Workshop on the Future Direction of Rural Electrification in Myanmar
At Department of Rural Development, The Ministry of Livestock, Fisheries and Rural Development, NayPyiTaw

[Session 2: The UT's Research]
15:05 - Cost Estimation in Rural Areas in Myanmar by UT

Policy Alternatives Research Institute

Demand Projection for Rural Electrification in Myanmar

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Demarcation of international organization

Organi-zation	Output of study	
JICA	National Electricity Plan (2030)	National Power System Expansion Plan Demand in 2030; Low case 9,100 MW, High case 14,542 MW, Installed capacity in 2030; 23,594 MW (scenario 3)
WB	Rural Electrification Plan (2030)	Rural electrification plan Electrification households; 7,236,000, Grid electrification; 99%,
ADB	National Energy Plan (2035)	National energy development plan
	Off-grid RE Demonstration Project	Verification test of off-grid electrification by SHS Supporting plan for electrification
U-Tokyo	Advisory Works on Rural Electrification Plan	Demand projection in rural area in 2030 Preliminary least cost off-grid electrification scenario

Framework of this Research

(1) Demand Projection

Estimate
- Setting target electrification rate (On-grid + Off-grid)
- Medium voltage distribution line area → Projection of electrification area (On-grid・Off-grid)
- The number of electrified villages and demand projection (Off-grid)

Population

Power supply plan
High voltage transmission lines extension plan

Achievements of rural electrification in neighboring countries

(2) Cost Estimation

Simulate
- Optimal system design for representative demand cases

Estimate
- Minimum cost for Off-grid electrification

(using “HOMER®“ for calculations)

Renewable energy potential

Costs of power generation technologies, etc.

Costs of fuel, etc.

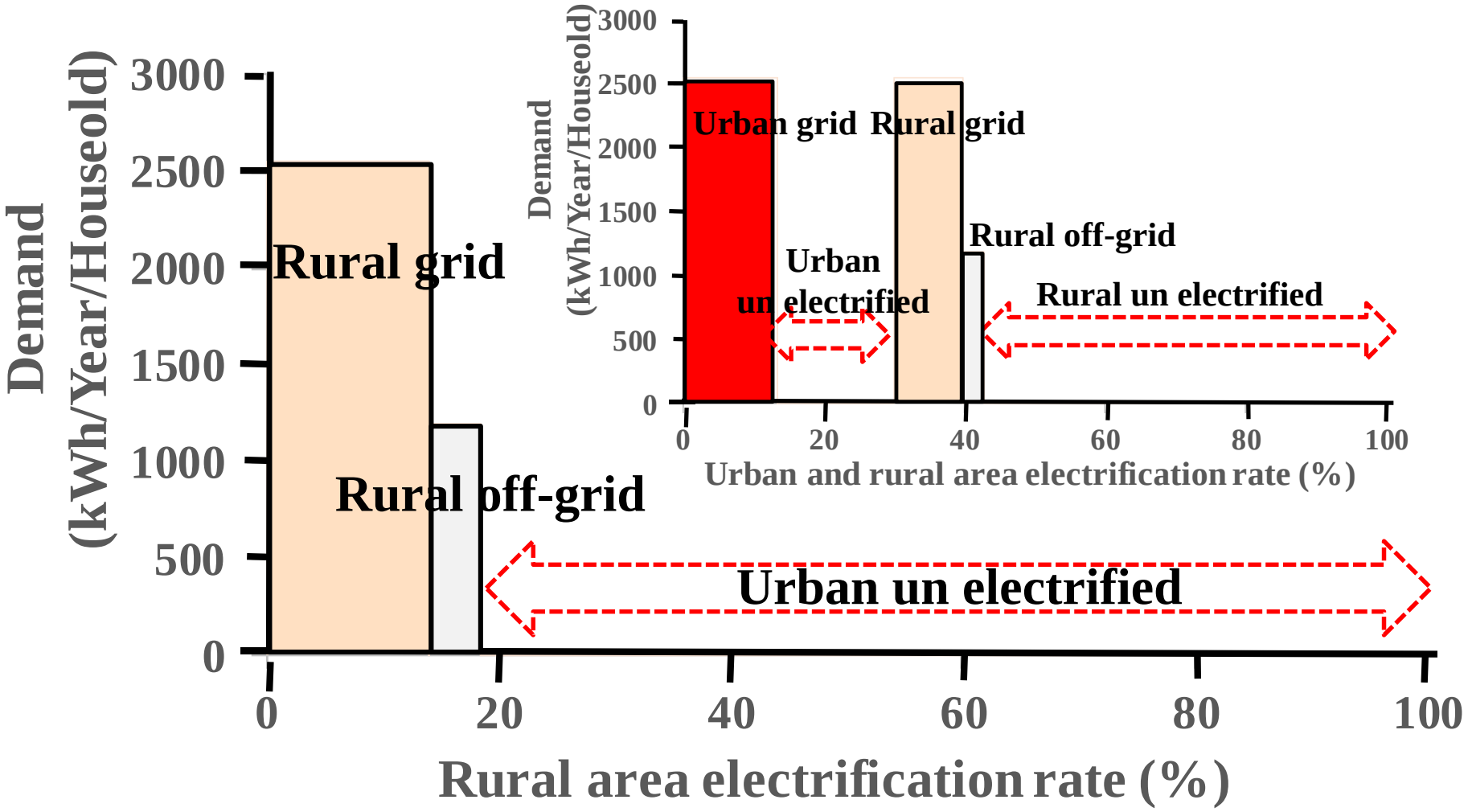
(3) Development of Preliminary Scenarios

Estimate
- Total cost to meet off-grid demand

2. Current Situation of electricity access in Myanmar (as of 2012)

- Total demand is 2,075 MW
- Household electrification rate is 26%
- Total population is estimated about 50.5 million
- About 70% of population live in rural area (64,346 villages)
- Of 64,346 villages, 17,554 villages are electrified
- Of which 3,802 villages are electrified by grid
- Another 13,752 villages are electrified by off-grid such as mini hydro, biomass(rice husk), diesel and etc.
- 45% of household in urban area electrified, but only 18% of household in rural area electrified

Electrification rate & energy demand in rural area in 2012



3. Demand projection for rural electrification

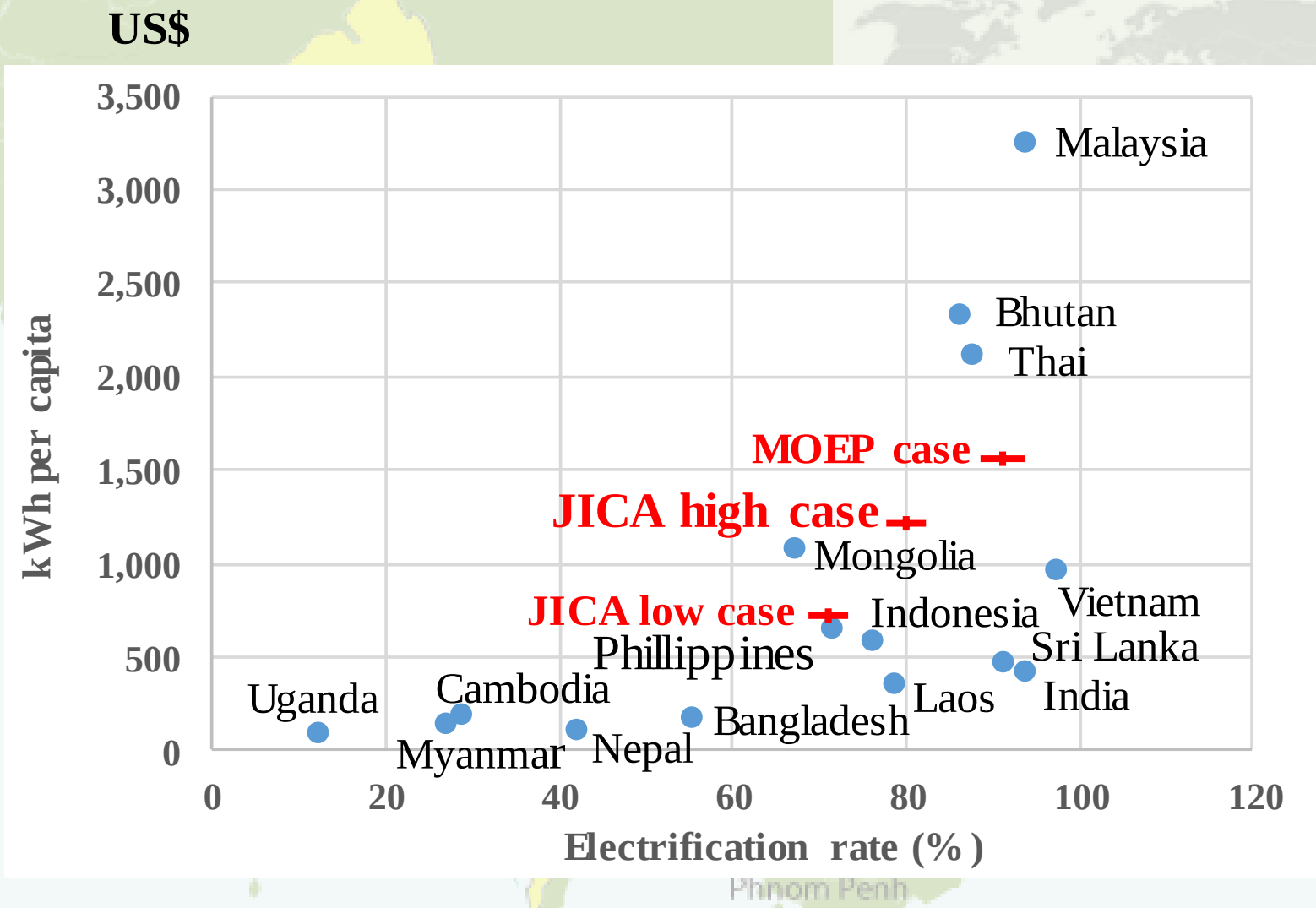
(1) Setting target household electrification rate

- Per capita kWh calculated by JICA MP demand forecast
- Estimation of country electrification rate target by per capita kWh In reference to the example of neighboring countries

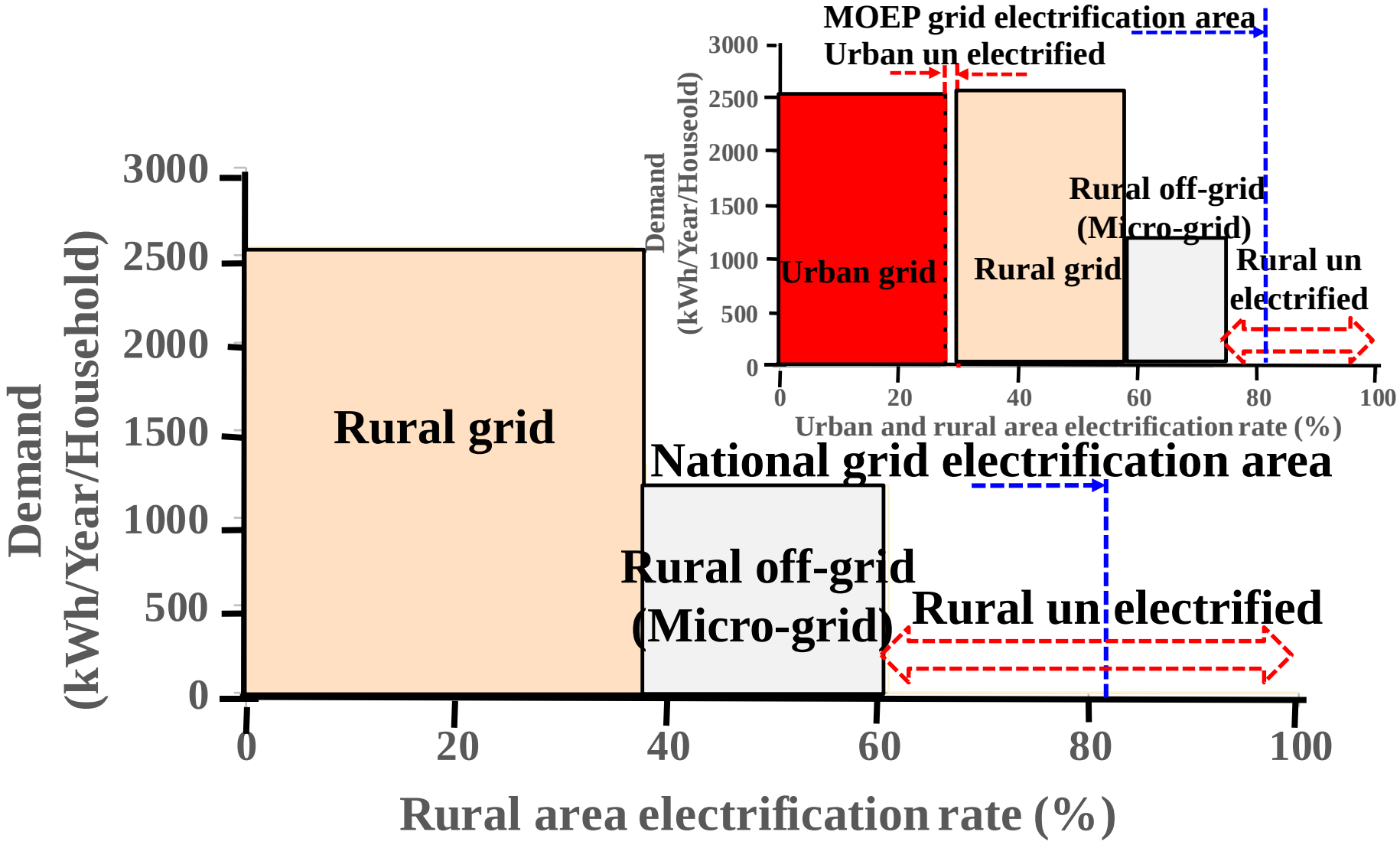
(2) Demand projection conditions

- Share of energy for household is set at 42% of the total energy base on the current actual data in Myanmar
- Urban electrification takes first priority and is followed by rural electrification
- Priority to grid electrification within allocated power supply into each state and region, and off grid electrification supplements it
- Area of grid electrification by power system expansion plans of JICA Master Plan and MOEP national grid expansion (HV line and sub station) plan
- 1.5%/year of population growth rate by UN data
- Even off-grid electrification requires to enable civilized living in modern society for low income household

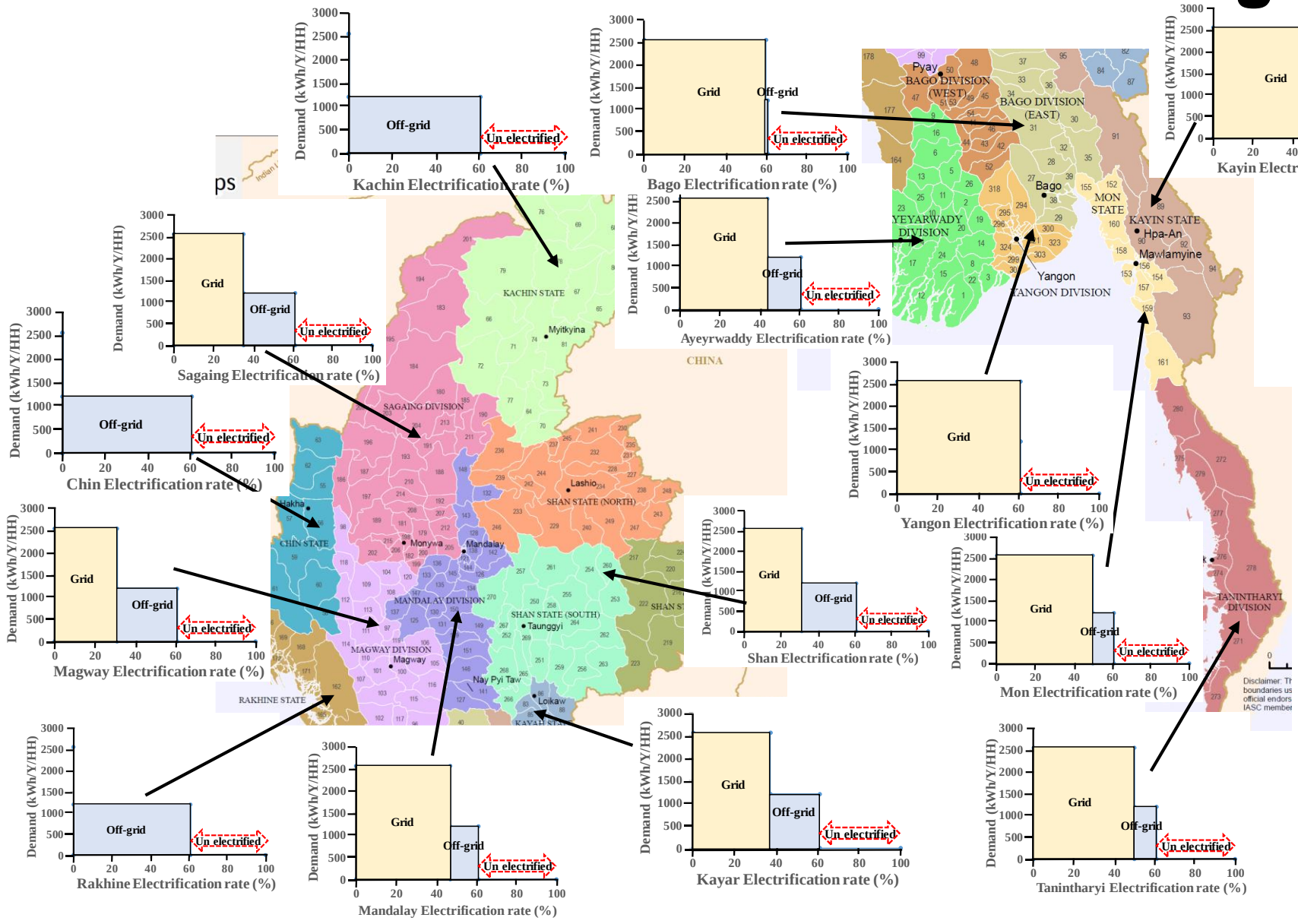
Setting target household electrification rate in 2030 as 70% applying low case



Electrification rate & energy demand in rural area in 2030



Electrification rate in 2030 in State/Region



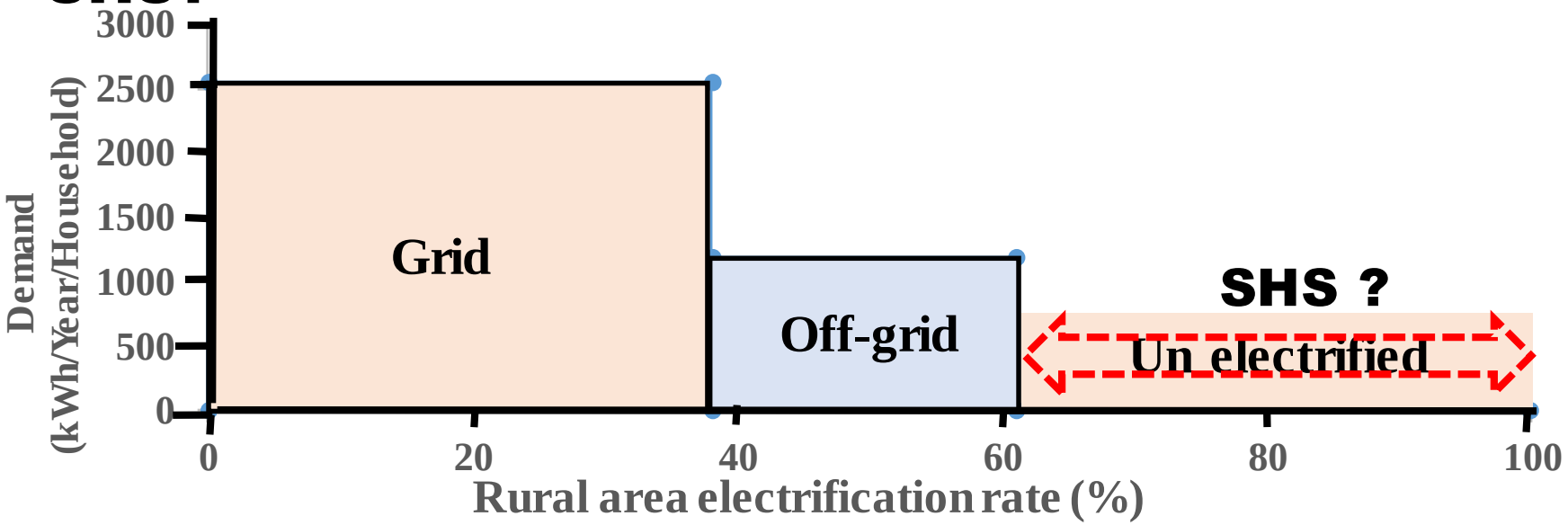
4. Conclusion and next step study

(1) Conclusion

- Off-grid household electrification rate in 2030 is 16% of total Household, whereas 39% of household in rural areas will remain un electrified.
- Proportions between grid and off-grid electrification vary widely in rural areas by state or region because of range of possible grid electrification area and allocated power supply to states and regions
- To achieve the target electrification rate of 70% by 2030, 434 MW of off-grid electrification will be required.
- WB Rural Electrification Plan which intends to cover 99% of whole country area by MV line grid in 2030, however because of power supply capacity by the national grid, certain amount of villages should be electrified by off-grid to accomplish target electrification rate in 2030

(2) Next step study

- **Utilization of current national census data (population and number of household in urban and rural area)**
- **Utilization of geospatial data**
- **Utilization of current data of household demand in urban and rural area**
- **Left of un electrified areas should be cover by SHS?**



Data and information which will improve our study

- Current national census data and
- Geospatial data of villages
- Current data of household and village electrification rates and demand
- Geospatial data of current and future plan of transmission line and sub-station
- Standard connection method of HV line and MV line
- Data of existing and planned small hydro power
- Data of existing diesel power