Myanmar: Towards Universal Access to Electricity by 2030

WORLD BANK GROUP

ESMAP
Energy Sector Management Assistance Program

Yangon, January 30, 2015

Towards universal access to electricity in Myanmar

- What has been done?

Development of Myanmar National Electrification Plan (NEP) 2015-30

- To serve as **comprehensive action plan** for developing, financing, and implementing electricity access scale-up program nationwide, with the target of achieving universal access by 2030.

- **To align support from different stakeholders** to implement national access targets and syndicate financing on a timely, ongoing and programmatic basis.

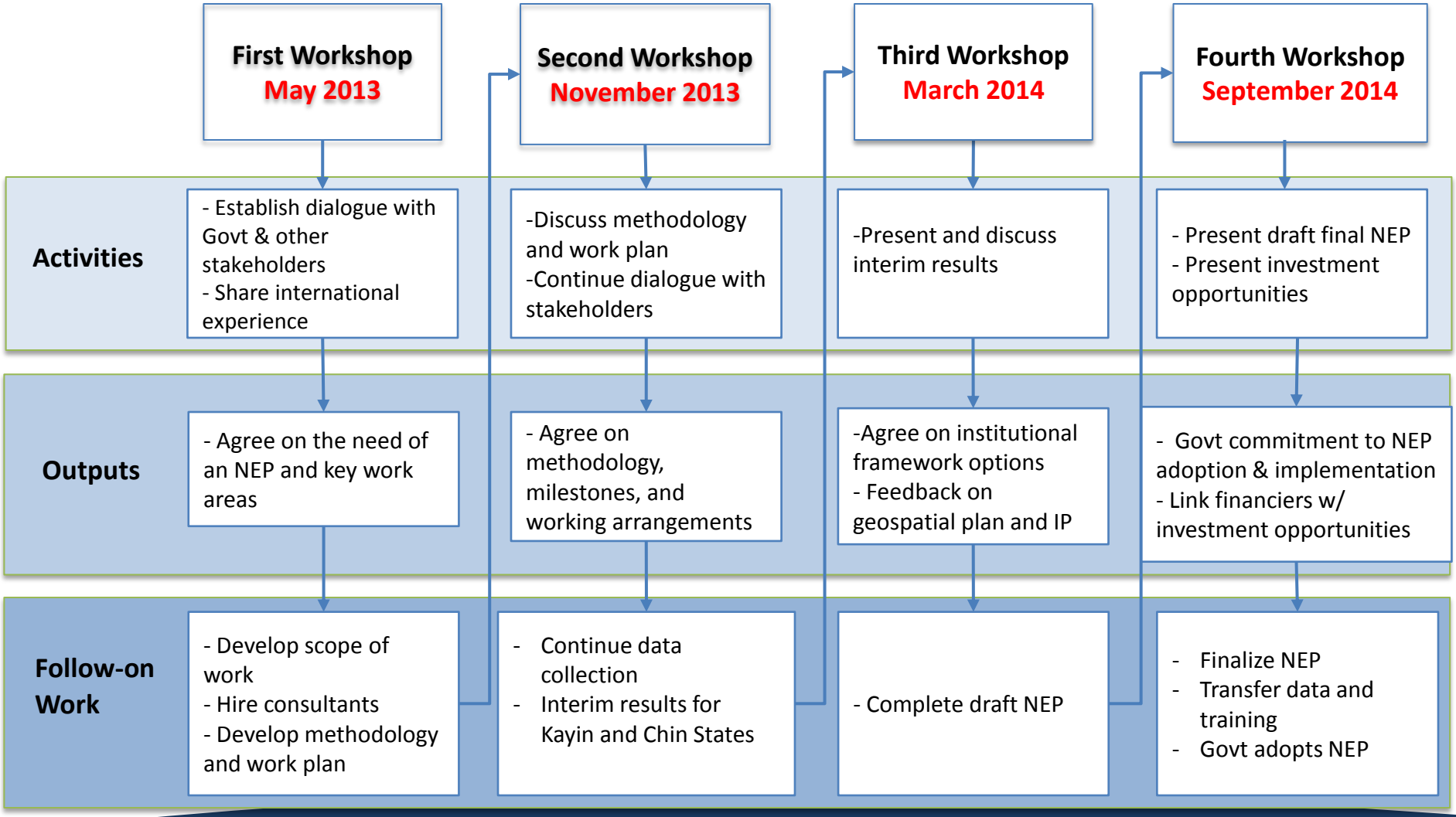
NEP Adopts a Programmatic, Sector-wide Approach…

Countries that have achieved rapid electrification have relied on **Programmatic, Sector-wide approach**

Key Features :

- Coordinated least-cost technical and investment planning
- Sustainable financing policy
- Stable flow of funds
- Results focused

Processes and Milestones



Government Ownership and Collaboration

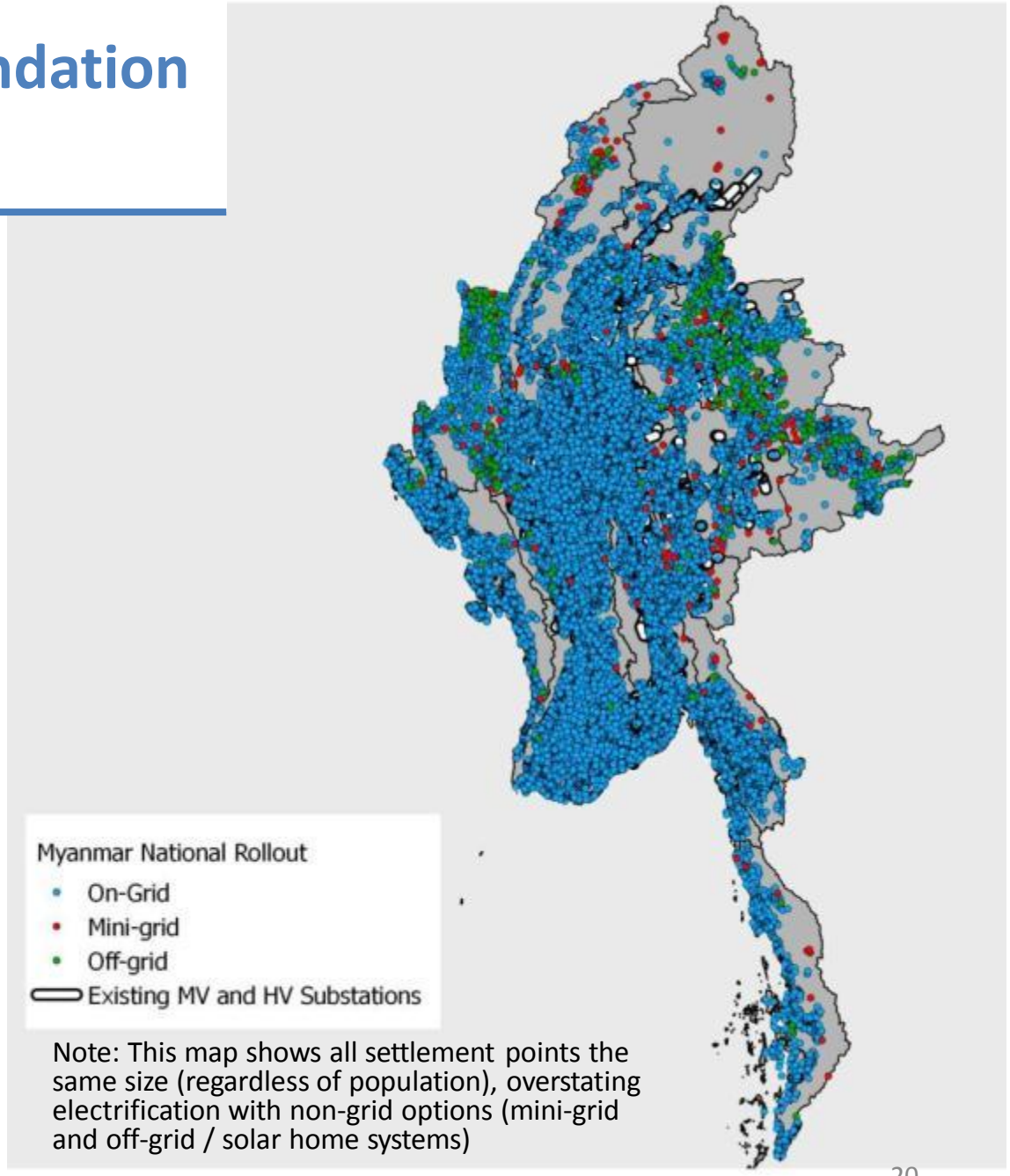
- Ministry of Electric Power (MOEP) and Ministry of Livestock, Fisheries and Rural Development (MLFRD) jointly lead the NEP.
  - Other member agencies of the National Electrification Management Committee (NEMC) and REPWSC participates.
  - World Bank supports.
- MOEP and MLFRD co-manage consultants together with World Bank. Includes strategic guidance on data collection, review of key deliverables, and organization of workshops
- Consultants help government prepare the NEP
- Coordination with other development partners on respective, related initiatives.

Myanmar National Electrification Plan

- Key Messages

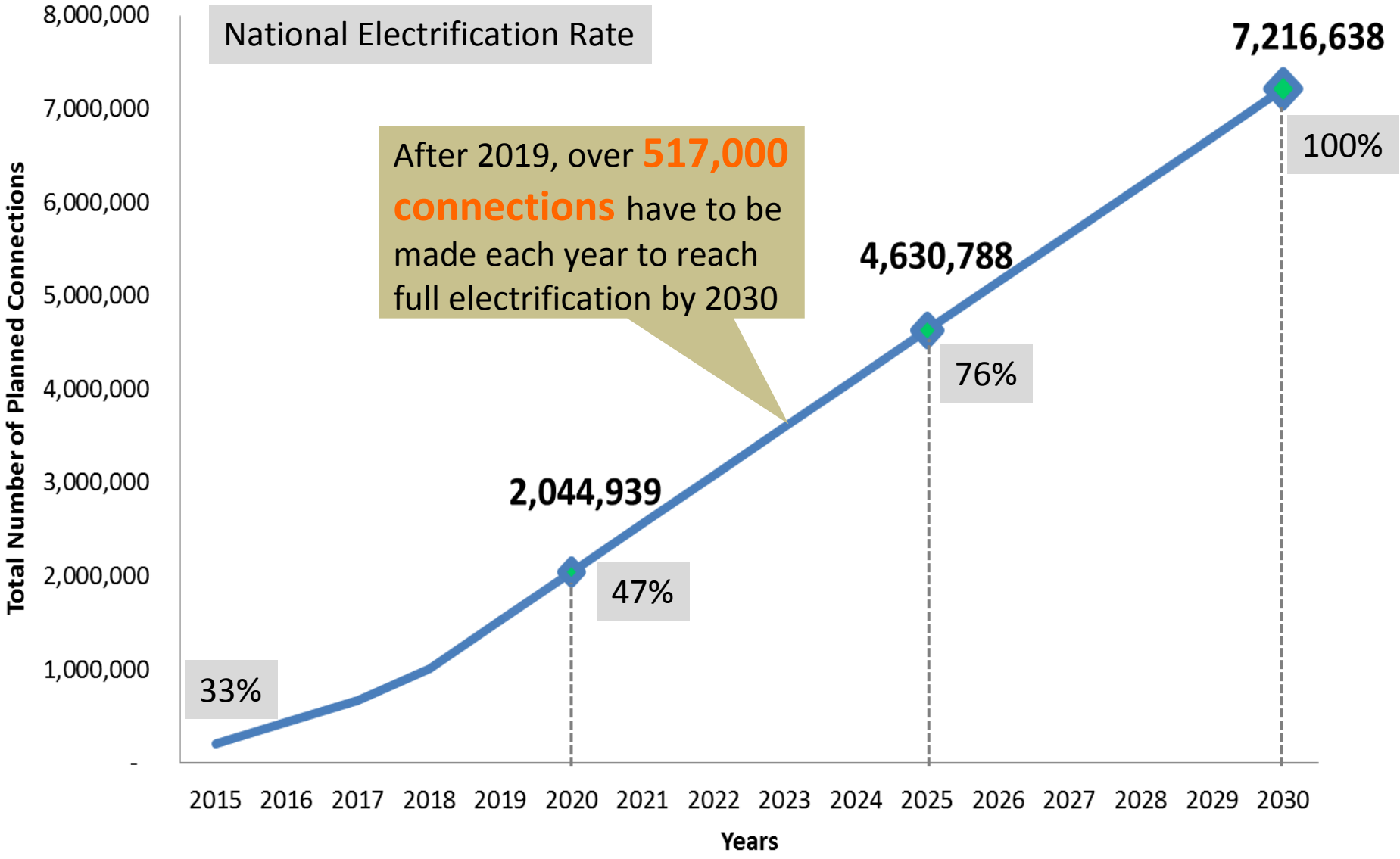
Least-cost recommendation for 2030

- By 2030, the majority are **grid connections**
- This represents **7.2 million households**
- Total cost is estimated at **US $5.8 billion** (US$800 per connection, average)
- This is additional to investments needed for generation & transmission



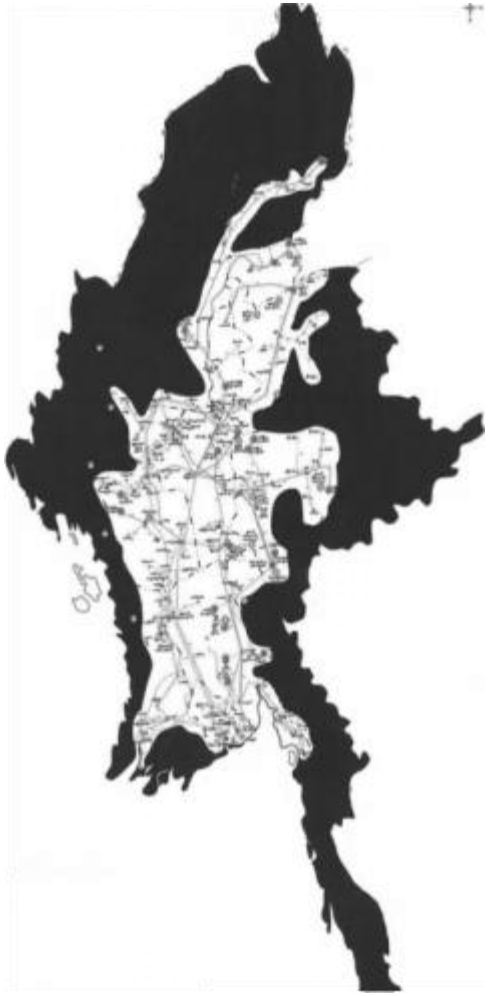
Note: This map shows all settlement points the same size (regardless of population), overstating electrification with non-grid options (mini-grid and off-grid / solar home systems)

Roadmap to Achieve Universal Access by 2030

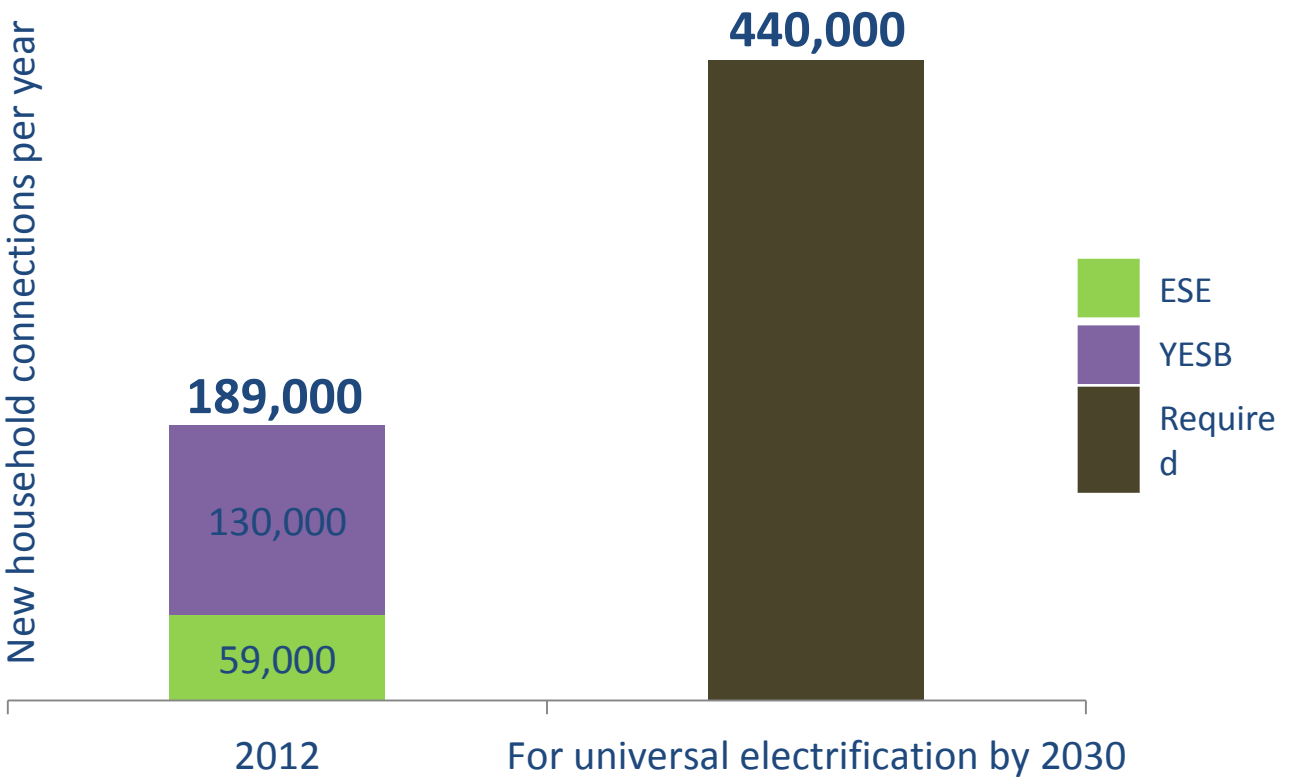


Myanmar's electrification challenge is immense…

The electrification rate is estimated at **33%…**



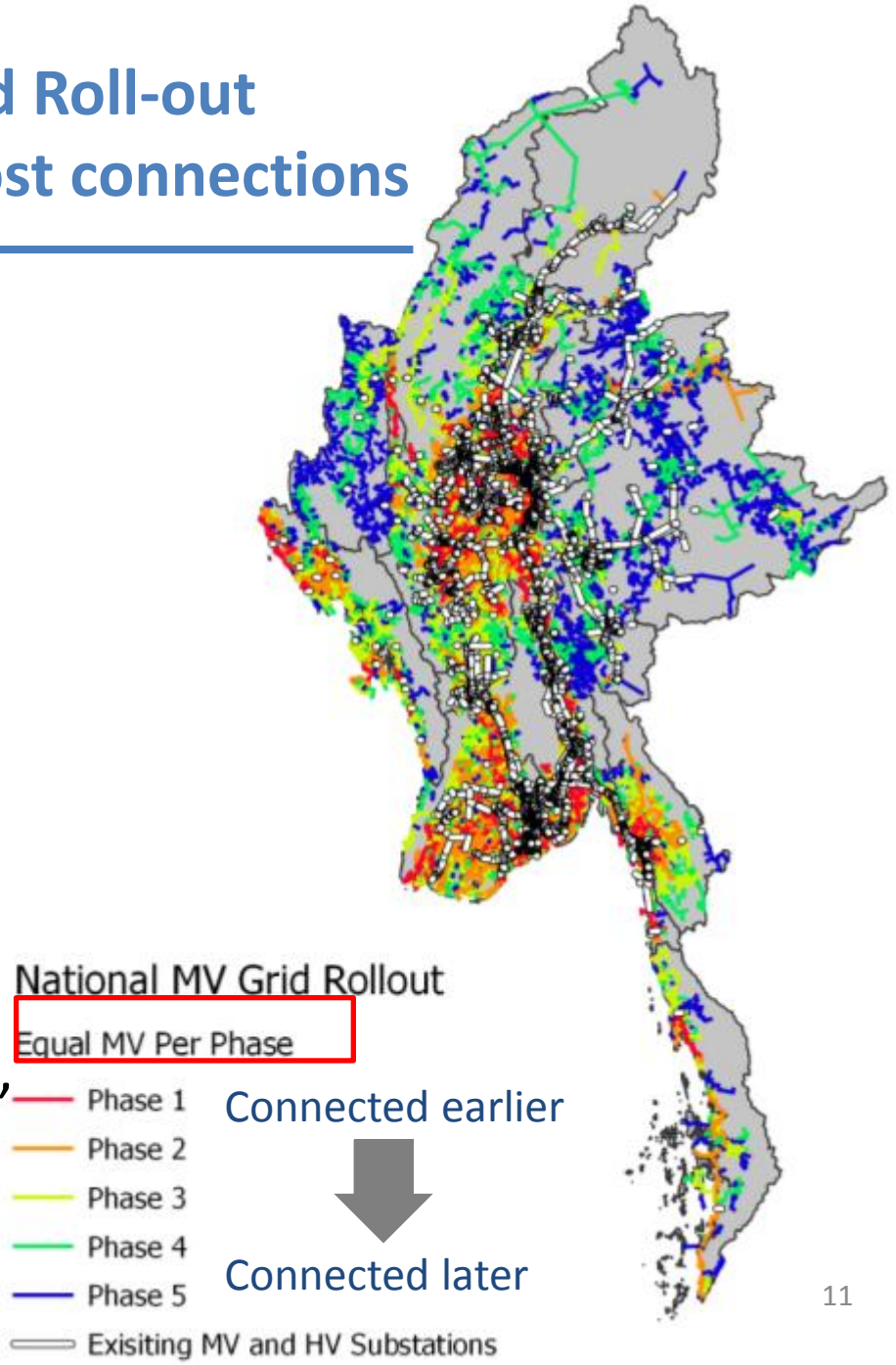
Need to connect over **2x** as many households per year to reach universal electrification by 2030…



Source: MOEP (2011-2012), ESE, YESB data and Castalia estimations
Assumes 6.5 people in a household

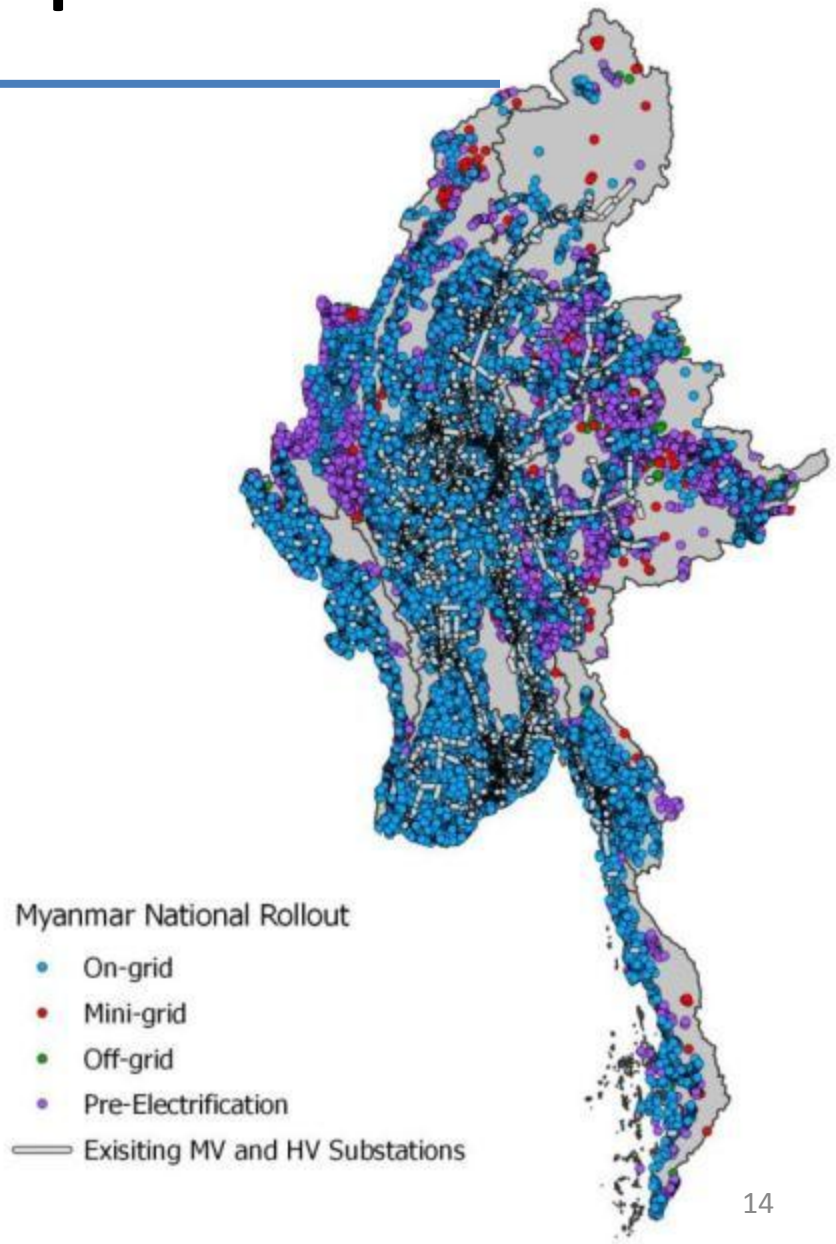
Recommended Sequencing of Grid Roll-out proceeds from low-cost to high-cost connections

- Dense areas require shorter distribution lines and lower cost per connection and will be connected first
- Remote communities require longer lines and higher cost and will be connected later
- Chin, Shan, Kachin and Kayah have highest cost per connection, thus to be connected in the final phases



Recommendations for off-grid pre-electrification

- **3-4% of the villages in the last phases of grid rollout are recommended for pre-electrification**
- **Pre-electrification villages shown in purple**
- **Shan, Chin, Kayah and Kachin States** represent major areas for pre-electrification



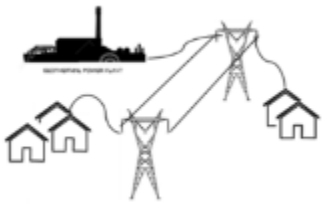
Appropriate pre-electrification technology depends on village size

- Solar home systems for smaller villages (<50 households)
  - may provide 75-175 kWh/yr for lighting/phones/TV
  - US $400-500 per household

    (These are international prices with good quality. Local prices may be lower, and quality can vary.)

- Mini-grids for larger villages (>50 households)
  - solar, hybrid, diesel, or micro-hydro where available
  - 200-250 kWh/yr: lighting/ICT/TV & fan/small fridge
  - US$1,400/HH
  - Could be integrated to grid later, and save on distribution investment, if built to grid standard

How many connections are feasible in the first 5 years?



- Feasible to implement about **1.7 million** additional grid connections from FY2015-19

	New connections required	2012 Actual	2015	2016	2017	2018	2019
ESE	6,993,539	59,000	75,000	150,000	225,000	337,500	517,170
YESB	207,752	130,000	130,000	77,752	0	0	0
Total			**205,000**	**227,752**	**225,000**	**337,000**	**517,170**

- And about **125,000** total mini-grid and off-grid household connections (includes **permanent** and estimated **pre-electrification** connections)

What is the financing need to achieve 1.7 million connections?

~ US$ 700 million from FY 2015-19 **w**ith national least-cost roll-out, including:

- **US$670 million** of capital investments and
- **US$24 million** of TA will be needed.

Institutional recommendations

Independent Regulator

- Advise on tariffs, standards and subsidies needed

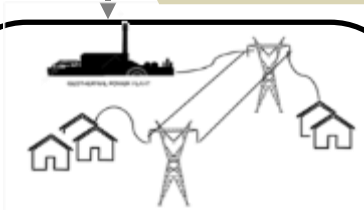
Executive Secretariat reporting to VP Office

- Overall management and coordination of geospatial plan
- Performance reporting
- Point source for donors

Donors

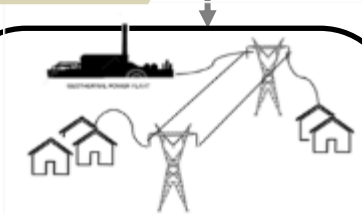
- TA to establish and train new entities
- Concessional finance
- Establish loan program with banks

Under MOEP leadership



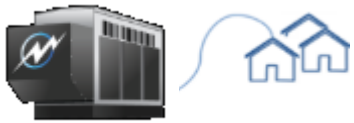
YESB Franchise Area

- Develop investment program with IFC
- Corporatize YESB



ESE Franchise Area

- Follow YESB path
- Set up sub-franchise concessions



Mini-grid connections

- **DRD manage & monitor**
- Decentralized, standard approach modeled on ESE sub-franchise concessions

Off grid connections

- **DRD manage & monitor**
- Re-orient to financial incentives rather than free solar home systems
- Support private sector provision

Private Sector

- Participate in sub franchise concessions
- Provide solar home systems

From Plan

To

Action

WBG Engagement in Myanmar Power Sector

Accelerate electricity service expansion

- **National Electrification Project ($300-400 million) in preparation**
- Develop results-based scheme and public–private partnership

Increase generation capacity

- 106 MW CCGC plant – implementation under way ($140 million)
- Advising the government on IPP procurement
- Provide guarantee support to facilitate private sector investments

Improve system efficiency and financial viability

- IFC to assess YESB corporatization
- IFC to review private sector investments in electricity distribution

Development Partner Coordination

Sector Planning	Legal and Regulatory	Financial Sustainability	Transmission & Distribution	Generation	Rural Energy
Analytical Basis for Strategic Decisions	EITI Application Support	Financial Viability Action Plan	Distribution Improvement in Yangon	New CCGT for MEPE & IPPs; PPP Transactions	Off-grid power program
Energy Master Plan for NEMC (ADB/Japan (JFPR))	Electricity Law & Electricity Regulation (ADB/Norway)	Strengthening Financial Management (Multi-donor)	4-region distribution system improvement	Donated GT and generators (GOT, Japan/JICA)	Rural Electrification Project
National Electricity Plan (Power Sector Master Plan)			National Power Transmission Network (ADB-JICA-Korea)	Urgent Rehab and Upgrade (Yangon, Thilawa, Baluchaung, Hlaingthaya)	Rural Power Infrastructure (electrification in 14 regions/states)
National Electrification Plan	Rural Electrification Law	Economic Valuation of Natural Gas in domestic mkt.	Advisor for Yangon Electricity Supply System	PPP bidding and contracting support (ADB/DFID)	Studies on Off-grid Small Scale Hydro
Energy Efficiency Policy and Renewable Energy Devel. Plan	Environmental and Social Safeguard and Conservation		YESB Corporatization Support through Investment and Advisory Support	Institutional development for sector management of PPPs	

= ADB = JICA = WBG = Others/Joint

National Electrification Project: Objectives

- Help increase access to electricity in Myanmar

- Expected outcomes include:

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

National Electrification Project: Proposed Components

Component 1: Grid rollout (US$ 200 million)

For extension of distribution lines operated by ESE and YESB and connections of villages and households.

Component 2: Off-grid pre-electrification (IDA US$ 80 million)

For mini-grids and household systems in remote villages unlikely to connect to the grid in the next 8-10 years. Includes:

- solar photovoltaic (PV) systems
- mini-hydropower
- Wind, diesel and hybrid systems (e.g. diesel/solar).

National Electrification Project- Proposed Components

Component 3: Capacity building and technical assistance (US$ 20 million)

For support to Government agencies (union, state/ region, district) to plan, implement, monitor and evaluate the NEP. Includes:

- technical design
- economic and financial analysis
- environmental and social impact management
- procurement and financial management.

Component 4: Contingent Emergency Response (US$ 0 million)

For a fast re-allocation of finance in case of natural disaster.

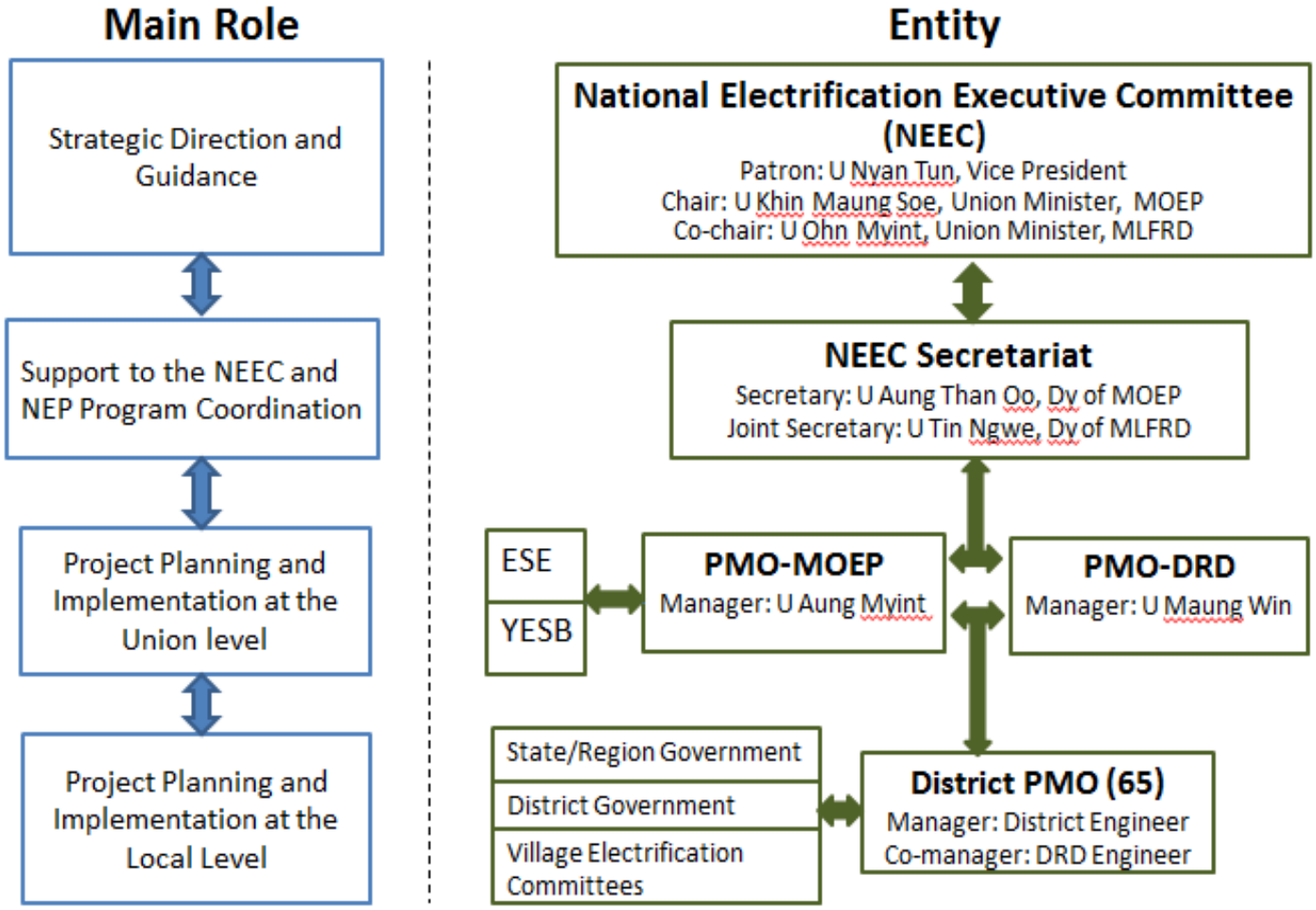
Priority Investment Activities for Grid Extension based on National Electrification Plan

States/Regions	# Townships	# Villages	# HHs
Ayerwaddy	26	704	77,901
Bago(East)	14	558	76,523
Bago(West)	14	784	73,382
Chin	4	13	1,141
Kachin	10	180	29,112
Kayah	3	39	1,762
Kayin	3	87	9,114
Magway	12	227	32,503
Mandalay	20	680	99,531
Mon	7	96	15,915
Nyapitaw	8	170	34,704
Rakhine	No data	No data	No data
Sagaing	30	733	99,818
Shan(East)	2	4	210
Shan(North)	1	3	154
Shan(South)	18	290	28,113
Tanintharyi	7	24	5,700
Grand Total	**179**	**4,592**	**585,583**

Priority Investment Activities for Off-Grid Electrification based on National Electrification Plan

		Solar Home Systems		Mini-Hydro	
States/Regions	# Townships	# Villages	# HHs	# Villages	# HHs
Ayearwaddy	3	12	2,668	-	-
Bago(East)					
Bago(West)					
Chin	9	115	5,344	10	793
Kachin	3	28	4,000	-	-
Kayah	3	15	750		
Kayin	2	62	3,333	-	-
Magway					
Mandalay					
Mon					
Nyapitaw					
Rakhine					
Sagaing					
Shan(East)	9	108	5,298	3	821
Shan(North)	8	66	4,000	1	600
Shan(South)	5	41	4,000	2	600
Tanintharyi					
Grand Total	42	447	29,393	16	2,814

Myanmar NEP Institutional Implementation Framework



Project Preparation Schedule

Milestone	Date
World Bank approves project concept	November 2014
Consultative meeting with civil society	January 2015
Parliament approves project request	March 2015
Public consultation on draft Environment and Social Management Framework	May 2015
World Bank Board of Directors approves project	July 2015
Project implementation begins	September 2015

NEP reports and project materials can be found at:

https://energypedia.info/wiki/
Achieving_Universal_Access_to_Electricity_in_Myanmar

Discussions and Q&As