

Total Electrification Strategy for 100% Household Electrification of the Philippines by 2022

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Background

- It is a declared policy of the State to ensure and accelerate the total electrification of the country and ensure the quality, reliability, security and affordability of the supply of electric power.
- The Department of Energy (DOE) issued Power Development Plan (PDP) 2016-2040 which provides the Electrification Roadmap toward total Energy Access in 2040 with specific target of country's 100% household electrification level by 2022 based on 2015 Census.
- President Rodrigo Duterte, through DOE Secretary Alfonso Cusi, issued directives **to pursue and accelerate total electrification by 2020**, address ailing Electric Cooperatives (ECs), and ensure greater private sector participation.
- On **24 May 2018**, DOE issued a Department Order No. DO2018-05-0010 creating the "Task Force E-Power Mo" (TFEM) for the purpose of ensuring access to electricity for the communities that remains unserved and underserved by distribution utilities and electric cooperatives as mandated by their franchises. The Task Force is comprised by DOE, National Electrification Administration (NEA), and National Rural Electrification Administration (NREA).



Status of Household Electrification

Initial Estimate as of 31 December 2017

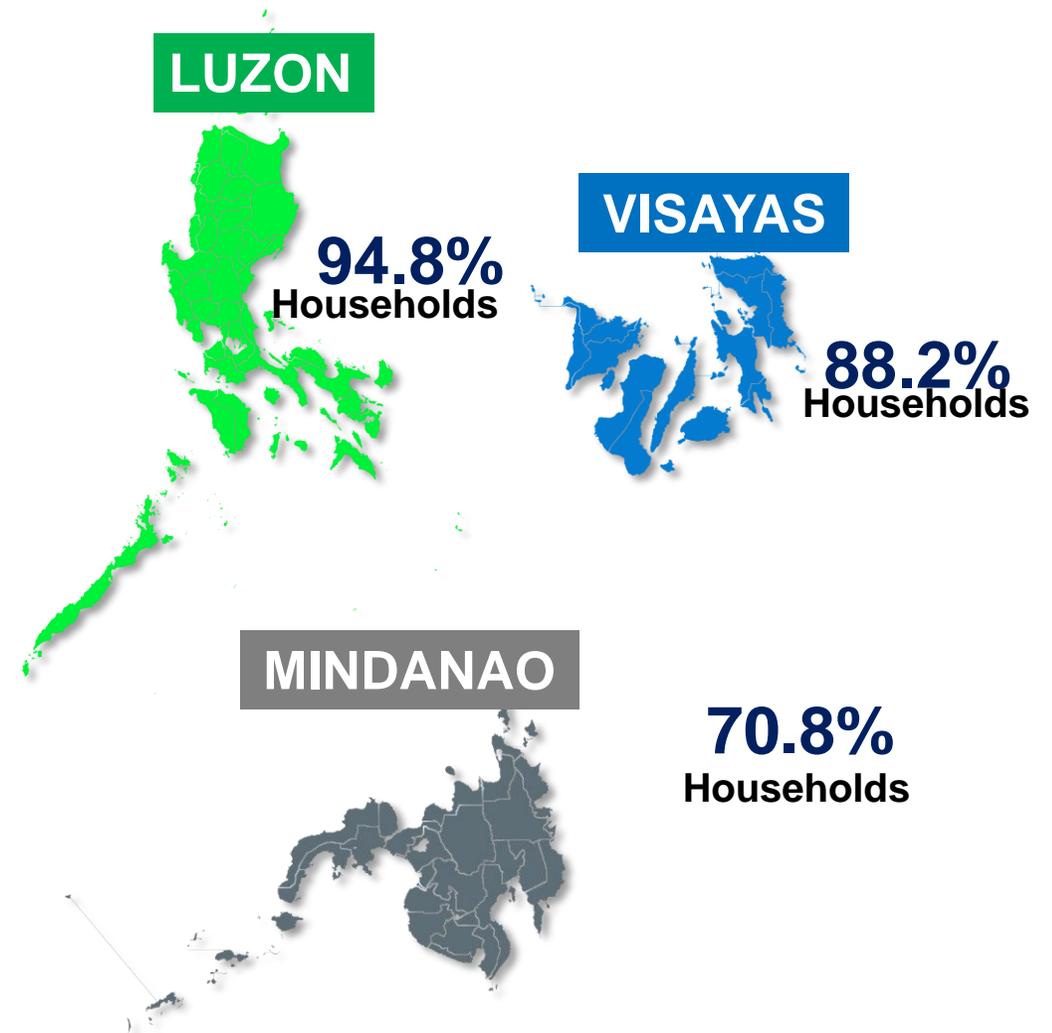


20.94 Million Households have electricity out of **23.72 Million Households** in the country

(Potential HH Population Based on initial DDP 2018-2027 by DUs)

Distribution Utilities (in Millions HH)	HH Population*	Served HH	Unserved HH	HH Electrification Level (%)
120 Electric Cooperatives	14.59	12.19	2.39	83.6%
MERALCO	6.98	6.82	0.16	97.7%
Other Private Distribution Utilities	2.14	1.92	0.22	89.1%
Philippines	23.72	20.94	2.78	88.3%

Note: As of the Aug 31, 2018, the initial report shows HH Electrification Level at 89.7% but subject to DOE's validation

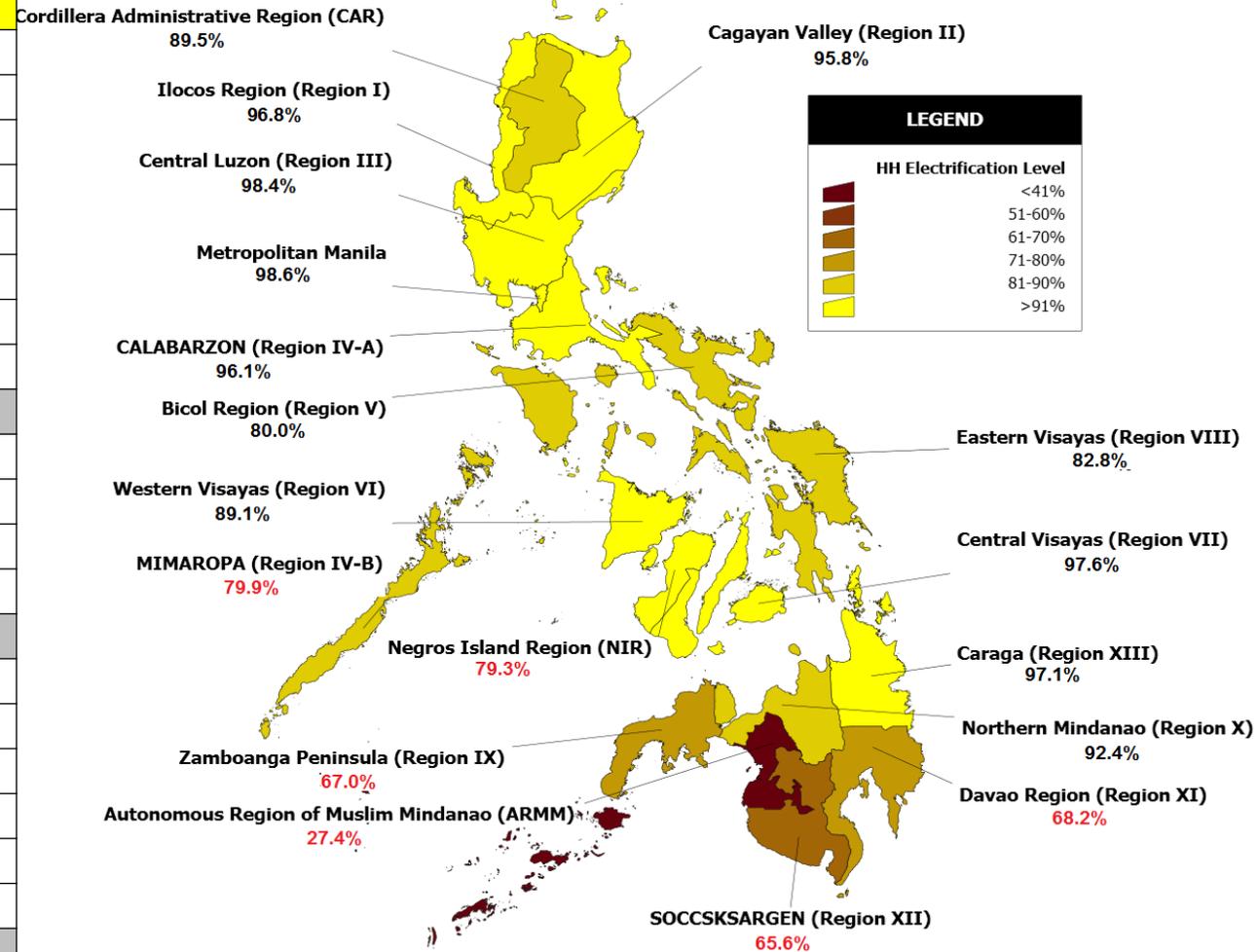


Status of Household Electrification

Initial Estimate as of 31 December 2017

Region	Total HH*	Served HH	Unserved HH	HH Elect'n Level %
CAR	409,100	365,999	43,101	89.5%
I	1,179,133	1,141,887	37,246	96.8%
II	795,800	762,314	33,486	95.8%
III	2,793,456	2,748,334	45,122	98.4%
IV-A	3,718,758	3,572,657	146,101	96.1%
IV-B	708,077	566,065	142,012	79.9%
NCR	3,233,605	3,189,357	44,248	98.6%
V	1,197,558	957,954	239,604	80.0%
Luzon	14,035,487	13,304,568	730,920	94.8%
VI	1,019,375	908,244	111,131	89.1%
VII	1,426,286	1,391,344	34,942	97.6%
VIII	1,003,543	831,235	172,308	82.8%
NIR	1,016,400	806,494	209,906	79.3%
Visayas	4,465,604	3,937,317	528,287	88.2%
ARMM	618,600	169,190	449,410	27.4%
CARAGA	633,700	615,515	18,185	97.1%
IX	754,300	505,444	248,856	67.0%
X	1,004,722	927,878	76,844	92.4%
XI	1,177,596	803,588	374,008	68.2%
XII	1,026,019	672,999	353,020	65.6%
Mindanao	5,214,937	3,694,614	1,520,323	70.8%
Philippines	23,716,028	20,936,499	2,779,530	88.3%

Note: Red texts indicate electrification level below 80%



Source: DOE (Initial Estimate)



Missionary Electrification

As of 31 December 2017

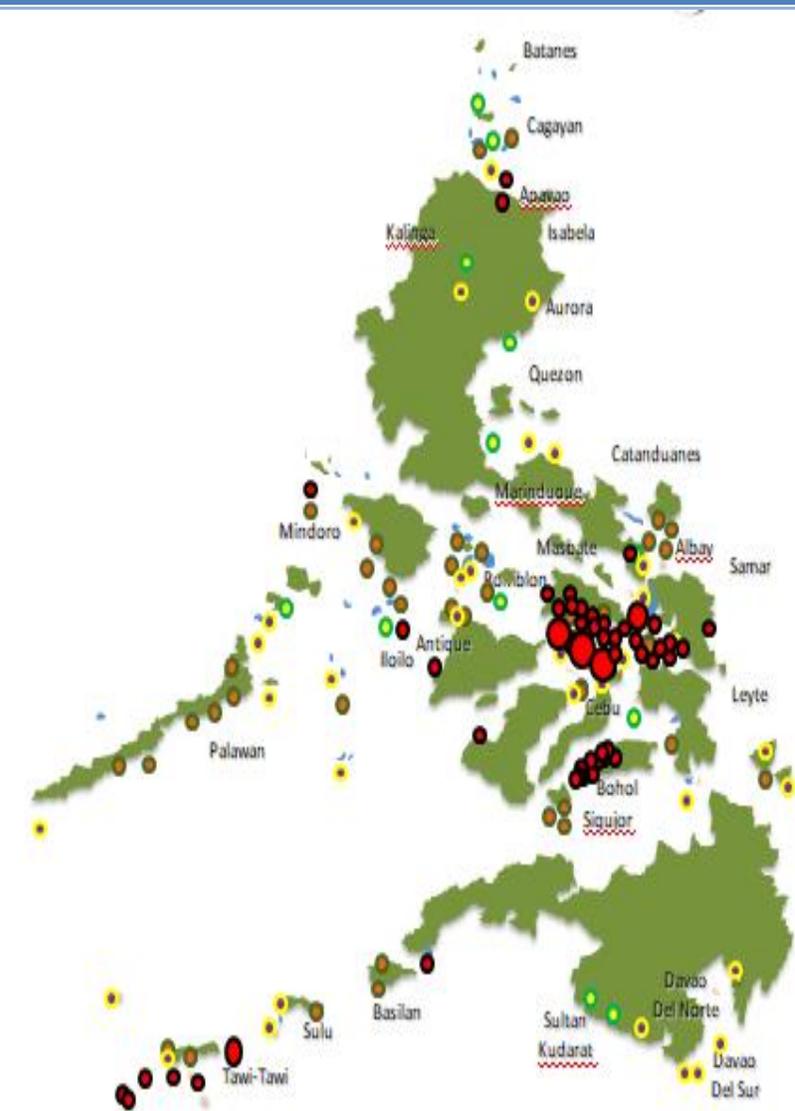
REGION	PLANTS	AREAS	CAPACITY (MW)		Maximum Demand (MW)	No. of Household
			Rated	Dep.		
Luzon	221	155	314.108	240.069	166.297	725,697
NPC SPUG-PLANTS	201	147	112.190	87.242	49.713	308,116
a. Existing Areas	63	56	110.199	85.467		
b. Mini Grid	3	3	0.629	0.540		
c. PRES	135	88	1.362	1.235		
NPP/QTP/RE Dev.	20	8	201.918	152.827	116.584	417,581
Visayas	51	47	39.417	28.008	18.381	95,071
NPC SPUG-PLANTS	46	44	23.563	15.724	6.787	46,252
a. Existing Areas	32	30	21.723	14.420		
b. Mini Grid	14	14	1.840	1.304		
NPP/QTP/RE Dev.	5	3	15.854	12.284	11.594	48,819
Mindanao	25	22	79.789	59.131	34.998	146,207
a. Existing Areas	25	22	79.789	59.131		146,207
TOTAL NPC OWNED	272	213	215.542	162.097	56.500	500,575
TOTAL NPP/QTP PLANTS	25	11	217.772	165.111	128.178	466,400
GRAND TOTAL	297	224	433.314	327.208	184.678	966,975

Total Households in the Philippines 20,936,499*

Total Households in the Missionary Areas 1,554,087**

Served Households in Missionary Areas 966,975 (62.22%)

Households to be Electrified 587,112 (37.78%)

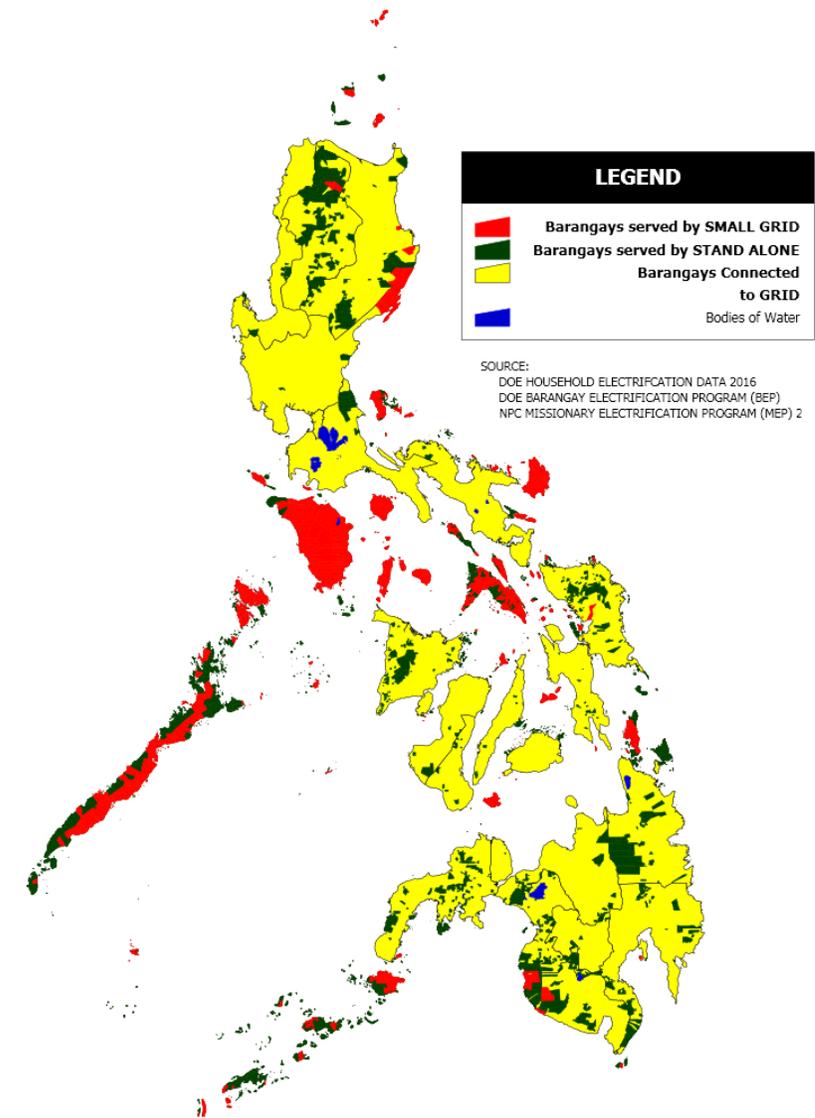
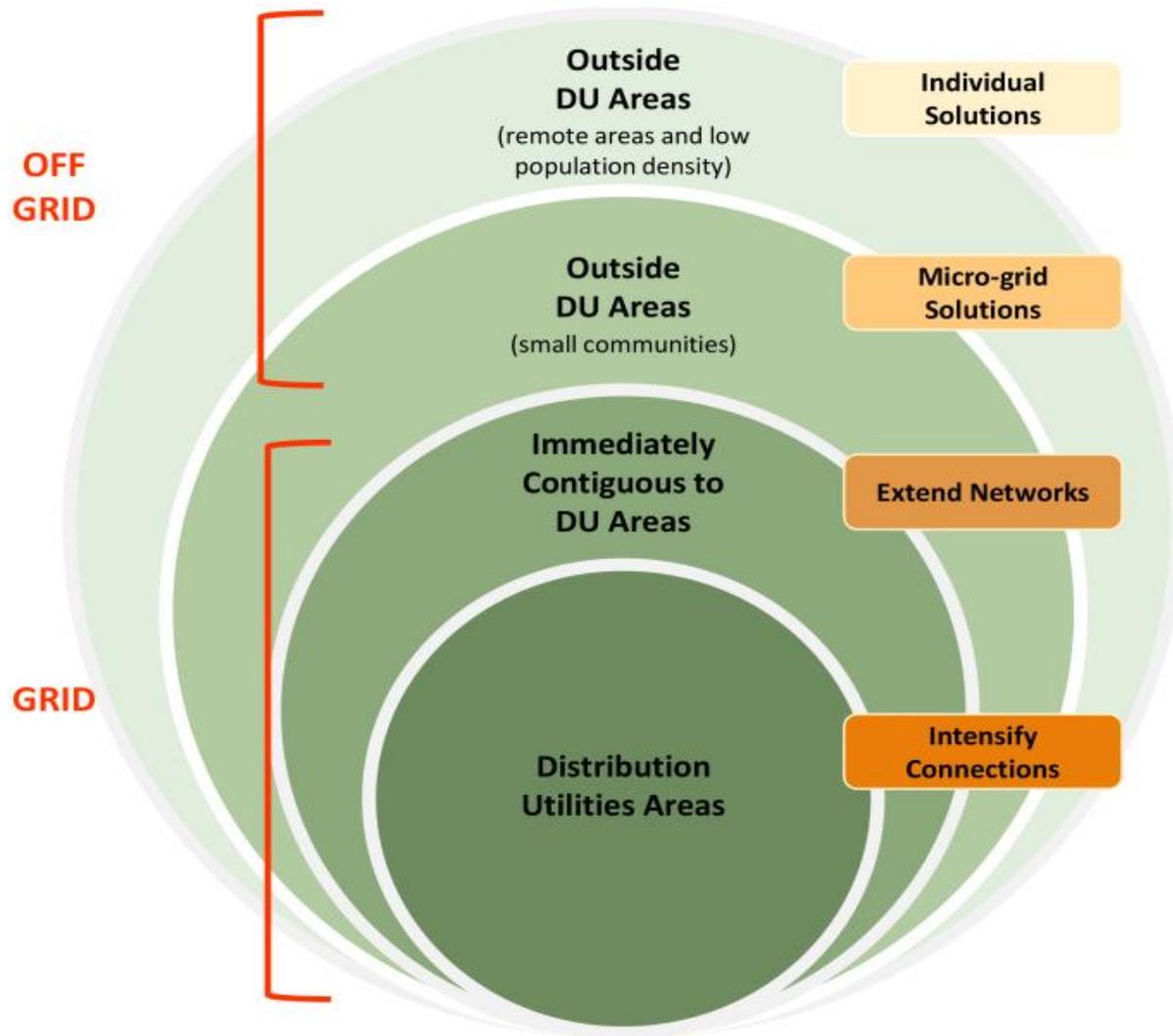


* DOE data

** PSA 2015 data

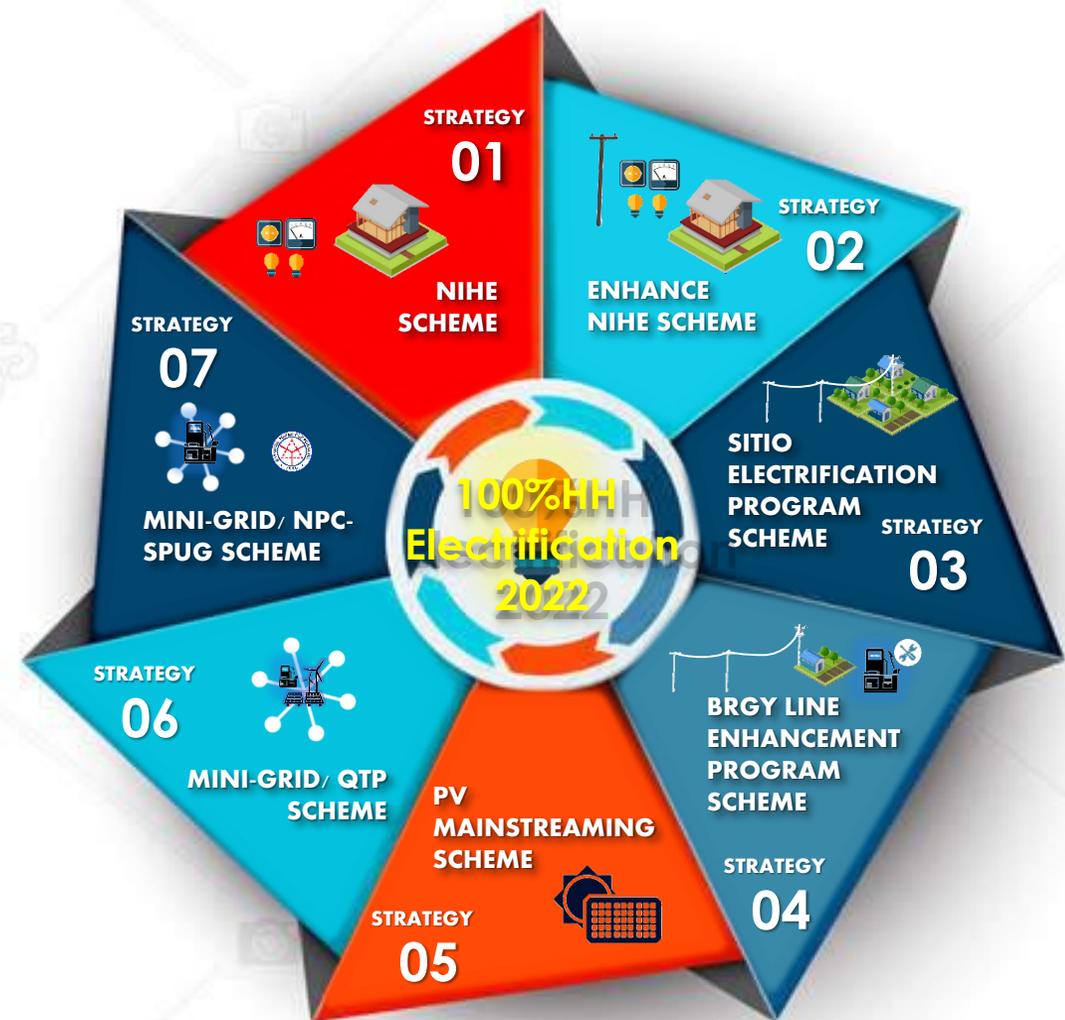


Electrification Strategies to address Unserved Areas



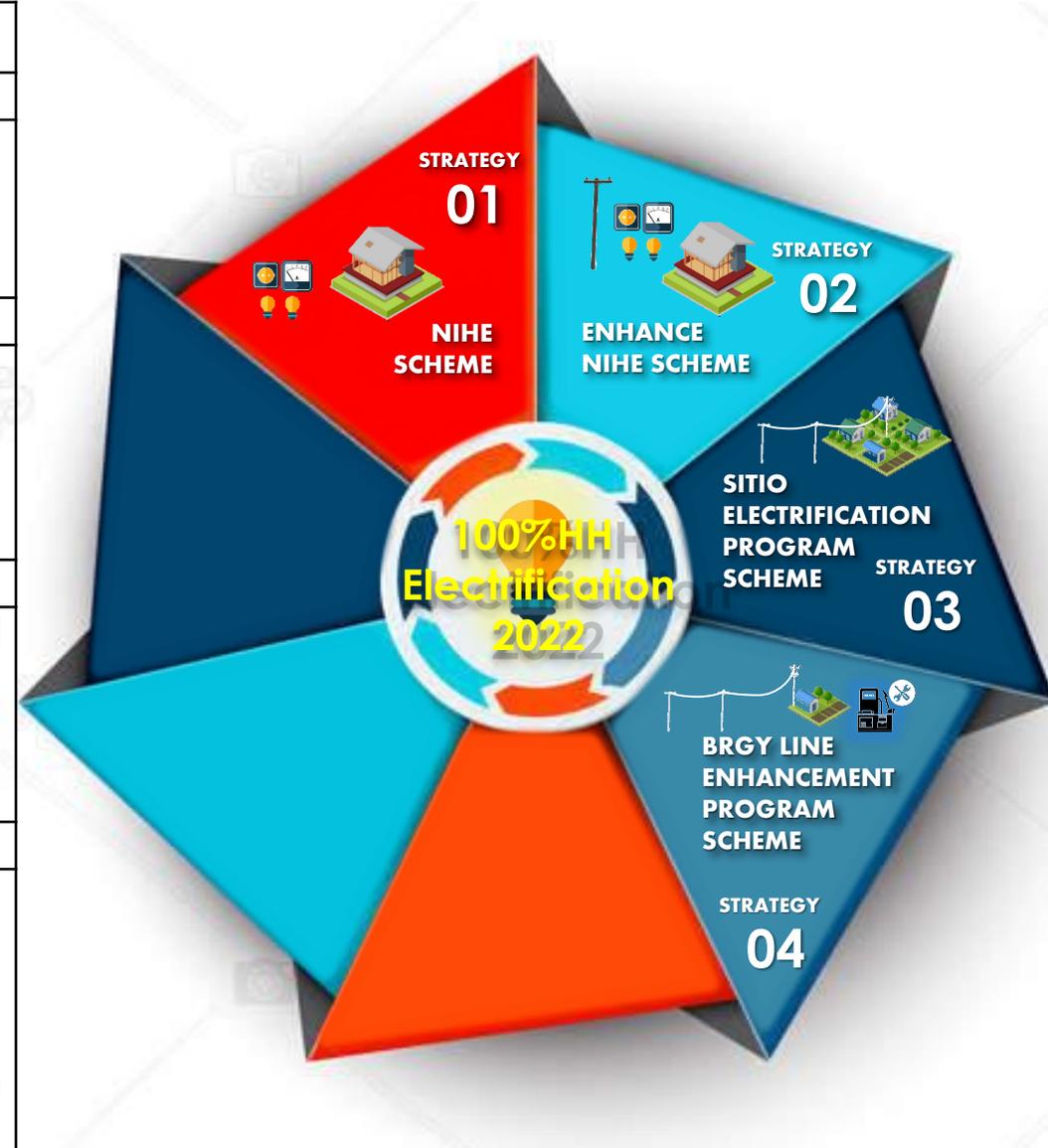
Electrification Strategies to address Unserved Areas

- Program-matching criteria and roll-out scheme to strategically identify appropriate electrification program per specific setup of un-electrified/underserved area/households
- Taking into consideration the **specific type of area: contiguous, island, isolated, etc. vis-as-vis the viability of the areas**
- Strategies subdivided into:
 - Household Electrification
 - Grid Electrification
 - Off-grid electrification



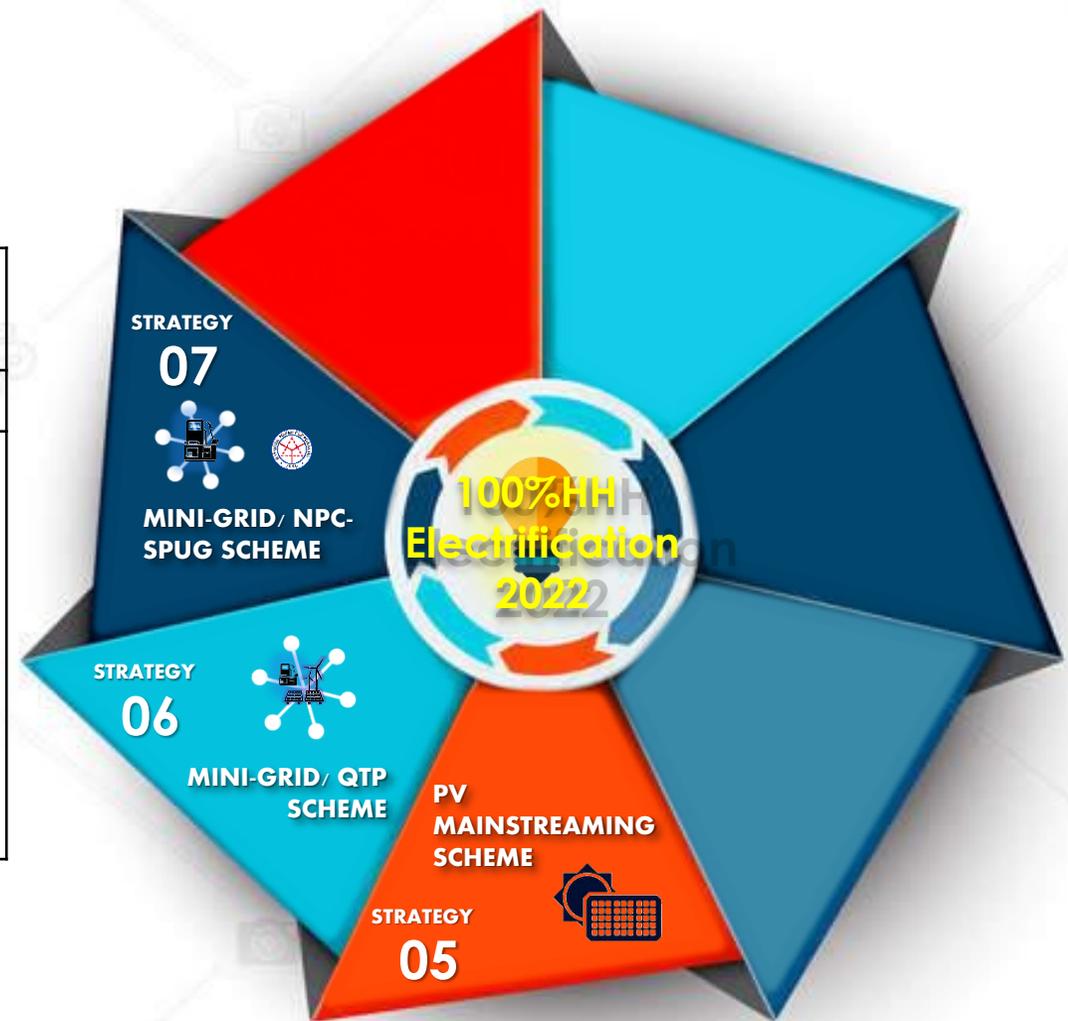
Household & Grid Electrification Strategies for Unserved Areas

Area/Household Configuration	Description of program
1. Nationwide Intensification of Household Electrification (NIHE) SCHEME	
Households situated in areas with existing distribution facility	Provision of housewiring subsidy including atleast 2 bulb and 1 convenience outlet, kWhr Meter and Service Drop
2. Enhanced NIHE SCHEME	
Households situated in areas with Existing distribution facility but requires additional 1-3 Poles (more than 30meters)	Aside from housewiring subsidy includes the provision of funding for required additional poles to household situated to distribution facilities of the DUs.
3. Sitio Electrification Program (SEP)	
Clustered households that are viable for grid-extension to nearest tapping point of the ECs and don't have adverse impact on system loss	Provision of funding assistance to fund grid extension project to served areas
4. Barangay Line Enhancement Program (BLEP)	
Clustered households previously energized by off-grid solution that are feasible to grid-extension to nearest tapping point and also the HH situated in a grid-able island or isolated mainland area	Provision of funding assistance to fund grid extension project including: <ol style="list-style-type: none"> 1. Overhead lines, 2. Submarine Cable 3. Enhancement/Upgrading of Distribution lines



Off-grid Electrification Strategies for Unserved Areas

Area/Household Configuration	Description of program
5. PV MAINSTREAMING SCHEME	
Dispersed households are not feasible to grid extension to nearest tapping point and not a contiguous area and unviable to extend the line	Provision of individual PVSHS to household that can provide lighting and charger capability. <ol style="list-style-type: none"> 1. PVM- EU funded 2017-2019 2. Continue the program Budget 2019



Renewable Energy based Off-grid Electrification Solution

PV Mainstreaming Projects 2011-2013

PILOT-TESTING OF THE PV MAINSTREAMING PROJECT THROUGH THE “FEE-FOR-SERVICE” MODEL WITH THE SIX (6) ECS IN THE VISAYAS FROM 2011-2013 To A Total of 3002 Hhs

BANELCO, Bantayan, Cebu

- 75 Wp SHS to 482 HHs

BOHECO II, Bohol

- 50 Wp SHS to 528 HHs

CEBECO II, Cebu

- 50 Wp SHS to 300 HHs

NOCECO, Negros Occidental

- 75/50 Wp SHS to 544 HHs

VRESCO, Negros Occidental

- 50 Wp SHS to 773 HHs

NORECO I, Negros Oriental

- 50/75 Wp SHS to 375 HHs



Renewable Energy based Off-grid Electrification Solution

Household Electrification Program (HEP) using Renewable Energy System

-From 2011 to 2017, a total of **56,900 PV SHS units (10Wp/30Wp)** were provided to household situated to off-grid areas. **440 units of 75Wp** for communal facilities and **1,505 units of 75Wp Streetlight** facilities.



30-Wp Solar Home System

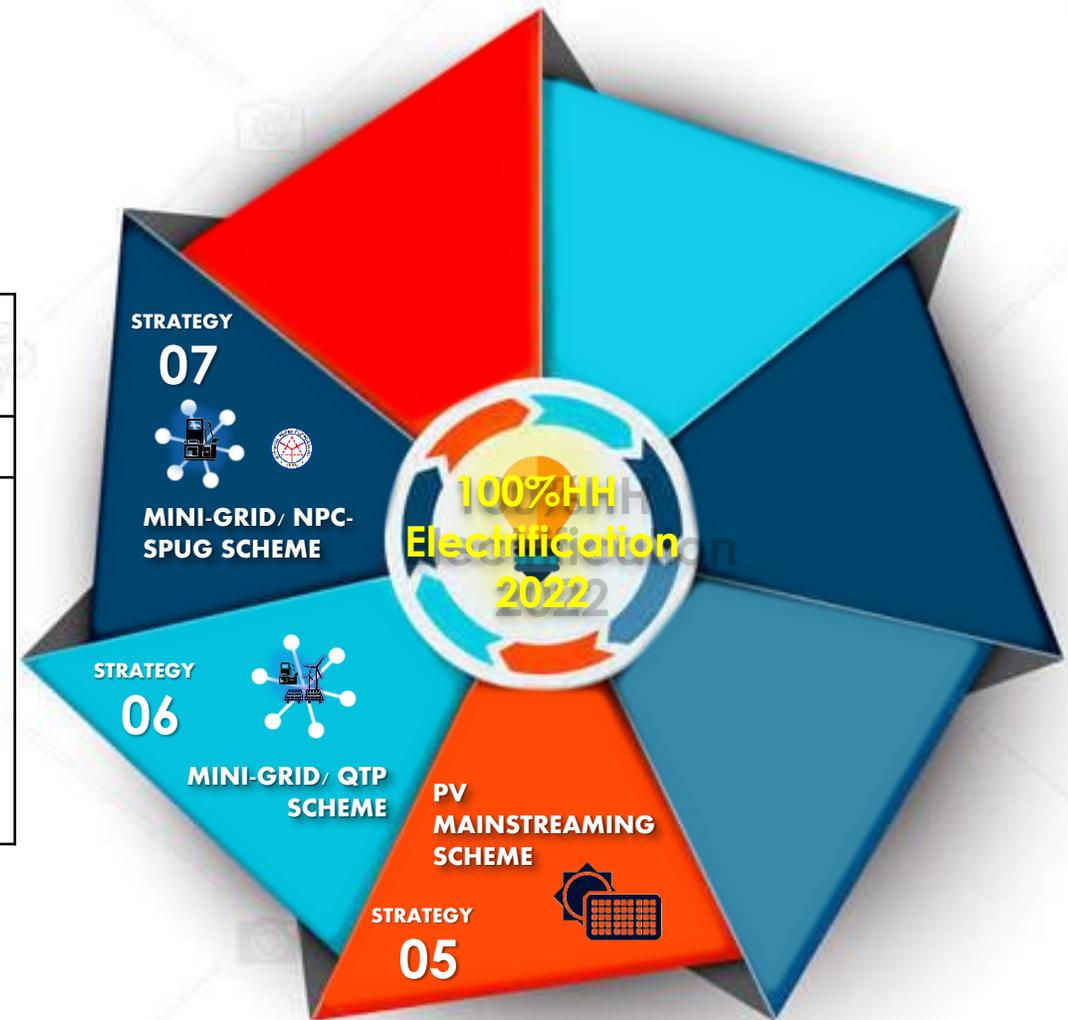


10-Wp Solar Home System



Off-grid Electrification Strategies for Unserved Areas

Area/Household Configuration	Description of program
6. MINI-GRID/ Qualified Third Party (QTP) SCHEME	
Clustered households that are not feasible to grid extension to nearest tapping point and in a contiguous area Viable for mini-grid system	Provision funding for Generation and Distribution Component for Mini-grid. Entry of Private Sector in the form of QTP



Opportunities for RE Based Electrification Solution

Operational Definition of QTP

DOE DC-2005-12-011

- I. An alternative electric service provider (other than DU) that provides service to Unviable Areas Remote/unviable areas cannot be served by DU
- II. Meets the standards and qualification criteria of DOE
- III. Duly qualified and authorized by ERC pursuant to Section 59 of EPIRA and Rule 14 of EPIRA-IRR

Entities who may be eligible as QTP

ERC Res. 22 s. 2006

- I. A candidate QTP chosen through the Selection Process of DOE
 - Requires DOE Endorsement to ERC for authorization as QTP
- II. An Entity who is already engaged in generation and distribution of electricity in Unviable Areas deemed qualified/authorized by ERC



Renewable Energy based Off-grid Electrification Solution

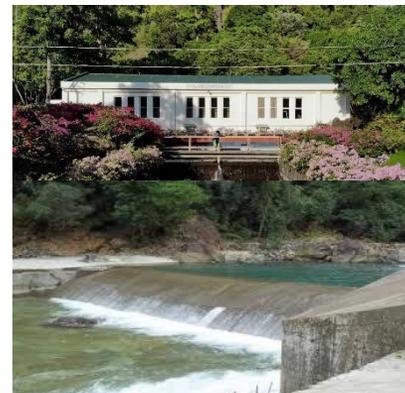
MICROGRID PROJECTS & QUALIFIED THIRD PARTIES (QTP)



EC/DU	Palawan Electric Cooperative, Inc.
Project	Powersource Philippines Inc. Qualified Third Party Project
Capacity	1.05 MW Diesel - Biomass
Households Connected	1744 HHs
Status	Operational, with Authority to Operate, April 2010



EC/DU	Biliran Electric Cooperative, Inc.
Project	Higatangan Micro-Grid Project
Capacity	10 kWp Solar Pv; 50 kW Diesel Generator; 20 kWh + 16 kWh extra BESS
Households Connected	472 HHs
Donor	ELT Korea
Status	October 2018, Commissioning



EC/DU	Romblon Electric Cooperative, Inc.
Project	Cantingas Mini-Hydro
Capacity	1,350 kW Hydro Plant
Households Connected	
Status	Completed, December 2009
Business Model	Joint Venture/Spinoff Company



Renewable Energy based Off-grid Electrification Solution

MICROGRID PROJECTS & QUALIFIED THIRD PARTIES (QTP)



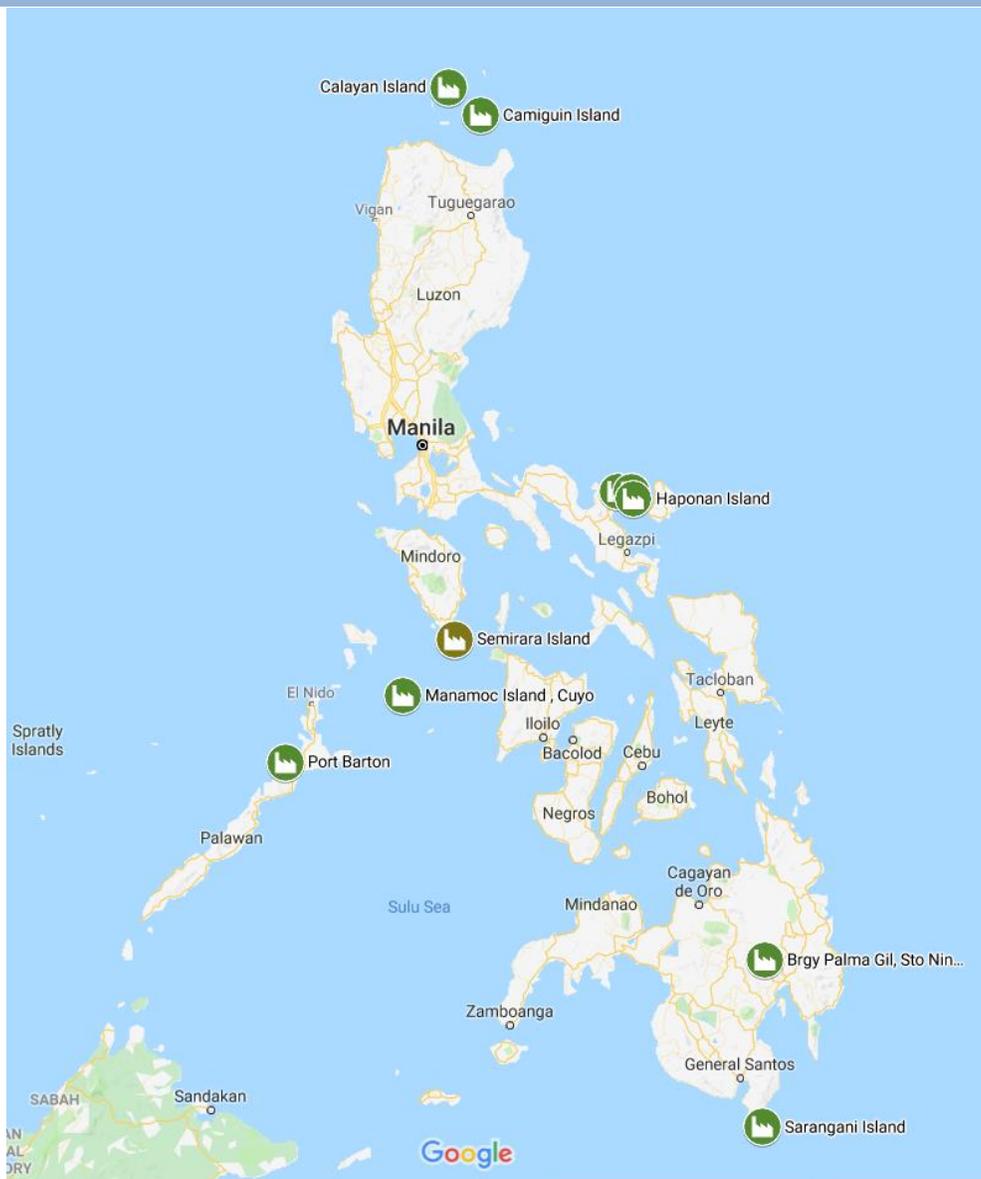
EC/DU	Davao del Sur Electric Cooperative, Inc.
Project	Dalupan Micro Hydro Power Plant
Capacity	25 kW Hydro
Households Connected	194 HHs
Status	Operational



EC/DU	Romblon Electric Cooperative, Inc.
Project	Cobrador SolarDiesel-Energy Storage Hybrid System
Capacity	30 kW Solar PV; 180 kWh Lithium-ion Batteries; 15 kW Diesel Generator
Households Connected	244 HHs
Status	Completed, March 2016
Business Model	Grant Fund/Commercial Loan

Opportunities for RE Based Electrification Solution

Initial Potential Sites in the Philippines for Mini/Micro-grid Systems for QTP players

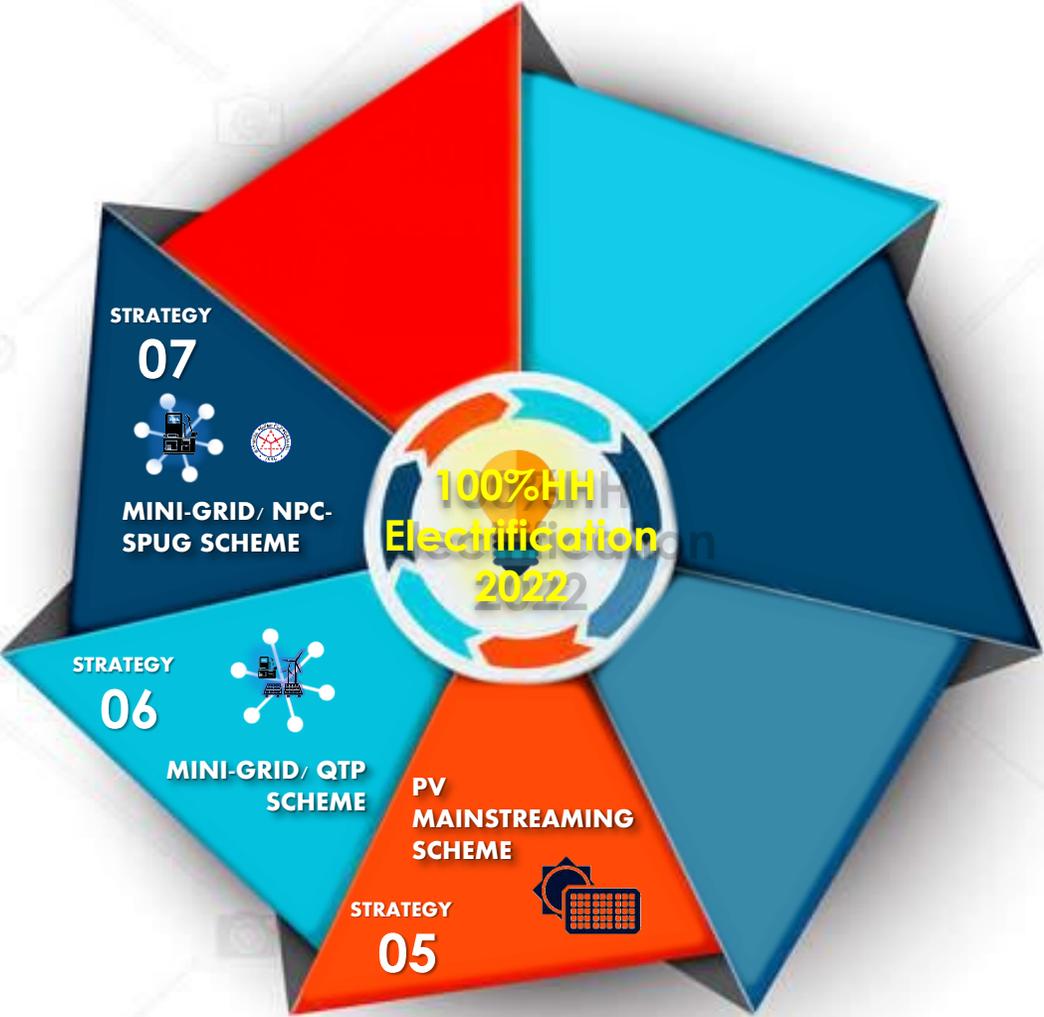


PROJECT LOCATION	TECHNOLOGY	TARGET HHs	PROPONENT	STATUS
Semirara Island, Caluya, Antique	-	-	SEUI	For submission of final technical and financial proposal
Lahuy Island, Haponan Island in Municipality of Caramoan and Quinasalag Island in the Municipality of Garchitorena, Camarines Sur	-	-	FPIEC	Ongoing processing of application
Sarangani Island, Davao Occidental	-	-	-	For reposting of public notice
Calayan and Camiguin Islands, Calayan, Cagayan	-	-	-	For reposting of public notice
Barangay Palma Gil, Barangay Sto. Nino, Barangay Dagohoy in the Municipality of Talaingod, Davao del Norte	-	-	-	For posting
Bgy. Poblacion, Dumarán and Bgy. Manamoc, Cuyo, Province of Palawan	-	-	PSPI	Ongoing processing of application
Bgy. Port Barton, San Vicente, Palawan	-	-	PSPI	Ongoing processing of application

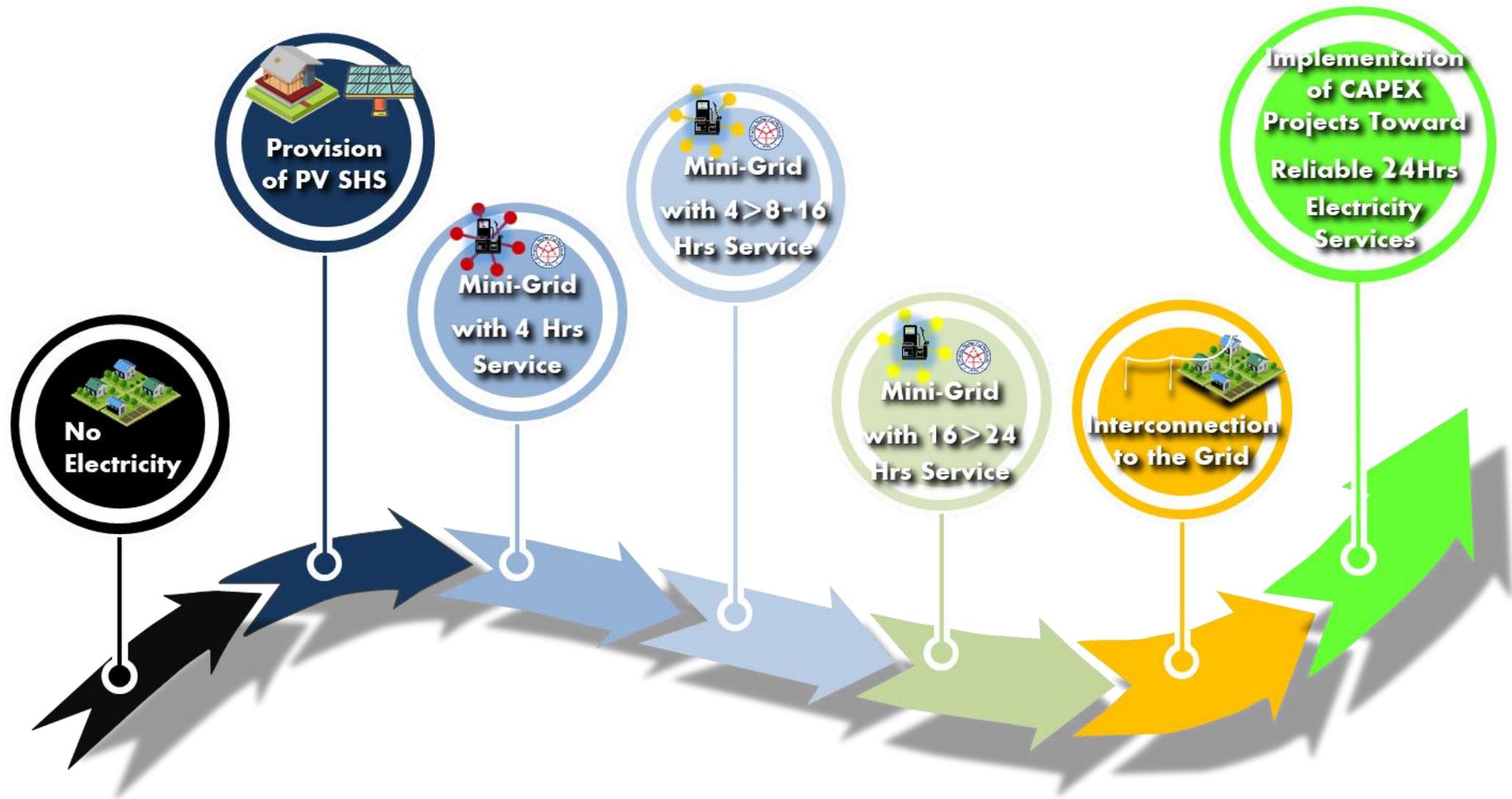


Off-grid Electrification Strategies for Unserved Areas

Area/Household Configuration	Description of program
7. NPC-SPUG MINI-GRID SCHEME	
Clustered (contiguous) households that are not feasible to grid extension to nearest tapping point and unviable for mini-grid system where No QTP Players have energized	Provision funding for Generation and Distribution Component by NPC-SPUG



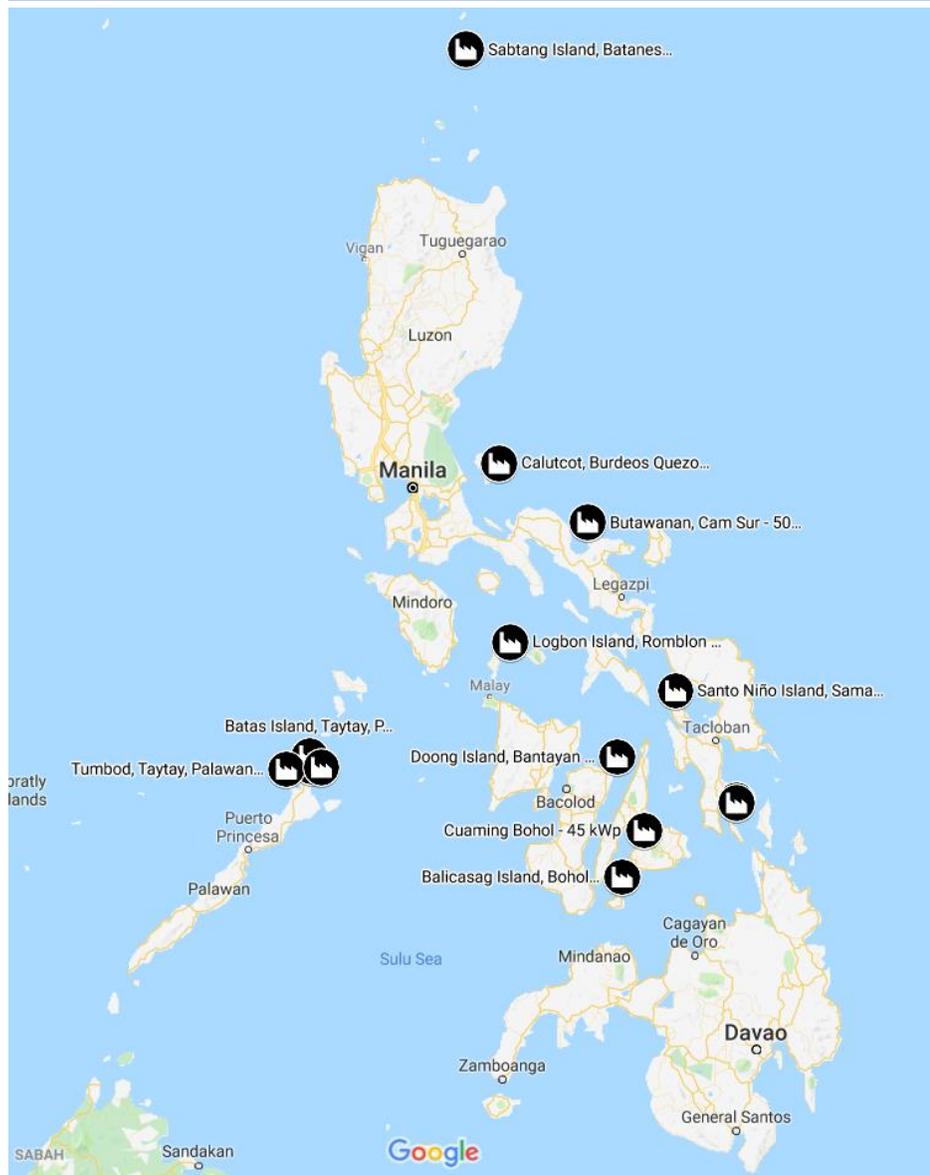
Strategy Handling Underserved Areas



Opportunities for RE Based Electrification Solution

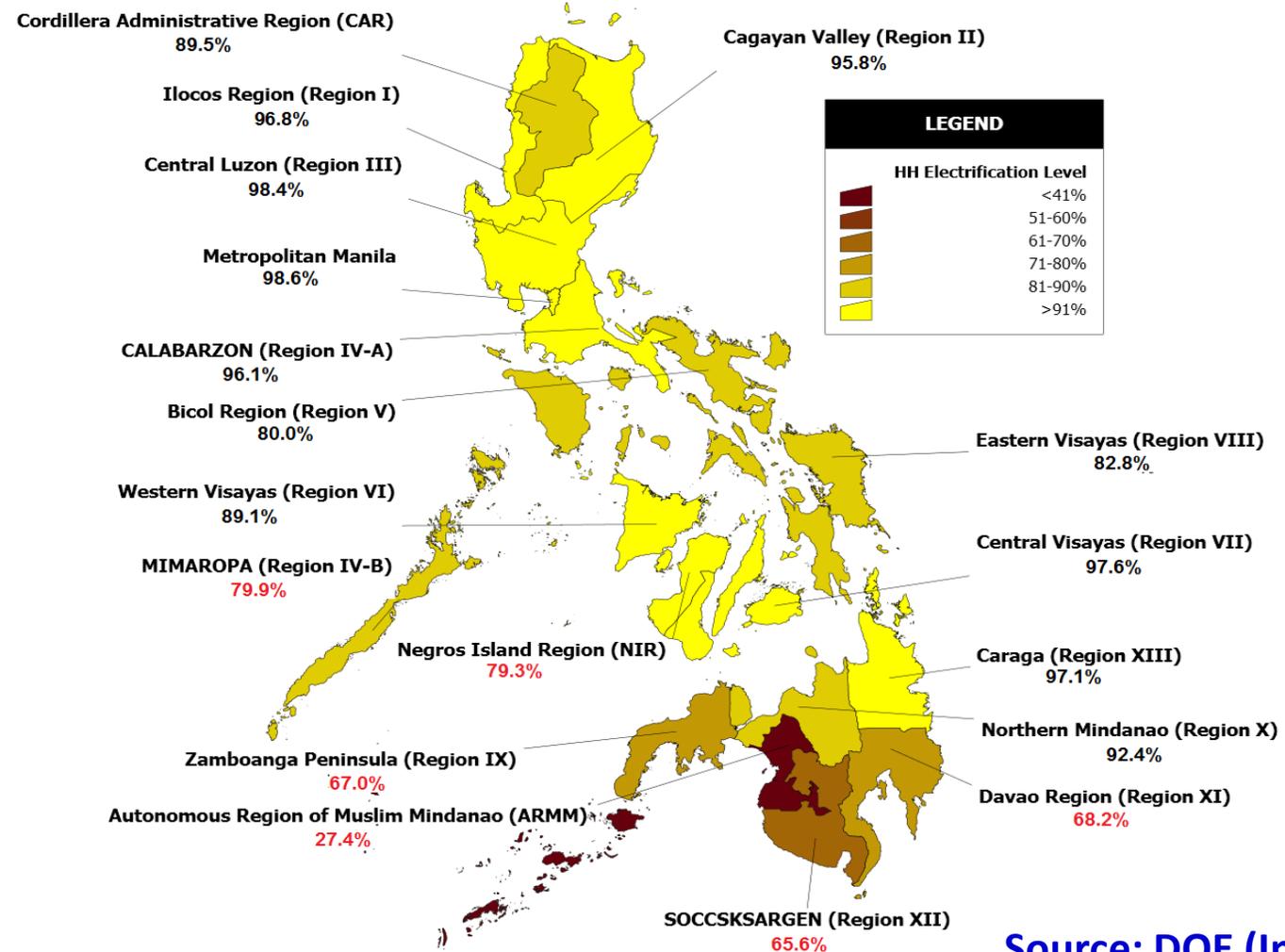
Initial Potential Sites in the Philippines for Hybridization of NPC Diesel Plants

- Butawanan, Siruma, Cam. Sur (50 kWp)
- Calutcot, Burdeos, Quezon (50 kWp)
- Depla, Taytay, Palawan (50 kWp)
- Meytegued, Taytay Palawan (38 kWp)
- Batas, Taytay, Palawan (50 kWp)
- Tumbod, Taytay, Palawan (50 kWp)
- Debangan, Taytay, Palawan (38 kWp)
- Sabtang Island, Batanes (125 kWp)
- Santo Niño Island, Samar (300 kWp)
- Logbon Island, Romblon (30 kWp)
- Doong Island, Bantayan Cebu (400 kWp)
- San Pedro, Hinunangan, S. Leyte (38 kWp)
- San Pablo, Hinunangan, S. Leyte (38 kWp)
- Balicasag, Bohol (55 kWp)
- Cuaming, Bohol (45 kWp)



Target Areas of LFP-Total Electrification Program 2019

HH Electrification Level per Region as of December 31, 2017



- All target areas for both PV SHS and Mini-Grid Projects are all unserved areas that will be determined by the TFEM-TWG in coordination with NEA, NPC and the concern ECs/DUs based on the appropriate technology/strategy as provided in Consolidated MasterPlan to be reviewed by the Task Force to avoid double funding.

Source: DOE (Initial Estimate)

Way Forward

Finalizing the National Unified Strategy for Total Electrification

- Inventory and Uniform Database of all Unserved, Underserved and Unviable Areas in the country
 - List of existing electrification projects and no. of beneficiary HHs
 - List of proposed programs and actions to address last-mile stretch of household electrification
 - Budgetary requirements for each of the program/project
 - Recommendation on Issue that will be encountered by the DU to implement the project.
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- **Identification of potential partners specifically in Off-grid Electrification in the country**



Thank you.

