ENERGY TRANSITION PARTNERSHIP

Powering Prosperity and Enabling Sustainability in South East Asia

Demand Side Management for the Philippines

Distribution Utilities Survey Report

Assessment of Readiness of Distribution Utilities and Economic Zones for DSM

By

IIEC
International Institute for Energy Conservation

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UNOPS · AFD · Federal Ministry for Economic Affairs and Climate Action · Department for Energy Security & Net Zero · Environment and Climate Change Canada / Environnement et Changement climatique Canada · CIFF Children's Investment Fund Foundation · Sequoia Climate Foundation · Australian Government Department of Climate Change, Energy, the Environment and Water

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1 INTRODUCTION

1.1 Background

The Southeast Asia Energy Transition Partnership (ETP) brings together governments and philanthropies to work with partner countries in the region - to contribute to the achievement of the UN's Sustainable Development Goals (SDGs) and the Paris Climate Agreement objectives. ETP supports the transition towards modern energy systems that can simultaneously ensure economic growth, energy security, and environmental sustainability. ETP's strategy is built around four inter-related pillars of strategic engagement that are squarely aligned to address the barriers to energy transition. These are (i) policy alignment with climate commitments, (ii) de-risking energy efficiency and renewable energy investments, (iii) extending smart grids, and (iv) expanding knowledge and awareness building.

This technical assistance, under the ETP, for the Philippine Department of Energy (DOE) will establish a Demand Side Management (DSM) Program for the electric power industry for the reduction of energy demand by promoting a range of strategies that influence and encourage end-users to reduce electricity consumption, shift load patterns, and reduce peak demand. DSM will enhance distribution grids' efficiency, enhance system flexibility and reliability, and delay the need for additional power plants. The TA will strengthen the implementation of the policy by delivering capacity building and developing a DSM toolkit. The combined impact of reduced energy consumption and increased penetration of variable renewables to the grid will result in more significant GHG emissions reduction and displace fossil-fuel based power generation.

The Philippines is unique in that there are 148 electricity distribution utilities (DUs) operating across the country and it is a regulated business requiring a franchise. The DUs comprise 19 private investor-owned utilities (PIOUs), 121 Electric Cooperatives (ECs), 5 EnerZones[1], 2 local government units (LGU) and 1 Multi-purpose Cooperative (MPC). Technical and financial capacities to undertake DSM programs among these DUs are varied and it is vital that the readiness to develop and implement DSM programs by these DUs are well understood. Considering this, the survey of distribution utilities in the Philippines was conducted under the Component C (DSM Implementation Plan) of the TA to evaluate the capacity and readiness of DUs in the Philippines pertaining to DSM program development and implementation.

1.2 Survey Overview

This survey was designed to support the development of a DSM Implementation Plan and the primary objective of the survey is to determine the readiness of DUs and EnerZones in design and implementation of DSM programs. The secondary objective of the survey is to determine specific training and capacity building areas required by the DUs and EnerZones.

[1] Enerzones are privately-owned distribution utilities that power the communities and businesses in the assigned economic zones.

2 SURVEY OVERVIEW AND METHODOLOGY

2.1 Profile of DUs in the Philippines

The Philippines have deregulated their electricity sector following the enactment of Republic Act (R.A.) No. 9136 or EPIRA of 2001. The Independent Electricity Market Operator of the Philippines Inc. (IEMOP), a non-stock, non-profit corporation, serves as the market operator of the Wholesale Electricity Spot Market (WESM). The main grid's transmission system remains a government asset and is owned by the National Transmission Corporation (TransCo). The National Grid Corporation of the Philippines (NGCP) operates and maintains the transmission system through a concession agreement. Delivery of electricity to the end-users is the responsibility of the distribution sector, which is served by 148 DUs as described earlier. Most of these DUs, except EnerZones and LGUs, operate under the regulatory authority of the Energy Regulatory Commission (ERC). In addition to the ERC's regulatory framework, ECs also operate under supervision of the National Electrification Administration (NEA). ERC was created by EPIRA as an independent, quasi-judicial regulatory body to promote competition, encourage market development, ensure customer choice and penalize abuse of market power in the electricity industry. NEA, according to the National Electrification Administration Reform Act of 2013 (Republic Act No. 10531), is authorized and empowered to, among others, supervise the management and operations of all electric cooperatives (ECs), to pursue the total electrification of the country through the ECs by way of enhancing distribution development, and to ensure the economic and financial viability and operation of all ECs.

The structure of the power industry in the Philippines, showing different layers of responsibilities among DOE, ERC and NEA, is illustrated in Figure 2-1.

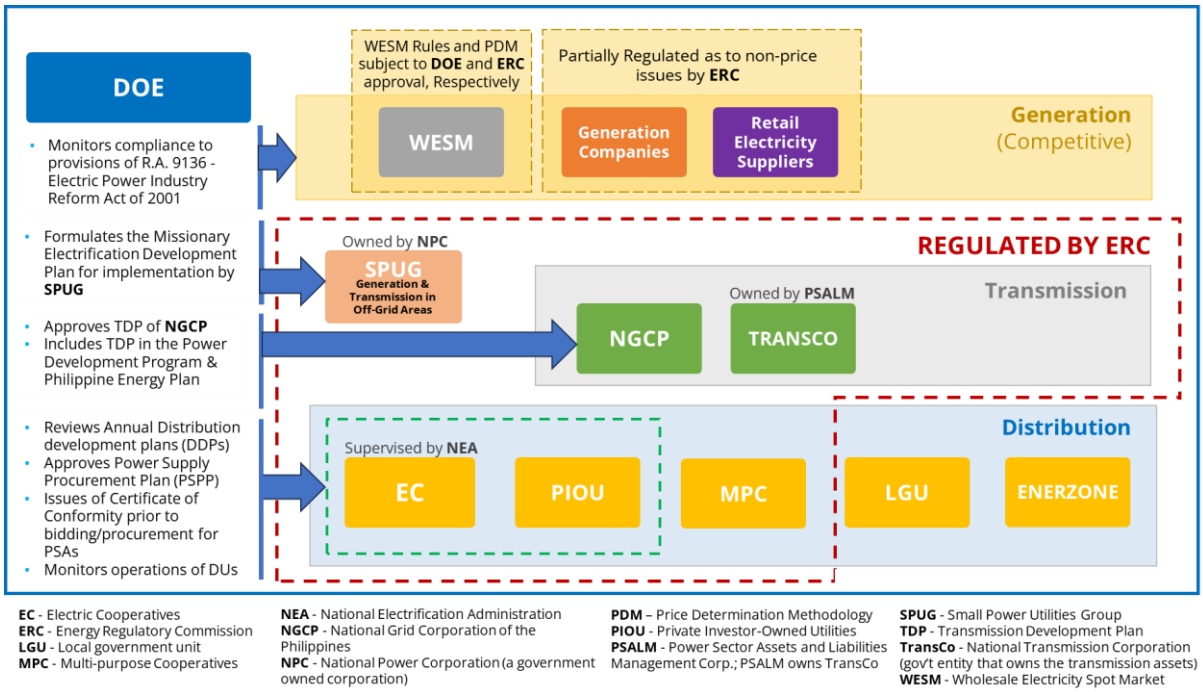
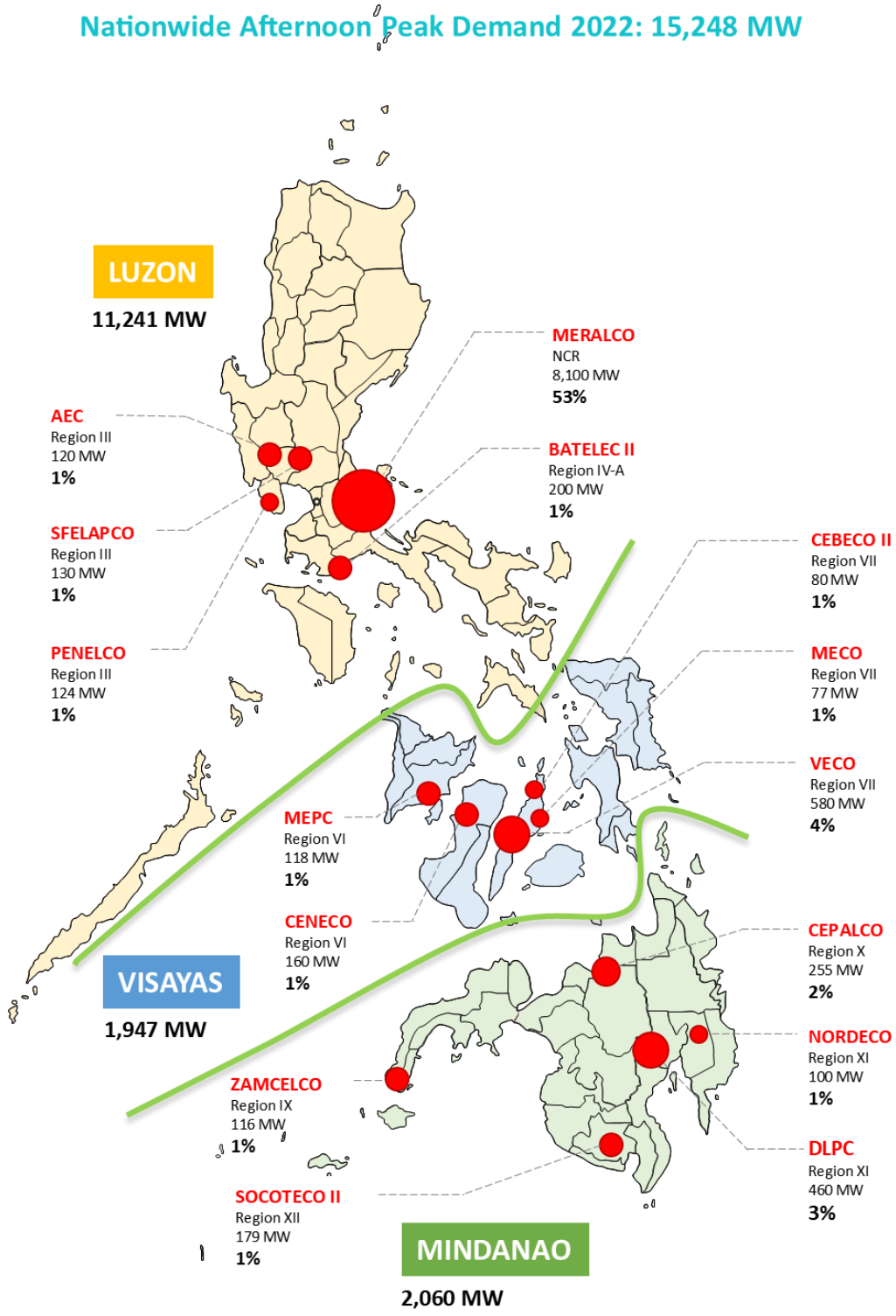


Figure 2-1: Structure of the Philippine Power Industry and Role of Key Stakeholders

Analysis of utility data provided in the Procurement Supply Procurement Plan (PSPP) reports submitted to DOE by DUs in 2023 (with data until the end of 2022) reveals that top five DUs in

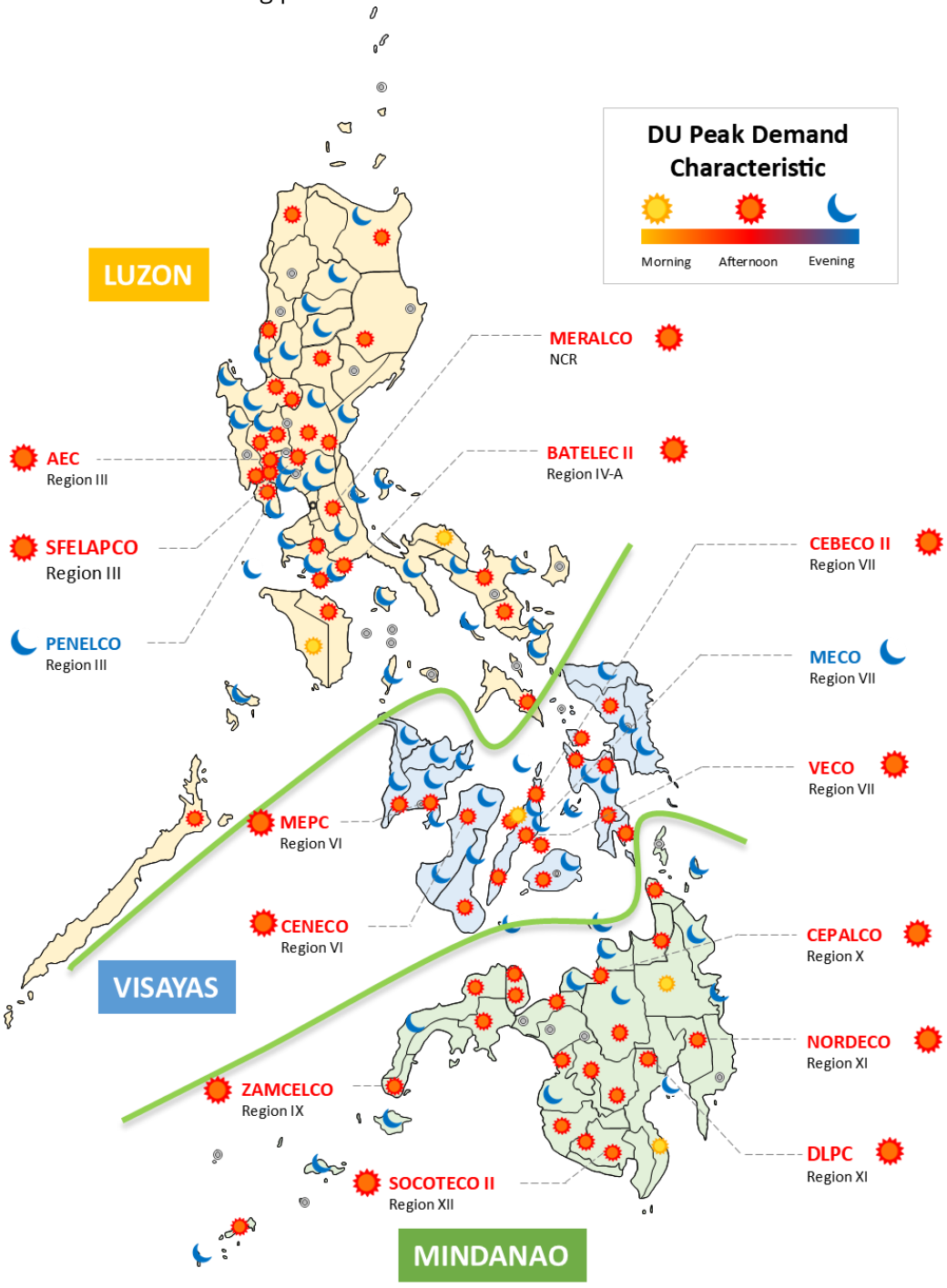
Luzon, Visayas, and Mindanao cumulatively contribute around 74% of the afternoon nationwide peak demand in 2022, as illustrated in Figure 2-2.



Source: Author's analysis based on 2023 PSPP reports

Figure 2-2: Contributions of Large DUs to Afternoon Peak Demand in the Philippines

Figure 2-3 shows typical daily load profiles of DUs in the Philippines based on 2023 PSPP reports. It is found that most top five DUs in each region have afternoon peaks, while other DUs can be classified as small DUs since the contribution of each individual DU to the national peak demand is less than 1%. 33% of these small DUs have afternoon peaks and 64% have evening peaks. There are also few DUs with morning peak demand and all of which are ECs.



Source: Author's analysis based on 2023 PSPP reports

Figure 2-3: Typical Peak Demand Profiles of DUs in the Philippines

2.2 Survey Methodology

The DU survey was conducted through distribution of survey questionnaires, developed in consultation with DOE. The survey questionnaire was prepared as an online Google form, divided into 5 sections as follows:

1. **Contact Information** – This section requests the respondent to provide contact details and information such as organization name, address, contact person, title, telephone, and email.
2. **Utility Information** – This section collects relevant DU operating data such as electricity generation (MWh/year), peak demand (MW), customer demographics by different sectors (e.g., residential, commercial, industrial), and electricity sales (MWh/year).
3. **DSM Knowledge and Training** – This section aims to collect relevant information that enablesanalysis of the current level of DSM knowledge and technical capacity within a DU and assessment of specific training needs to build capacity of DU staff in development and implementation of DSM programs.
4. **DSM Activities** – This section collects data on past and ongoing DSM plans and activities implemented by the DU and information on key barriers to the implementation of past and ongoing DSM programs, and additional resources required by the DU.
5. **Additional Information** – This section allows DU to provide more information on issues related to development and implementation of DSM programs.

The final survey questionnaire, as shown in Annex A, was distributed to all DUs in early September 2023 in collaboration with DOE. In addition, NEA provided assistance in following up on feedback from the ECs. The DUs' responses to the survey questionnaire were collected until April 11, 2024, and the analysis of these responses is discussed in Section 3 of this report.

3 ANALYSIS OF RESPONSES FROM DISTRIBUTION UTILITIES

3.1 Summary of the DUs Responded

As of April 2024, 81 DUs, or 55% of all DUs in the Philippines, responded to the survey questionnaires. Table 3-1 summarizes the responses by DU type and it is found that all EnerZones responded to the survey questionnaire. 16 PIOUs, accounting for 84% of all PIOUs, responded to the survey questionnaire, including large DUs such as MERALCO, VECO and CEPALCO. About 50% of ECs responded to the survey questionnaire, while 2 LGUs and 1 MPC did not respond to the survey questionnaire.

Table 3-1: Summary of Responses by DU Type, as of April 2024

Type of DUs	Number of DUs	Number of Respondents	Response Rate (%)
EC	121	60	50%
PIOU	19	16	84%
ENERZONE	5	5	100%
LGU	2	0	0%
MPC	1	0	0%
Total	**148**	**81**	**55%**

In terms of the response rates by region, 61% of DUs in Luzon, 55% in Visayas and 42% in Mindanao, responded to the survey questionnaire, as shown in Figure 3-1.

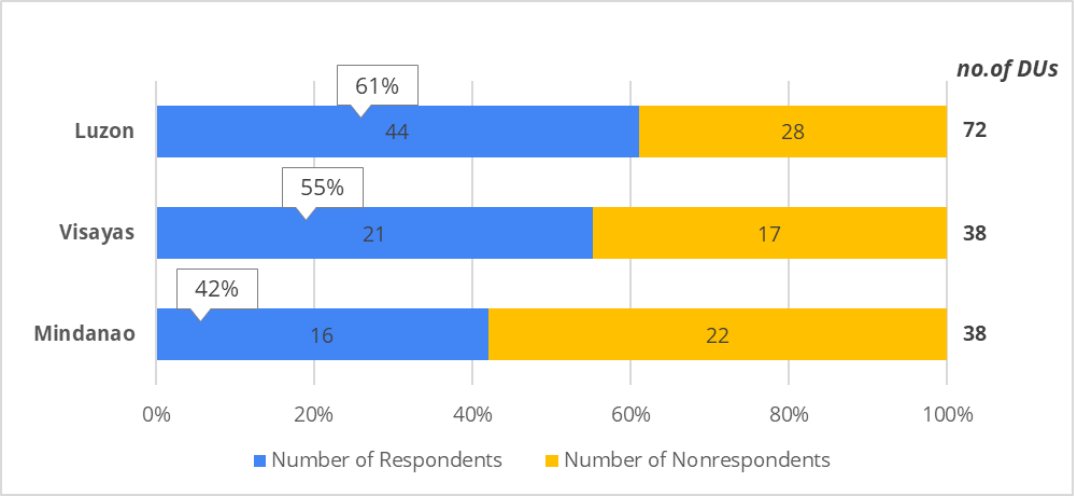


Figure 3-1: Summary of Responses by Region, as of April 2024

3.2 Summary of Utility's Electricity Data

This section reviews the significance of the DU respondents in terms of their cumulative shares of peak demand, electricity sales and number of customers compared with the nationwide data of the same year (2021). The Philippines' total peak demand in 2021 was recorded at 16,036 MW[2]. The operating data on peak demand, electricity sales and number of customers in 2021 reported by the DU's respondents, when compared with the total peak demand of the entire country, are shown in Table 3-2. It is found that although only 55% of all DUs responded to the survey questionnaire, these DUs accounted for 80% of peak demand and electricity sales in 2021. The total number of customers served the DU respondents are also significant, accounting for about 90% of the total electricity customers in the Philippines.

Table 3-2: Comparison of DU Respondents' Operating Data and Nationwide Statistics

Operating Parameters	Nationwide Statistics (2021)	Cumulative Responses	%
Electricity Peak Demand (MW)	16,036	12,751	80%
Electricity Sales (GWh)	87,417,408	69,932,476	80%
Number of Electricity Customers	19,900,000	17,911,067	90%

Note: Number of customers is based on the 2019-2028 Distribution Development Plan issued by DOE.

3.3 DSM Knowledge and Training Needs

The DSM Knowledge and Training section has 6 questions consisting of 5-point Likert scale and direct questions requesting DUs to provide information on their understanding of the DSM, DSM training programs attended, number of staff with understanding and ability to conduct DSM in their own utility, educational qualifications of staff in conducting DSM activities, and the importance of DSM training needed. The results of each question are summarized below.

Question 3.1: How would you rate DSM knowledge of the responsible department/division within your utility?

Knowledge on DSM: 78% of respondents rate their knowledge on DSM as 3 or below for the maximum scale of 5. The summary of the total respondents' knowledge on DSM is given in the Table 3-3 below *(1 to 5, 1 being not knowledgeable at all and 5 being very knowledgeable).*

[2] https://doe.gov.ph/sites/default/files/pdf/energy_statistics/01_Summary%20of%202022%20Power%20Statistics.pdf

Table 3-3: Summary of Responses to Question 3.1 by DUs type

Type of DUs	Scale 1 (Not Knowledgeable at All)	Scale 2 (Slightly knowledgeable)	Scale 3 (Moderately knowledgeable)	Scale 4 (Fairly knowledgeable)	Scale 5 (Very knowledgeable)	Nonrespondent
EC	10	18	22	7	1	2
PIOU	2	2	7	3	0	2
ENERZONE	0	0	2	3	0	0
LGU	0	0	0	0	0	0
MPC	0	0	0	0	0	0
Total	**12**	**20**	**31**	**13**	**1**	**4**

Figure 3-2 are the responses to DSM knowledge in % by DU type. Analysis of the total Likert scale score by type of DUs found that EnerZones have the highest total score of 72%, while PIOUs and ECs reported to have some knowledge on DSM with the total scores of 49% and 48% respectively.

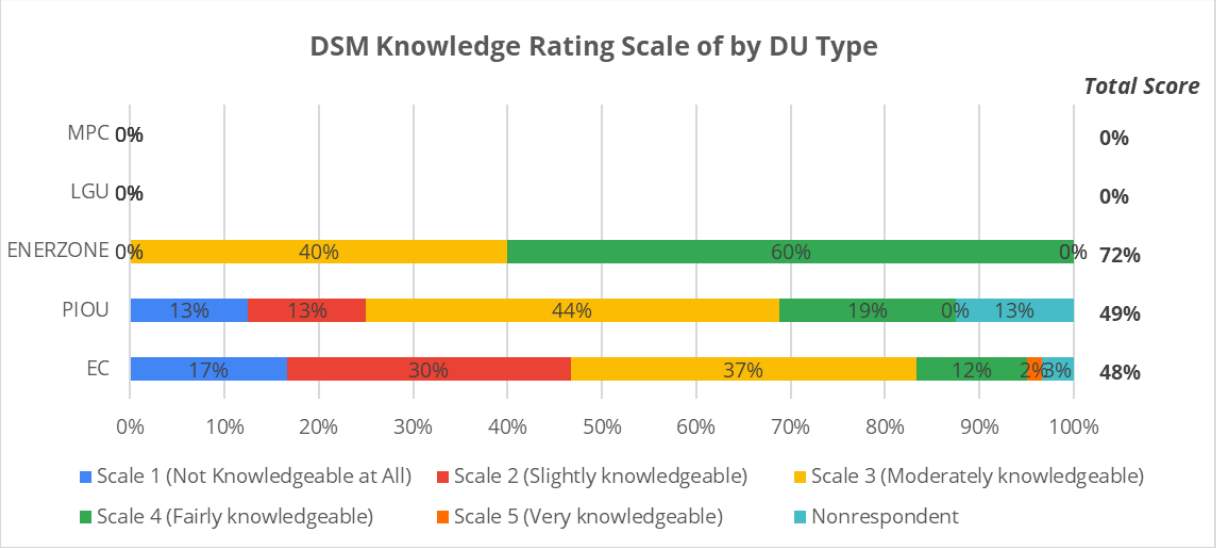


Figure 3-2: Summary of DSM Knowledge Rating Scale in % and Total Score

Question 3.2: How many staff are currently undertaking DSM activities in your utility?

Staff performing DSM activities in the utility: DU respondents reported an average of 1 to 3 staff undertaking DSM activities.

Table 3-4: Total Number of Staff Performing DSM Activities in the Utility by DUs Type

Type of DUs	Responses (in #)	No. of Staff performing DSM activities	Average number of staff per DUs
EC	60	51	Less than 1
PIOU	16	37	2 to 3
ENERZONE	5	8	1 to 2
LGU	N/A	N/A	N/A
MPC	N/A	N/A	N/A
Total	**81**	**96**	**6**

Question 3.3: Have any staff previously attended DSM or energy efficiency training programs? If so, please provide details.

Previous Attendance in DSM or Energy Efficiency Training: On average, only 1 staff from each DU respondent attended previous DSM or energy efficiency training programs. Based on survey responses, these training programs, such as energy conservation training, energy engineering programs, and competency courses (e.g., seminars on EE&C, and DSM on load forecasting and methodology) for energy managers and energy auditors, were organized by government agencies. DU respondents also highlighted insufficient capacity to implement DSM programs.

The summary of the number of staff who have previously attended DSM or EE Training programs is given in the Table 3-5 below.

Table 3-5: Total Number of Staff Previously Attended DSM or Energy Efficiency Training Programs

Type of DUs	Responses (in #)	No. of Staff Previously Attended DSM or EE Training Programs	Average number of staff per DUs
EC	60	6	Less than 1
PIOU	16	12	Less than 1
ENERZONE	5	2	Less than 1
LGU	0	0	0
MPC	0	0	0
Total	**81**	**20**	**1**

The comparison between the number of staff currently undertaking DSM activities and those who have attended DSM or EE training programs reveals a significant gap. Many staff in DUs involved in DSM activities lack formal training in DSM or EE with only around 21% having received such training.

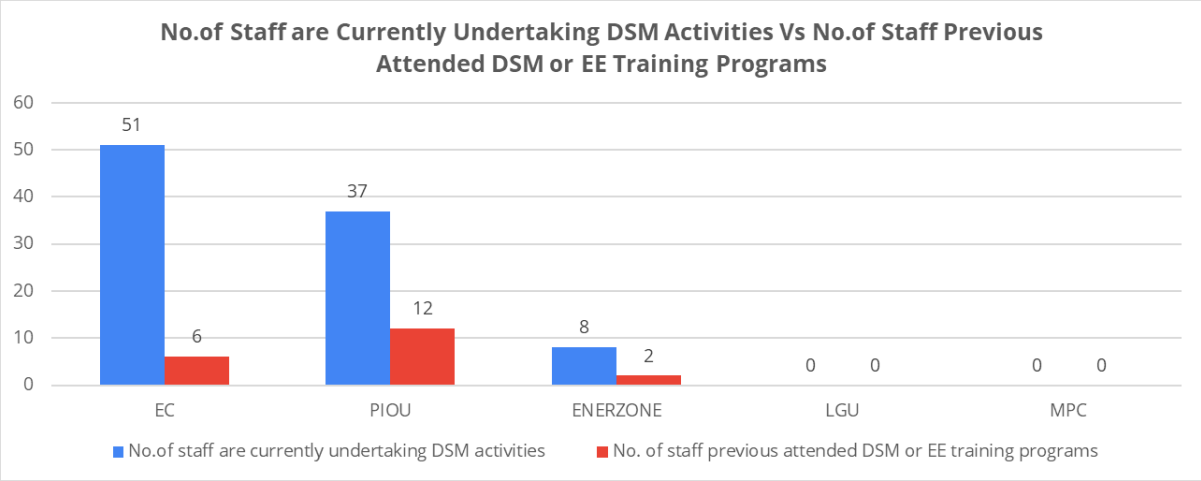


Figure 3-3: Number of Staff Currently Undertaking DSM Activities compare with Staff Previous Attended DSM or EE Training Programs

Question 3.4: What are the educational qualifications of the staff undertaking DSM activities?

Educational Qualifications of Staff Undertaking DSM Activities: Most DSM operational staff have educational qualifications in Engineering, particularly in Electrical Engineering. Some DUs reported other qualifications for DSM operational staff, such as technical knowledge in power system and communication. The survey responses are shown in the Table 3-6 below.

Table 3-6: Summary of Survey Responses on the Educational Qualifications of Staff Undertaking Necessary DSM Activities

Type of DUs	Summary of Educational Qualifications for DSM Operational Staff
EC	- Bachelor's degree in Engineering (Electrical Engineer) or Energy Management - Bachelor of Science in Electrical Engineering (BSEE) - Master's degree in Energy Management - Bachelor of Science in Accountancy (BSA) - College Graduate under the Institute of Sustainable Development (ISD)
PIOU	- Bachelor's degree in engineering - Bachelor of Science in Electrical Engineering (BSEE) - Master's degree in Energy Engineering (MS)
ENERZONE	- Bachelor's degree in Engineering (Electrical Engineer)

LGU	N/A
MPC	N/A

Question 3.5: Do you have sufficient technical capacity to implement DSM programs?

Technical Capacity for DSM Implementation: About 75% responded that they do not have sufficient technical capacity for implementation of DSM programs. The summary of survey responses is given in Table 3-7 and Figure 3-4 below.

Table 3-7: Summary of Survey Responses on Technical Capacity to Implement DSM Programs

Type of DUs	Sufficient	Insufficient	Nonrespondent
EC	10	46	4
PIOU	4	11	1
ENERZONE	1	4	0
LGU	0	0	0
MPC	0	0	0

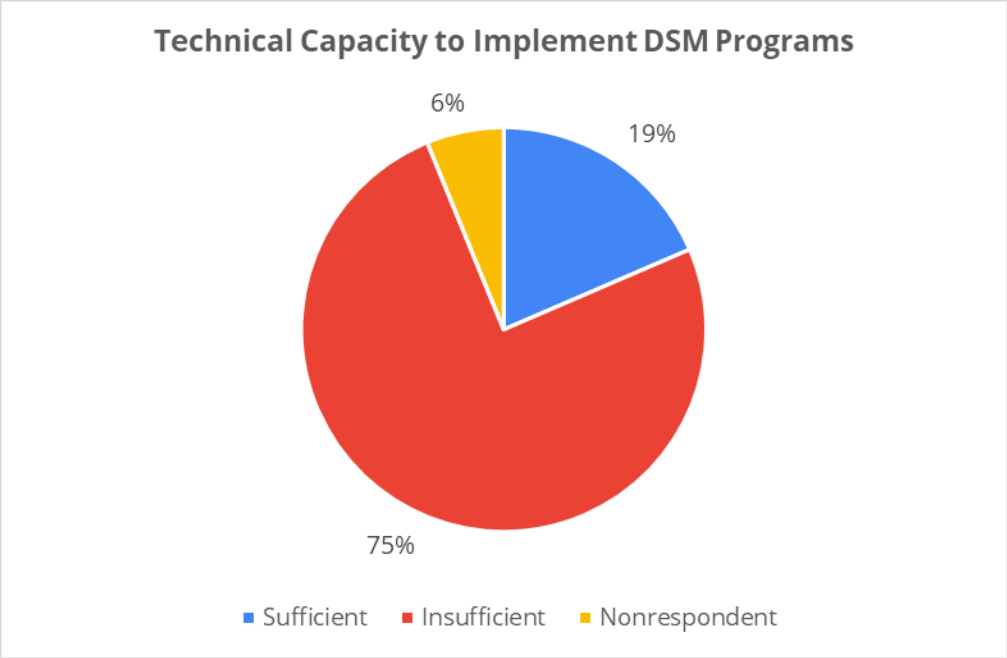


Figure 3-4: Summary of Existing Technical Capacity to Implement DSM Program

Question 3.6: Please specify the importance of each DSM training need

Importance of DSM training: About 70% of respondents rated each training topic outlined in the survey questionnaire as "Very Important", while about 23% rated all topics as "Fairly Important". recognize the importance of DSM training needs. The responses are uniform across different types of DU respondents.

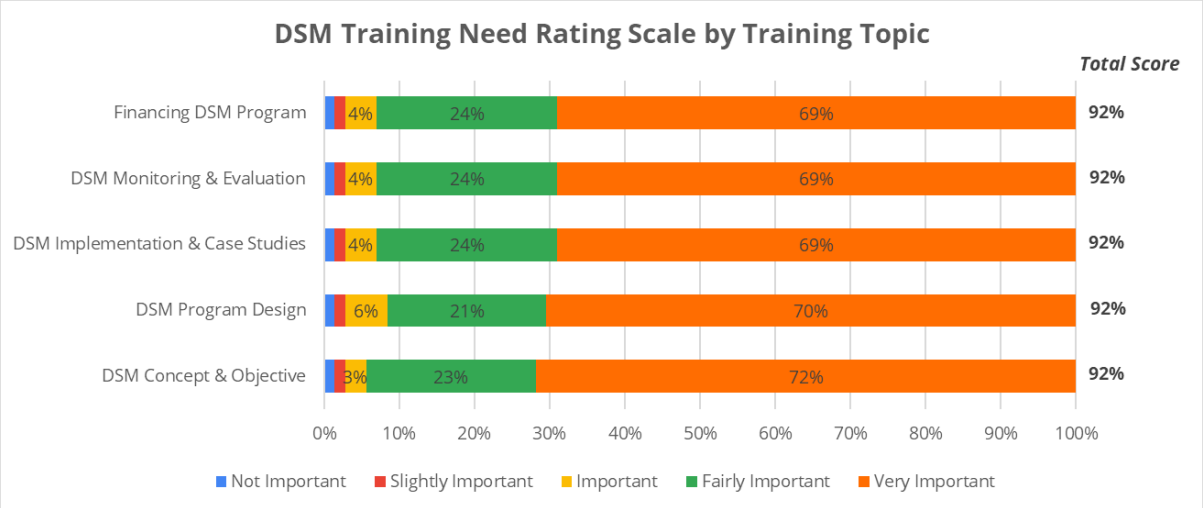


Figure 3-5: Summary of Training Need by Topic in % and Total Score

3.4 Summary of DSM Activities

This section focuses on past and ongoing activities on DSM planning, capacity development, and program implementation, including allocated budget, key barriers, and additional resource needs. It also examines rooftop solar programs, popular installation types, existing installations, and permit requirements within their franchise area.

Question 4.1: Have you prepared a DSM Plan?

Experience in Preparation of DSM Plan: Overall, about 81% of the DU respondents have never prepared any DSM plans. Evaluation of the survey responses by DU type found that 31% of PIOU and 20% of EnerZone respondents (one EnerZone) reported experience in preparation of DSM plans, while only 8% of EC respondents reported similar experience. Experience in preparation of DSM plan has no relationship with types and sizes of DUs as the responses show that there are large PIOUs and ECs with no experience in DSM planning, while some smaller PIOUs and ECs have experience in preparing DSM plans. This may be due to a lack of human resources for developing such plans as outlined in the responses to questions 3.4 and 3.5 regarding the number of staff engaged in DSM activities or staff who have received DSM training.

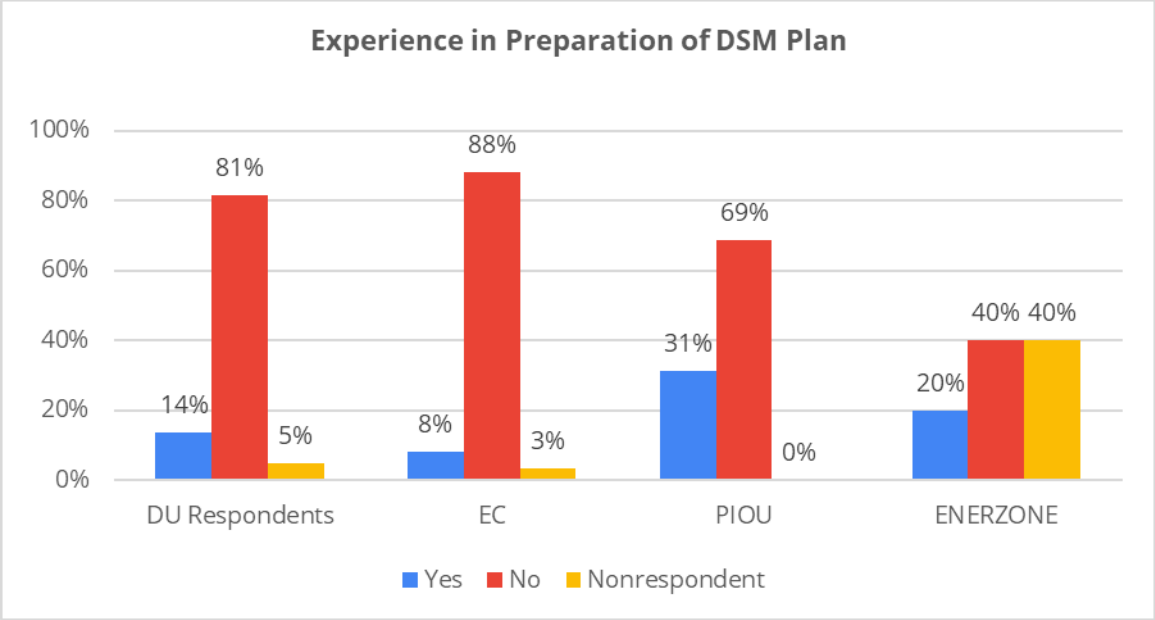


Figure 3-6: Summary of Experience in Preparation of DSM Plan

Question 4.1.1: If you have prepared a DSM Plan, which year you prepared the plan?

Year in which DSM Plans Prepared: Not all the DU respondents that specified experience in preparation of the DSM plans provided information on the years when the DSM plans were prepared. For those who provided the info, 2016 was reported as the earliest year the DSM plan was prepared, and 2 DSM plans were prepared in 2023.

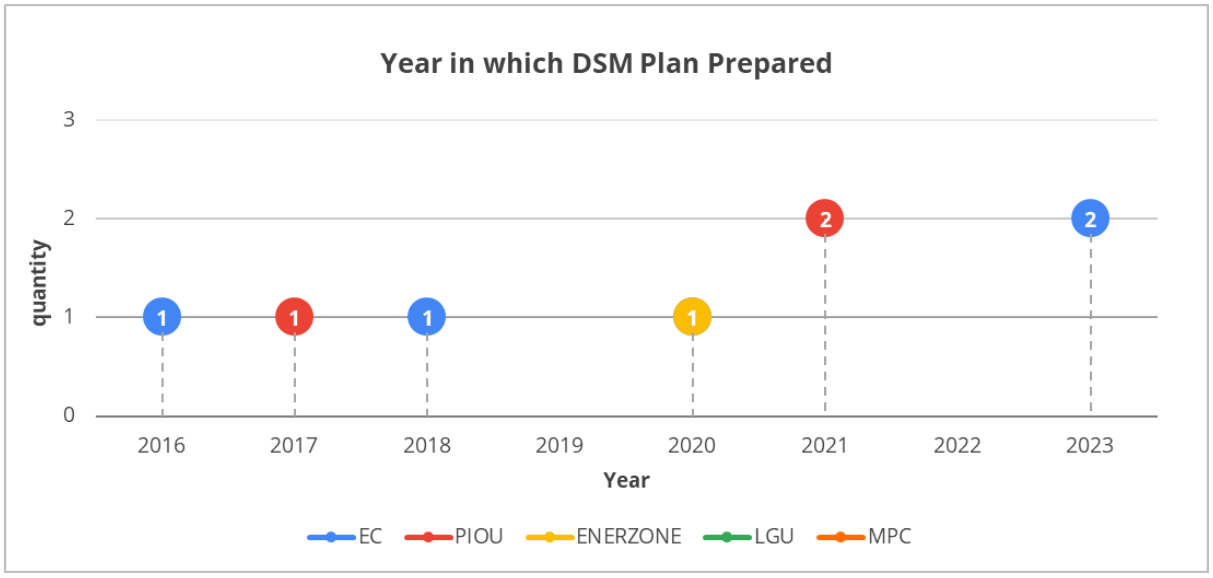


Figure 3-7: Years in which DSM Plans Prepared

Question 4.2: What are the key DSM programs in the Plan? (Please provide titles of the DSM programs)

Key DSM Programs in the Plan: The majority of the DSM programs in the plans relate to load management programs, such as the Interruptible Load Program (ILP), followed by programs aimed at promoting energy efficiency and conservation (EE&C). The results are summarized in the Table 3-8 below.

Table 3-8: Summary of Survey Responses on Key DSM programs in the Plan

Type of DUs	Key DSM Programs in the Plan
EC	Load Management: - Shifting Schedule of Operations of Industrial Sectors - Interruptible Load Program (ILP) - Automatic and manual load dropping scheme for large load customers/feeders/substations - Demand Response (DR) Energy Efficiency and Conservation (EE&C): - Information and education campaign / energy usage calculator / NOCECO label for energy efficiency Others: - Power Supply Procurement Plan (PSPP)
PIOU	Load Management: - Interruptible Load Program (ILP) - Peak/Off-Peak Program (POP) - Load Shifting of Identified Key Accounts - Voluntary Load Curtailment (VLC) - System Loss Reduction - Embedded Generation Program Energy Efficiency and Conservation (EE&C): - EE&C Educational Campaign - Information Drive for Residential and Commercial Customers Energy Conservation - Lighting Efficiency Programs - Promotion of Electric Vehicles - Power Factor Improvement Distribution and Infrastructure Improvement: - MERALCO's Distribution Tariff Design - Net Metering Program (NM) - Prepaid Retail Electric Service (PRES) Customer Engagement and Communication:

	- Information, education and communication (IEC) to Customers
ENERZONE	- DSM is being done by a separate team from the shared units/functions.

Question 4.3: Based on the key DSM programs in Section 4.2, please list the programs that have been or are being implemented.

DSM programs Implemented: The DSM programs that have been implemented by PIOUs and ECs are those focusing on Load Management Programs, such as Interruptible Load Program (ILP), Peak/Off-Peak Program (POP), Voluntary Load Curtailment (VLC), followed by programs aimed at promoting energy efficiency and conservation (EE&C), such as Lighting Efficiency Programs or EE&C Educational Campaigns.

Table 3-9: Summary of Survey Responses on DSM Programs Implemented

Type of DUs	Key DSM Programs in the Plan
EC	Load Management Programs: - Automatic and Manual Load Dropping Scheme for Large Load Customers/Feeders/Substations - Shifting Schedule of Operations of Industrial Sectors - Interruptible Load Program (ILP) - Voluntary Load Curtailment (VLC) - Emergency Response Information and Education: - Information and Education Campaign Others: - Power Supply Procurement Plan (PSPP)
PIOU	Load Management: - Interruptible Load Program (ILP) - Peak/Off-Peak Program (POP) - Power Factor Improvement - Embedded Generation Program Energy Efficiency and Conservation (EE&C): - Lighting Efficiency Programs - Energy Efficiency and Conservation (EE&C) Educational Campaign - Promotion of Electric Vehicles Customer Engagement and Communication: - Information, education, and communication (IEC) to Customers - Information Drive for Residential and Commercial Customers Energy Conservation
ENERZONE	- DSM is being done by a separate team from the shared units/functions.

Question 4.4: Do have a sufficient budget allocation for DSM programs?

Budget Allocation for DSM Programs: About 63% did not comment on the sufficiency of the DSM budget allocation, while 23% responded that they do not have sufficient budget allocation for DSM programs. The summary of survey responses is shown in Figure 3-8 and Table 3-10 provides the responses breaking down by type of DUs.

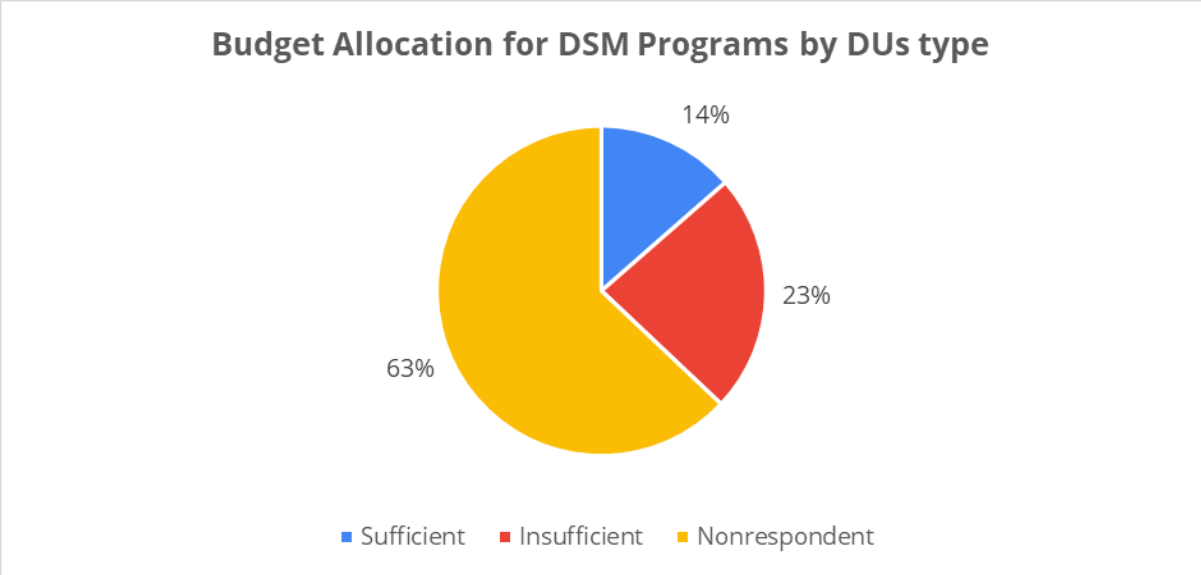


Figure 3-8: Summary of Survey Responses on Sufficiency of Budget Allocation for DSM Programs

Table 3-10: Summary of Survey Responses on Sufficiency of Budget Allocation for DSM Programs

Type of DUs	Sufficient	Insufficient	Nonrespondent
EC	6	17	37
PIOU	4	2	10
ENERZONE	1	0	4
Total	**11**	**19**	**51**

Question 4.5: What are the key barriers you have identified for implementation of DSM programs?

Key Barriers to DSM Program Implementation: 70% of the DU respondents highlighted that lack of awareness, knowledge and human resources are the main barriers to DSM program implementation, closely followed by organizational/staffing difficulties (69% of the DU respondents). The summary of survey responses on key barriers is shown in the Table 3-9 below.

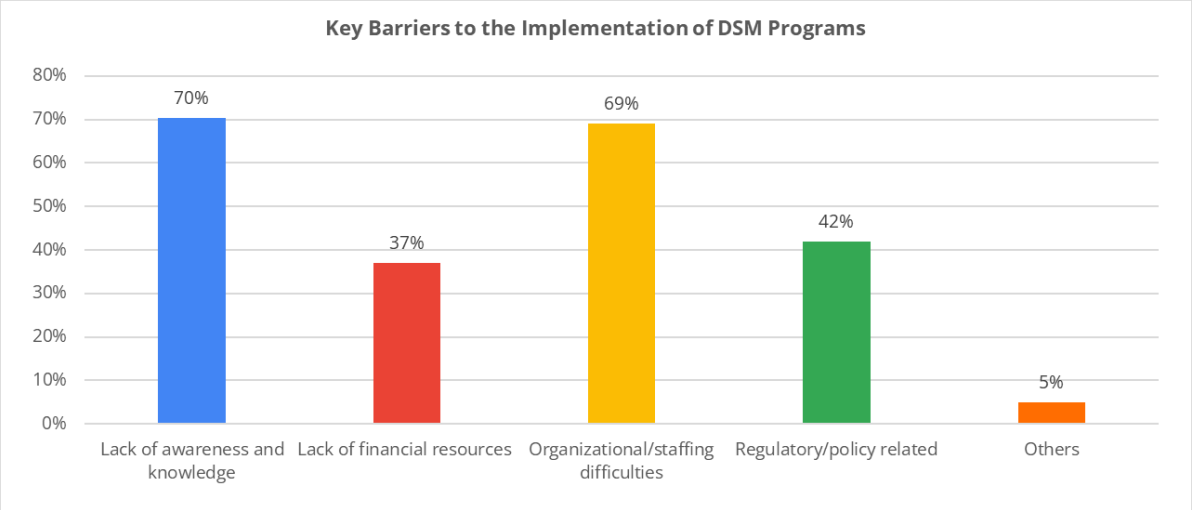


Figure 3-9: Key Barriers to DSM Program Implementation

Table 3-11: Summary of Survey Responses on Key Barriers to DSM Program Implementation by DU Type

Type of DUs	Lack of awareness and knowledge	Lack of financial resources	Organizational/ staffing difficulties	Regulatory/ policy related	Others
EC	43	26	45	28	3
PIOU	11	4	8	3	1
ENERZONE	3	0	3	3	0
Total	**57**	**30**	**56**	**34**	**4**

Question 4.6: What additional resources may be required for DSM programs?

Resources Required for DSM Program Implementation: Human and financial resources are the two main resources needed for DSM program implementation with 74% and 65% respectively. The survey responses also indicated that addressing these barriers requires supporting mechanisms and capacity building for DSM program development and implementation, such as seminars on DSM, fast-tracking ERC Capex approval, capacity building for EC personnel, and policies for TOU rates.

Table 3-12: Summary of Survey Responses on Additional Resources That May Be Required for DSM Programs

Type of DUs	Additional human resources	More budget	Others
EC	47	44	6
PIOU	10	7	1

ENERZONE	3	2	0
LGU	0	0	0
MPC	0	0	0
Total	**60**	**53**	**7**

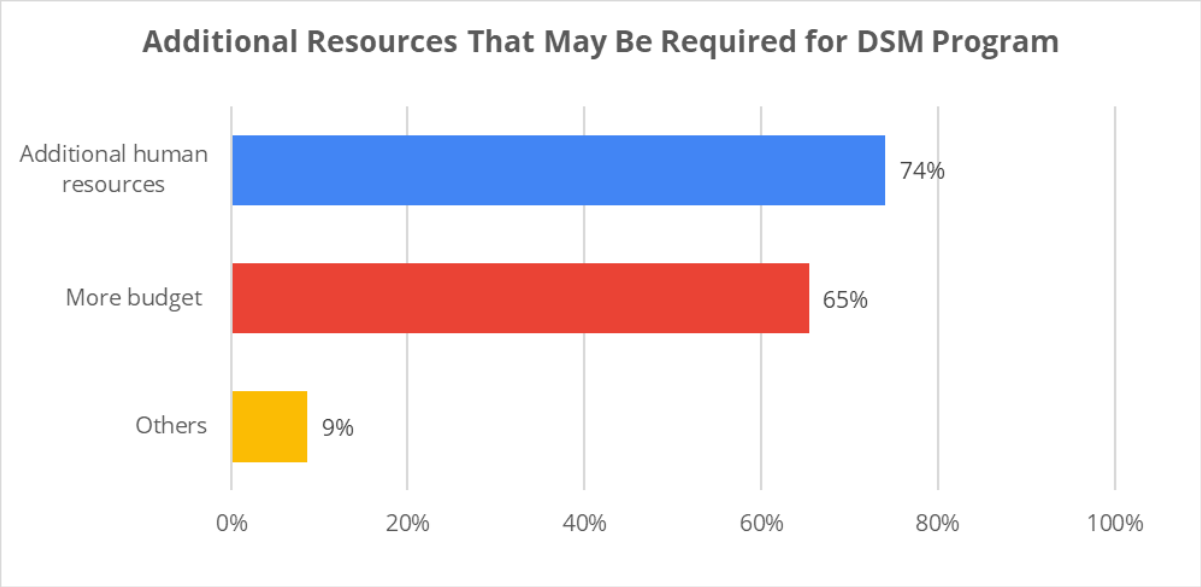


Figure 3-10: Summary of Survey Responses on Additional Resources May Be Required for DSM Programs

Question 4.7: Do you have rooftop solar program or rooftop solar PV installation in your network?

Rooftop Solar Program or Rooftop Solar PV Installation: About 55% responded that they have rooftop solar PV installations or rooftop solar program in their networks. The summary of survey responses is given in the Figure 3-11 and Table 3-13 provides the responses broken down by type of DUs.

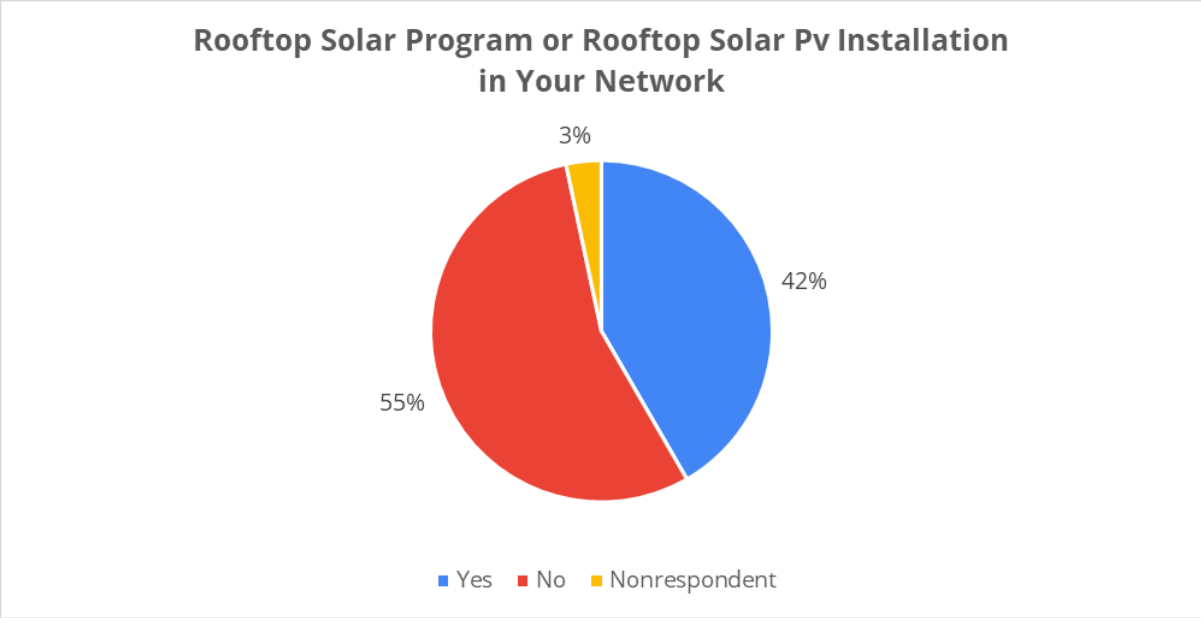


Figure 3-11: Summary of Survey Responses on Rooftop Solar Program or Rooftop Solar PV Installation in a Network

Table 3-13: Summary of Survey Responses on Rooftop Solar Program or Rooftop Solar PV Installation in a Network

Type of DUs	Yes	No	Nonrespondent
EC	25	33	2
PIOU	13	3	0
ENERZONE	2	1	2
LGU	0	0	0
MPC	0	0	0
Total	**40**	**37**	**4**

Question 4.7.1: If you have rooftop solar program or rooftop solar PV installation in your network, please specify the total installed capacity (kWp).

Cumulative Installed Capacity of Rooftop Solar PV: The cumulative installed capacity in kilowatt-peak (kWp) of rooftop solar PV systems reported by the DU respondents is approximately 67,000 kWp. These rooftop solar PV systems account for less than 1% of the cumulative peak demand of the EC and PIOU respondents. As for the 2 EnerZones respondents, their rooftop solar PV systems account for almost 10% of the cumulative peak demand.

Table 3-14: Cumulative Installed Capacity (kWp) on Rooftop Solar PV Installation compared with the Peak Demand of the DU respondents

Type of DUs	Number of DU Respondents	Total Installed Capacity (kWp)	Total installed capacity (MWp)	Peak Demand (MW) of the DU respondents	Peak Demand share (%)
EC	21	11,649.21	11.65	2,730	0.43%
PIOU	12	40,014.11	40.01	9,866	0.41%
ENERZONE	2	15,320	15.32	155	9.88%
Total	**35**	**66,983.07**	**66.98**	**12,751**	**10.72%**

When examining each region individually, Luzon has the highest cumulative Installed capacity, totaling 44,600 kWp. The Manila Electric Company (MERALCO) reported the highest rooftop solar PV installation capacity at 23,431 kWp. The summary of survey responses by region is provided in the Table 3-15 below.

Table 3-15: Cumulative Installed Capacity of Rooftop Solar PV Systems by Region

Region	Number of DU Respondents	Number of DU Respondents with Rooftop Solar PV	Total Installed Capacity (kWp)
Luzon	44	19	44,572.81
Mindanao	16	8	11,078.26
Visayas	21	8	11,332.00
Total	**81**	**35**	**66,983.07**

Question 4.8: What is the most popular type of rooftop solar installation utilized in your franchise area?

Most Popular Type of Rooftop Solar Installation: Grid-tied solar installations with electricity export are the most popular type of rooftop solar systems utilized in DU franchise areas. The summary of survey responses is given in Figure 3-12.

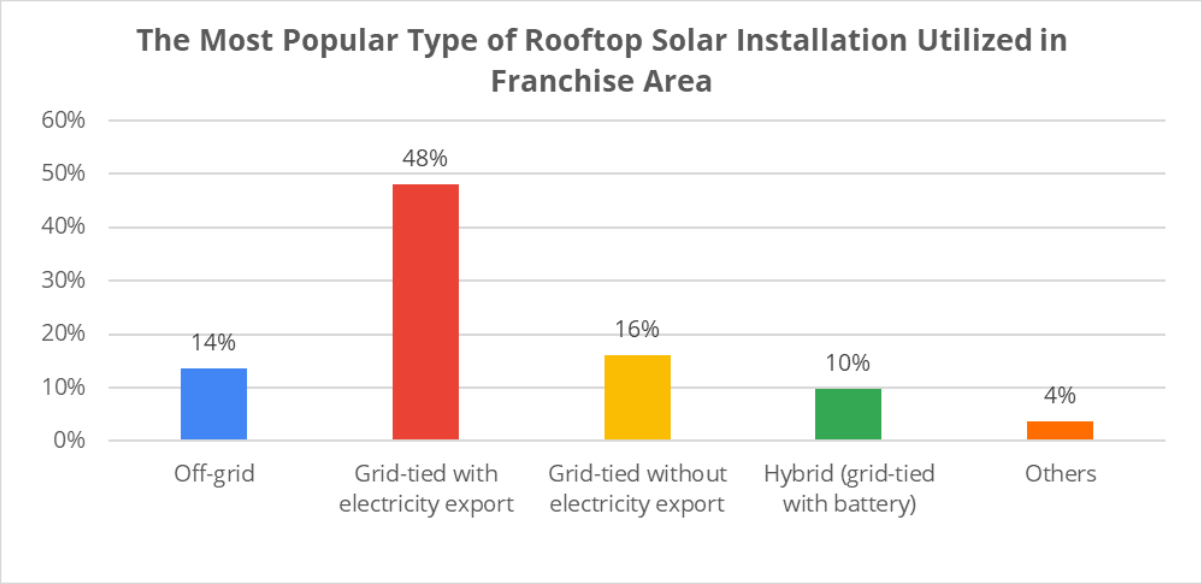


Figure 3-12: Most Popular Type of Rooftop Solar Installation Utilized in Franchise Area

Table 3-16 provides the responses on types of rooftop solar PV systems broken down by type of DUs.

Table 3-16: Most Popular Type of Rooftop Solar Installation Utilized in Franchise Area

Type of DUs	Off-grid	Grid-tied with electricity export	Grid-tied without electricity export	Hybrid (grid-tied with battery)	Others
EC	11	23	9	5	3
PIOU	0	14	3	3	0
ENERZONE	0	2	1	0	0
LGU	0	0	0	0	0
MPC	0	0	0	0	0
Total	**11**	**39**	**13**	**8**	**3**

Question 4.9: What percentage by type of rooftop solar installation in your franchise area in 2021?

Percentage of Rooftop Solar Installation in 2021: EC and PIOU respondents reported 69% and 75% of all rooftop PV installation are grid-tied with electricity export systems, while EnerZone respondents reported that 70% of the rooftop systems in their franchise areas are grid-tied systems without electricity export (see Figure 3-13). Off-grid rooftop solar PV systems still account

for quite a large share (21%) in ECs' franchise areas, but these types of rooftop solar PV systems are much less common among PIOUs' and EnerZones' franchise areas.

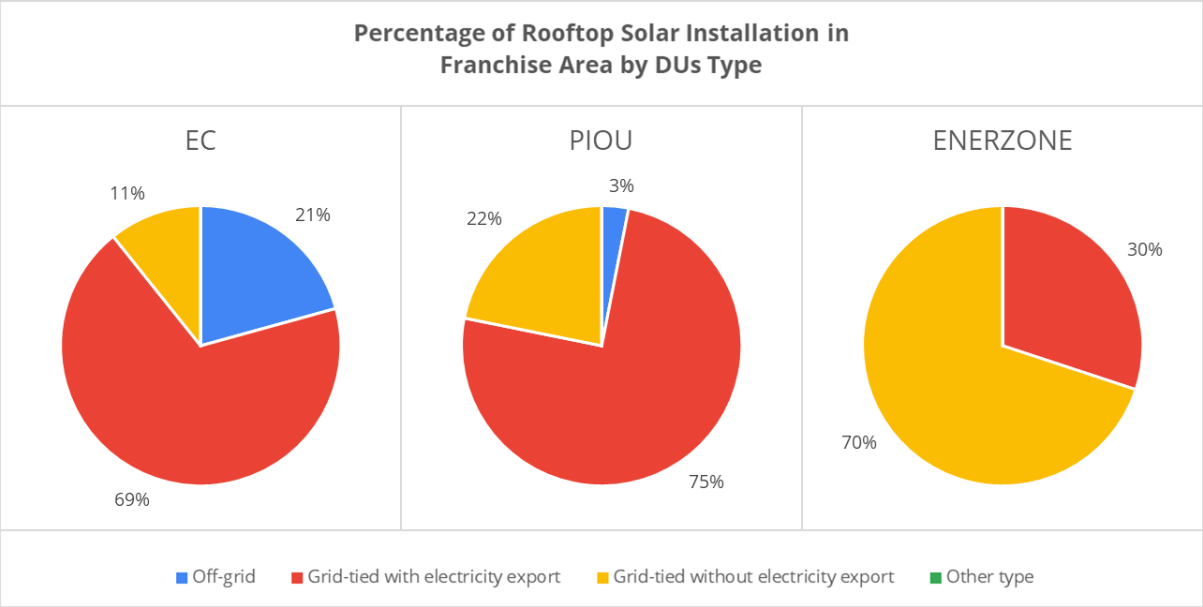


Figure 3-13: Percentage of Rooftop Solar Installation by DU Type in 2021

Question 4.10: Do you require a rooftop solar installation in your franchise area to apply for a permit prior to its installation?

Obtaining Permission Prior to Installation of a Rooftop Solar System Requirement: Most rooftop solar PV systems need to apply for a permit before installation. About 17% of EC respondents reported that installation of a rooftop solar PV system in their franchise areas does not require a permit. The summary of survey responses is given in the Table 3-17 below.

Table 3-17 Summary of Survey Responses on Obtaining Permission Prior to Installation of a Rooftop Solar PV System

Type of DUs	Yes - Residential areas	Yes - Commercial areas	Yes - Industrial areas	Yes - Other areas	No
EC	26	25	23	0	10
PIOU	13	13	12	0	1
ENERZONE	3	3	3	0	0
LGU	0	0	0	0	0
MPC	0	0	0	0	0
Total	**42**	**41**	**38**	**0**	**11**

3.5 Additional Information (Comments and Suggestions)

The section provides an open-ended question allowing the DU respondents to share comments and suggestions related to DSM programs and training.

Question 5.1: Please provide any other information with issues relating to DSM Programs and Training.

Several DUs highlighted that lack training and expertise in DSM, limitations on human resources for DSM program development and a need for raising awareness about DSM within DUs. The needs for DSM training to enhance staff capabilities are expressed by various DUs.

Table 3-18: Comments and Suggestions Relating to DSM Programs and Training

Type of DUs	Comments and suggestions
EC	- ABRECO staff lacks DSM training due to turnover and organizational restructuring and needs formal training for employees. - ESAMELCO staff lacks DSM-related training, resulting in limited knowledge of DSM. - NORDECO staff lacks technical expertise in DSM and requires proper training. - Require DSM training for the staff and interest expressed in participating in DSM training to enhance capabilities. - ZANECO staff have expressed interest in participating in DSM training to enhance their capabilities. - CENECO staff lacks human resources and knowledge since the organization structure isn't updated. - Additional human resources needed for DSM program formulation. - Need for DSM awareness creation within offices. - Need information on the DSM training schedule. - Seminars necessary for DUs on DSM Programs.
PIOU	- The issue arises with DSM Program implementation, after the enactment of EPIRA and restructuring of the electric power industry, DSM Program implementation by the DU sector where costs would be internalized only within the DU, but benefits would be diffused across the entire industry became an issue. - Need for policy creation for DSM implementation in DUs. - Continuous training is essential for existing and new personnel to ensure that the company is on a solid footing and foundation that can depend on in case of personnel departure. - Advocacy for widespread DSM training - There's a call for a standardized DSM framework and training roadmap. - Interest expressed in participating in DSM training programs to increase awareness.

ENERZONE	- Interested in participating in any upcoming training programs related to DSM.

4 CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

A survey of all the DUs were undertaken with the objective of identifying their readiness to undertake DSM. As of April 2024, **81 DUs (55%)** have responded to the survey, and it is found that although only 55% of all DUs responded to the survey questionnaire, these DUs accounted for around 80% of peak demand and electricity sales in 2021. The total number of customers served these DU respondents are also significant, accounting for about 90% of the total electricity customers in the Philippines.

Capacity of DU respondents in undertaking DSM program varies, irrespective of DU types. According to the survey responses, there are PIOUs, ECs and EnerZone with experience in preparing and implementing DSM programs and have sufficient resources for implementation. There are also DUs with limited DSM program experience and having inadequate resources for implementation. Note that most of DU respondents have not undertaken DSM programs and they have limited or no resources for DSM implementation.

All respondents, except MERALCO, indicated the need for DSM Training in all aspects of DSM program design, implementation, M&E and project financing, including those classified in top five DUs in each region. Some of these top five DUs still lack experience in DSM programs and face challenges due to inadequate resources for implementation, while most the remaining small DUs (mostly ECs) have not undertaken DSM programs with limited or even no resources for implementation. This underscores the necessity for capacity building of DUs staff involving in DSM implementation.

4.2 Recommendations

To effectively build capacity of DUs and develop the implementation plan for DSM programs, it is recommended to categorize the DUs, based on the survey responses, into 3 main categories, as outlined in the Table 4-1 below. The rationale for the categories was to identify DUs that could be considered for the pilot programs in Phase 1 of the Implementation phase, the DUs requiring limited assistance and those requiring extensive training for readiness for implementation in Phase 2. It should be noted that, from the 148 DUs, there were 67 that did not respond to the survey. This comprises 3 PIOUs, 61 ECs, 2 LGUs, and 1 MPC. It is imperative that these non-respondent DUs are also considered in some way in the development phase of the DSM Implementation Plan and the capacity building program for DUs.

Table 4-1: Proposed Categorization of DUs

Category 1	Category 2	Category 3
DUs currently implementing DSM programs and have	DUs with limited DSM program experience and	DUs who have not undertaken DSM programs and with limited or no

Category 1	Category 2	Category 3
sufficient resources for implementation.	having inadequate resources for implementation.	resources for implementation.
Criteria		
• DUs having sufficient technical capacity to implement DSM • Have prepared a DSM Plan • Have sufficient budget for DSM	• DUs having 2 more staff undertaking DSM activities	• DU's having no staff allocated for DSM activities
Number and Type of DUs		
Total DUs = 15 PIOU = 4 EC = 10 ENERZONE = 1	Total DUs = 14 PIOU = 6 EC = 7 ENERZONE = 1	Total DUs = 52 PIOU = 6 EC = 43 ENERZONE = 3

5 ANNEXES

5.1 Annex A: Survey Questionnaire

DSM Policy for the Philippines
Survey of Distribution Utilities

This survey is undertaken as a part of the Demand Side Management (DSM) Project in the Philippines funded by UNOPS and Energy Transition Partnership (ETP) to support the development of a DSM Policy and Implementation Plan for the Philippines and building the capacity of the Distribution Utilities (DUs) and Economic Zones (EZs) in the design and implementation of DSM programs in their respective franchises. The survey has 2 objectives – (1). To ascertain the readiness of DUs and EZs to design and implement DSM programs, and (2) training needs of current staff to increase the capacity to develop and implement DSM programs.

1. Contact Information

Organization Name	
Address	
Contact Person	
Title	
Telephone	
Email	

2. Utility Information

Please provide the utility information available for the year 2021.

Electricity Generation (MWh/yr)				
2021				
Peak Demand (MW)				
2021				
Customer Numbers	**Industrial**	**Commercial**	**Residential**	**Other**
2021				
Electricity Sales (MWh/year)				
2021				

3. DSM Knowledge and Training

3.1	How would you rate DSM knowledge of the responsible	1 to 5, 1 being no knowledge and 5 being very knowledgeable				
		1	2	3	4	5

<table>
<tr><td></td><td>department/division within your utility?</td><td></td></tr>
<tr><td>3.2</td><td>How many staff are currently undertaking DSM activities in your utility?</td><td></td></tr>
<tr><td>3.3</td><td>Have any staff previously attended DSM or Energy Efficiency Training programs? If so, please provide details</td><td></td></tr>
<tr><td>3.4</td><td>What are the educational qualifications of the staff undertaking DSM activities?</td><td></td></tr>
<tr><td>3.5</td><td>Do you have sufficient technical capacity to implement DSM programs?</td><td>☐ Yes – please go to Section 4
☐ No – please go to Section 3.6</td></tr>
<tr><td>3.6</td><td>Please specify the importance of each DSM training need.
(1 to 5, 1 being not important and 5 being very important)</td><td>
<table>
<tr><th>DSM Topic</th><th>Not Important</th><th></th><th></th><th></th><th>Very Important</th></tr>
<tr><td>DSM Concept & Objective</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr>
<tr><td>DSM Program Design</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr>
<tr><td>DSM Implementation & Case Studies</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr>
<tr><td>DSM Monitoring & Evaluation</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr>
<tr><td>Financing DSM Program</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr>
</table>
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</td></tr>
</table>

4. DSM Activities

4.1	Have you prepared a DSM Plan?	☐ Yes ☐ No – please go to Section 4.5
4.1.1	If you answer "Yes" in Section 4.1, which year you prepared the DSM Plan?	
4.2	What are the key DSM programs in the Plan?	

	(Please provide titles of the DSM programs)	
4.3	Based on the key DSM programs in Section 4.2, please list the programs that have been or are being implemented	
4.4	Do have a sufficient budget allocation for DSM programs?	☐ Yes ☐ No
4.5	What are the key barriers you have identified for implementation of DSM programs?	Please select all that are applicable. ☐ Lack of awareness and knowledge ☐ Lack of financial resources ☐ Organizational/staffing difficulties (lack of human resources, no dedicated DSM units) ☐ Regulatory/policy related ☐ Others (please indicate): _____
4.6	What additional resources that may be required for DSM programs?	Please select all that are applicable. ☐ Additional human resources ☐ More budget ☐ Others (please indicate): _____
4.7	Do you have rooftop solar program or rooftop solar PV installation in your network?	☐ Yes ☐ No – please go to Section 5
4.7.1	If you answer "Yes" in Section 4.7, please specify the total installed capacity (kWp) in your rooftop solar program or rooftop solar PV installation.	

<table>
<tr><td>4.8</td><td>What is the most popular type of rooftop solar installation utilized in your franchise area?</td><td>Please select all that are applicable
☐ Off-grid
☐ Grid-tied with electricity export
☐ Grid-tied without electricity export
☐ Hybrid (grid-tied with battery)
☐ Others (please indicate):
_____</td></tr>
<tr><td>4.9</td><td>What percentage by type of rooftop solar installation in your franchise area in 2021?</td><td><table><tr><th>Type of Rooftop Solar PV</th><th>2021</th></tr><tr><td>Off-grid</td><td>____%</td></tr><tr><td>Grid-Tied with Electricity Export</td><td>____%</td></tr><tr><td>Gird-Tied without Electricity Export</td><td>____%</td></tr><tr><td>Others (Please specify_____)</td><td>____%</td></tr></table></td></tr>
<tr><td>4.10</td><td>Do you require a rooftop solar installation in your franchise area to apply for a permit prior to its installation?</td><td>☐ Yes, please select all that are applicable
☐ Residential areas
☐ Commercial areas
☐ Industrial areas
☐ Others (please indicate):
_____
☐ No</td></tr>
</table>

5. Additional Information

Please provide any other information with issues relating to DSM Programs and Training

Thank You for Your Cooperation