

Rural Electricity Access
by
MOLFRD

Department of Rural Development
Ministry of Livestock, Fisheries and Rural Development

January 2015

Relevant Ministries on Myanmar Rural Electrification

1. Ministry of Livestock, Fisheries and Rural Development
2. Ministry of Electrical Power
3. Ministry of Industry
4. Ministry of Science and Technology
5. Ministry of Agriculture and Irrigation

Rural Electricity Access

DRD under Ministry of Livestock, Fisheries and Rural Development (MLFRD) as the leading Ministry

Rural Electrification in Myanmar

- Grid Electrification
 - Extend distribution from the Grid
- Off- Grid Electrification
 - Diesel Generator
 - Solar
 - Mini- Hydropower
 - Bio-Gas/ Mass

Present Policies and Institutional Structure for Electricity Access

To promote off-grid rural electrification as the following:

- (a) Organizing village electrification committee(VEC)
- (b) Conducting rural development committee in village & township,
- (c) Surveying the community needs, Cooperating between government and people as forming the committee from the village community.
- (d) Allocating the budget according to the parliament's decision, and
- (e) Cooperation with private sectors – UN agencies, INGO, NGO – to achieve the electrification target.

Rural Electrification System By DRD

- 1. Annual allotment of the government budget;**
- 2. Local or villages themselves programs and implemented by Rural Development Bank's Loans**
- 3. Hire Purchase system with private sector**
- 4. Getting the international investment grant and loan;**
- 5. Cooperating with NGO, INGOs, Donors, Private and Public Partnership**

SHS (Specification)

<input type="checkbox"/> 92Watt Solar Module (5hr Charging)	-1No.
<input type="checkbox"/> Battery (12V~75AH)	-1No.
<input type="checkbox"/> Controller with Inverter (10A/12V~24V)	-1No.
<input type="checkbox"/> LED-3W	-2No.
<input type="checkbox"/> Cable (5m, Length)	-2No.
<input type="checkbox"/> Phone Charging (can use)	
<input type="checkbox"/> TV(22“) (25Watt), LCD (not included TV Cost) (using 3hr)	-
<input type="checkbox"/> Estimated Cost	-K200000 (200US\$)

SHS (Stand-alone)



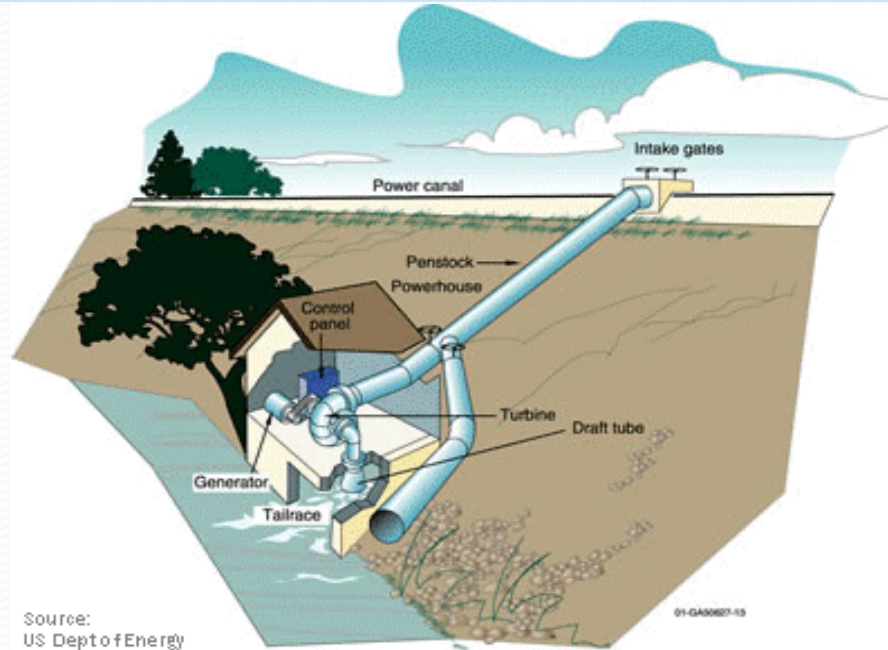
Central Distribution System with Solar/100 H.H (Specification)

<input type="checkbox"/> 250Watt Solar Module (including Frame (M.S), (5hr Charging)	-12No.
<input type="checkbox"/> Battery (12V/200AH)	-8No.
<input type="checkbox"/> Inverter (1KVA)	-2No.
<input type="checkbox"/> LED-3W[(2)No x 100] (can use - 5hr)	-200No.
<input type="checkbox"/> LED-5W (Street Light)	-40No.
<input type="checkbox"/> Lamp Post- 12' x (3" x 3") (5H.H/ 1 Post; Timber Post)	-40No.
<input type="checkbox"/> Estimated Cost	-20 Million Kyat (20000US\$)

Central Distribution System



Mini- Hydropower System



Source:
US Dept of Energy

- ❑ 10KW Dynamo/ Turbine
- ❑ Bulb – (5W A.C x 2No)/H.H
- ❑ Pump Station to Village Head
- ❑ 2 Line Wire Cable
- ❑ Estimated Cost

-1No.

-200No.

-2 Mile

-2.25 Mile

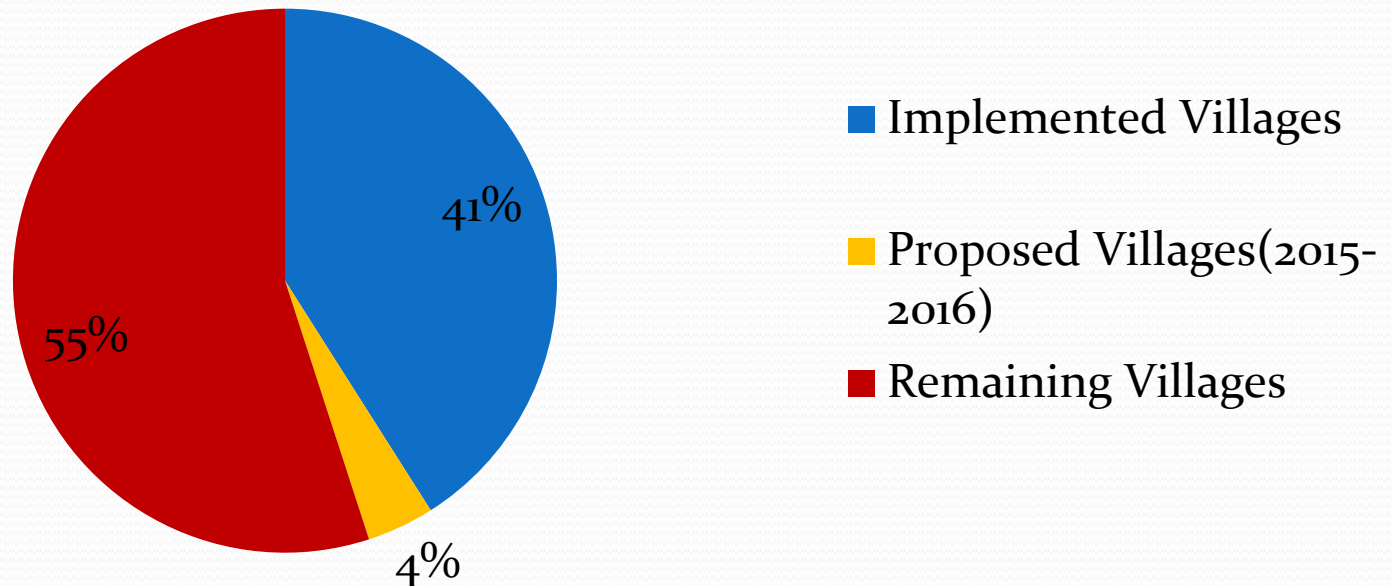
-6 Million Kyat

(6000US\$)

Implementations for Rural Electrification

- ❑ Total Village in Myanmar - 64917 villages
- ❑ Implemented villages up to (2013~2014)
(on/off Grid) - 23034 villages
- ❑ Implementing villages in (2014~2015)
(DRD And MOEP) - 3323 villages
- ❑ Remaining villages - 38560 villages
- ❑ 2015-2016 Propose
(DRD Only) - 2308 villages

Measurement of Implementation for Rural Electrification (Up to 2014-2015)

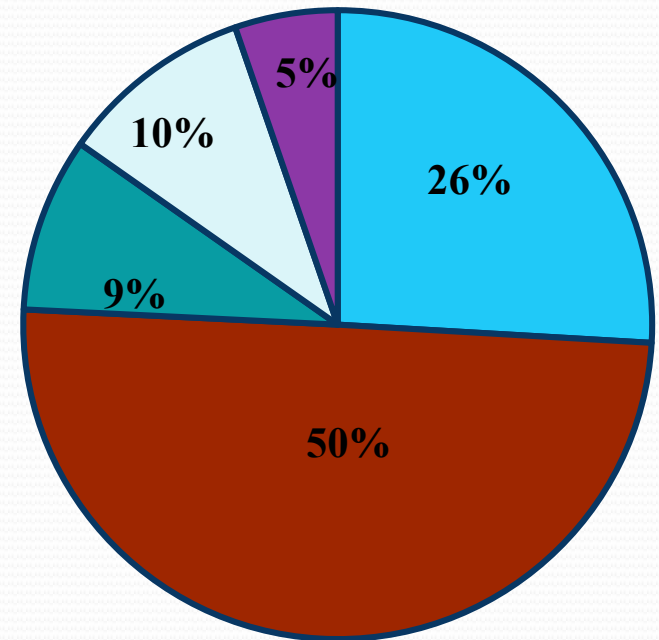


Implementation for Rural Electrification in the Entire Country		
Implemented Villages	26357	41%
Proposed Villages to Implement	2308	4%
Remaining Villages	38560	55%
Total Villages	64917	100%

Current Situation of Rural Electrification

□ 26357 villages out of 64917 villages are electrified in Myanmar up to 2014~2015 Fiscal Year

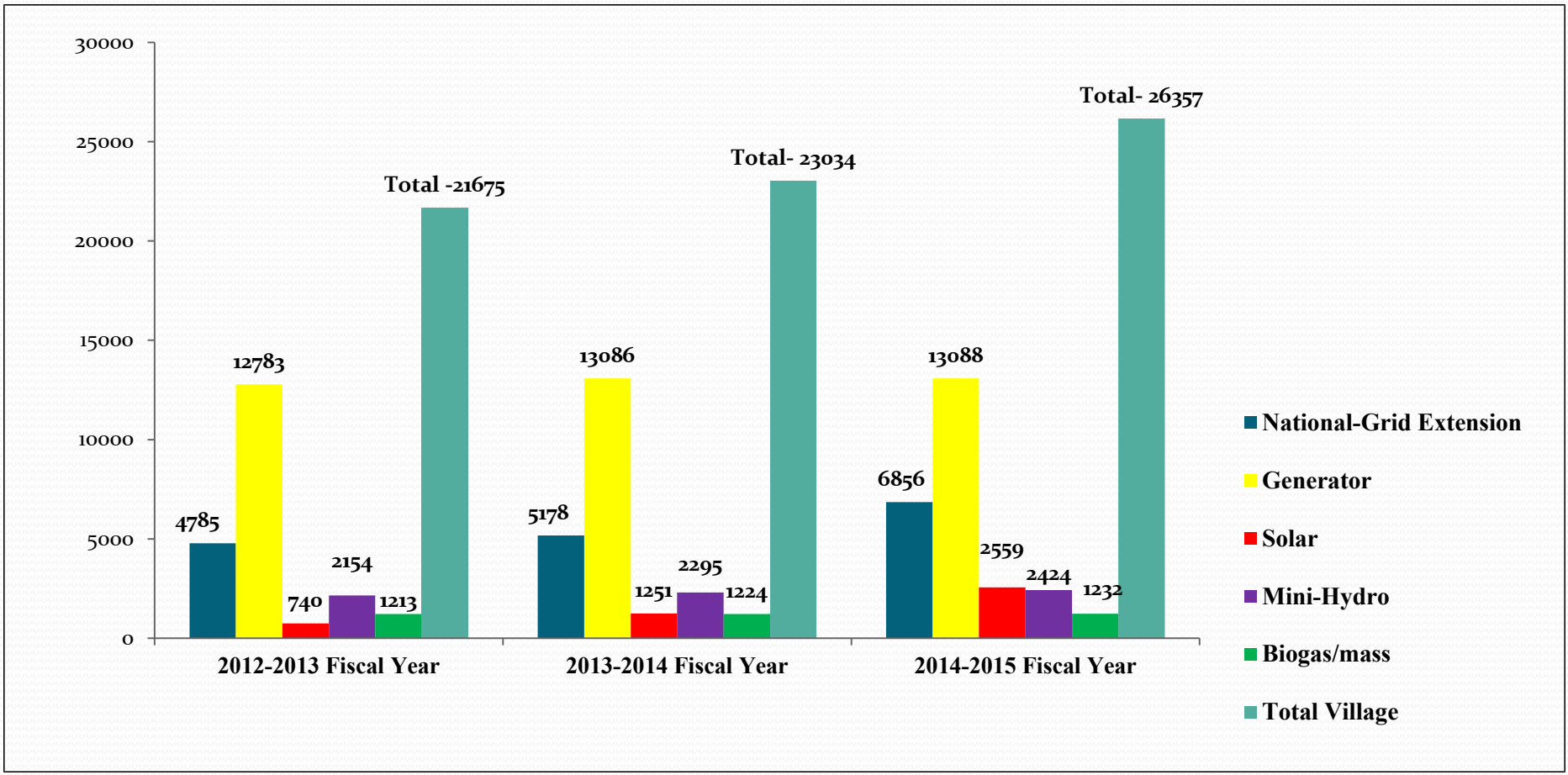
- National grid - 6918 villages, (26%)
- Generator - 13088 villages, (50%)
- Mini-Hydropower - 2426 villages, (9%)
- Solar system - 2693 villages, (10%)
- Bio-mass/ gas - 1232 villages, (5%)



■ National Grid ■ Generator ■ Mini-Hydro

■ Solar ■ Bio Gas/Mass

Annual Progress of Implemented Villages for Rural Electrification

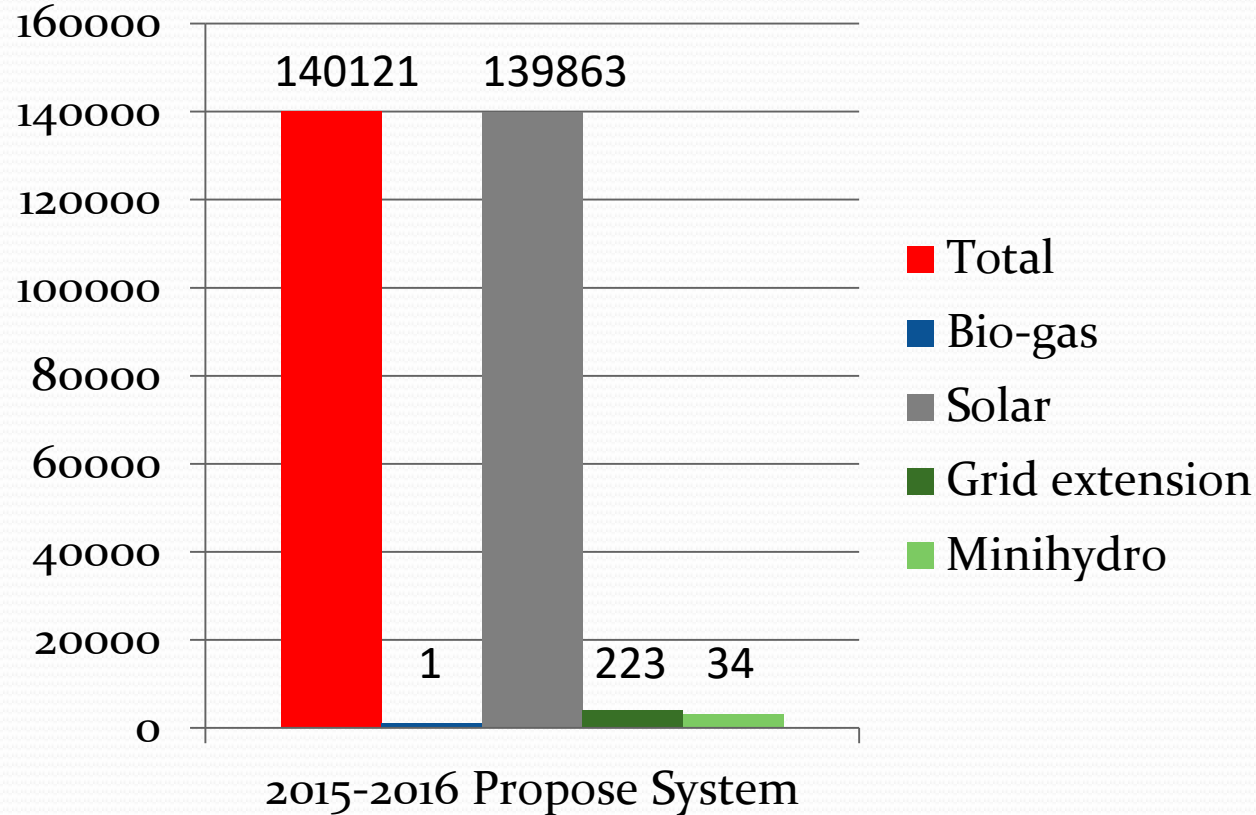


Implementations of Rural Electrification from 2012-2013 to 2014-2015

(By Department of Rural Development)

Sr.	FY Years	Total	Electrification Systems					Budget	Effective	Effective
		Villages	Electric	Solar	Hydro-Power	Biogas	Diesel Engine	(Million)	Household	Population
1	2012-2013	184		184				2955.4	17616	93386
2	2013-2014	205	4	148	51	2		4366.1216	39670	185652
3	2014-2015	1689	84	1595	131	8	2	40599.974	207465	1034344
	Total	2078	88	1927	182	10	2	47921.4956	264751	1313382

Proposed Plan for 2015-2016



Sr.	FY Years	Total	Electrification Systems					Budget	Effective	Effective
		Villages	Electric	Solar	Hydro-Power	Biogas	Diesel Engine	(Million)	Household	Population
3	2014-2015	2308	223	139863	34	1	-	36298.00	146123	750000

Co-operating With Community and Rural Development Bank Loan

- (a) Form Village electrification committee(VEC)**
- (b) Sanction from MOEP,**
- (c) Cost estimation and technically check by MOEP,**
- (d) 50% subsidy by community,**
- (e) 50% loan by Rural Development Bank,**
- (f) Installation by VEC, (Private company/MOEP)**

The List of Villages are implemented by Rural Development Bank's Loans

No.	Region / States	No. of Township	No. of Villages (11 KV Line within 2 miles)	Loans (Kyat in million)
1	Magway	4	23	1063.570
2	Sagaing	8	42	1411.120
3	Shan	3	9	363.550
4	PaO	1	1	150.000
5	Bago	10	32	1175.200
6	Nay Pyi Taw	4	14	479.840
7	Ayeyaweddy	6	44	1186.110
8	Mandalay	6	20	859.000
	Total	42	185	6688.390

Hire Purchase System

- (a) Form VEC**
- (b) Co-operating with private company, bank and community,**
- (c) 20% bank deposit by private company,**
- (d) 20% down payment by community,**
- (e) 80% loan by Rural Development Bank to VEC,**
- (f) Installation by private company,**
- (g) Technical assistant by private company,**
- (h) Collect/pay back by VEC.**

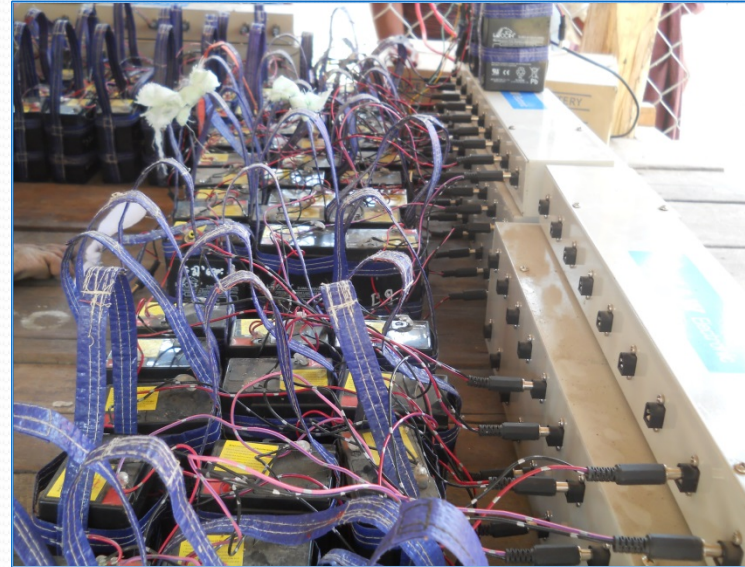
Private Sector

- (a) Form (VEC)
- (b) Survey by private sector,
- (c) Installation by private sector,
- (d) Training by private sector,
- (e) Cost investment by private sector,
- (f) One household need to collect 100kyat per day,
- (g) After six month community possess each household system,

Spec for one unit(60 household)

(1)130W,21V,7Amp solar pannel	-(1)no
(2)1.5W LED Bulb Lamp	-(120)no
(3)6V,4Ah Drycell Battery	-(60)no
(4)Joint Box(12V-6V)	-(2)no
(5)Charge controller	-(1)no
(6)Measurement meter	-(1)no

SHS Implemented by private sector



Cooperation with International Organizations

➤ Asian Development Bank (ADB)

☐ Phase. I

- Focus on off-grid renewable energy development demonstration at 20 villages in Mandalay Region and Chin State with MOI.

☐ Phase. II

- Capacity Development Technical Assistance (CDAT) with DRD, MOLFRD.
- Project Area: (3) Regions: Mandalay, Sagaing, Magway
- Project period: 2014 February to 2016 February
- Grant Amount: US\$ 2 Million

Development Fund aided by International Cooperation Development Fund (ICDF),Taiwan

Kayin State

Townships	Village	Household
Baran	4	250
Hlaing Bwae	3	270
Than Taung Gyi	4	250
Kaut Ka Rate	1	250
Kyar Inn Sate Kye	1	250
Phar Pon	5	250
Total	18	1520

❑ 1520 sets x 55\$=83600 US\$

❑ 8 W Solar panel

❑ 3W LED (1)N0

❑ USB 1 pcs

➤ Consulting International Organization

☐ JICS (Grants- USD 8.7 Million)

- Project - Micro-Hydro and solar power
- Site - (20) Solar and Mini-Hydro Villages in Chin and Shan States
- Period - 2014-2017
- 2014-2015 - Micro-Hydro (4)village
- solar (5)village

☐ KfW German Development Bank (Grants - US\$ 9 million) (Commitment)

- Project - S.H.S
- Site - Shan State

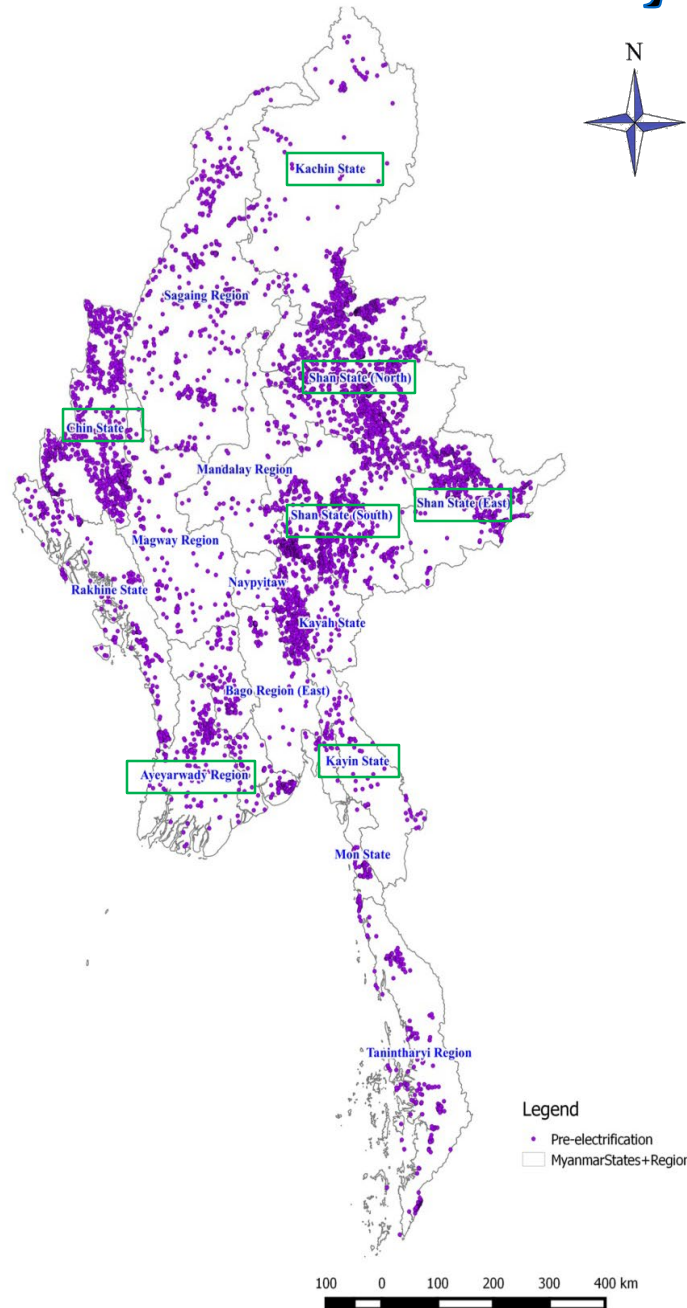
Way forward

- Review
- Modified
- To Develop sustainable specification for SHS and mini hydro
- To development guidelines and regulation for mini grid
- To develop rural electrification law
- Capacity building for staffs

The Project area for Pre-Electrification in FY 2015-2016 (US \$ =10 million)

Sr.	State/ Region	Percentage On Total Amount	Cost (million)	Solar House Hold		Mini-Hydro		Remark
				Effective House Hold	No. of V ollage	Effective House Hold	No. of V ollage	
1	Kachin	12%	1200	4000	28	-	-	Cost per house hold
2	Kayin	10%	1000	3333	62	-	-	for S.H.S -(0.3)million
3	Chin	20%	2000	5344	115	793	10	Cost per house hold
4	Shan(E)	20%	2000	5298	108	821	3	for Mini-Hydro - (0.5)million
5	Shan(N)	15%	1500	4000	66	600	1	
6	Shan(S)	15%	1500	4000	41	600	2	
7	Ayeyarweddy	8%	800	2668	12	-	-	
	Total	100%	10000	28643	432	2814	16	

Pre-Electrification for Myanmar

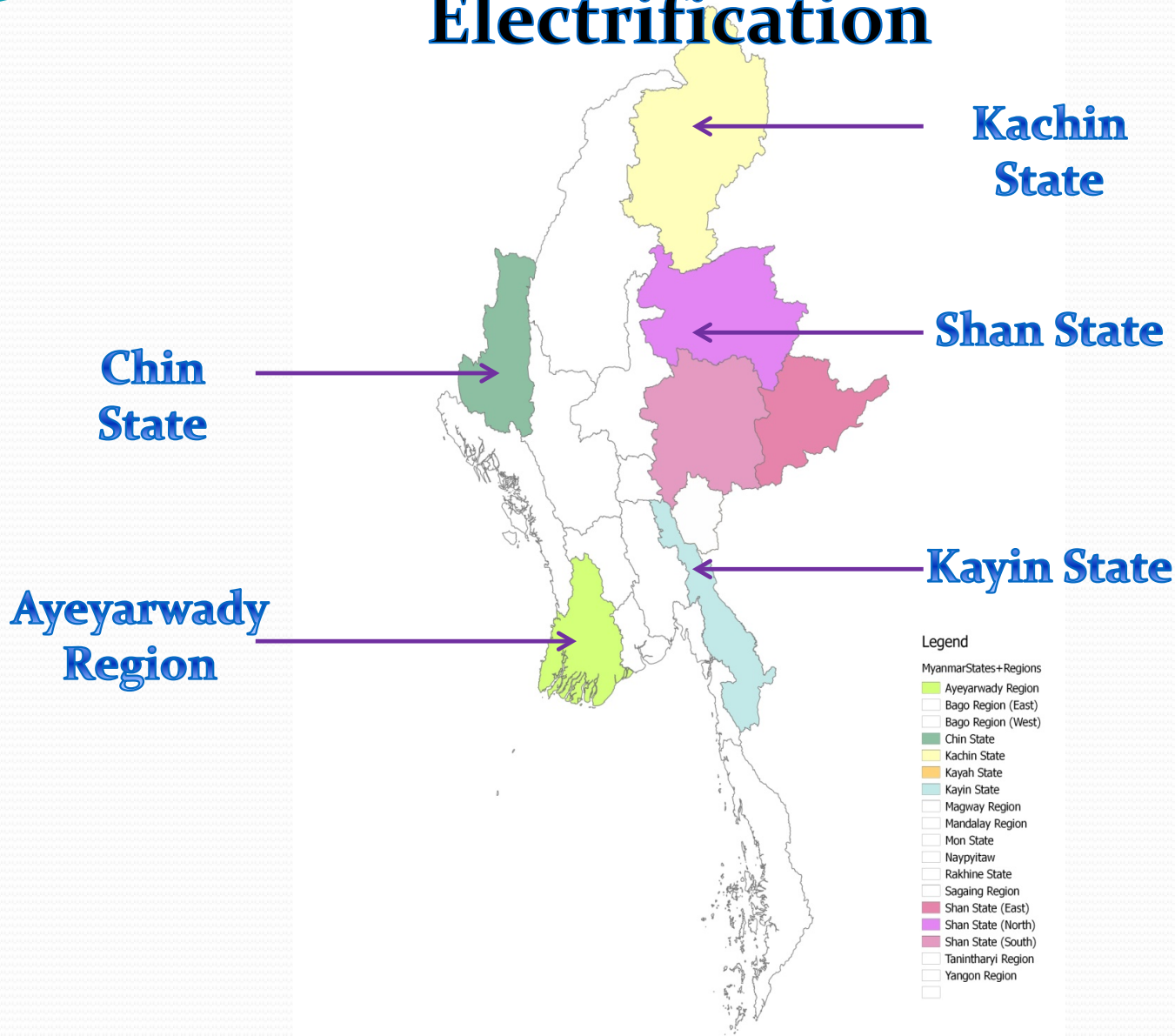
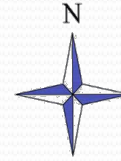


Legend

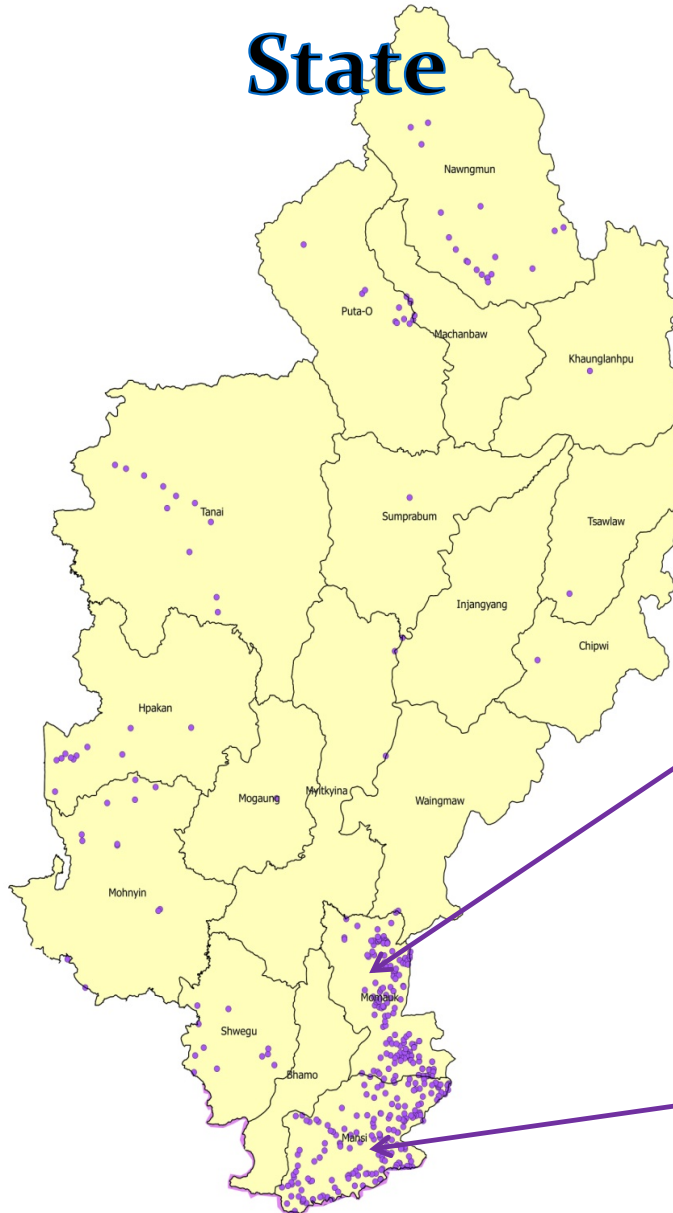
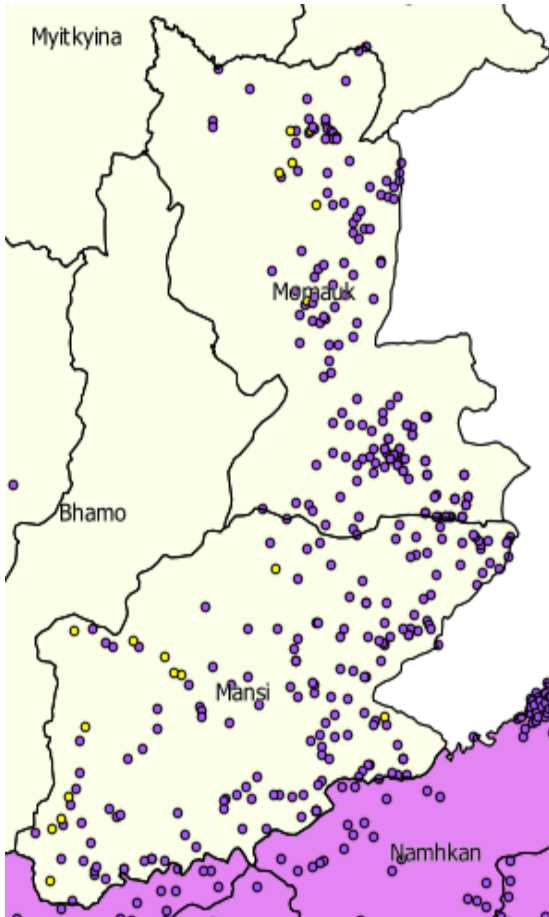
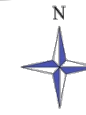
- Pre-electrification
- Myanmar States + Regions

100 0 100 200 300 400 km

Proposed State & Region for Pre-Electrification



Pre-Electrification for Kachin State



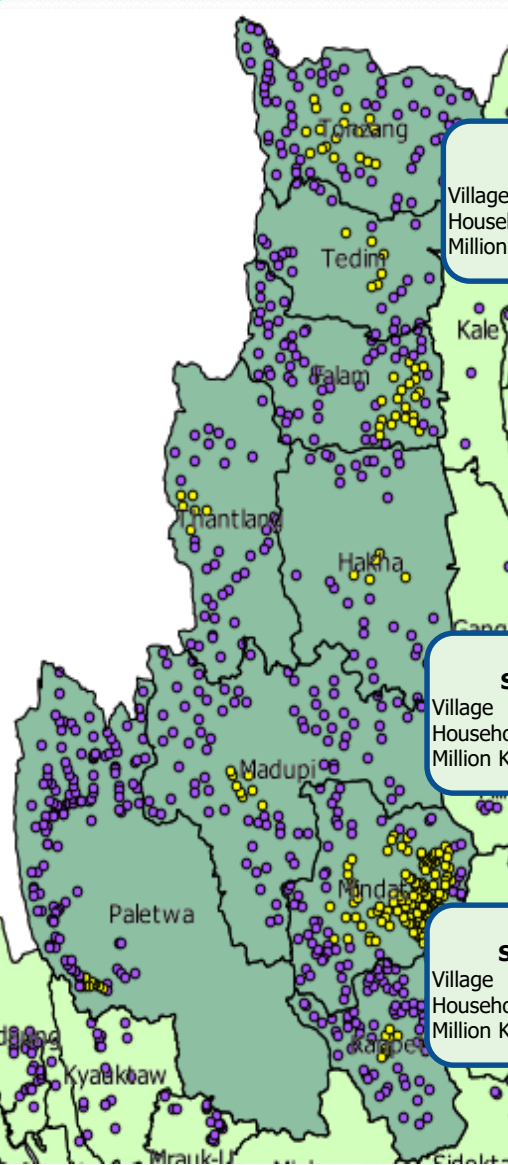
Momaik (Solar)	
Village	- 13
Household	- 1360
Million Kyat	- 408

Manshi (Solar)	
Village	- 15
Household	- 2640
Million Kyat	- 792

Legend

- Proposed Village
- Pre-electrification

Pre-Electrification for Chin State



Tedim

Solar	Mini-Hydro
Village - 5	Village - 1
Household - 320	Household - 36
Million Kyat - 114	

Thantlang (Solar)

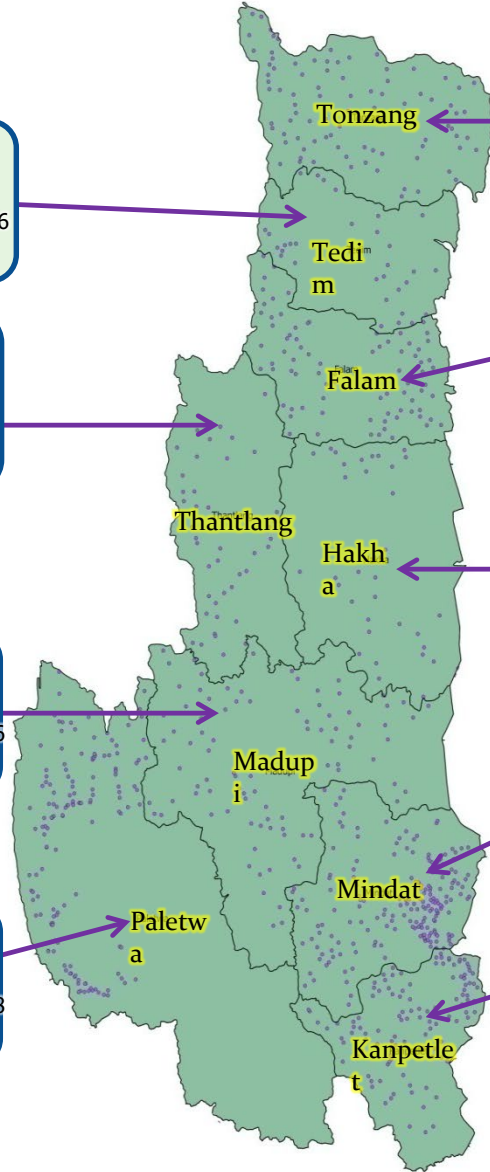
Village - 5
Household - 314
Million Kyat - 94

Madupi

Solar	Mini-Hydro
Village - 4	Village - 2
Household - 840	Household - 216
Million Kyat - 360	

Paletwa

Solar	Mini-Hydro
Village - 5	Village - 1
Household - 743	Household - 248
Million Kyat - 347	



Tonzang

Solar	Mini-Hydro
Village - 17	Village - 2
Household - 707	Household 100
Million Kyat - 262	

Falam (Solar)

Village - 19
Household - 523
Million Kyat - 157

Hakha (Solar)

Village - 4
Household - 296
Million Kyat - 89

Mindat

Solar	Mini-Hydro
Village - 49	Village - 2
Household - 1305	Household - 113
Million Kyat - 448	

Kanpatlat

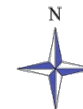
Solar	Mini-Hydro
Village - 7	Village - 2
Household - 296	Household - 80
Million Kyat - 129	

Legend

- Proposed Village
- Pre-electrification

Pre-Electrification for Shan State

State



Muse (Solar)	
Village	- 7
Household	- 647
Million Kyat	- 194

Namhkan (Solar)	
Village	- 8
Household	- 637
Million Kyat	- 191

Namtu (Solar)	
Village	- 6
Household	- 316
Million Kyat	- 95

Kyaukme (Mini Hydro)	
Village	- 1
Household	- 600
Million Kyat	- 300

Mongyai (Solar)	
Village	- 23
Household	- 1067
Million Kyat	- 320

Loilen (Mini Hydro)	
Village	- 1
Household	- 500
Million Kyat	- 250

Si Sai (Solar)	
Village	- 13
Household	- 1500
Million Kyat	- 450

Lingkho (Mini Hydro)	
Village	- 1
Household	- 100
Million Kyat	- 50

Pinlaung (Solar)	
Village	- 13
Household	- 1500
Million Kyat	- 450

Pekon (Solar)	
Village	- 15
Household	- 1000
Million Kyat	- 300

Hseni (Solar)	
Village	- 9
Household	- 510
Million Kyat	- 153

Lashio (Solar)	
Village	- 5
Household	- 316
Million Kyat	- 95

Tangyan (Solar)	
Village	- 8
Household	- 507
Million Kyat	- 152

Mongkhet	
Solar Village	- 32
Solar Household	- 1227
Million Kyat	- 568
Mini Hydro Village	- 1
Mini Hydro Household	- 300
Million Kyat	- 150

Mongyan (Mini Hydro)	
Village	- 1
Household	- 300
Million Kyat	- 150

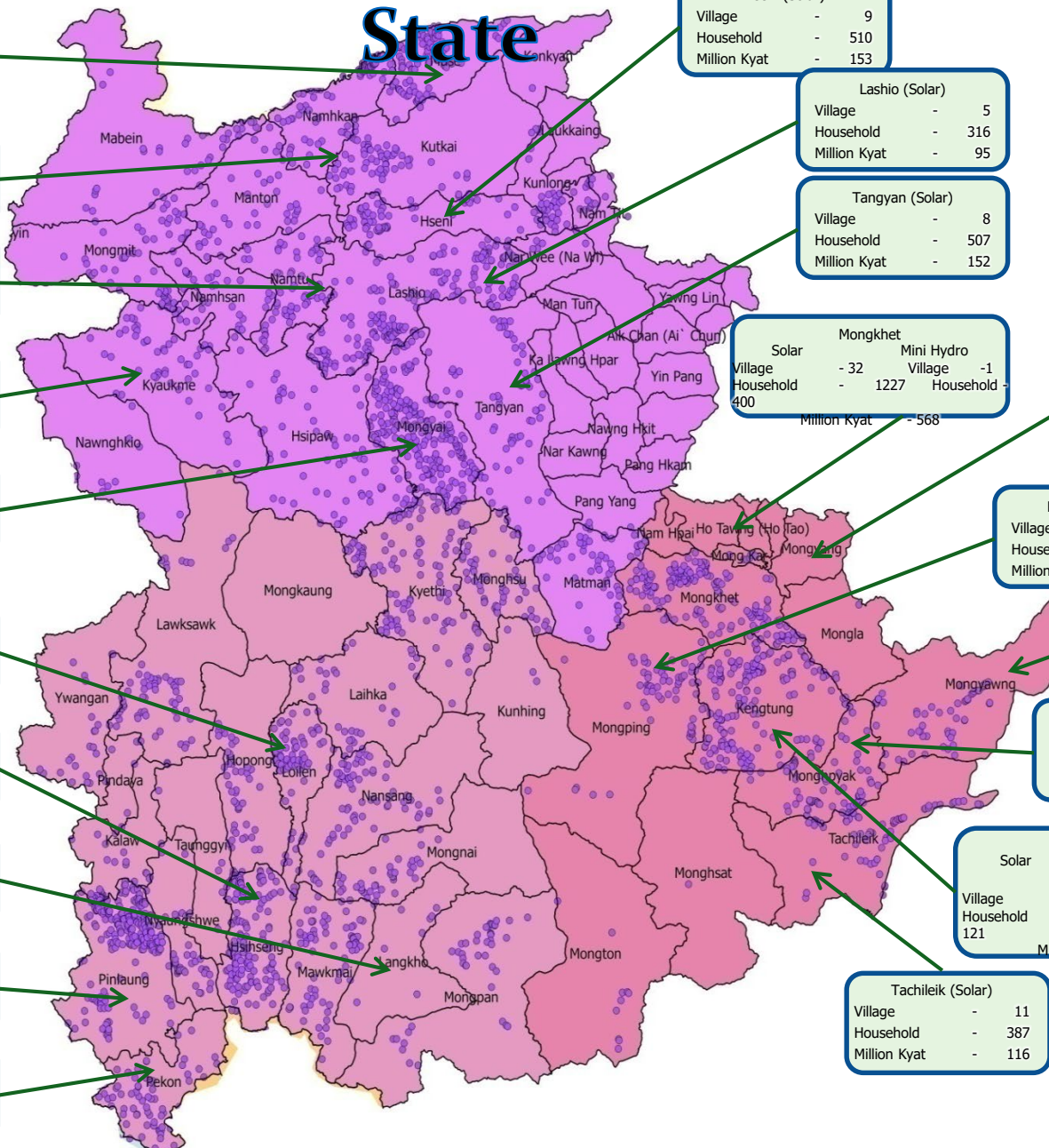
Mongping (Solar)	
Village	- 10
Household	- 530
Million Kyat	- 159

Mongyawng (Solar)	
Village	- 9
Household	- 386
Million Kyat	- 116

Monghyak (Solar)	
Village	- 15
Household	- 413
Million Kyat	- 124

Kengtung	
Solar Village	- 31
Solar Household	- 2355
Million Kyat	- 767
Mini Hydro Village	- 1
Mini Hydro Household	- 300
Million Kyat	- 150

Tachileik (Solar)	
Village	- 11
Household	- 387
Million Kyat	- 116



Legend

- Proposed Village
- Pre-electrification

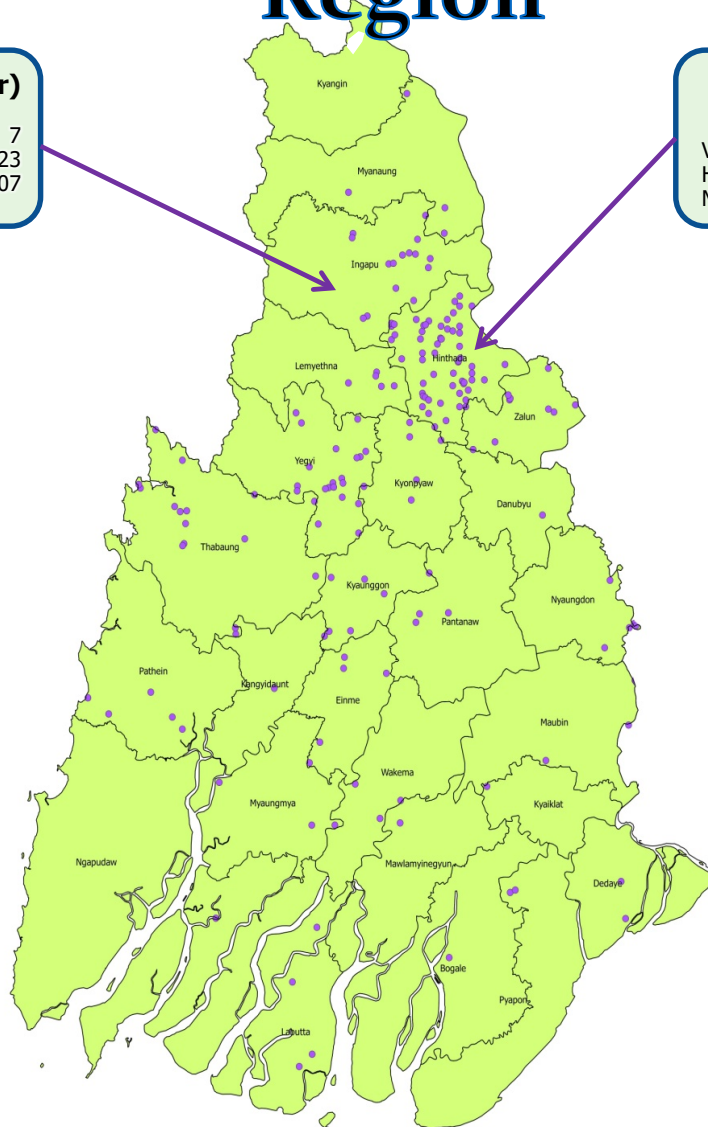
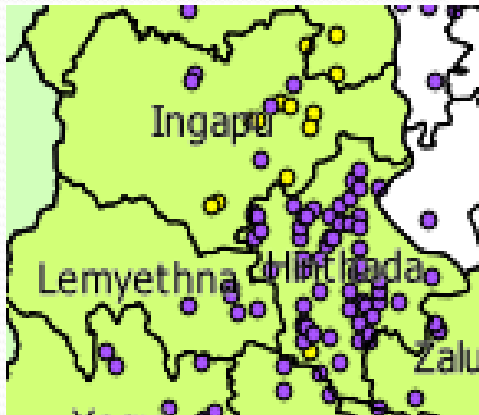
Pre-Electrification for Ayeyarwady Region

Ingapu (Solar)

Village - 7
Household - 1023
Million Kyat - 307

Hinthada (Solar)

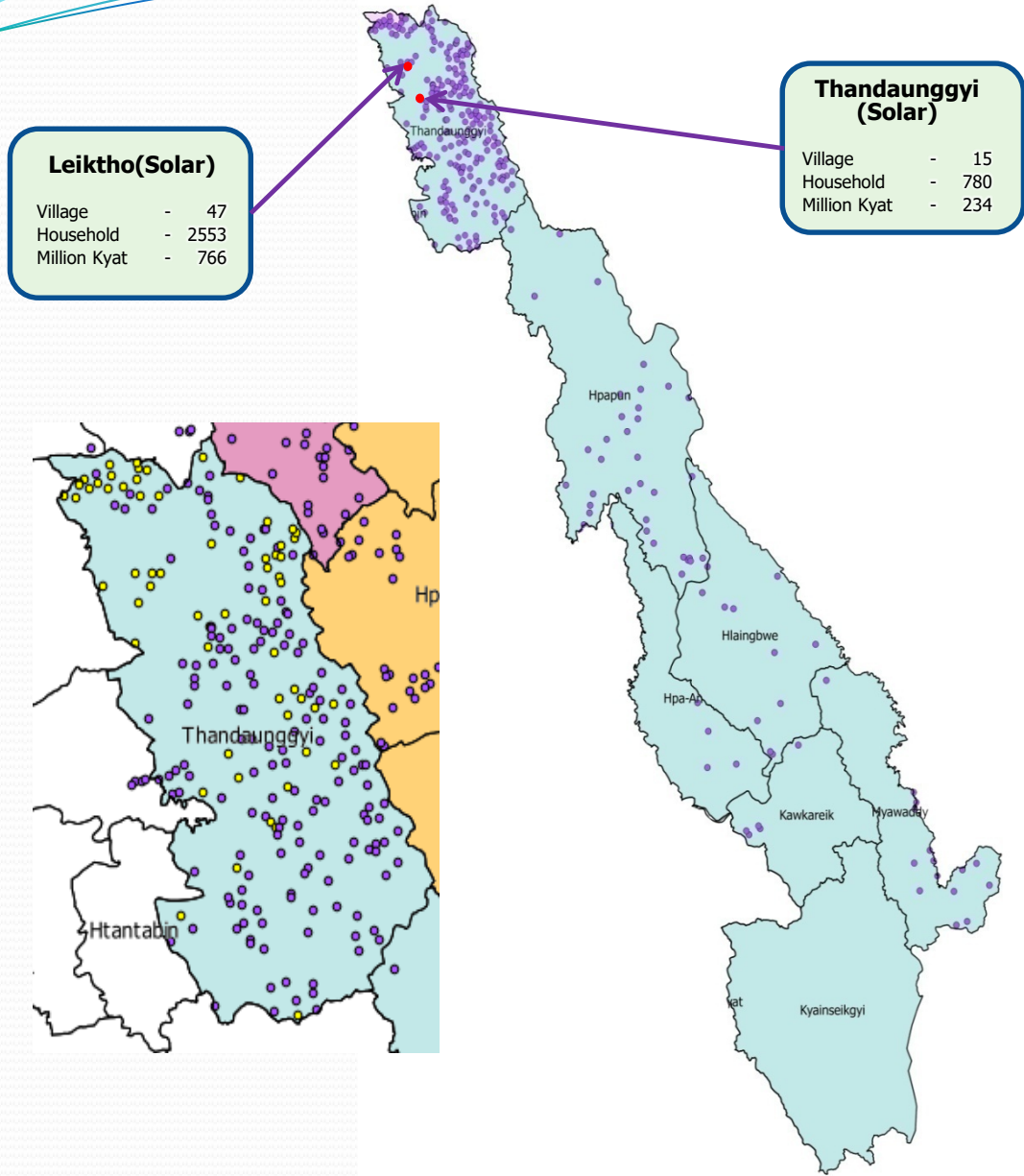
Village - 5
Household - 1645
Million Kyat - 493



Legend

- Proposed Village
- Pre-electrification

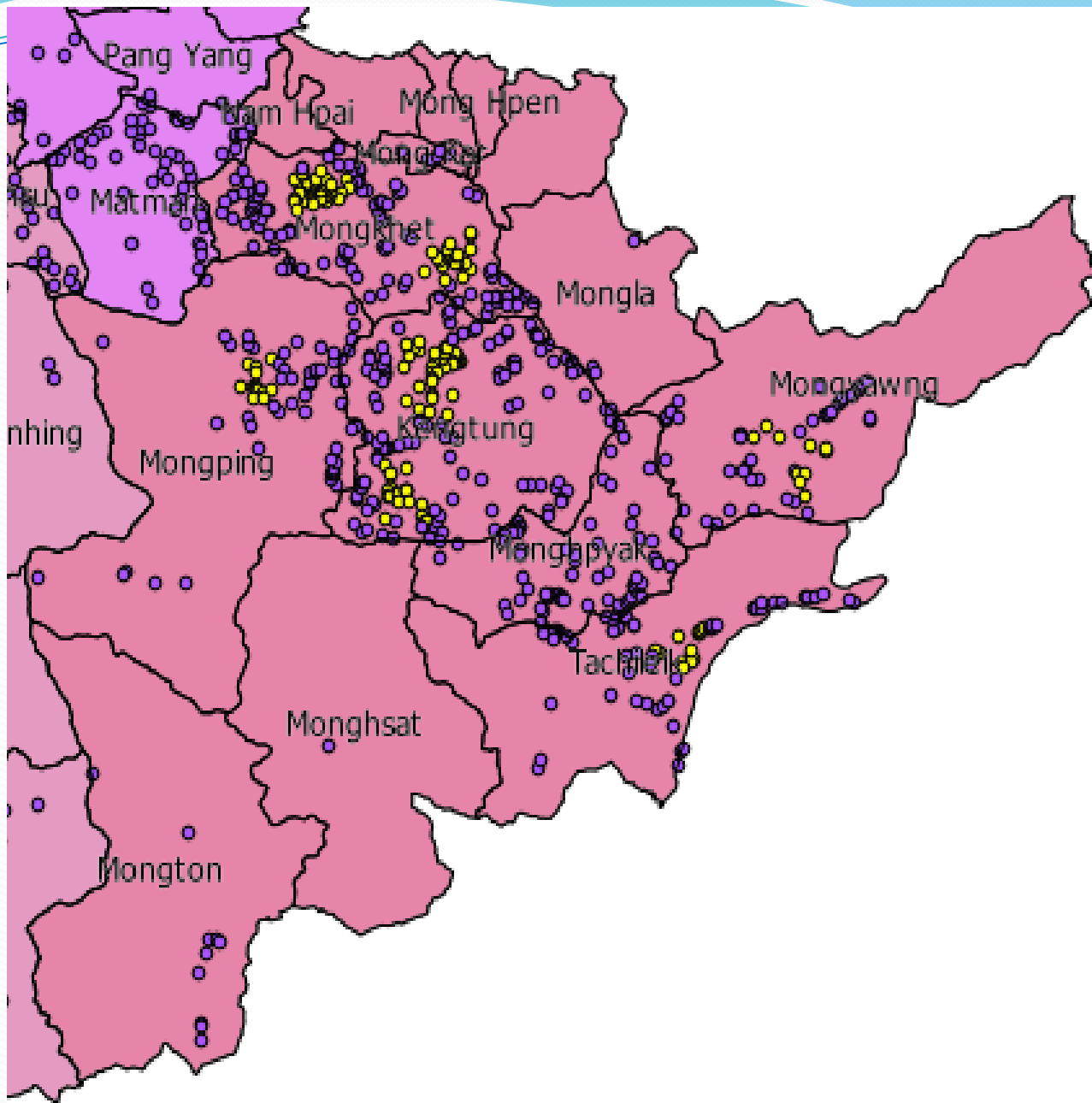
Pre-Electrification for Kayin State



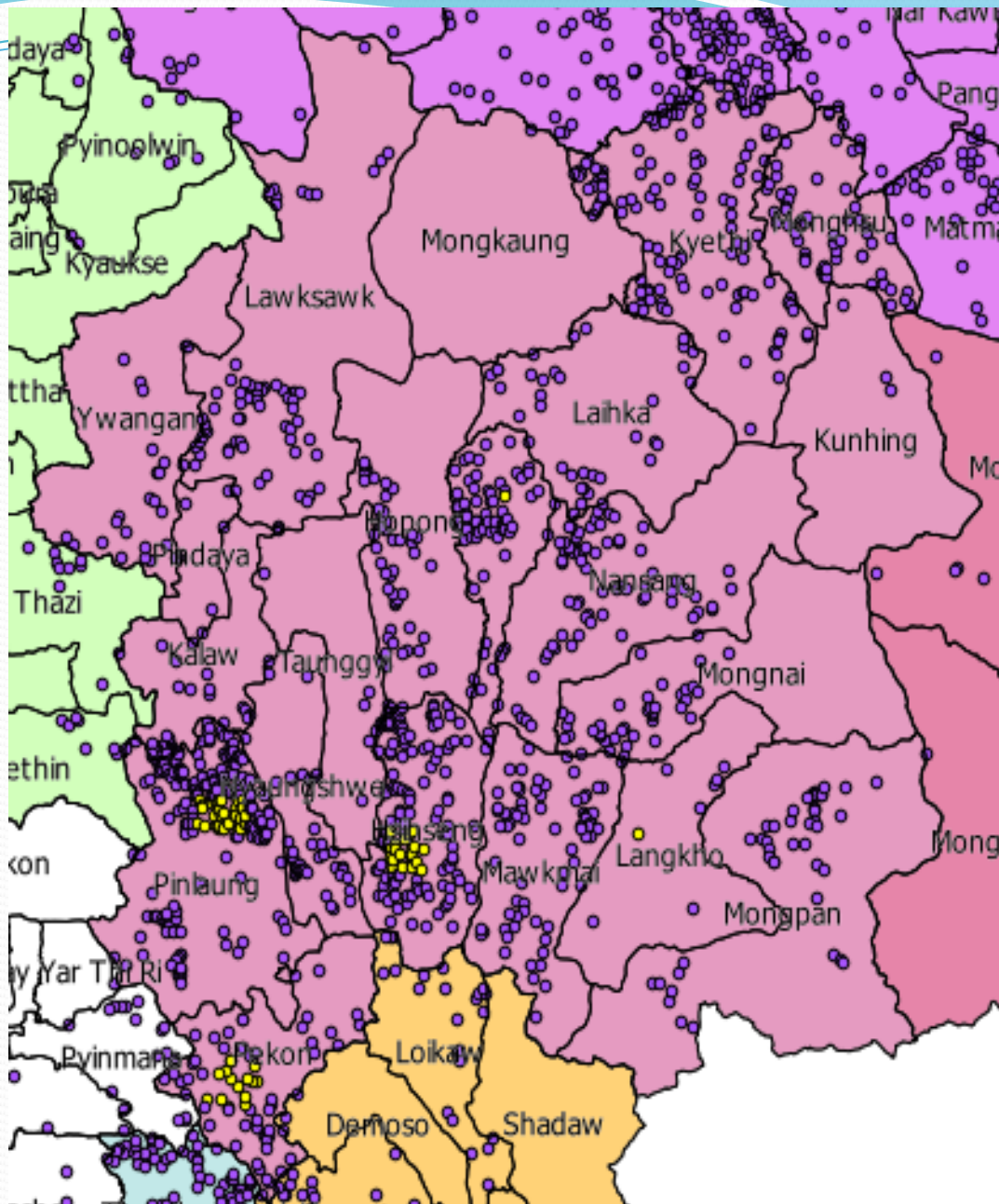
- Legend**
- Proposed Village
 - Pre-electrification



Thank You for Your Attention



The map displays the administrative boundaries of the Mong Hpa Sub-township, which is divided into several administrative areas. The areas shown are Pang Yang, Nam Hoi, Mong Hpen, Matma, Mong Ra, Mong Htet, Mongla, Mongyawng, Mongping, Kengtung, Mongpyak, Tachin, Monghsat, and Mongton. The map also shows the locations of sampling points, which are marked with purple and yellow dots. The sampling points are distributed across the sub-township, with a high concentration in the central Kengtung area. The map is a topographic map, showing the terrain and the locations of the sampling points. The map is a map of the Mong Hpa Sub-township, showing its administrative boundaries and the locations of sampling points. The map is a map of the Mong Hpa Sub-township, showing its administrative boundaries and the locations of sampling points. The map is a map of the Mong Hpa Sub-township, showing its administrative boundaries and the locations of sampling points.



Challenges

- ❖ Lack of Rural Electrification Law
- ❖ Regulation for Mini - grid
- ❖ Limitation for Private Sector Investment
- ❖ Capacity Building(Government and private sector)
- ❖ Sustainability for specification
- ❖ Subsidy Policy
- ❖ QC (Quality control)

Specification of Solar System used for Rural Electrification in Yangon Region by ICDF's Assistance

- ❑ Solar Charging System
 - ❑ 105W Solar panel
 - ❑ 3W LED (10)N0
 - ❑ USB 10Pcs & Distributor
- ❑ Total Cost-
 - ❑ **152 sets x 740\$ =112480\$**