further to the above, opportunities exist to:

- Raise awareness of the possible uses of electricity in order to optimise benefits for communities;
- Leverage social investment/corporate social responsibility (CSR) programming in renewable energy initiatives being undertaken by private sector investors, foundations, social enterprises and others; and
- Leverage the benefits of the telecommunications rollout throughout Myanmar.

In addition, the Project is expected to strengthen organisational capacity related to the management of electrification programs at Union, State/Region, District and Village levels, including within Village Electrification Committees (VECs).

### **6.1.1 Improvements in the availability and reliability of electricity supply**

The goal of the Project is to help increase access to electricity in Myanmar and a key potential benefit is improvement in the availability and reliability of electricity supply, including for vulnerable groups that have previously been excluded from access. This can be better achieved through an equitable and culturally appropriate approach to involving local communities, poor and vulnerable population groups, in particular. Focus should also be on improving the inclusiveness of communications and engagement activities undertaken by VECs and throughout the SRE process.

### **6.1.2 Economic development and livelihoods creation opportunities**

#### **6.1.2.1 Electricity as an enabler for doing business**

The WBG *Myanmar - Investment climate assessment: sustaining reforms in a time of transition* Report, published in January 2015, found that access to electricity was identified by private firms in Myanmar as the third most-important constraint to doing business. The findings were informed by research using a stratified sample of 1,092 randomly selected firms spanning: small, medium, large firms; micro firms; and informal firms. Businesses were interviewed in Yangon, Mandalay, Bago, Taunggyi and Monywa.

The Assessment observed that the problem is particularly prominent for medium and large firms and that almost all firms in Myanmar (94 per cent) face power outages. Five per cent of micro firms, 15 per cent of small firms, 17 per cent of medium firms and 46 per cent of large firms cited access to electricity as the main obstacle to business.

It reported that, as a consequence, most firms in Myanmar are forced to rely on their own or shared generators for power, at least during outages, and that the problem is most acute during the dry season when there is lower power production from hydropower stations.

Manufacturing firms (31 per cent) cited access to electricity as a far more important constraint than retail firms (13 per cent) and other service sector firms (11 per cent).

The report found that improving electricity infrastructure for manufacturing firms will be critical in attracting investment into the manufacturing sector.

Amongst other sectors, tourism is a sector that has prioritised the importance of reliable electricity supply. The Myanmar Tourism Master Plan 2013-2020 includes as a key action the provision of a reliable electricity supply in all main tourist destinations.<sup>60</sup> Currently, due to frequent power cuts, in many areas, hotels and other industry players use expensive diesel-driven generators as alternative supply.

### 6.1.2.2 Perceived cost savings through decreased use of diesel fuel

#### 6.1.2.2.1 Urban SMEs

PSIA Phase 1 research found that business owners interviewed in Yangon and Mandalay felt that if the government were able to reduce power fluctuations, increase voltage capacity and ensure a 24-hour steady supply of electricity that that this would enable them to significantly reduce their level of expenditure on diesel fuel, which was considered more burdensome than the cost of electricity. Businesses interviewed spanned: very small family-run businesses and businesses using unskilled labour whose products included small-scale food production and packaging companies, and mechanics; and medium-sized businesses including mould making, printing and purified water companies and also smelting businesses (iron rods and construction materials). The different level of electricity consumption of the businesses surveyed is shown in Table 19 below. Eighty-five per cent of the businesses interviewed as part of the Phase 1 research regularly use generators (100 per cent of those in Chin).

Table 19: Different types of businesses surveyed (Yangon and Mandalay)

Cities	Number of SMEs by consumption (Units kWh)		
	1-500	501-10,000	10,001-20,000
Yangon	8	17	0
Mandalay	13	10	2
Total	21	27	2

#### 6.1.2.2.2 Off-farm SMEs

PSIA Phase 1 research found that off-farm Small and Medium Enterprises (SMEs) in rural areas relied heavily on diesel generators. With the exception of villages connected to the grid, generators were the main power source for business across rural sites. Of 20 business owners interviewed, 14 relied on generators as their main power source (four were connected to the grid and two others used solar power or bio-fuel). The fluctuations in the price of diesel were an important concern for these businesses. Sudden increases in price reduced profits significantly and limited SMEs' ability to expand and increase production. There was high demand among this group for grid-based electricity services that were expected to reduce cost and, in particular, bring more stability to running costs (as fuel price hikes can be unpredictable). Price of fuel was found to vary across research sites with more remote sites paying considerably

<sup>60</sup> Myanmar Tourism Master Plan, 5.3.5 Improve the coverage and reliability of electricity supply at key destinations, p. 62.

more. Overall, prices ranged from 3,400 kyats/gallon in Magway to 5,400 kyats/gallon in Rakhine. During the research period, the price tended to average 4,000 kyats/gallon.

Table 20 Rural SMEs monthly use of diesel

Usage (per month)	Monthly Cost (kyats)	Types of business
10-15 gallons	4,000 to 4,500	Small movie theater, small general store and billiards
15-35 gallons	52,000 to 140,000	Private power distributor, mini-store and cow-feed production
35-55 gallons	140,000 to 220,000	Rice mill, battery recharging business
100-300 gallons	400,000 to 1,200,000	Fisheries (storing fish on ice and fish processing)

### 6.1.2.2.3 Other commentary related to cost savings and benefits

Diesel was the primary source of energy for livelihood activities for the vast majority of households and small businesses interviewed. PSIA Phase 1 research found that a common concern for better off/middle income households and small businesses in Hakha was the high cost of fuel for diesel generators. There was significant hope that improved access to electricity would eventually result in savings. As in rural areas, the use of solar panels as an alternative to diesel (for lighting) was frequently observed for households that were able to afford the upfront investment.

Participants in FGD and Key Informants (in villages 4, 7, 8 and 9) without access to reliable electricity supply also referred to the fact that the service received was “expensive” given the poor quality. They expressed a keen interest in access to the Government grid (should the connection to the village be affordable) as it would result in “savings” (lower rates for a better service than what they currently have access to).

### 6.1.2.3 Enabling Livelihood Opportunities within villages

During the field research undertaken during February – March 2015 with MoEP and DRD counterparts, a number of male villagers commented that, with improved access to electricity, they would like to operate rice mills and/or oil mills in their villages. This would improve their ability to add value to their crops and therefore potentially command an improved market price. Other ideas proposed were drying machines, water pumping, brick-making machines and also a motorbike repair shop. A limited number of female villagers mentioned that access to electricity would enable them to undertake sewing and/or embroidery activities at night.

PSIA Phase 1 research found that, currently, agricultural tasks for large/medium/small scale farmers were systematically carried out with diesel generators. These were owned by large/medium-scale farmers and rented out to small-scale farmers. Better off households, in villages with reliable electricity supply, used electricity for water pumping and limited irrigation. In the areas surveyed, fishermen mainly relied on diesel generators for productive activities (i.e. for lighting to sort fish in the evenings).

### 6.1.3 Training, capacity building and employment opportunities

The potential for improved training and employment opportunities was not frequently referenced by stakeholders consulted but is likely to be an important factor during the rollout of the NEP. Particularly if the township governments and companies involved in

the construction and rollout activities prioritise use of appropriately qualified, and transparently selected, service providers and personnel.

In addition, it is likely that there will be employment opportunities for local people during construction and operations and maintenance activities associated with the new grid and off-grid infrastructure.

#### **6.1.3.1 Training and capacity building for individuals**

Mindful of this, international Non-Government Organisation (NGO), the Agency for Technical Cooperation and Development (ACTED), has been implementing a pilot project since March 2014, with Swiss Development Cooperation (SDC) support, focused on implementing quality short vocational training courses in line with Kayah labour market needs. One of the four curricula developed is electronic wiring. The project also offers internship placements in Myanmar for vocational training graduates from the refugee camps in Thailand, to practice skills and gain experience in a work environment thus preparing them for potential safe and voluntary return to Myanmar.<sup>61</sup>

#### **6.1.3.2 Opportunities to expand business opportunities for SMEs**

Implementation of the Project could yield a significant range of opportunities for SMEs across Myanmar either directly or indirectly associated with the grid roll-out and off-grid pre-electrification program.

There are many initiatives underway in Myanmar focused on strengthening the financial and organisational capacity of SMEs that could be leveraged.

These include the IFC-financed program with Yoma Bank, to expand the Bank's lending to SMEs, described as "a sector of Myanmar's economy in desperate need of financing to grow and create more jobs".<sup>62</sup> The IFC's program of support includes provision of advice on the development of new products and delivery channels for SMEs and is expected to help Yoma Bank provide an additional 1,000 loans worth \$370 million to small and medium enterprises in Myanmar by 2019.

In addition, international not for profit organisation, Building Markets, has played a key role since November 2012 in assisting Myanmar SMEs to secure contracts with international organisations. Building Markets' Sustainable Marketplace Initiative in Myanmar (SMI-Myanmar) has trained over 400 businesses, increasing their understanding of international contractual standards and procurement requirements and has helped local businesses win 139 contracts worth over USD\$11 million.<sup>63</sup>

Another relevant initiative underway is an activity being implemented by Indiana University's Kelley School of Business, with United States Agency for International Development (USAID) funding, *The Advancement and Development Through Entrepreneurship Programs and Training* initiative has a focus on: increasing the institutional effectiveness of the Yangon Institute of Economics (YECCO), including its

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<sup>61</sup> Agency for Technical Cooperation and Development (ACTED), February 2015, Women's Empowerment Through Access to Electricity Project Proposal p.2

<sup>62</sup> International Finance Corporation, September 16, 2014, IFC and Yoma Bank Ink Deal to Expand Financing for Small and Medium Enterprises in Myanmar

<sup>63</sup> <http://buildingmarkets.org/our-impact/myanmar>, accessed 24 March 2014



Entrepreneurship Centre of Excellence; and strengthening entrepreneurial activities throughout Myanmar.

One particular area of opportunity for micro and SMEs could be in establishing and/or strengthening businesses that manage collection of used batteries associated with solar home systems and recycle them and/or enable their safe disposal.

#### 6.1.4 Health, Education and Wellbeing

##### 6.1.4.1 Potential health benefits and opportunities

Key health benefits of the proposed NEP mentioned during the stakeholder consultations were linked to:

- reduction in the need to use charcoal and firewood for cooking purposes therefore reduced smoke within the household when undertaking cooking duties;
- improved hygiene while cooking when using rice cookers; hands not dirty from charcoal and firewood when handling rice.

In addition, stakeholders valued the intention of the Project to prioritise access to electricity for health clinics, particularly in poor and vulnerable areas.

There are additional opportunities whereby access to electricity, and communications technology, can assist in delivering health services and providing health benefits.

#### **BOX 8**

For example, Norwegian telecommunications company Telenor has signed a Memorandum of Understanding (MoU) with healthcare provider Marie Stopes International (MSIM) to launch mobile health initiatives for maternal and childcare in underserved communities in Myanmar. Women will receive advice on birth, child and reproductive healthcare via text and voice activated SMS, interactive voice response, and through call centres with customised real-time advice by healthcare professionals. The partners plan to offer 3G-enabled mobile telemedicine services where patients living in rural areas can consult with doctors in the major cities through the mobile network.<sup>64</sup>

In 2014, Qatari telecommunications company Ooredoo launched a maternal health information application (app) for Ooredoo Myanmar subscribers. Named maymay, meaning 'mother' in Myanmar language, the app is designed to provide maternal health information to pregnant women. The service's key features are maternal health advice notifications and a doctor locator service.

##### 6.1.4.2 Potential education benefits and opportunities

The primary education-related benefit that stakeholders mentioned was access to light at night to enable students to study. Another potential benefit identified was access to knowledge and also to the "modern world". Some villagers commented that, if they had access to electricity, then they would be able to be at the same level as urban people; for example, using modern electrical equipment such as a computer might help the villagers to access modern education as urban people can now do. Stakeholders consulted valued

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<sup>64</sup> <http://www.telenor.com/media/articles/2014/telenor-and-marie-stopes-announce-joint-mhealth-initiative-in-myanmar/>, accessed 24 March 2014



the intention of the Project to prioritise access to electricity for schools, particularly in poor and vulnerable areas.

In all rural research sites, PSIA 1 research found that current usage of electricity was limited and that households (with and without access to the Government grid) highlighted the importance of an electricity connection to “be linked up to the outside world” particularly through a TV. There was a sense in a village with no electricity connections that they were left behind in terms of the “modernisation” process (particularly where better-off villages in the vicinity were connected to the grid).

There are many initiatives underway in Myanmar sponsored by development partners, private companies and foundations that include an education dimension. Access to these could be enabled through access to electricity and, in particular, through the combined access to both information and communications technology (ICT) and electricity.

### **BOX 9**

For example, Ericsson, a Swedish multinational communications technology company, and the UK Department for International Development (DFID) have developed a strategic partnership through the Girls Education Challenge and will support marginalised girls’ education in Myanmar “by improving access to the internet, delivering teacher training and enabling students to experience a 21<sup>st</sup> century education”.<sup>65</sup> The initiative leverages the global education initiative *Connect to Learn*. It aims to connect schools with mobile broadband, deliver educational content and teacher training, and improve the learning outcomes of over 14,000 marginalised girls in Myanmar within two years.<sup>66</sup>

DFID is providing approximately £3.7 million in funding which will be matched by the partners through cash and in-kind contributions. The initiative will allow up to 50 secondary schools to be connected to the internet through mobile broadband. The initiative will also deliver a comprehensive in-service professional development program for teachers, and specific educational program for students, using child-friendly computing solutions to improve literacy and numeracy amongst the female student population. Up to 600 scholarships will also be provided to marginalised girls, enabling them to stay in school and complete their secondary education.

Ericsson will work with the United Nations Education, Science and Cultural Organisation (UNESCO), the Earth Institute at Columbia University, Finja Five (an innovative start-up at Lund University), Qualcomm Incorporated, through its Qualcomm® Wireless Reach™ initiative, and the external evaluator EduEval to deliver the program. UNESCO will provide teacher and student training, the Earth Institute will implement a community-driven scholarship program and conduct research to support a scalable framework for integration of ICT in resource-poor secondary schools, Finja Five will provide child-friendly computing solutions, Qualcomm Wireless Reach Initiative will provide funding and project management, and EduEval will provide monitoring and evaluation services.

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<sup>65</sup> Ericsson, October 10 2014, Ericsson and the UK Government Partner to Improve Girls’ Education in Myanmar

<sup>66</sup> *ibid.*

### 6.1.4.3 Perceived general improvements in lifestyle and wellbeing

Some stakeholders consulted associated improvements in lifestyle and wellbeing with access to electricity. Such improvements included general enjoyment and also the ability to watch television and movies and listen to music.

Women also commented on the additional time that they would have available if they were able to use modern electronic appliances such as rice cookers and also were no longer required to travel to source and cart firewood for use in cooking.

Villagers that already have access to electricity – through micro-hydro or small-scale solar home systems – commented on the improvements in their lives that access to the grid would provide – in terms of improved availability of electricity provision.

PSIA Phase 1 research found that uses of electricity were very consistent across research sites in rural areas and considerably more homogeneous than in urban areas. Household use was primarily for lighting and TV as shown in Table 21 below. For middle income households it was often the only use made of electricity. In addition, in five of the nine villages with a connection to an electricity service, poor households did not use electricity at all, relying on batteries, candles and kerosene lamps.<sup>67</sup> Only a small proportion of better off households in villages with access to grid/private sector provider had a few more appliances (consistently kettle, iron, electric stove and/or rice-cooker). The villages in Shan State were an exception as they were significantly better off than others in the sample.

Table 21: Uses of electricity by welfare group across rural areas

Electricity Sources	Village	Poorer households	Middle Income	Better off
<b>Use of electricity</b>				
Grid Connection (Government or Private Provider)	Village 1 (Magway)- Grid	Lighting	Lighting and TV	Lighting, TV, Cooking, Ironing and livelihood activities (water pumping/threshing)
	Village-2 (Shan-N) Grid	Lighting	Lighting and TV	Lighting, TV, Cooking, Ironing and livelihood activities (water pumping/threshing)
	Village-3 (Chin) - Hydro	Lighting	Lighting	Lighting, TV, Ironing
	Village-5 (Shan-E) - Hydro	Lighting	Lighting, TV, Cooking, Ironing and livelihood activities (water pumping/threshing)	Lighting, TV, Cooking, Ironing and livelihood activities (water pumping/threshing)
Community Initiatives	Village-4 (Chin) - Hydro	None	Lighting	Lighting and TV
	Village-7 (MDY) – Generator	None	Lighting and TV	Lighting and TV
Household re-distribution/small businesses using	Village-6 (Magway) - Village	None	Lighting and TV	Lighting and TV

<sup>67</sup> Please refer to Section 2.1 outlining that for villages with connections to the grid household with access to the service are usually those better off.

Electricity Sources	Village	Poorer households	Middle Income	Better off
<b>Use of electricity</b>				
diesel generators	Monastery generator			
	Village-8 (Rakhine)- Household redistribution	None	Lighting and TV	Lighting and TV
	Village-9 (Rakhine) - Household re-distribution	None	Lighting and TV	Lighting and TV

### 6.1.5 Empowerment of Women

Some stakeholders consulted, such as ACTED, identified the potential for women’s empowerment through access to electricity. ACTED have developed a project proposal for implementation of a two year project in at least three townships in Kayah State that aims to: improve women’s livelihood opportunities and reduce their domestic workload through rural electrification. The target groups for the proposed project are: villages recently or soon to be connected to the national grid, with a strong focus on women.<sup>68</sup>

ACTED’s proposal comments that it expects the provision of electricity to have considerable potential to improve the lives of women. Specifically, it notes, “While cooking is women’s major energy need, low electricity access is a limiting factor in meeting women’s needs for mechanical energy for food processing and water pumping, lighting for carrying out household tasks, access to communications and information, community services such as health clinics, schools and street lighting, and in lighting and other services for small and medium size businesses.”<sup>69</sup>

### 6.1.6 Strengthened Environmental Management

Many villagers, particularly in northern Chin State, commented on the fact that increased access to electricity, if provided in sufficient quantities, could reduce the significant deforestation impacts caused by harvesting of wood for use as firewood and cooking purposes. Linked to this practice are other environmental issues such as erosion, landslides and, more broadly, climate change.

PSIA Phase 1 research found that weather conditions in Chin State require the use of fire wood for both cooking and heating. Better off and middle income households usually keep a stock of firewood for the whole year. Poorer households cannot afford to purchase firewood and therefore collect wood from the forest. Community leaders in the poorer ward visited highlighted that the surrounding forest has been quickly depleting, with households having to go further and further away to get firewood. This is a task usually carried out by women with implications in terms of time/effort spent on household chores. Concerns about de-forestation have been raised by local authorities.

<sup>68</sup> Agency for Technical Cooperation and Development (ACTED), February 2015, Women’s Empowerment Through Access to Electricity Project Proposal p.1

<sup>69</sup> Agency for Technical Cooperation and Development (ACTED), February 2015, Women’s Empowerment Through Access to Electricity Project Proposal p.4

### 6.1.7 Improved Community Safety

A number of CSO and village level stakeholders commented on the linkage between electricity and security; both generally and also specifically for women.

With access to electricity and street lamps, people can walk around the streets at night with a reduced risk of falling over. Some villagers also commented on the dangers for children associated with the use of firewood for cooking.

The correlation between electricity and improved physical security for women has been noted. A 2009 UN-HABITAT report, *The Global Assessment on Women's Safety*, notes that, "Many women and girls face domestic violence not only in their homes and in relationships, but also in public spaces due to poor choices in urban design and poor management of those spaces. In practical terms this can relate to factors such as inadequate street lighting, unsafe underpasses, ineffective community policing and lack of rehabilitation programmes for those involved in antisocial use of public spaces. During times of conflict or social unrest, those factors can further exacerbate the risk of gender-based violence."<sup>70</sup>

### 6.1.8 Heightened awareness of the potential benefits of electricity

A key opportunity that exists is to raise awareness of the potential benefits of access to electricity. In general, it was noticed that villagers' current level of awareness was largely linked to what they had directly seen and/or been told by others within their community. To maximise the benefits of the Project, communities could be provided with information and guidance about how to use electricity to improve their livelihoods, and could be linked with microfinance providers, markets and/or other enablers (CSOs and NGOs, other) that may be able to assist in facilitating these improvements.

### 6.1.9 Leverage private sector initiatives including social investment programming

Throughout Myanmar, there is likely to be significant investment by private sector companies in renewable energy initiatives that support the UN's *Sustainable Energy for All Initiative*.<sup>71</sup> This is particularly the case given GoM's focus on ensuring that Myanmar investors contribute 1-5 per cent of their (after tax) profit to social investment/CSR initiatives, and the significant need within Myanmar for rural electrification. The Project could investigate ways to leverage the initiatives of investors and other foundations and social enterprises interested in working in the field of renewable energy, as well as the planned collaboration with development partners. Examples of this include:

#### **Total Access to Energy Program**

In 2010, global energy operator, Total launched its **Total Access to Energy program** with the aim of improving access to energy for low-income communities. **Awango by Total** is the first large-scale project to emerge from the program, marketing photovoltaic solar solutions to offer a range of solar lighting lamps and phone chargers. The solutions were initially tested in four pilot countries — Cameroon, Kenya, Indonesia and the Republic of the Congo — starting in 2011 and are now being sold in many more

<sup>70</sup> UN –HABITAT, 2009, *The Global Assessment on Women's Safety*, p. 3

<sup>71</sup> <http://www.un.org/wcm/content/site/sustainableenergyforall/home/Initiative>, accessed 26 March 2015

countries under the Awango by Total brand, including in Myanmar.<sup>72</sup> Its focus is to provide affordable and reliable solar lighting to low-income communities. Total works with development partners, including the IFC, and local community associations to train resellers, organise micro-finance, contact isolated communities and assess the impact of its operations.<sup>73</sup>

### **Shell Group Energy Initiatives**

The Shell Group's independent charity, Shell Foundation, has a focus on leveraging Shell's skills and networks to develop solutions around major social and environmental issues linked to the energy sector. One area of social enterprise is the provision of energy to rural and poor communities throughout the world with limited access to energy by offering decentralised energy solutions such as solar lighting, biogas, biomass, gasification and the sale of low-cost energy products. The Shell Foundation supports a portfolio of pioneer enterprises to offer alternative and affordable energy products in rural areas, as well as building the infrastructure to accelerate and support their continued growth.<sup>74</sup>

#### **6.1.10 Leverage the benefits of the telecommunications rollout throughout Myanmar.**

Some of the content included in this section has referenced the significant benefits that can be achieved through the crossing of increased access to electricity and the ongoing liberalisation of the telecommunications sector. As noted above, telecommunications companies are preparing to offer mobile health, agriculture and banking services and many others are also using the increased potential for communications technology to expand their outreach and provision of services throughout Myanmar.

## **6.2 Potential impacts, risks, issues concerning proposed Project activities**

In addition to the potential benefits and opportunities associated with the Project, there are also potential impacts, risks and issues. These include:

- Infrastructure impacts during construction and operations activities, including land acquisition and/or loss of assets such as trees and standing crops;
- Contractor and supply chain risks during construction and operations;
- Social exclusion, based on an inability to afford access to the expanded electricity services available and lack of connections to facilitate access;
- Indebtedness, in particular due to the high cost of connection via SRE;
- Impacts on ethnic minorities and vulnerable groups;
- Governance and capacity of Village Electrification Committees;
- Renewable Energy product and planning risks;
- Transparency and accountability of procurement;

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<sup>72</sup> Oxford Business Group, 2014, The Report: Myanmar 2014 p.78

<sup>73</sup> <http://www.total.com/sites/default/files/atoms/files/csr-report-2013.pdf>, accessed 26 March 2015

<sup>74</sup> <http://www.shellfoundation.org/Our-Focus/Access-To-Energy>, accessed 26 March 2015

- Cumulative impacts.

These potential areas of impact are discussed further in the report sections below.

### 6.2.1 Infrastructure impacts during construction and operations activities

The Project activities for **Component 1: Grid Rollout** are proposed to be:

1. Central procurement of equipment to support the grid rollout; and
2. Distribution of this equipment to state/region supply stores.

Given this, the NEP will not be directly involved in the following activities however, through financing support, it will enable their implementation:

1. Power generation and supply to the grid roll-out;
2. ESE electricity distribution activities associated with the grid roll-out, as follows:
  - Sub-station and Distribution Lines (Power Lines):
    - i. Expansion of existing Medium Voltage (MV) substations<sup>75</sup>;
    - ii. Construction of new MV substations;
    - iii. Construction of new and/or rehabilitation of existing MV (33 KV) distribution lines, Low Voltage (LV) distribution lines and MV/LV transformers<sup>76</sup>;
    - iv. Connection of households with service lines and meters;
    - v. Operation of Substations; and
    - vi. Operation of Power Lines:

Project activities undertaken under **Component 2: Off-Grid Pre-Electrification Program** will focus on provision of support for:

1. Mini-grids (including community micro-hydropower projects as well as other technologies such as biomass, biogas, solar or wind). Hybrid systems that include a backup diesel generator are also eligible. Micro-hydropower projects are anticipated to be capped at one MegaWatt (MW).
2. Solar home systems, of varying sizes, from larger systems that include the ability to power TVs for 1-2 hours, DC fans and other small appliances to those that cover basic needs (e.g. three light points, cell phone charging).

Key potential negative impacts during the construction of infrastructure associated with Project on and off-grid activities, and during operations and maintenance periods, include potential impacts on land use, ethnic minorities, community safety and also the social impacts that result from negative environmental impacts. Key potential social impacts are discussed in the following sections of this report. Other potential impacts are discussed further in the ESMF.

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<sup>75</sup> In this context, a medium voltage substation is defined as a 33/11 KV substation.

<sup>76</sup> Low Voltage (LV) Lines are distribution lines of less than or equal to 11 Kilo Volt (KV). MV/LV Transformers (33KV/11KV, 11KV/0.4KV) are step down transformers having input of MV (Medium Voltage) and output of a lesser voltage or LV (Low Voltage) electrical power.

### 6.2.1.1 Potential impacts on Land

Land impacts could span management of processes associated with voluntary donation of land through to payment of compensation for access to land and/or acquisition of land to house infrastructure. The project's Resettlement Policy Framework (RPF), part of the ESMF, includes measures to address both land acquisition and voluntary land donations.

Land ownership is an area of significant complexity within Myanmar and any activities that involve access to and use of land will require the conduct of careful and thorough screening and due diligence activities and clear and transparent documentary evidence of the activities undertaken. Consultation and engagement activities associated with land, in particular those that have the potential to impact ethnic minorities and vulnerable peoples, will require particular care.

Of relevance, in most of the upland areas of the country populated by various ethnic minority groups, land is owned communally and used, occupied, or possessed under a customary land allocation system. Another point of consideration is the significant internal displacement that has taken place over the past several decades, and the large numbers of reports of land confiscation during and after conflict.<sup>77</sup>

Sufficient time must be allocated to ensure a high level of awareness and understanding of the proposed infrastructure, the associated benefits and any costs. A two-phased consultation process is recommended, with sufficient time provided to enable affected community members to familiarise themselves with the information provided. Interpretation support using local languages may need to be provided and consultation materials may need to be translated into ethnic languages. Potentially, the process may require third party monitoring and/or support by civil society organisations for some larger subprojects or in conflict or post-conflict areas. There will need to be heightened awareness to the potential for 'elite capture' of any benefits associated with land compensation and acquisition activities.

#### 6.2.1.1.1 Summary of Land Aspects and Component 1: Grid Rollout

##### 6.2.1.1.1.1 Construction Phase

Medium Voltage (MV) substations constructed by the MoEP are typically of an outdoor type, which requires about 3 acres (1.21 hectares) of land including staff housing, control building and switch yard. Expansion of existing MV substations and/or construction of new MV substations may result in direct and indirect land use change. In addition, construction activities related to substations can require additional access to land during planning and implementation phases.

Construction of new and/or rehabilitation of existing MV (33 KV) distribution lines, Low Voltage (LV) 11 KV distribution lines and MV/LV transformers requires access to land for the erection of Spun Pre-stressed Concrete distribution poles and during construction activities, including for the stretching of cables across poles. Access to land may also be required to provide storage for SPC poles and MV/LV transformers. Clearing of the right of way (RoW) is required, which can necessitate cutting/ trimming

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<sup>77</sup> Soe Nandar Linn, Economic & Political Weekly, Myanmar: Conflicts over Land in a Time of Transition p.70.



of trees or affect standing crops in rural areas. There may also be potential impacts on land while distribution lines are being commissioned.

In regards to connection of households to service lines and meters, access to land will be required for installation of MV/LV step down transformers (11KV/0.4 KV), which are mounted on H-Poles and from which three phase lines are extended to domestic users. Access to land may be required during mobilisation and installation of materials and equipment including meter box, distribution panel, main switch, fuse, circuit breaker, internal switches, cables, bulbs, lamps, concrete poles for power lines and other relevant accessories.

#### *6.2.1.1.1.2 Operations Phase*

Operation and maintenance of substations may require some access to land related to solid and hazardous waste disposal and maintenance of the Right of Way.

Operation and maintenance of power lines may require some access to land during clearing of branches and any other potential obstructions to the power lines. Also, regular patrolling along power lines to identify immediate maintenance activities required.

#### *6.2.1.1.2 Summary of Land Aspects and Component 2: Off-grid pre-electrification*

As with the grid roll-out activities, there is the potential that some land may need to be acquired and/or compensated for some off-grid pre-electrification subprojects. There is also the potential that a villager/s and/or a village may donate land to house mini-grid or/other infrastructure.

Construction, operation and maintenance of a Bio Gas Plant may require access to and/or acquisition of land on which the bio gas plant could be built. Access to land may also be required during the civil works construction phase in which material and equipment for construction of the plant would be mobilised and the plant constructed. Also, access to land during commissioning of the system and maintenance activities.

In relation to installation, operation and maintenance of Solar Photovoltaic (PV) Systems, there may be tree cutting and vegetation clearance to maximise access to sunlight and/or install solar PV systems – e.g. solar panels on poles – for systems that are not installed on the roof top. *Note: there are not anticipated to be potential land impacts for small-scale home solar systems.*

For construction, operation and maintenance of Mini Grids: Hydro/Solar, access to and/or acquisition of land on which the mini grid power station would be established may be required. The size of a typical mini grid solar PV system is 10 foot by 10 foot. This structure would typically house a charge controller, battery and inverter. Potential tree cutting and vegetation clearance may be required to maximise access to sunlight on solar panels and/or install solar PV systems. Access to land may also be required to lay the cables and wires associated with the mini grid power station. Also, during commissioning of the system and maintenance activities. This could include temporary use of land for storage of materials.

For construction, operation and maintenance of Diesel Generator Plants, access to and/or acquisition of land on which the diesel generator plant could be established may



be required. The components of a typical diesel generator plant are an air fan, engine, battery, fuel tank, dynamo, exhaust pipe, concrete poles for cables, 3 phase, 4 wiring system to end user households. In addition, access to land on which the cables and wires associated with the wiring system could be laid may be required. Also, access to land during commissioning of the system and maintenance activities.

In relation to construction, operation and maintenance of Mini Hydro Power Plants (<1 MW). The mini-hydro power plants that would be funded through the NEP are considered 'run of the river' hydroelectric plants. They do not require the construction of a reservoir and can be installed in a place where the water drop and steady flow rate are high enough. Potential land use impacts include impacts on other users of the river; for example, for agricultural activities such as rice paddy farming. Land is required for construction of a powerhouse to house a generator and turbine and also for poles that link to the powerhouse and transmit the electricity within the village.

In relation to construction, operation and maintenance of Wind Turbines, access to and/or acquisition of land on which wind turbines will be constructed may be required. Also, access to land may be needed during the commissioning of the system and maintenance activities.

#### 6.2.1.1.3 Findings and Insights from PSIA Field Research regarding Land

##### *6.2.1.1.3.1 Land purchase and donation for the installation of community electricity infrastructure*

**In all but two rural electricity schemes reviewed as part of the PSIA II, electricity infrastructure was located in common village land.** The exceptions to this were Village 23 in Mandalay (temple land) and Village 22 in Rakhine (private land for a small scale private providers' scheme). It is important to note that for Village 19, 20 (Ayeyarwady) as well as Villages 23, 24 (Mandalay) villages no longer have available common village land for future construction/location of public infrastructure. This is likely to be a growing trend, with land for location of future infrastructure more likely to have to be purchased or acquired from private landowners.

**It is also important to note that at village level there are no accurate records of what constitutes "common village land".** The delineation of this "category of land" is available for consultation at the township level land registry office. The process of land titling is ongoing at national level. The village administration, traditional leaders and farmers in the sites visited had no records/registration of common land but indicated there was consensus in the village about "land to be used for public purposes/common good".

**In Chin, Shan, Kayin, land use patterns differed, with substantially more land qualified as "common village land" still available.** In Shan/Kayin, traditional leaders play a key role in the allocation of land for cultivation/natural resource use in the case of common forest land. The process of land registration is ongoing with a number of overlapping claims noted. This traditional land sharing pattern, where households share plots and cultivate them in turn, has brought additional complexity to the land registration process, with new claims being made on land ownership by households

currently cultivating the plots – although they are not considered by the community to be the “owners” of the land.

**Documentation of ‘donation’/allocation of village land for location of electricity infrastructure was rare in the areas covered by PSIA Phase II.** Certification of the agreement reached on the location of infrastructure by the Village Administrator (and record keeping by the VEC) was noted in Kayin, Mon and Mandalay only. The location of electricity poles was discussed in the context of the VEC and with participating households. Overall, poles were located in common village land along the road and, in rare cases, in private plots for access by households. The process through which location is determined was a series of informal discussions as part of the scheme’s design until consensus was reached – this process was never documented and no formal agreements were signed with households. Given the limited number of households involved, their role in contributing to the scheme and the overall availability of common village land, there were no disputes regarding land and location of investments apart from one case in Rakhine (village 21) where initial agreement with a household about the location of a pole in their yard had to be reviewed. In discussions with the Village Administrator (VA) and VEC, the location of the pole was reviewed successfully and the issue easily settled.

**All infrastructure in urban areas (six new wards covered under PSIA Phase II) was located in municipal/public land (with information on “land ownership” available for consultation at township level).**

**Table 22: Location of electricity infrastructure in rural areas**

Village Name	Access to Electricity	Location of infrastructure	Documentation
Village 1 (Chin)	Government (Hydro)	Common village land	No
Village 14 (Chin)	Community (Hydro)	Common village land	No
Village 3 (Magway)	Government Grid	Common village land	No
Village 15 (Kayin)	Government Grid	Common village land	Yes
Village 16 (Kayin)	Community Initiative	Common village land	Yes
Village 17 (Mon)	Government Grid	Common village land	Yes
Village 18 (Mon)	Community Initiative	Common village land	Yes
Village 19 (Ayeyarwady)	Government Grid	Common village land	No
Village 20 (Ayeyarwady)	Community Initiative	Common village land	No
Village 21 (Rakhine)	Government Grid Connection through military camp	Common village land	No
Village 22 (Rakhine)	Community Initiative	Private land	No
Village 6 (Shan)	Private Company (Hydro)	Common village land	No
Village 23 (Mandalay)	Government Grid	Temple Land	No
Village 24 (Mandalay)	Government Grid	Common village land	Yes
Village 25 (Mandalay)	Community Initiative	Common village land	Yes

**The research team identified two cases where land had been used for infrastructure investment projects by government/private company without due**

**consultation and compensation being paid to land owners.** Village 22 in Rakhine has an ongoing dispute with a company running a gas extraction business, with the pipeline currently running through paddy land and village land having been used for the construction of a road without appropriate compensation being paid to the village. The second case is similar in nature in Village 20 in Ayeyarwady, where a new factory has been built in the vicinity of the village. The factory is now getting access to electricity and a contractor has initiated construction, setting up poles on farmers' land without information, prior warning or compensation. At the time of the analysis, villagers were in the process of demonstrating to obtain compensation. They had requested through the VA and township that work be halted until the issue/land dispute was resolved but at the time of fieldwork this had not been successful and construction of the electricity infrastructure for the factory was proceeding.

- It is important to note that limited capacity for supervision of SRE and grid expansion at township level will have implications in how land donation/purchase is managed under the Project. Additional staff, technical assistance (TA), training will be required on this front – also on the consultations to be organised with VEC and the community, and the documentation of land donation.

## 6.2.2 Key Contractor and Supply Chain Risks

### 6.2.2.1 Potential Impacts Associated with Land Compensation and Acquisition

Potential impacts associated with land use and acquisition, as discussed above, are relevant to the activities of companies implementing construction and operations activities supported by the Project. As with implementation of the current telecommunications infrastructure rollout, a control framework will need to be in place.

For reference, Telenor's control systems for land issues include:

- Contractual obligations – tower companies.
- 3 steps to identify rightful ownership (identification, documentation, and neighbour consent).
- Established complaint system.
- Unannounced site inspections by Telenor's Business Assurance team.<sup>78</sup>

### 6.2.2.2 Community Safety Impacts during Construction and Operations

Both the grid and off-grid components of the Project will involve construction and operations activities and therefore have the potential to impact the safety of communities. This can occur through the conduct of the construction and operations activities themselves but also through the involvement/influx of labourers from outside the community. Management and mitigation approaches to guard community health and safety will need to be documented in the ESMF.

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<sup>78</sup> Telenor Myanmar, 19 August 2014, Telenor Myanmar – Business Sustainability Update p 15.

### **6.2.2.3 Potential for Child and Forced Labour**

As with the implementation of the current telecommunications infrastructure rollout within Myanmar, there is the potential for use of child labour by construction companies involved in Project activities, and also for forced labour within communities. These potential risks will need to be considered in the design of the ESMF monitoring and grievance redress mechanisms.

In August 2014, Telenor reported that, through on-site inspections by its Business Assurance Team and Network Rollout Team, it had identified incidents of underage and child labour in its supply-chain on sites in Bago and Mandalay. The incidents violated the company's Supplier Conduct Principles, which state that: nobody under 15 years will be employed; and for tower construction sites, minimum age 18 years, as some aspects of the work are potentially hazardous.<sup>79</sup>

There is also a potential risk that community involvement in Project activities could be 'conscripted' rather than being a voluntary and/or recompensed contribution. The International Labour Organization (ILO) and the GoM have agreed to a Supplementary Understanding, which gives Myanmar Resident Citizens the right to lodge complaints alleging the use of forced labour following ILO's Forced Labour Complaints Mechanism. This complaints mechanism is designed to allow genuine victims of forced labour, with the assistance of the ILO Liaison Officer, an opportunity to seek redress and/or remedies from the government authorities in full confidence that no retaliatory action will be taken against them.<sup>80</sup>

### **6.2.2.4 Inadequate Consultation and Engagement**

Consultation and engagement, including free, prior and informed consultations as required by OP 4.10 with ethnic minorities, is a new concept in Myanmar. Companies that are successful in tendering for involvement in the implementation of project activities will need to follow project requirements outlined in the ESMF in regards to consultation and engagement practices. Awareness raising and sharing of information is needed. Company experience in community relations and engagement could be a criterion for procurement evaluation and tender award. Sensitivity to the community context will be of critical importance within conflict/post-conflict areas and with ethnic minorities.<sup>81</sup>

### **6.2.3 Social exclusion, based on an inability to afford access and lack of connections**

A key potential impact is the social exclusion of vulnerable households, either for reasons of affordability and/or for lack of access to the necessary documentation. The analysis of data collected both during PSIA Phase I and II indicated that access to electricity in rural areas is limited by the current coverage of the grid but also by the fact

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<sup>79</sup> Telenor Myanmar, 19 August 2014, Telenor Myanmar – Business Sustainability Update pps 18-19

<sup>80</sup> As defined by the ILO, forced labour is defined as any work that a person is required to do against their will, under threat of any form of penalty if they do not comply or cooperate. It includes any work required by any person whether from the Civil Administration Authorities, the Military or the Private Sector. Myanmar Law prohibits the use of forced labour. See <http://www.ilo.org/yangon/complaints/lang--en/index.htm>, accessed 27 March 2015.

<sup>81</sup> See also the Fragile States Principles developed by the OECD in 2007 to guide development activities in fragile states: <http://www.oecd.org/dacfragilestates/>, accessed 27 March 2015

that villages must cover the costs of the connection from the main “transmission” line to the village itself following the Self-Reliant approach to electrification. Affordability of connection charges for individual households is an important barrier for the extremely poor/vulnerable. While proximity to the grid plays an obviously important role in determining access to electricity, the affordability of the connection to the village (for which villages are required to raise their own funds) plays an equally determining part.

In addition, the research team noted that poor households were excluded right from the planning stages – as village leaders/elites assumed their inability to pay and did not invite them for discussions. No instances of cross-subsidisation were observed (where the village itself put in place a mechanism to facilitate access to poorer households). In five of the nine villages with a functioning electricity scheme, poor households did not use electricity at all, relying on batteries, candles and kerosene lamps.<sup>82</sup>

PSIA Phase 1 research also found noteworthy issues of access, particularly by informal settlers in Yangon (namely in the poorer ward visited, YGN-3).<sup>83</sup> While the costs of the connection were indicated as a barrier to access by a small minority, the most commonly mentioned reason for using these “better than nothing at all” services in Yangon (i.e. informal electricity providers) was the inability to secure the necessary documentation (including household and land registration as well as approval of the application by the ward leader) to apply for a connection.

Households considered vulnerable/marginalised within the poorer wards researched in Yangon and Mandalay reported challenges with making monthly electricity payments (both for grid connection and for small scale distributors). Overall, the main coping strategies noted were delays in payment and borrowing from neighbours. The cost of household connections in poorer wards within Yangon and Mandalay, where the government service does not yet have full coverage, was a significant barrier to access for low-income households.

#### **6.2.3.1 Importance of Connections in the Electrification Process**

Similar to what was observed during PSIA Phase I, political connections of the village administration, the linkages between religious leaders and the township and/or private contractors were key in securing additional resources as well as providing guidance and support to navigate the complex SRE process. Villages in the sample that did not have these informal connections (those with access only through private providers tended to be unsuccessful in their application, reporting lack of response from township department and particular a lack of funds for the initial investment needed). The initiative of the local administration, traditional and religious leaders and well off households and their ability to mobilize their informal networks and connections were key factors in the success of village SRE. Significantly, visits to rural areas by high level government officials (as noted during Phase I) often coincided with the allocation of discretionary funds for electrification. This was noted in three of the eight villages covered by PSIA Phase II. Without these formal sources of support or informal connections (including township endorsed contractors) respondents reported that their

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<sup>82</sup>Refer to Section 2.1 of the PSIA Phase 1 Report, outlining that for villages with connections to the grid, households with access to the service were usually those better off.

<sup>83</sup> Informal settlers in Yangon (YGN 3) are not included in wards records and therefore not officially “counted” in data on access to electricity (please see Table 9)

application would not receive the necessary attention and the response to their request would “take too long”.

### **6.2.3.2 Role of Women in the Electrification Process**

Women were systematically excluded from participating in the VECs, with the exception of Village 1 in Chin. In all other instances, women were not considered eligible for participation. Where communities had suggested their inclusion (notably in Village 17 in Mon and Village 15 in Kayin), the Township Electricity Department requested their names be removed from the list as the duties of VEC members were considered to be “too much responsibility for women” and may require them to work in the evenings. The inclusion of a female member in the Chin VEC was attributed by informants to the training received by the Village Administration on gender through an externally funded (INGO supported) intervention on water resource management. The training stressed the importance of women’s involvement/leadership in the planning process of community-based interventions.

### **6.2.3.3 Related Impacts on Social Cohesion**

PSIA and Social Assessment research sighted villages that were partially electrified; either due to some villagers’ lack of ability to fund the costs of connection to the grid or because equipment provided through the government-funded solar home system (SHS) program did not supply sufficient equipment for all households within the village. This situation has the potential to weaken the social cohesion within a community and potentially become a trigger for conflict within the community. It will be important to be mindful of this potential risk, during planning and implementation of subprojects.

### **6.2.4 Indebtedness, in particular due to the high cost of connection via SRE**

As noted during PSIA Phase I, it is the high cost of the initial connection to the government electricity grid that constitutes the biggest obstacle to access from both village and for middle-income and poor households within the targeted villages. Of the eight villages targeted in the study, those with access to electricity provided by Government services/private company were: (i) provided with access/village connection free of charge by government or by the private company supplying electricity; (ii) in the case of Village 6 in Shan were exceptionally well-off<sup>84</sup> and able to raise the necessary funds from households; or (iii) contracted heavy debt to be able to cover the cost of connection (Villages 23 and 24 in Mandalay). Respondents in the remaining villages systematically highlighted the cost to the households of establishing this initial connection as the key obstacle for their lack of access. The perception that government subsidies for these connections were not available (or were granted only in very exceptional circumstances) was reported systematically across research sites.

In two of the new villages covered by Phase II of the PSIA, the research team noted that SRE had resulted in significant debts for the village. This had resulted from a combination of factors, including an under-estimation of the total cost of the investment required to complete the works. Construction work was stopped in both instances as

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<sup>84</sup> Research team observation highlighted the quality of housing construction, infrastructure and related it to the source of income of the village/migration.



villages ran out of funds for completion and the Village Administration borrowed for the remaining amount. Particularly difficult agricultural seasons in the Mandalay dry-zone of the last few years made the re-payment of the debts increasingly difficult with the VEC and VA taking on additional informal loans and selling assets (including land) to be able to make loan payments.

In four of the eight VECs in the PSIA study sample, the township electricity department was responsible for overall maintenance of the scheme but funding was not available at township level for major repairs. Villages were required to fund these costs themselves without having planned/budgeted for eventual maintenance and repair costs. None of the villages regularly collected user fees that may help them offset the costs. Large unforeseen costs with maintenance in two instances further contributed to village and household debt. In one instance funds were borrowed from the contractor that had initially set up the scheme.

### **6.2.5 Impacts on Ethnic Minorities and Vulnerable Groups**

The Project is to be implemented in all states and regions of Myanmar. In particular, the off-grid program plans to target about 500,000 households in the remote, less accessible villages in the Chin, Kachin, Kayah, Kayin, Shan, Tanintharyi and Sagaing states/regions. The project presents potential issues related to equity in access to services and quality of services in areas with ethnic minorities as well as other vulnerable population groups.

In general, PSIA research did not reveal significant variation in terms of social inclusion and community participation across regions/ethnic groups in sample villages, although one case was noted, as described below. Elite capture of the process and limited communication with the community was the overall trend observed. The PSIA Phase II villages included two mixed villages (Village 17 in Mon and Village 6 in Shan). In the Mon case, the village is made up of Palong (20 per cent), Burma (45 per cent) and Kayin (35 per cent) farmers with all groups being represented in the VEC and in the planning of village electrification. Burma and Kayin tended to dominate local government institutions, which did not affect the distribution of benefits from the electricity scheme. There was no ethnic dimension to the exclusion of poor households in this case. What determined household ability to access electricity was exclusively household income. In the case of Village 6 in Shan electricity was provided by a large private company (hydro). The village is predominantly Shan with a minority (20 per cent) Palong households. Livelihoods and household welfare tend to be divided along ethnic lines with Palong households living on the outskirts of the village and being predominantly landless farmers and daily laborers. Palong households were therefore at an economic disadvantage in terms of joining the electricity service. Importantly, however, in this case, the private company, linked to the village administration (Shan dominated), provided better conditions of access for Shan households – namely initial credit and the ability to pay connection fees in instalments. No such flexibility was provided to Palong households with the result that all those in the village currently excluded from accessing electricity are Palong.

#### **6.2.5.1 Potential Impacts during Construction and Operations Activities**

Construction and operations activities associated with the Project may present possible triggers for conflict. Particular triggers may include:

- the use of companies and/or labourers sourced from a different ethnic group and from outside the area of project implementation;
- inadequate stakeholder consultation and engagement, including in local languages and with insufficient advance notice and consultation;
- lack of awareness of land use and ownership structures within the community;
- low awareness of the cultural value of community forests;
- community safety concerns, especially of women going out for shifting cultivation.

Further, if ethnic minorities and vulnerable groups have previously had a negative experience, in particular in relation to an infrastructure development project, this could affect their level of interest in and engagement with the Project and its subprojects.

Local companies should be contracted for construction and operations activities wherever possible, through a transparent contracting and procurement process.

### **BOX 9: Land Acquisition for Transmission Lines**

*Note that this example focuses on construction of power transmission lines, which is not the focus of the Project, whose focus, rather, is power distribution. Nevertheless the issues highlighted are pertinent to NEP implementation.*

Around the end of 2014, there began an electricity project – building tower stations for Min-Bu–Sittwe Electricity Line in villages in the Rakhine Mountain Ranges. This included various activities such as constructing roads, setting up towers and setting up cables through land, orchards and forests. Around 10 people from other regions, supposedly from Rakhine State came along as labourers. Unlike the Gas Pipeline Project, there were not any foreign labourers.

The A-sho people in the township generally make their living by cultivation especially shifting cultivation. Their main religions are Buddhism and Christianity: nonetheless, most people believe in Nat worshipping. Even though the indigenous people realised that there would be a project, they did not have access to any information about the stakeholders responsible for the project (the government or the private company or the international organisation). There was no transparency as to the possible impacts of tower stations, geography of mapping and grievance mechanisms including compensation systems.

Lack of transparency led to land acquisition problems. Land acquisition and compensation is more complicated in hilly regions, orchards and forests than in middle regions of Myanmar as there is more destruction and ownership can be ambiguous. Unlike in other regions, there is land erosion in hilly regions when the soil is dug up,

Two kinds of land issues can generally be categorised for these hilly regions – private land or orchards and community forests. People as individuals usually get compensation to some extent. However, even in this case, an orchard is compensated not for the land but for the trees planted there since the land is regarded as government property.

The problem is more complicated and there are more concerns, and complaints, related to community forests. Forests are not usually compensated as they are regarded as the



government's property. However, from the indigenous peoples' point of view, forests are very important, not only for the environment but also for their social life as well as their religious and cultural beliefs. Conflicts, misunderstandings and complaints occurred because of these differences.

There were certain environmental impacts caused by the project. Nature itself as well as forests and orchards were to some extent destroyed. Since trees were felled down and the forest was destroyed to build the tower stations, negative consequences such as climate change, contamination of streams due to waste, and soil erosion occurred.

There were also several concerns from the social side. There were 30 to 35 people involved in building the power stations. About 20 or 25 were local laborers working manually demanding tasks such as digging and carrying soil and bricks. The rest were from other regions, apparently from the Rakhine Region coming along with their Sub-Assistant Engineer to mainly work in construction activities in which local people are inexperienced. Since there were 'strangers' (labourers from other region), there were concerns about the safety of local people (especially of women going out for shifting cultivation). Moreover, during the construction period, labourers (both local and foreign) used drugs and alcohol therefore chances of conflicts and quarrels between them increased.

Similar issues arose in the gas pipeline project previously implemented. Land for shifting cultivation was used and cultural Nat worshipping was disturbed. Moreover, there were internal conflicts between Myanmar and Chinese labourers.

These two sequential projects are believed to have caused negative environmental consequences, including increased temperature. Furthermore, rumours have spread that another fibre project would be coming in soon. Based on their experience to date, the community is worried about coming projects.

#### **6.2.5.2 Potential for Bypassing Communities during the Grid Rollout**

There is the potential that communities living in remote areas will be bypassed during grid rollout activities. Infrastructure could be expanded and constructed through their areas but they may not be the beneficiaries of the electricity delivered through it. It will be important to consider how to balance and sequence provision of off-grid electrification services to these communities if they are not able to be directly serviced as part of the grid rollout.

#### **6.2.5.3 Conflict and Post-Conflict Areas**

The WBG's Country Partnership Framework (CPF) for Myanmar FY15-17 observes that Myanmar's transition is taking place in a context of continued fragility, conflict and violence, including religious violence, and an ongoing but incomplete peace process to address long-standing grievances of the country's many ethnic minorities. It has also been noted that the lack of access to electricity was a factor for some displaced people to stay in refugee camps or longer-established EAG-run IDP settlements.

A number of potential conflict risks identified in the CPF are relevant to **the Project**. These include: avoiding inadvertent marginalisation of effective service delivery structures maintained by ethnic armed groups; and ensuring access to project benefits by marginalised groups.

The perceived level of equity, transparency and accountability associated with the implementation of the grid rollout and off-grid activities will be key. Considered targeting and sequencing of NEP-related activities, both grid and off-grid, underpinned by a transparent and broadly communicated rationale will be very important. Further to this, it will be critical for the NEP to be implemented using a conflict-sensitive approach underpinned by thoughtfully designed, inclusive and well-executed consultation and engagement strategies. Regular and transparent monitoring, including third party monitoring with community involvement, can play a valuable role in managing perceptions of transparency and accountability.

There is a strong potential that access by the government or private companies contracted to the government to conflict and post-conflict areas in order to implement NEP activities may be limited throughout the period of NEP implementation. This may impact the potential for the project to achieve its objective of increasing access to electricity, and in turn may exacerbate and/or trigger the potential for conflict within these areas. Some may also perceive NEP as a mechanism for incursion by the state into areas controlled by Ethnic Armed Groups (EAG).

At the same time provision of infrastructure, such as electricity, and social services may have significant potential to contribute to peacebuilding. In particular, coordination and collaboration efforts between state and service providers supported by EAGs could improve the quality of service provision, while also supporting the war-to-peace transition. Involvement of, and consultations with, ethnic State authorities as well as ethnic non-state groups and communities are important for successful implementation of NEP. Supporting schools and health clinics services by government as well as non-government service providers would also be important to enhance NEP' benefits.

To mitigate the above potential risks, it will be critical for the **Project** to integrate conflict-screening within the ESMF, to embrace broad-based and inclusive community-based planning processes and to have a sound and nuanced understanding of the community context ahead of project implementation at village level.

#### 6.2.5.3.1 Key Considerations for NEP Implementation

Effectively undertaking project implementation within such a diverse cultural and linguistic context will require specific consideration in regards to:

- Language use, in particular in relation to:
  - Preparing written and visual consultation and engagement materials;
  - Undertaking consultation and engagement activities;
  - Preparing IEC materials including in regards to community safety;
  - Undertaking monitoring and evaluation activities.
- Ensuring equitability, in particular in relation to:
  - engagement of ethnic minority representatives, including within villages comprised of a mix of ethnicities;
  - reducing conflict risks due to either real or perceived discrimination against areas administered by or associated with EAGs; and

- targeting, sequencing and implementation of the rollout of the grid and off-grid components of the program.
- Identification and consideration of how to mitigate barriers to access electricity amongst poor and vulnerable households, including female-headed households.

### **6.2.6 Capacity and Governance: SRE Process and VEC**

As discussed earlier in this report, there is a great deal of flexibility in the way communities organise themselves to progress their applications for access to the Government's electricity grid. While the Electricity Committees required to be established under the 12-point Document are responsible for raising funds and overseeing construction and maintenance, little is mandated by the MoEP in terms of: (i) selection of committee members; (ii) Terms of Reference or roles of different members (including segregation of duties for financial management and procurement); (iii) community planning and mobilisation process; (iv) basis for calculating tariffs and maintenance charges to be collected. In addition, communities are not required to mobilise the full amount needed for construction before the start of the works and some conduct construction in phases over a number of years. Decisions about these issues are left to the communities themselves which introduces a lot of variation in the approach followed. Further to this, township level Electricity Departments do not have the human resources, technical or financial capacity to provide oversight to VEC operations.

As part of the preparatory work in planning subprojects, it will be important to gain an understanding of the composition and experience of the VEC/s in the relevant village/s, and scope any capacity building activities required to be undertaken as part of sub-project implementation, including through the support of the TAG.

### **6.2.7 Renewable Energy Product and Planning Risks**

#### ***6.2.7.1 Waste associated with Renewable Energy products and systems***

There is strong potential for e-waste derived from the introduction of new and higher quality renewable energy infrastructure that makes existing equipment obsolete.

A DRD key informant met with during the field research commented on the solar waste already happening in village areas. This was in part due to the provision of low quality products and lack of inclusion of some required components, such as functioning charge controller systems and fuses. However, the risk remains that there will be e-waste during the implementation of the Project, such as batteries used for solar home systems, and there will need to be efficient ways to manage their recycling and/or safe disposal.

There is also the potential for waste from micro-hydro schemes when components such as turbines stop working. Also, if current micro-hydro schemes become supplanted by other renewable energy options implemented through the Project.

#### ***6.2.7.2 Limited Awareness of Actual Situation at Village Level***

One risk that became evident during the field research was that there may be limited awareness at township level of the current status and nature of access to electricity

within a village e.g. in terms of access to solar home panels. This impacts the quality of the planning that the government can undertake.

Another risk that became evident was that if there is a large gap in time between the government planning activity and the delivery of renewable energy products and/or a gap between the level of need within a village and the volume of product that the government can afford within its budget that some households may miss out. Then, because a village has received some support within this budget year, it may not be eligible to receive funding within the next budget year. And so there is a situation of a village partially but not fully electrified.

### **6.2.8 Transparency and Accountability of Procurement**

There is a strong theme of transparency and accountability evident within Myanmar's political, economic and social transition, and key commitments by the government in this regard. As the Project involves procurement activities, both for the grid and off-grid components, there are potential risks associated with the transparency and accountability of procurement activities. The actual risks and also the perception of risks will require active management.

Of relevance, PSIA research within eight villages in relation to VECs commented that across the eight sites where VEC activities were reviewed, the relationship with contractors hired to implement the scheme and the procurement process was unclear.

### **6.2.9 Cumulative Impacts**

Given the current pace of economic development within Myanmar, there is potential for cumulative impacts on communities, both through the conduct of the grid rollout and also during the implementation of the off-grid activities. As defined by the International Finance Corporation (IFC), "Cumulative impacts are those that result from the successive, incremental, and/or combined effects of an action, project, or activity when added to other existing, planned, and/or reasonably anticipated future ones".<sup>85</sup>

This is particularly the case in urban areas, where expansion of the grid and improvements in the quality of service of electricity provision are likely to lead to increased energy consumption for industrial use. For example, there is the potential that communities living in proximity to Industrial Zones and Special Economic Zones may experience increased pollutant emissions. Other potential impacts may include secondary or induced social impacts such as in-migration of peoples, to live in proximity to the industrial area, and/or more traffic congestion and accidents along community roadways due to increases in transport activity.

At village level, other cumulative impacts may result from the combination of a series of development projects implemented in relatively quick succession. For example, as referenced in the Chin case study- an electricity infrastructure project followed by a gas pipeline infrastructure project followed by a likely fibre optic infrastructure rollout.

Managing such cumulative impacts should be considered, and may include:

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<sup>85</sup> International Finance Corporation, 2013, Good Practice Handbook: Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets p. 19

- Analysis of the potential impacts and risks of proposed activities in the context of the potential effects of other human activities and natural environmental and social external drivers on valued environmental and social components (VECs);<sup>86</sup> and
- Identify concrete measures to avoid, reduce, or mitigate such cumulative impacts and risks to the extent possible.

## 7 Stakeholder Consultations

On 30 January 2015, an initial consultative meeting with NGOs and CSOs was held to share information on the Project. Approximately 40 people participated including representatives of local and international NGOs and CSOs, business and media, as well as MoEP and DRD PMO staff responsible for safeguards. Participants raised questions on topics including: how concessional are World Bank loans; what costs will the Government and households need to bear; where will the power come from to meet the extra demand; and how to reconcile differences between the WB and GoM environmental policies. Also asked where questions regarding; what mechanisms will be in place for grievances and to prevent corruption; how the Government will prioritise connections; how to balance and integrate electrification with other development needs; and how to build capacity.<sup>87</sup>

During January – March 2015, the PSIA included consultations with civil society, government, development partners and some business stakeholders. This focused on obtaining insights into the potential social impacts of proposed project activities, per the requirements of the World Bank’s operational policies on environmental assessment (OP 4.01), indigenous peoples (OP 4.10) and involuntary resettlement (OP 4.12). The PSIA and consultations considered particular issues and risks concerning ethnic minorities, in accordance with the requirements of the World Bank’s operational policy on indigenous peoples (OP 4.10), and engaged with civil society stakeholders focused on land, gender and natural resources governance.

This research complemented an earlier program of consultations and engagement undertaken by Enlightened Myanmar Research (EMR) during the first phased of the PSIA February 2014-March 2015. This sought input from government, civil society and the private sector on the status of and perceptions regarding electricity access in Myanmar, as stakeholder input into the design of the proposed National Electrification Project. The methodology for these stakeholder consultations is discussed earlier in this report.

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<sup>86</sup> The IFC defines VECs as: environmental and social attributes that are considered to be important in assessing risks; they may be: Physical features, habitats, wildlife populations (e.g., biodiversity); Ecosystem services; Natural processes (e.g., water and nutrient cycles, microclimate); Social conditions (e.g., health, economics); or Cultural aspects (e.g., traditional spiritual ceremonies. *ibid.* p.21

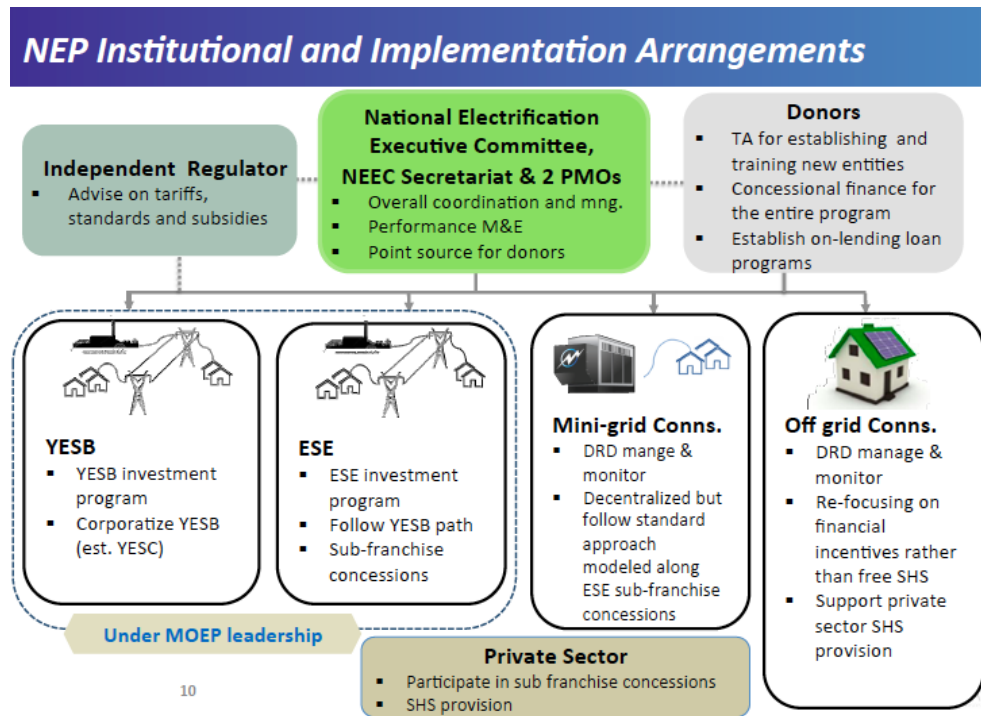
<sup>87</sup> World Bank Group, Aide Memoire, Myanmar Electric Power Project (P143988) and National Electrification Project (P152936), January 12-30, 2015 p. 7

## 7.1 Key stakeholders and institutional arrangements for Project activities

### 7.1.1 NEP Institutional and Implementation Arrangements

The figures below show the proposed Institutional and Implementation Arrangements and the Institutional Implementation Framework envisioned for the Project.

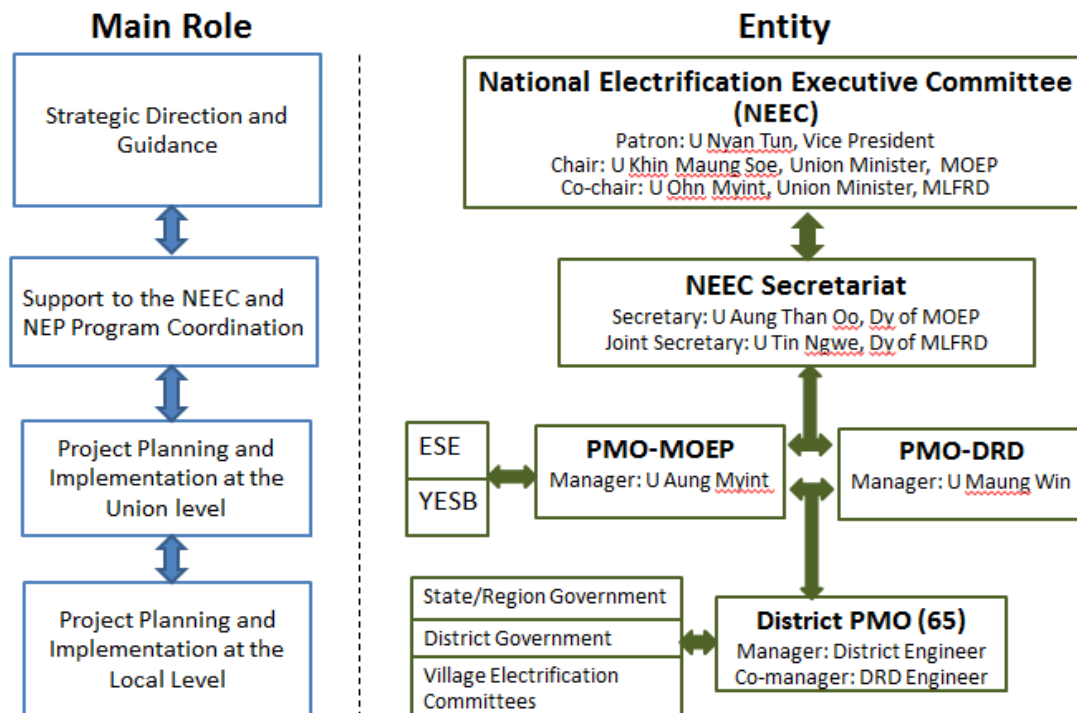
**FIGURE 4: NEP INSTITUTIONAL AND IMPLEMENTATION ARRANGEMENTS**



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Source: Presentation on Myanmar Energy and Power Sector and Support by Development Partners, January 2015.

**FIGURE 5: NEP INSTITUTIONAL IMPLEMENTATION FRAMEWORK**



The NEEC Secretariat would be informed and engaged regularly in the implementation of the NEP as part of general reporting of project implementation. Within the MoEP and MFLRD (DRD), the Executive Committee, consisting of the MoEP and MFLRD Union Ministers and other senior officials would have overall oversight responsibility of the proposed Project and would be informed regularly about overall implementation.

As outlined within the above Figure, Union-level PMOs would be responsible for project planning and implementation at the national level, while local level project planning and implementation would be led by the District PMOs.

#### 7.1.1.1 Grid Implementation Approach

ESE and YESB are proposed to implement a combined and coordinated procurement program for the materials and equipment required for the rollout. Many of the new connections will be made by private and community enterprises.

These are likely to be:

- Sub-franchises to the ESE and YESB grids.
- Mini-grids – both permanent and pre-electrification.
- Household solar systems.

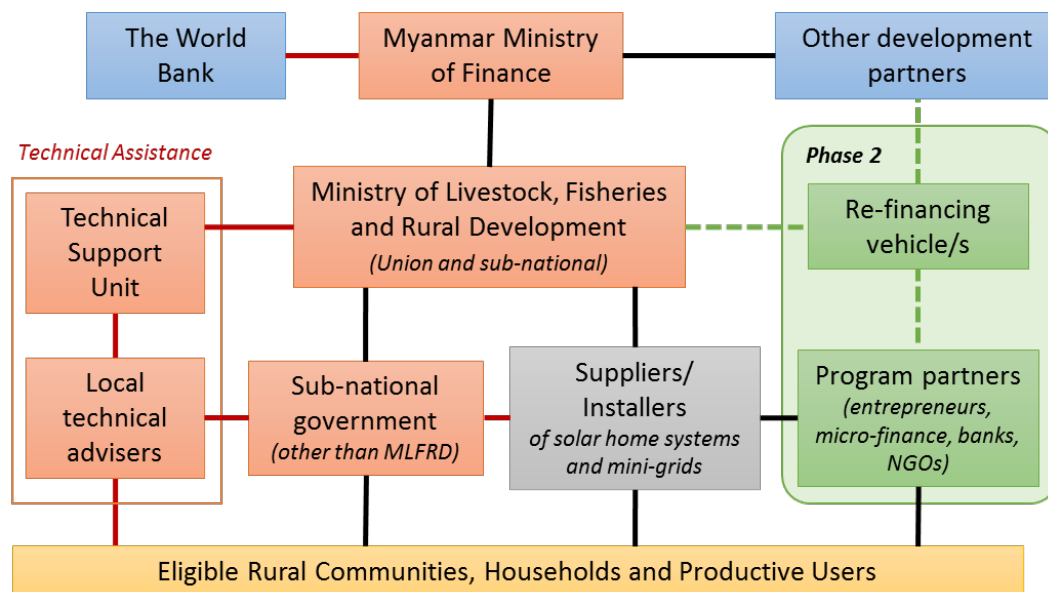
The entities that will provide the infrastructure and connections will require financing from the banking sector.

#### 7.1.1.2 Off-Grid Pre Electrification Approach

The institutional framework is currently being further developed for the off-grid pre-electrification component of the project (Component 2), down to village level. Figure 6 below shows the current proposed implementation framework for Component 2.

**FIGURE 6: OFF-GRID PRE-ELECTRIFICATION IMPLEMENTATION FRAMEWORK**





The Project's Off-grid program intends to provide substantial technical assistance to overcome limitations in access to knowledge and technology, capacity constraints of businesses and government, poor quality of products and services, low consumer awareness and knowledge, among others.

It will offer technical assistance at the local level through a Technical Advisory Group (TAG) comprising local NGO/CSOs and consultants collaborating with local government (especially but not exclusively DRD staff). It will help village communities and townships to mobilise expert help to select and develop the appropriate off-grid electrification choices and to successfully implement them.

A Technical Support Unit (TSU) at the Union level with international and national expertise will provide technical backstopping to the TAG, support policy and regulatory development, work with the financial sector to adopt/adapt mechanisms for consumer and supplier financing, develop and disseminate streamlined contracting and procurement processes, arrange capacity building and training for participating companies and government agencies, support knowledge and technology transfer, support DRD in consumer awareness and information campaigns, monitoring and evaluation, and assist in program management.

## 7.2 Key findings from stakeholder consultations

### 7.2.1.1 Findings from PSIA Phase 1 Research<sup>88</sup>

Key findings from PSIA research included that some of the authorities at departments under the MoEP felt that only a large-scale program like the Project would assist in enabling the MoEP to "have a big leap forwards", and remove the barriers they had been facing in making the required structural changes.

Repairing existing, old and damaged infrastructure was seen as a larger challenge than building new infrastructure. Some government stakeholders mentioned the effectiveness of the pilot partnership project underway with private companies in the

<sup>88</sup> See Section 2 for an overview of the stakeholders involved.



distribution sector, in Mandalay and Yangon. They commonly identified the private companies' effectiveness in replacing very old infrastructure with new infrastructure, reducing unit losses and providing faster, responsive customer service.

A key challenge referenced was the lack of public understanding of the cost of the government subsidisation of tariffs. This was seen as a barrier for the ministry to be able to set a price that would enable system improvements to ensure quality service. Most of the departmental authorities stated that even the new (2014) tariff rate was still low in order to offset the losses of the government and reinvest for system improvements. They described a "circle of deficits". Due to shortfalls in the tariff collected, the government was not able to afford system improvements and therefore provided a low quality service, which meant that the public was not happy to pay an increased tariff. Raising the awareness and understanding of the public was seen as necessary however currently the government-funded newspaper was the only regular channel between the departments and the public.

Capacity building was a common recommendation made by almost all departmental authorities; not just ad-hoc training but also long-term coaching by technical experts based in Myanmar.

The need for public relations (community relations) departments within each department under MoEP was identified, to provide regular information and responses to public concerns and issues, and also correct public misperceptions as necessary.

According to the ESE, self-reliant electrification has been more encouraged in recent years and the procedure for application has been simplified. The technical requirements laid out in the 12-Point Document have been streamlined (down from 72). Approval of community applications and certification of compliance is now reviewed at Regional rather than Central/Ministerial level.

### **7.2.2 Private sector**

Different interests and concerns were expressed by the private sector, from the perspectives of both supply and demand. The supply side mainly expressed their views about the current advantages and challenges in investing in the generation and distribution sector and concerns for their businesses and investment opportunities when the sector became corporatised. The demand side reinforced their desire for a quality service and to transition from the current situation of self-reliance for building infrastructure and maintenance to increased private sector investment in the distribution sector.

The Social Assessment, undertaken during January – March 2015, included a focus on understanding lessons that may be able to be learned from the implementation of the national telecommunications infrastructure rollout. This considered both social impacts and risks, and also community consultation and engagement approaches, including in relation to grievance management.

KIIs were held with international telecommunications companies, Telenor and Ooredoo, and also the Myanmar Centre for Responsible Business (MCRB) Team Lead for the Telecommunications Sector Wide Impact Assessment (SWIA).

Consultation was also undertaken with the Myanmar Business Coalition on AIDS, which describes itself as “a business-led organisation acting to engage companies into social and environmental initiatives in Myanmar.”<sup>89</sup> The Coalition has Township Business Coalitions in seven states and regions, namely Pyay (Bago Region), Mandalay (Mandalay region), Pakokku (Magway Region), Monywa (Sagaing Region), Lashio and Muse (both in Northern Shan State), and Thingangone (Ayerwady Region), as well as in Yangon. Potentially, the Coalition could play a role in training and awareness raising programs regarding social responsibility (social safeguards, social impact assessment and mitigation, community safety, contractor management) that could be held for Myanmar businesses interested in being involved in the implementation of NEP activities.

### 7.2.2.1 Findings from PSIA Phase 1 Research

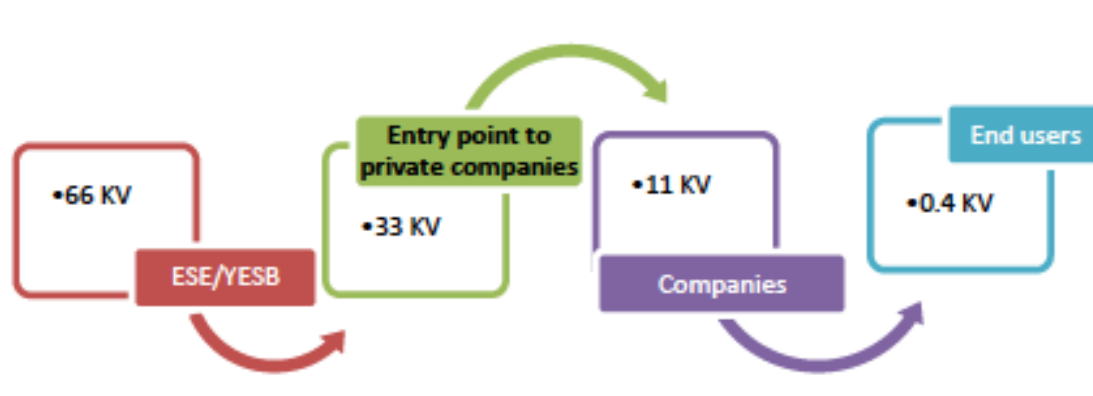
#### 7.2.2.1.1 Private sector – supply side

PSIA research found that there was significant local and external private investment in the generation and distribution sector. In the generation sector, private investment covered different types of generation, from hydro-power and gas turbine to medium scale diesel generation. In the distribution sector, formal partnerships were reported between YESB/ESE and private companies. In the current partnership system, the companies take the role of operators of the distribution lines, starting at 33 KV as an entry point and delivering to end users. From the starting point output stage of 33 KV, the companies are responsible for system improvements, such as replacing overload transformers and digital meters. In addition to technical improvements, the companies are responsible for the human resources appointed by the government at township level to maintain them, providing 10 per cent additional amount over the government capacity scale.

Government stakeholders commented that private sector investments have brought new technologies and approaches as well as exploration regarding mini-grid technology and feasibility that seemed supportive of project targets.

Figure 7 below shows the division of responsibility between government distribution bodies and private companies in the distribution network.

**FIGURE 7: PUBLIC AND PRIVATE SECTOR INTERFACES IN DISTRIBUTION NETWORKS**



<sup>89</sup> <http://www.mbconaid.org>, accessed 8 April 2015

The common challenge identified was the significant cost for the system improvements required, as the infrastructure throughout the supply chain needed to be upgraded. The old infrastructure cannot bear the current power consumption, posing significant risk and damage to other infrastructure such as transformers.

The delay of the new Electricity Law was seen as a barrier for some companies, especially medium and small-sized local companies. As private sector investment in the electricity sector is guaranteed only by the new Electricity Law, some foreign companies have been waiting and not yet decided on partnership with local investment companies.

The companies recommended mini-grid facilities as a better option than solar home systems in rural areas, due to the limited durability of solar home systems.

They also commented on the challenges they face in securing credit ratings from local banks and also access to reasonably priced loans. They requested that support be provided to enable better financial services to emerge in Myanmar.

#### 7.2.2.1.2 Private sector – demand side

PSIA Phase 1 research covered three groups of SMEs in Yangon and Mandalay, defined in terms of their electricity consumption. Feedback on the tariff increases and coping strategies adopted varied, depending on the new tariff band they now found themselves in.

Table 23: Different types of businesses surveyed (Yangon and Mandalay)

Cities	Number of SMEs by consumption (Units kWh)		
	1-500	501-10,000	10,001-20,000
Yangon	8	17	0
Mandalay	13	10	2
Total	21	27	2

**Very small, family run businesses and businesses requiring unskilled labour reported not being affected by changes in tariffs.** These made up a significant proportion of the businesses surveyed and included small-scale food production and packaging companies and mechanics. Overall, the rates were considered affordable and no particular negative coping strategies were observed among this group.

**Medium-sized businesses (in the second and third group) were the most affected among those surveyed.**<sup>90</sup> The second group of businesses includes mould-making, printing and purified water companies, now required to pay 25 additional kyats per unit (a 30 per cent increase in relation to the previous tariff structure). These businesses considered themselves “hard hit” by the increases, particularly as they have had to shoulder the additional electricity costs together with diesel costs. Generators were still needed to address gaps in electricity supply (fluctuations in capacity and brief black-outs). The third group of businesses was found only in the Mandalay industrial zone surveyed. These were two smelting businesses (iron rods and construction materials),

<sup>90</sup> It's important to note that the analysis did not cover individual discussions with large-scale companies although the Myanmar Chamber of Commerce and the Management Committee of Industrial Zones in Mandalay and Yangon were consulted on the overall quality of the electricity supply and on their perspectives regarding tariff increases.

which fell under the second tariff block, with an additional 50 kyats to be paid per unit (i.e two-thirds increase in their bill compared to the previous tariff). Using generators for these businesses is extremely expensive and they rely heavily on the grid connection, having invested significantly in setting up the necessary infrastructure in the Industrial Zone.

**The most common coping strategy reported was to increase prices for the consumer when this was possible** (in some instances, pre-existing contract commitments meant that businesses incurred losses). Medium-sized businesses in the second group coped by laying off some staff, reducing production and no longer holding stock (i.e producing only when they had a specific order). Larger businesses in the third group reported that they had some time to prepare (around three months) and find cheaper suppliers and re-negotiate prices and, in spite of a higher increase, were in a comparatively better situation.

Quality of service was the most common challenge identified by SMEs and the management committees of industrial zones. The irregularity and fluctuation in provision of electricity damages equipment and reduces the quality of products.

Management committees of industrial zones, who are currently responsible for existing common infrastructure within the zones (with technical support by the government or private companies acting as operators), were not comfortable with the responsibility they had been taking for maintenance and expected a compensation/concession/exemption on tariff rates.

Transparency was demanded of both the government and the private sector; knowledge of why a specific company was chosen for the distribution service in their area and what services and commitments it could provide.

#### **7.2.2.2 Findings from Social Assessment Research**

KIIs undertaken in regards to the telecommunications rollout highlighted the potential challenges associated with land that subprojects may face; for example, in regards to managing expectations regarding land and also ensuring rightful ownership.

Also the importance of:

- providing training to contractors - in regards to ensuring adherence to health, safety, security and environment (HSSE) standards and regard for labour and human rights;<sup>91</sup> and
- undertaking a regular program of unannounced site inspections and audits.

A key aspect of Telenor's approach relevant to the Project is its focus on undertaking thorough due diligence of its contractors, including in relation to national and international standards and good practices and linkages with *Specially Designated Nationals*.<sup>92</sup> Telenor has developed The Telenor Way Framework, which consists of Governing Documents (Code of Conduct, Group Governing Principles, Policies and

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<sup>91</sup> In alignment with the UN Guiding Principles on Business and Human Rights

<sup>92</sup> <http://burma.usembassy.gov/sdn-list.html>, accessed 8 April 2015

Manuals), Vision, Values and Leadership Expectations.<sup>93</sup> Telenor’s approach and practices regarding community consultation and engagement and grievance management, including with ethnic groups, provide insights that could be relevant to the implementation of the Project. A key proposal raised during the consultation with Telenor was the value of investing in exposure visits<sup>94</sup>, to show the transformational potential – and also highlight the potential risks and impacts (positive and negative) of similar projects undertaken in similar implementation contexts. This capacity building approach should be considered during implementation of the Project.

Discussions with Ooredoo highlighted the role that telecommunications plays as a platform for foreign direct investment into Myanmar, and that this is also the case with electricity. Both are key infrastructure elements required to support effective business operations. The interrelationship between telecommunications and electricity is a key dimension that could be considered as part of the Project impact evaluation framework.

### 7.2.3 Civil society organisations

At November 2014, there were about 189 organisations (82 INGOs, 60 NNGOs, 25 Border-based Organisations, 14 UNs, etc.), working in 19 sectors and 142 sub-sectors across Myanmar, according to the Myanmar Information Management Unit (MIMU) list.<sup>95</sup> A number of these maintain a focus on natural resource management and governance, many with a specific focus on land, human rights and transparency.

#### 7.2.3.1 Findings from PSIA Phase 1 Research

Research undertaken by EMR to inform the PSIA Phase I report found that, from the CSO side, more transparency and accountability was expected of the government and the private sector in managing and investing in extractive industries. Of relevance, generation of electricity from hydro-power and coal was seen as a trade-off between economic development and the natural environment.

Key points from EMR’s research with CSOs and resource persons are as follows:

- Lack of transparency was reported as a common demand from all CSOs and resource persons interviewed. They stated that the government informed the CSOs only after policies were decided and that they had a very limited opportunity to discuss or provide feedback at meetings.
- The laws for a Fair Pricing Mechanism were recommended as separate laws or by-laws. These were considered important for awareness raising and negotiation with consumers.
- Awareness raising and educating the public through “technocrat societies” and accredited CSOs was recommended, as these have strong knowledge and understanding of the sector, policy and structural issues. These were identified as a medium between the policy decision makers, the public and the media.

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<sup>93</sup> <http://www.telenor.com/about-us/corporate-governance/anti-corruption/anti-corruption-handbook/telenor-way/>, accessed 8 April 2015

<sup>94</sup> also known as site visits or study tours

<sup>95</sup> <http://www.themimu.info/3w-maps-and-reports>, accessed 27 March 2015

- The role of the Regulatory Body mentioned in the new Electricity Law was seen as significant.
- Policies and implementation towards effective renewable energy projects were seen as recommended and a separate Directorate was proposed (rather than MoI).
- CSOs recommended that the Ministry and international development partner organisations providing support to national electrification in Myanmar also support CSOs' efforts in promoting rural electrification. Individual home solar and high capacity solar facilities for common usage in communities were a common approach being promoted by CSOs directly involved in rural electrification activities. Some were also involved in providing technical training to communities.

#### 7.2.4 Ethnic minorities

Field research to inform the findings of this report was undertaken with a broad range of ethnic groups and in rural and urban settings. Research was undertaken in the ethnic states of Mon, Kayin, Chin, Rakhine and Shan. The ethnic groups met with in the different States and Regions are as below.

**TABLE 24: ETHNIC COMPOSITION OF PARTICIPANTS IN FIELD RESEARCH**

States					Regions			
Mon	Kayin	Shan	Chin	Rakhine	Ayeyarwaddy	Mandalay	Yangon*	Magway
Mon	Kayin	Shan	Chin	Rakhine	Bamar	Bamar	Bamar	Bamar
Kayin	Bamar	Palaung		Bamar			Chin	
Bamar	Mon	Pa-O					Kachin	
Pa-O		Danu					Karen	
		Nepali					Shan	

\*In addition to the list below, efforts were also made to meet with Mon representatives in Yangon and project documentation was sent to Rakhine CSOs to seek their input. Ethnic minority organizations will be invited to the public consultations scheduled in May.

During consultative discussions with ethnic civil society organisations, the key issues raised related to ensuring:

- Equitable distribution of benefits, including when considering the targeting, sequencing and implementation of the grid and off-grid components of the Project;
- Consultation and engagement with ethnic groups is undertaken with cultural awareness and cognisance of language and cultural differences, including in regards to land ownership and community forests;
- Advance notice is provided of consultation and engagement activities, and that a number of such activities are undertaken in a sequenced way, so that all communities, including ethnic minorities and those in ethnic states, have time to understand the potential impact of the proposed activities (positive and negative)

and also the processes and roles (government, company, other) associated with the implementation of the proposed subproject.

While, in general, ethnic peoples were welcoming of the initiative, some key informants and CSOs (both ethnic and Bamar) expressed reservations regarding the proposed source of the electricity that would power the grid rollout aspect of the Project. In Myanmar, CSOs have expressed concern regarding new hydropower plants, and have highlighted the cultural value of Myanmar's major rivers. These concerns, while noted, are not within the scope of the Project.

## 8 Recommendations

This section discusses recommendations from the PSIA phases I and II and the supplementary social assessment and consultations. Recommendations concern the design and implementation of the National Electrification Plan and the National Electrification Project and its Environmental and Social Management Framework (ESMF).

### 8.1 Related to the Cost of Electricity Service Connection and Provision

- **As with rural areas, subsidising connections to the home in poor wards would seem important for a more equitable electrification roll-out. Regularising and simplifying requirements for applications/connections in informal settlements would equally be key.** As with the rural poor and marginalised households, a closer analysis of the energy consumption among this group would be important for the design of life-line tariffs. With current tariffs already being unaffordable there is a risk that this vulnerable group will be left out of the electrification process.
- **Any tariff increases should be matched with an increase in the quality of service.** In Yangon and Mandalay, particular segments of participants in the PSIA Phase 1 study reported being “very affected” by the tariff increase, namely middle-income households and some categories of SMEs. However, in the case of middle-income wards, where feedback on tariffs was strongly negative, there were, in fact, no negative coping strategies reported. Respondents in this case linked their dissatisfaction with the tariff increases with the lack of improvements in the quality of services.
- **Maintain a focus on researching barriers to access for poor and marginalised households, in support of the design of any tariff measures.** Across all sites visited for the PSIA Phase 1 research, <sup>96</sup> a significant proportion of poor and marginalised households, not connected to the grid at the time of the study, could not afford the cost of the basic services of informal providers (Kyats 1000 to 1500/month for lighting in the evenings). Extending access to electricity to this group under NEP would require not only subsidising the cost of overall connections, connections to the households but also the introduction of further subsidised tariffs. *Additional analysis to be carried out in the new Living Standards Survey (2014) will be*

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<sup>96</sup> With the exception of the villages in Shan state which were exceptionally well off



*key to understanding energy consumption among this group as an input to the design of appropriate lifeline tariffs.*

- **Improvement in quality, reliability and repair services will be essential particularly if further increases in rates are expected to be put in place.** Communication with consumers, feedback and grievance redress mechanisms are virtually non-existent and information tends to flow based on personal connections.
- **Consider subsidisation or support for feasibility studies and procurement of technical assistance and hardware at community level.** The SRE approach currently in place allocates no funding to subsidize feasibility studies and technical assistance or hardware at community level meaning that currently only the better off villages and better off households within those villages are able to access government electricity services<sup>97</sup>. The limited guidance provided on the community mobilization and planning process for SRE seems to have resulted in a systematic exclusion of poor households within communities with access to government electricity.
- **Leverage WBG and other Development Partner Initiatives,** for example, the WBG/joint research program to be piloted in 2015, to provide up-to-date and credible estimates of poverty. Combining data from this pilot survey with unit record data from the Population Census, the World Bank will work with the Ministry of Immigration and Population to produce poverty maps using small area estimation methods and imputation techniques. In addition, the data will inform the design and implementation of the large-scale (18,000 households) national survey that the Government is planning with support from the WBG and other development partners. Together, these data are strengthening the analytical foundation of the Government's development programs, the design and evaluation of the Bank's lending operations as well as related analytical works on social inclusion, inequality and poverty in Myanmar to better understand dimensions of poverty in the country, including as experienced by ethnic minorities and vulnerable groups.<sup>98</sup>
- Minimise the potential for fragmented Development Partner programming, in accordance with the Nay Pyi Taw Accord for Effective Development Cooperation.

## **8.2 Maintain a Focus on the Potential for Social and Ethnic Exclusion**

Consider the potential for social exclusion based on barriers to access, As noted in PSIA Phase I – the cost of connection to the village is the key barrier to access, with a large percentage of the village population remaining without access even in the better-off villages. However, in mixed villages there is also the potential for social exclusion from benefits (based on religion and ethnicity) with the current SRE approach.

## **8.3 Strengthen NEP Stakeholder Engagement & Communications Program**

- **Strengthen the stakeholder engagement and communications programs to support implementation of the NEP.** In rural areas, there was an overall lack of

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<sup>97</sup> Among villages within reach of the grid.

<sup>98</sup> World Bank Group, 2015, Country Partnership Framework for Myanmar for the Period FY15-17 (Draft) p. 38



knowledge on the part of households about the electricity tariffs charged by Government and the increase taking effect in April<sup>99</sup> 2014. Across all 13 villages visited, only a very limited number of respondents had heard about the tariff increases. These were: (i) the members of the Electricity Committees at village level and; (ii) occasionally small business owners who had heard the announcements on TV.

- **Issues with Billing, Communication with Service Providers.** PSIA Phase II confirmed the PSIA Phase I trends on issues with billing, communication with service providers and reliability of the service. PSIA Phase II also confirmed the PSIA Phase I trends on coping with no significant delays/debt noted for regular charges among those connected. A new trend observed was the tendency among bigger consumers to want to split their charges by getting more than one meter (particularly for those with small home-based businesses negatively impacted by increased costs for SMEs). Specific recommendations would be capacity building of township/utilities to standardize billing and to include a number for complaints on the bill. Also to provide training for VECs on billing practices and documentation.
- **Develop a Grievance Resolution System.** There is currently no grievance resolution system in place in rural areas (with the exception of 1 VEC). Communication with service providers is easier in urban areas as noted in PSIA Phase I. Overall there is no system for redress/complaints in relation to VEC management of funds. For the NEP design, particularly for off-grid solutions, a dedicated system would be important (for feedback on service & “anti-corruption” measure”).
- **Include Awareness Raising of Benefits and Uses of Electricity.** A key opportunity that exists is to raise awareness of the potential benefits of access to electricity. In general, it was noticed that villagers’ current level of awareness was largely linked to what they had directly seen and/or been told by others within their community. To maximise the benefits of the NEP, communities could be provided with information and guidance about how to use electricity to improve their livelihoods, and could be linked with microfinance providers, markets and/or other enablers (CSOs and NGOs, other) that may be able to assist in enabling these improvements.
- **Establish a strong and transparent communications program.** Embed strong information-sharing mechanisms into Project implementation, including greater use of the Myanmar language radio and print media, as well as monitoring the impact of information disclosure, potentially through perception surveys. Emphasis should be placed on explaining the activities, potential impacts, implementation modalities sequencing of the Project (both on and off-grid components), as well as explaining the perceived benefits of the Project.
- Effectively undertaking project implementation within such a diverse cultural and linguistic context will require specific considerations in regards to:
  - Language use, in particular in relation to:

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<sup>99</sup> It is important to note that field work in rural areas was conducted in March 2014. This was following the announcement of the increase in rates but before the tariffs were reflected in the new bills.

- Preparing written and visual consultation and engagement materials;
- Undertaking consultation and engagement activities;
- Preparing IEC materials including in regards to community safety;
- Undertaking monitoring and evaluation activities.
- Ensuring equitability, in particular in relation to:
  - engagement of ethnic minority representatives, including within villages comprised of a mix of ethnicities;
  - reducing conflict risks due to either real or perceived discrimination against areas administered by or associated with EAGs; and
  - targeting, sequencing and implementation of the rollout of the grid and off-grid components of the program.
- Identification and consideration of how to mitigate barriers to access electricity amongst vulnerable households, including female-headed households.
- **Ensure village-level consultation and engagement activities are broad-based.** Ensure that consultation activities undertaken at village level are broad-based and not only with village leaders, particularly in villagers with a number of different ethnic groups. Potentially invite one representative per household. Inform local people at least one month in advance of the proposed subproject and ensure that their voices are heard.
- **Participatory and consultative implementation process:** For public consultation to be effective, communities must be knowledgeable about planned project activities and their potential impacts and given ample opportunities to express their concerns about project matters so that these concerns can be addressed through the Project's design and implementation arrangements. Instrumental in the process is a two-way and timely exchange of information between Project representatives and affected communities in which both parties are free to communicate without fear of reprisal. Public consultation also plays a role in ensuring that all affected persons, regardless of their social status, are given equal opportunities to express their concerns and receive a proportional share of the project's benefits even if it means Project planners make special arrangements to accommodate a person's circumstances and needs.

#### 8.4 Strengthen and Monitor VEC Governance and Operations

- **Strengthen the governance of VECs and also implement monitoring activities that can support a consistent approach to their operation and management.** Standard government rates were applied only in two of the four villages where electricity services were provided either by government or a private company (per kWh/hour). In the other two sites, tariffs collected were much higher than government rates at 200 Kyats/kWh and 50 Kyats/kWh and were set by the electricity committee. As noted earlier, the functioning of the electricity committee is largely unregulated and while these committees are responsible for the maintenance of the village's system, there is no guidance provided on what amounts to charge for

the service. In addition, the level of detail provided in the bill does not allow households to fully understand the tariffs, additional meter rental charges or other maintenance charges that may be added. Overall, where social capital was high and there was trust between the electricity committee and the villagers the amounts charged were not questioned.

- **Capacity Building for VECs will be required: further regulation of the functioning of the electricity committees and the provision of technical assistance including a focus on community participation, good governance and social accountability would be an equally important element.** Beyond the regulation of tariff setting in rural areas, the functioning of the electricity committees and their oversight would benefit from strengthening under the Project. Challenges with governance and instances of lack of transparency in financial management were observed by the PSIA Phase 1 research team. Overall, the quality of leadership and social cohesion at village level currently play the determining role in the absence of external regulation and support. The same SRE process can lead to very different outcomes, as noted by the research team, depending on the local context. VEC structures are “captured” by elites in all instances, with limited consultations with communities, no involvement of vulnerable households and no representation by women. If off-grid solutions under the Project are to rely on existing structures, it will be important to provide TA/reach agreement on guidance provided to VECs, and review the VEC Terms of Reference (ToR) and support provided by the township level, in order to minimise elite capture and the risk of continued exclusion of poor/marginalised households at village and ward level.

## 8.5 Practice of Land Donation Documentation

- **It will be important to provide consistent documentation regarding land donation.** Overall for small-scale community infrastructure, Phase II villages/wards locate infrastructure on “common village land” or municipal land. Documentation of these arrangements is highly variable across sites (Mon, Rakhine there were good documentation practices with ‘land donation” arrangements reviewed and endorsed by village administration. This was not the case in other rural sites/wards and will require that a clear/simple system be suggested/put in place as part of the ESMF. In addition, villages in the PSIA Phase II sample in Rakhine, Mandalay and Magwe no longer had “common village land” available – this is likely to be a growing trend and may require further land acquisition donation (private) going forward – which would also need to be considered in the ESMF. Phase II noted two cases of land disputes with government/ private company on land appropriation for investment projects, which will be detailed in PSIA Phase II inputs.

## 8.6 Recommendations for ESMF

### 8.6.1 Design features or measures to avoid adverse impacts

- Nature and the environment are key to the cultural identity of ethnic minorities and play a significant role in their livelihoods. Subprojects should be designed in such a way that they minimise any potentially negative environmental impacts, such as on

community forests and small streams, and include aspects of rehabilitation and restoration.

- The social elements of the ESMF should include a broad and inclusive consultative process for overall issues concerning the Project (including selection of sites/areas) and for subprojects that take into consideration the cultural and political context surrounding ethnic minorities, including equitable benefits, risks associated with ongoing or latent conflicts, transparency and governance
- Disaster risk: Myanmar is very vulnerable to natural disasters and has suffered through several devastating cyclones. Natural disasters and the impact of climate change are likely to represent an increasing challenge for Myanmar given the importance of agriculture for livelihoods—landslides are a common feature in many areas (e.g. in Chin State). The ESMF should identify criteria for site selection that take into consideration potential risks for landslide, flooding or medium to long m impacts from climate change.

## Annex 1: Legal and institutional framework: ethnic and vulnerable groups

Under the current government, free media is developing and ethnic parties and associations are politically active. Ethnic minority organisations may also play a stronger role going forward through the current Government's decentralisation efforts, which would afford States and Regions to play a more prominent role in decision-making and implementation of various policies and programs.

The paragraphs below provide a summary of the current legal and institutional framework in Myanmar in relation to ethnic and vulnerable groups.

### Legal Framework concerning Ethnic Minorities

#### Constitution of Myanmar

According to Chapter 1, clause 22 of the 2008 Constitution of Myanmar, the Union Government of Myanmar is committed to assisting in developing and improving the education, health, language, literature, arts, and culture of Myanmar's "national races."

It is stated that the "Union shall assist:

- a. to develop language, literature, fine arts and culture of the National races;
- b. to promote solidarity, mutual amity and respect and mutual assistance among the National races;
- c. to promote socio-economic development including education, health, economy, transport and communication, [and] so forth, of less developed National races."

The constitution provides equal rights to the various ethnic groups included in the *national races* and a number of laws and regulations aim to preserve their cultures and traditions. This includes the establishment of the University for the Development of the National Races of the Union which was promulgated in 1991 to, among other things, preserve and understand the culture, customs and traditions of the national races of the Union, and strengthen the Union spirit in the national races of the Union while residing in a friendly atmosphere and pursuing education at the University.<sup>100</sup>

Key principles within the Constitution that relate to National Race Affairs are Sections 15, 17 ©, 167 (a), 262 (e) and 262 (i). National Race Affairs Ministers are parliament representatives elected to undertake the affairs of national races. They can concurrently be in charge of other Ministries.

#### Section 15

For National races with suitable population, National races representatives are entitled to participate in legislature of Regions or States and Self-Administered Areas concerned.

#### Section 17 (c)

For National races of which representatives are so permitted to participate in legislature of Regions, States or Self-Administered Areas in accord with Section 15, such

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<sup>100</sup> [http://www.burmalibrary.org/docs15/1991-SLORC\\_Law1991-09-University\\_for\\_the\\_Development\\_of\\_the\\_National\\_Races\\_Law-en.pdf](http://www.burmalibrary.org/docs15/1991-SLORC_Law1991-09-University_for_the_Development_of_the_National_Races_Law-en.pdf)

representatives are to be permitted to participate, mainly, to undertake their National races affairs.

#### Section 167 (a)

The Region Hluttaw or the State Hluttaw may, if necessary, form Committee and Bodies with the Region or State Hluttaw representatives concerned to study and submit legislation, national races affairs vested by the Constitution.

#### Section 262 (e)

The Chief Minister of the Region or State shall submit the list of persons who are approved by the Region or State Hluttaw or Chairpersons of the Self-Administered Division or Self-Administered Zone and the list of persons who are representatives elected to undertake the affairs of National races to appoint as the Ministers of the Region or State to the President.

#### Section 262 (i)

The President may, in co-ordination with the Chief Minister, appoint Ministers for the Self-Administered Division or the Self-Administered Zone or Ministers for National races affairs as Ministers concurrently in charge of other Ministries.

### **Endorsement and Ratification of Relevant International Instruments**

In September 2007, Myanmar endorsed the United Nations Declaration on the Rights of Indigenous Peoples. Article 32 discusses indigenous peoples' right to free and prior informed consent (FPIC). It says: "States shall consult and co-operate in good faith with the Indigenous Peoples concerned through their own representative institutions in order to obtain Free and Prior Informed Consent prior to approval of any project affecting their land or territories". Article 10 discusses forcible relocation of indigenous people, and the need for FPIC. Article 26 about land rights is also relevant in relation to indigenous peoples.

Myanmar has not ratified International Labour Organisation (ILO) Convention 169 concerning Indigenous and Tribal Peoples in Independent Countries.

### **Recommendations at Meeting of Ministers of National Races Affairs and Chairman of Amyotha Hluttaw (National Parliament) –2014**

In June 2014, at a meeting of Ministers of National Races Affairs and the Chairman of Amyotha Hluttaw (the national Parliament), the following recommendations were made:

1. To inform completely, consult and get consent of indigenous people when implementing development processes, large projects, businesses, and extraction of natural resources in areas of indigenous people.
2. To have equal job opportunities. To appoint ethnic minority people in leadership role as well as in other roles if qualified.
3. To consider about Ministries of National Races Affairs in allocating the Regional/ State Level Budget and allow the Ministries to spend the budget to implement

more effectively for affairs of national races, and development projects. To manage staff structures and employment for the regions.

4. To add the following phrase – *“National Races are people continually residing in Myanmar regarding the Union of Myanmar as their original nation – Kachin, Kayah, Karen, Chin, Bamar, Mon, Rakhine, and Shan, people living in self-administered divisions, self-administered zones, people who have their own minister of national races, and people who have their own separate language and separate culture. This does not include immigrated or foreign residents’* to Clause (2), Paragraph (a) of the draft law protecting the rights of national races.

#### **Proposed Race and Religion Laws – December 2014**

In December 2014, President Thein Sein submitted to Parliament a package of four draft laws aimed at “protecting race and religion”. The proposed Religious Conversion Bill is of specific relevance. At the time of preparing the *PSIA to inform ESMF*, it had not been passed.

#### **On National Races Law. National Races Protection Law – February 2015**

On 13 January 2015, the secretary of the Pyidaungsu Hluttaw Bill Joint Committee stated that the Ethnic Rights Protection Law would be adopted in the coming hluttaw session. The law contains sections guaranteeing minorities the right to study their language and literature, practice other elements of their culture and maintain their traditions.<sup>101</sup>

A proposal to form a Union-level ethnic affairs ministry responsible for ethnic affairs was previously submitted in the Amyotha Hluttaw, but the proposal was rejected on the grounds that there were already many Union ministries and the ethnic affairs ministers could protect minority rights. In August 2013, the Pyithu Hluttaw instead proposed drafting a law for ethnic affairs.

On 24 February 2015, the new law was passed by the Upper House. Its purpose is defined as:

- a) In order for ethnic minority people to have equal citizen rights.
- b) In order to live together forever with friendship based on the genuine union spirit.
- c) In order to preserve and develop ethnic minorities' language, literature, art, culture, tradition, ethnic identity and historical heritage.
- d) In order to develop unity, mutual respect and mutual help among national races.
- e) In order to develop education, health, economy and transportation of ethnic minorities in less developed areas.
- f) In order for national races to fully access constitutional rights.

It states that if national races do not break the prescribed laws concerning national security, rule of law, peace and development and code of conduct for the citizens,

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<sup>101</sup> Myanmar Times, 23 January 2015, MPs prepare to debate proposed law on ethnic rights

- a) They have the right to freely adopt their language, literature, art, culture, tradition and religion.
- b) They have the right to teach and learn their own language and literature without affecting the National Education Policy.

### Also of contextual relevance - National Education Law

Also of contextual relevance is the National Education Law, which was approved by parliament in September 2014 despite objections from student unions and expert networks.<sup>102</sup> Protests across Myanmar since November 2014 have centred on a list of 11 demands of reform to the law; Demand 7 of which relates to ethnic minorities and preservation of their languages. Specifically, it states: “Respect basic right of ethnic minorities and introduce the use of mother tongues as medium of instruction.”

### Institutional Framework concerning Ethnic Minorities

The below paragraphs outline the role of specific Union-level Ministries in regards to ethnic minorities. Other than the role of these Ministries, and the 29 Ministers of Races represented in the Parliament, the governance of ethnic minorities is largely through the state/region governance structure.

Within this structure, the state/region *hluttaw*<sup>103</sup> is composed of two members elected per township and additional elected representatives for each of the “national races” comprising greater than 0.1 per cent of the state/region population but not already “obtaining” an ethnic state (such as the Karen in Kayin State).<sup>104</sup> Where elected ethnic representatives are present (according to the provision for dedicated constituencies for groups with 0.1 per cent of the population), these elected *hluttaw* representatives will be appointed Minister of Ethnic Affairs for their ethnicity.<sup>105</sup>

The constitution essentially assigns states and regions executive authority over the same areas as those included in the legislative list, though new responsibilities may be added under union law. State and region cabinet ministers are thus mandated to manage, direct, control, and inspect departments covering these areas in the region or state. As there are more than nine such departments, but typically only nine state and region ministerial portfolios, some ministers cover several domains.<sup>106</sup>

### Ministry of Border Affairs

The Ministry of Border Affairs is responsible for the Progress of Border Areas and National Races Department, which is responsible for the development of border areas, and the Department of Development Affairs, which is responsible for urban development.

The Ministry of Border Affairs is involved in resettlement campaigns in Rakhine State and cooperating with UN groups and international NGOs in relation to Rakhine State.

<sup>102</sup> <http://www.burmanet.org/news/2015/03/06/the-irrawaddy-a-new-generation-takes-to-the-streets-in-burma-min-zin/>, accessed 25 March 2015

<sup>103</sup> Council or assembly. Historically a council of ministers, now denotes legislative bodies at national and state/region level

<sup>104</sup> Asia Foundation, September 2013, State and Region Governments in Myanmar p.30

<sup>105</sup> *ibid.* p.14

<sup>106</sup> *ibid.*



### **Ministry of Immigration and Population**

The Ministry of Immigration and Population is the agency responsible for collecting demographic data including conducting the population census, to be used to support short and long-term national security, administrative, economic and social projects.

### **Ministry of Social Welfare, Relief and Resettlement**

The Ministry of Social Welfare, Relief and Resettlement plays a key role in ensuring the inclusive participation of vulnerable groups in the process of upgrading education and health services in Myanmar. It plays a key role in safeguarding the lives of vulnerable groups including children, youth, women, disabled people and the elderly.

### **Ministers of National Races Affairs**

The Ministers of National Races Affairs are Parliament representatives elected to manage affairs associated with national races. Ministers of National Races Affairs can later become Ministers of States/Regions. They can, concurrently, be in charge of other ministries. Their chief role is to participate in legislature related to Regions/States and Self-Administered Areas.

## Annex 2: “12-Points” Requirements for Electricity Committees

1. All poles throughout the power line must be concrete poles. The standard classifications are as below:
  - a) Full-grade 12M concrete pole for 33kV Line;
  - b) Full-grade 10M concrete pole for 11kV Line;
  - c) Full-grade 9M concrete pole for 400V Line.
2. Electric cables which are consistent with standard classifications mentioned below must be.
  - a) ACSR 1200 mm<sup>2</sup> or 150 mm<sup>2</sup> cables if the connection is to be taken from 33KV power grid owned by Ministry of Electric Power (MOEP).
  - b) ACSR 95mm<sup>2</sup> cables if the connection is to be taken from 11KV power grid owned by Ministry of Electric Power (MOEP).
  - c) To mitigate unit loss and avoid electrical hazards, ABC cables must be used for connection with 400 Volt within village and only if ABC cables are difficult to purchase, HDDB wire shall be used only if ABC cable is not available at construction of 400 volt power line in the village.
    - ABC Cable 95 mm<sup>2</sup> or HDDB Wire No.4 must be used 3-fusion-5-wire for 400 Volt connection lines
    - ABC Cable 95 mm<sup>2</sup> or HDDB Wire No.4 must be used 3-fusion-4-wire for 400 Volt connection lines
    - ABC Cable 70 mm<sup>2</sup> or HDDB Wire No.6 must be used 2-fusion-3-wire for 230 Volt connection lines
    - ABC Cable 50 mm<sup>2</sup> or HDDB Wire No.6 must be used 2-fusion-3-wire for 230 Volt connection lines
    - For street light ABC Cable 35mm<sup>2</sup>, HDDB Wire No.8 must be used
3. Must use standard iron bars and ceramic balls.
4. Must use local-made standard transformers which are recognized by MOEP. The use of transformers imported from other countries will have quality control test by MOEP. Wires, switches and connectors should be with standard colors- red, yellow and blue. No other different colors are allowed. Sub-stations for transformers must be built on 2 concrete posts, filled in with concrete floor which is 5 feet above from ground, and it has to be protected by square-match iron fences.
5. The plan has to include street lighting system and the village/villages have to pay the street lights.
6. The village electricity committee is responsible to operate to mitigate unit loss. MOEP will share the 10 per cent cost of unit loss for the village and the above 10 per cent unit losses has to be bared by the committee.
7. The footing of the pole has to be built with the standard (2ft x 2ft x 2.5 heights) and 6 inches above the ground level and 2ft is to be underground.

8. All of the bushes and tree branches along the power grid and street posts must cut down within specific distance.
  - a) To remove and cut trees and branches within 20fts from 11KV line which counts 10 feet to left-side and 10 feet to right-side from the line.
  - b) To remove and cut tress and branches within 10fts from 400V line which will be 5 feet to left-side and 5 feet to right-side from the line.
9. Electricity committee is responsible for long-term maintenance of power grid and sub- stations.
10. Regarding with hiring private electricians at the construction of power grid and sub-power stations, he or she must have the Certificate of First-grade Electrician recognized by the Ministry of Industry, Industrial Monitoring and Testing Unit. Those electricians has to submit the Chief Engineer of ESE (and YESB) the following supportive documents- the lists of materials which are to be used in building all necessary infrastructures, the map of power grid showing the location of power grid, the model of sub-station, and to explain the detail plans for the approval process.
11. If the connection is to be taken from the grid under the mandate of other Ministries, or organization or private ownership, the committee has to take consent from MOEP.
12. The committee will have to vest the management authority of the power cable of 11 KVA connections to MOEP, and the village committee has to allow if the MOEP do the connections from the cable.