



2011 Transmission Development Plan (Volume 2 Part 2)

Presentation to LUZON Customers

05 January 2012



Outline



- I. Objective
- II. Project Development
- III. Metering Asset Profile
- IV. CAPEX Programs

Objective



To provide the metering requirements of the NGCP Billing System and the TOU Billing Scheme of WESM and the Generators:

1. Providing Grid Code-compliant metering facilities and services to new connection points of Grid-connected Generators and Load Customers
2. As WESM MSP, providing metering data and services
3. Maintaining the integrity and Grid Code-compliance of the metering facilities through:
 - a. Programmed upgrading and replacement of metering equipment
 - b. Keeping the Metering Field Units equipped with proper Calibration and Testing Equipment
 - c. Keeping the Central Meter Laboratory in a state of compliance with regulatory requirements



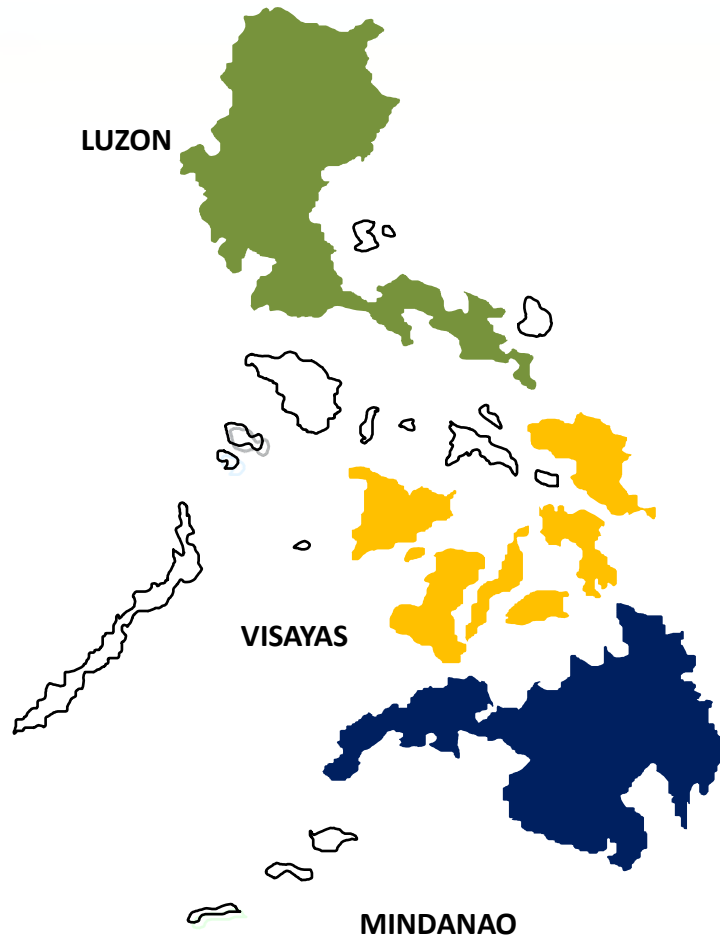
Project Development



All Projects are in pursuance to the Metering Requirements and Standards:

1. Grid Code and WESM Rules Requirements for Grid Metering Facilities
 - Technical Requirements
 - Provision of Meter Data to the WESM
 - Maintenance of Metering Facilities & Equipment
2. The OATS Rules
 - Provision of capital equipment to metering facilities
 - Recovery of CAPEX investments in metering assets
3. ERC Guidelines for WESM Metering Service Provider (MSP)
 - Automated Meter Data Retrieval (AMR) System
 - Metrology Program and Procedures and Meter Calibration Laboratory
 - Equipment & Facilities for the Testing of Meters and Instrument Transformers

Metering Coverage



Luzon – 513 Metering Installations

Visayas – 241 Metering Installations

Mindanao – 192 Metering Installations

Metering Infrastructure



A. METERING INSTALLATION

1. Revenue Meters (Main & Alternate)
2. Current Transformers
3. Potential Transformers
4. Lightning Arrester
5. GSM Modem
6. Test Switch/Test Block
7. Meter Box
8. PT/CT Pedestals
9. Concrete Foundation

B. AMR SYSTEM

1. MV 90 Software
2. Server
3. Workstations
4. GSM Modems

C. CENTRAL METER LABORATORY

1. Laboratory Watt-hour Standards
2. CT/PT Standards
3. Computer Hardware & Software

Metering Installation



Current Transformer

Pedestal Structure

Meter Box

- Revenue Meter
- GSM Modem
- Test Switch

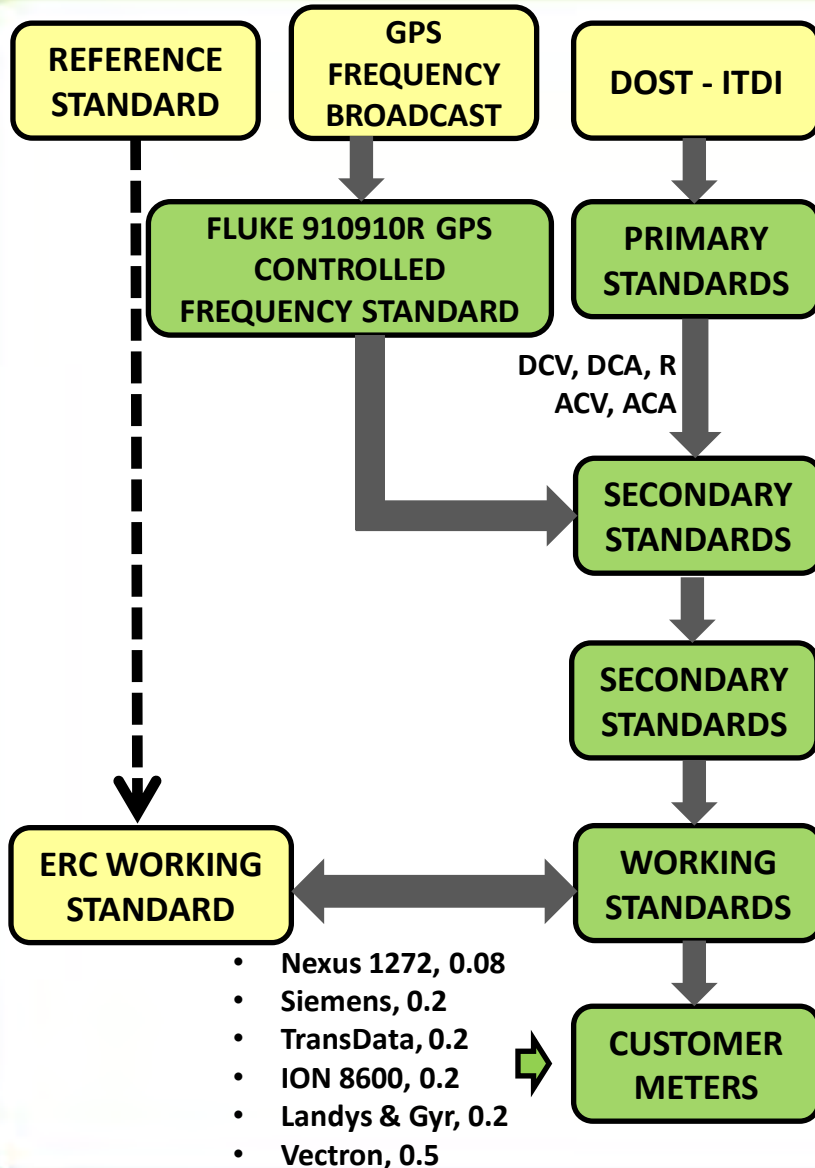
Lightning Arrester

Potential Transformer

Concrete Foundation



Central Meter Calibration Laboratory



National Standard Laboratory

- 10VDC Standard Stability: 1.2 ppm
- 10K Resistance Standard Uncertainty: 1.0 ppm
- 8.5 Digit Reference Multimeter



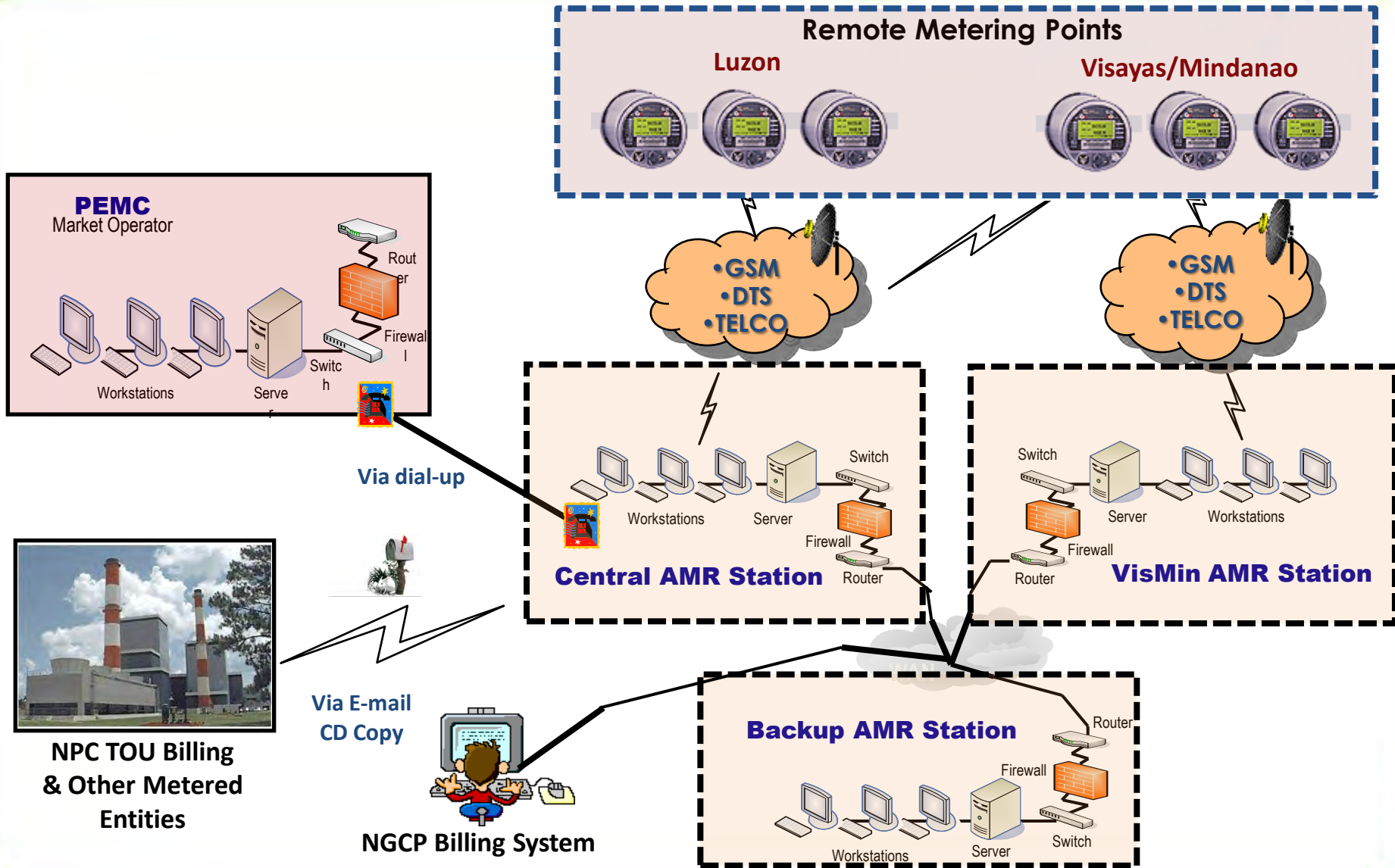
Radian, RD 22
Accuracy: 0.005

Radian, RD 31
Accuracy: 0.005

- PTS 3.3, 0.05
- MTE, PWS 2.3, 0.2
- MTE, CP200, 0.05
- MT, CS200, 0.05
- Omicron, CMC-156
- SC-60, 0.05
- SC-10, 0.6



Automated Data Retrieval (AMR) System



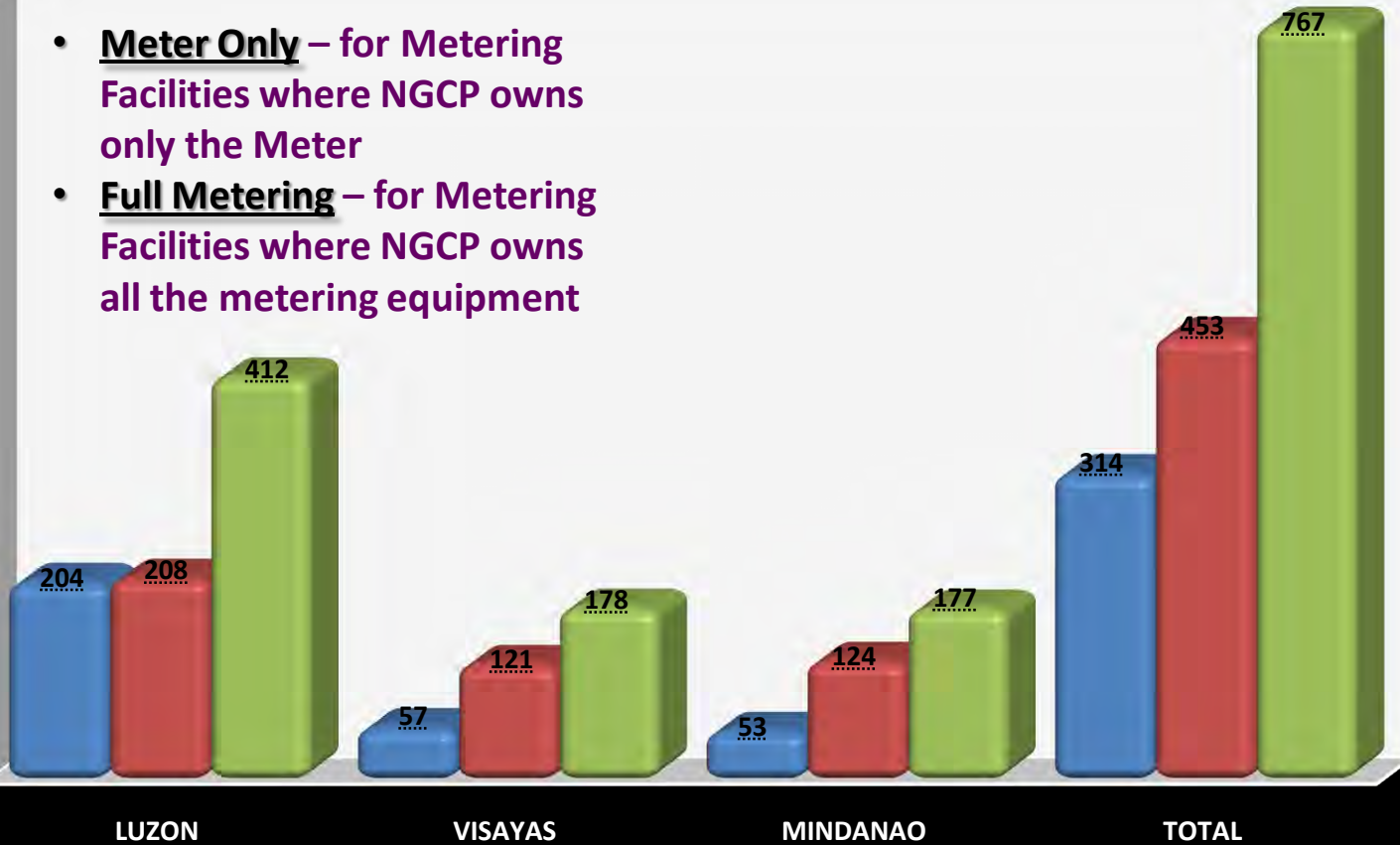
Metering Installation Profile



LOAD CUSTOMERS

■ FULL ■ METER ONLY ■ TOTAL

- **Meter Only** – for Metering Facilities where NGCP owns only the Meter
- **Full Metering** – for Metering Facilities where NGCP owns all the metering equipment



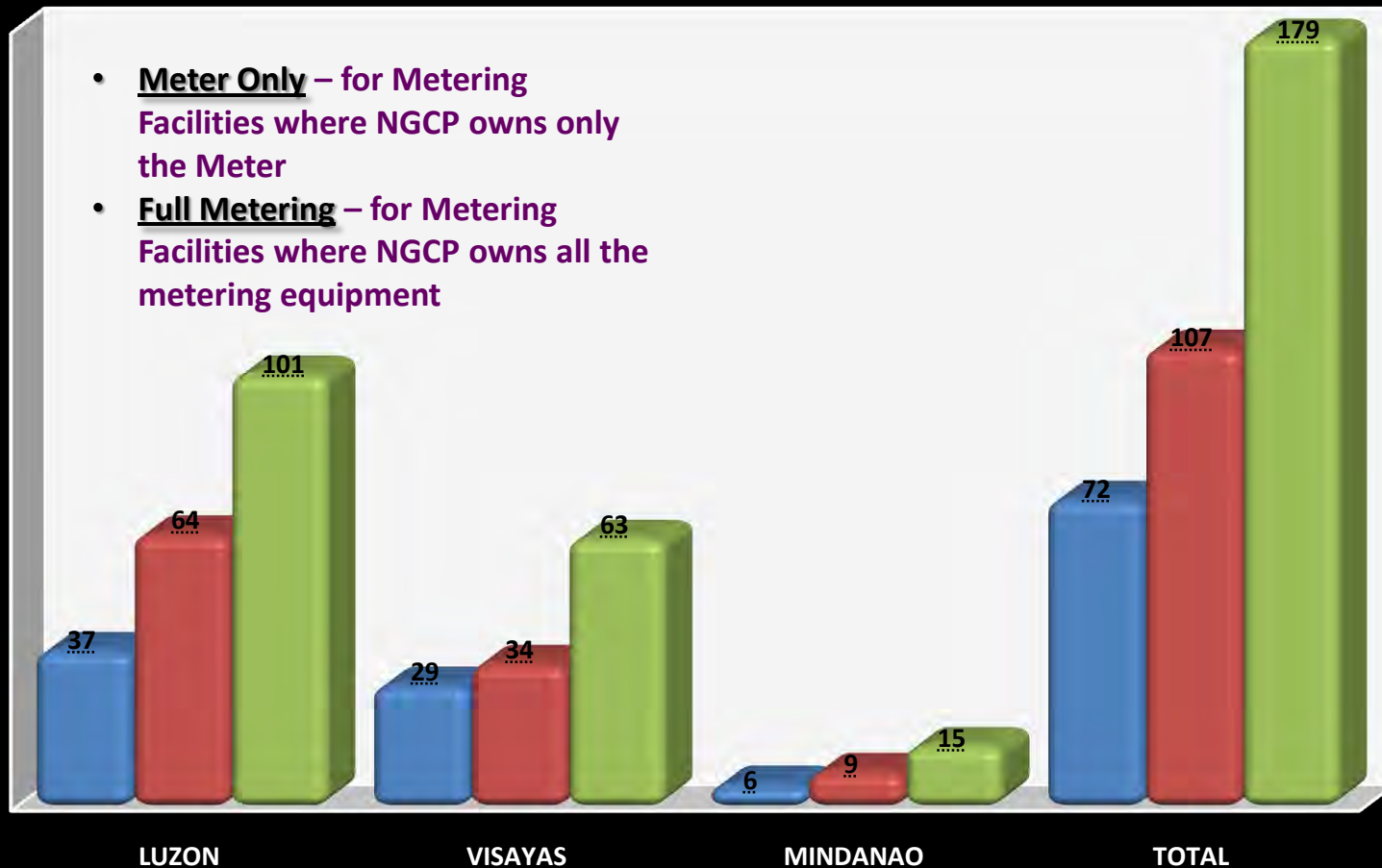
Metering Installation Profile



GENERATORS

■ FULL ■ METER ONLY ■ TOTAL

- **Meter Only** – for Metering Facilities where NGCP owns only the Meter
- **Full Metering** – for Metering Facilities where NGCP owns all the metering equipment

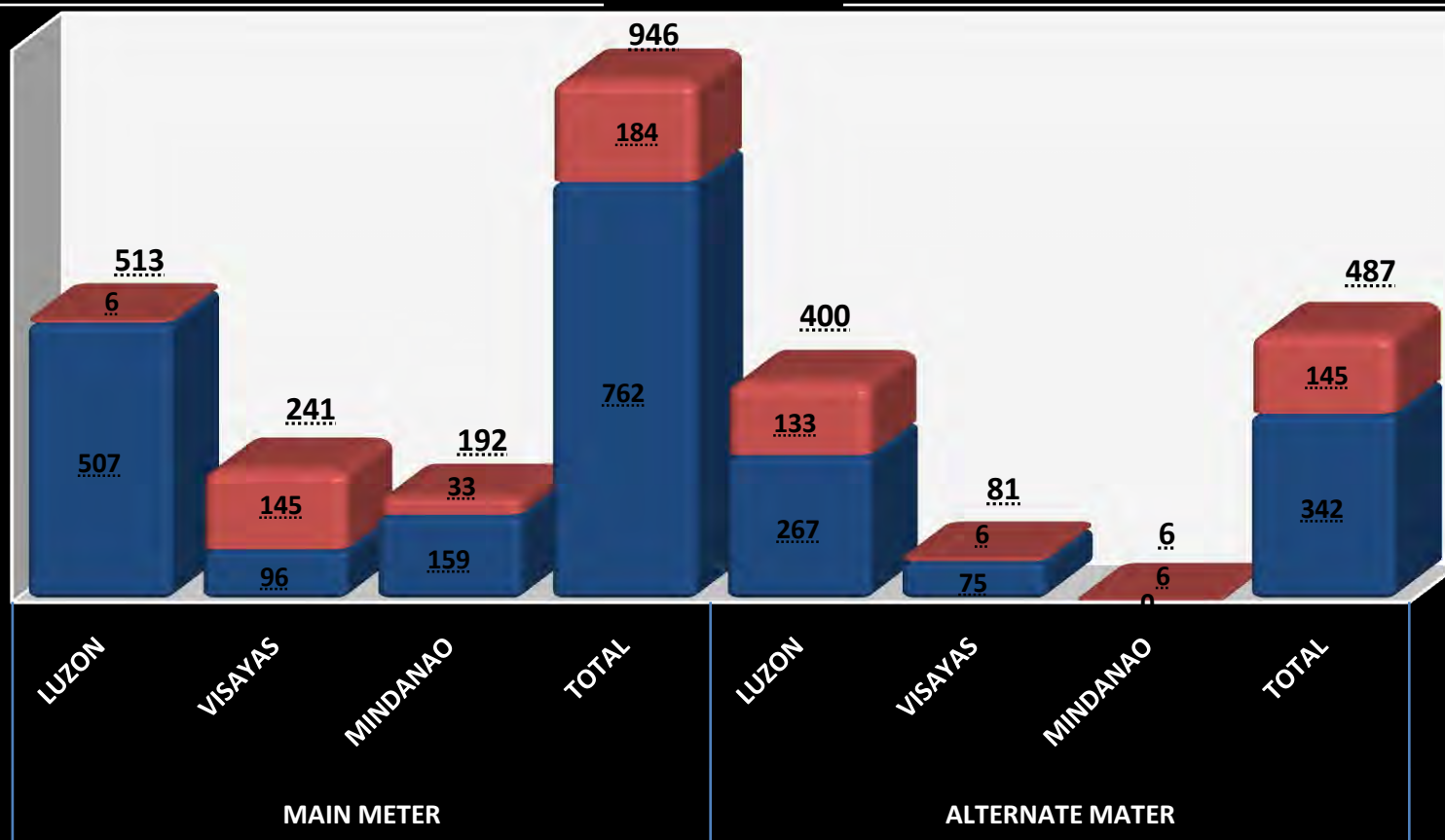


Metering Asset Profile



REVENUE METERS

■ < 8 ■ > 8

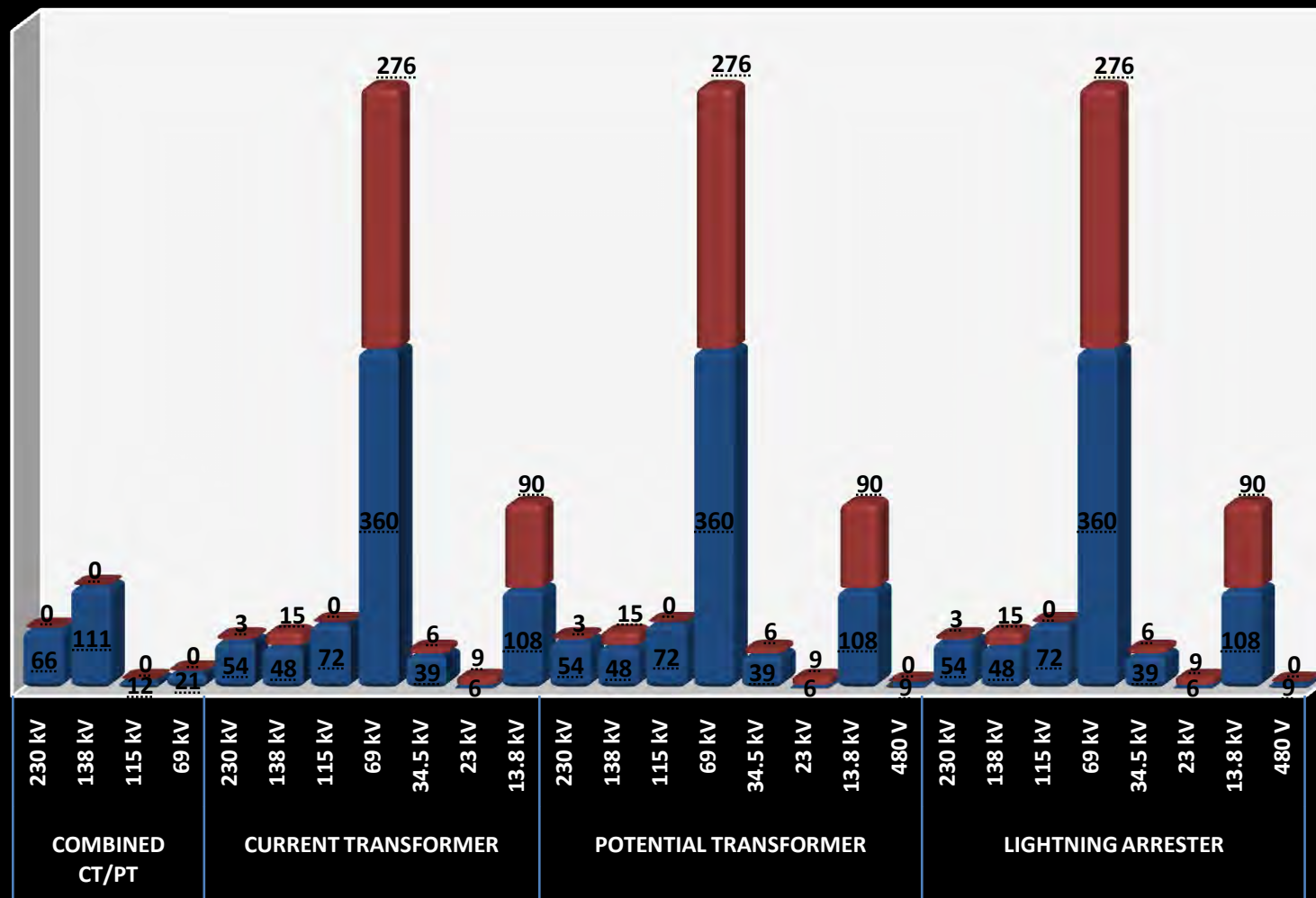


Metering Asset Profile



INSTRUMENT TRANSFORMER

■ < 20 ■ > 20

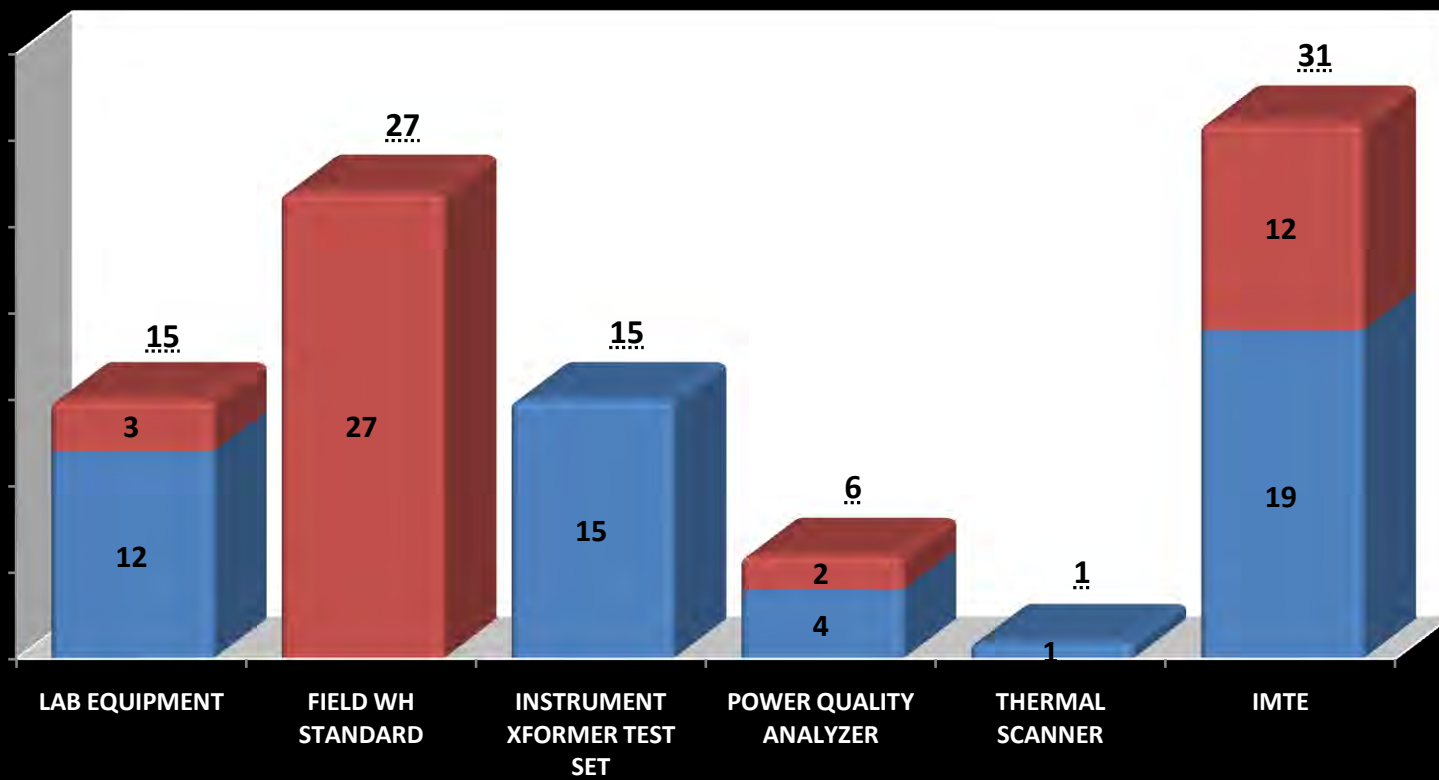


Metering Asset Profile



TEST EQUIPMENT

■ <4 ■ >4

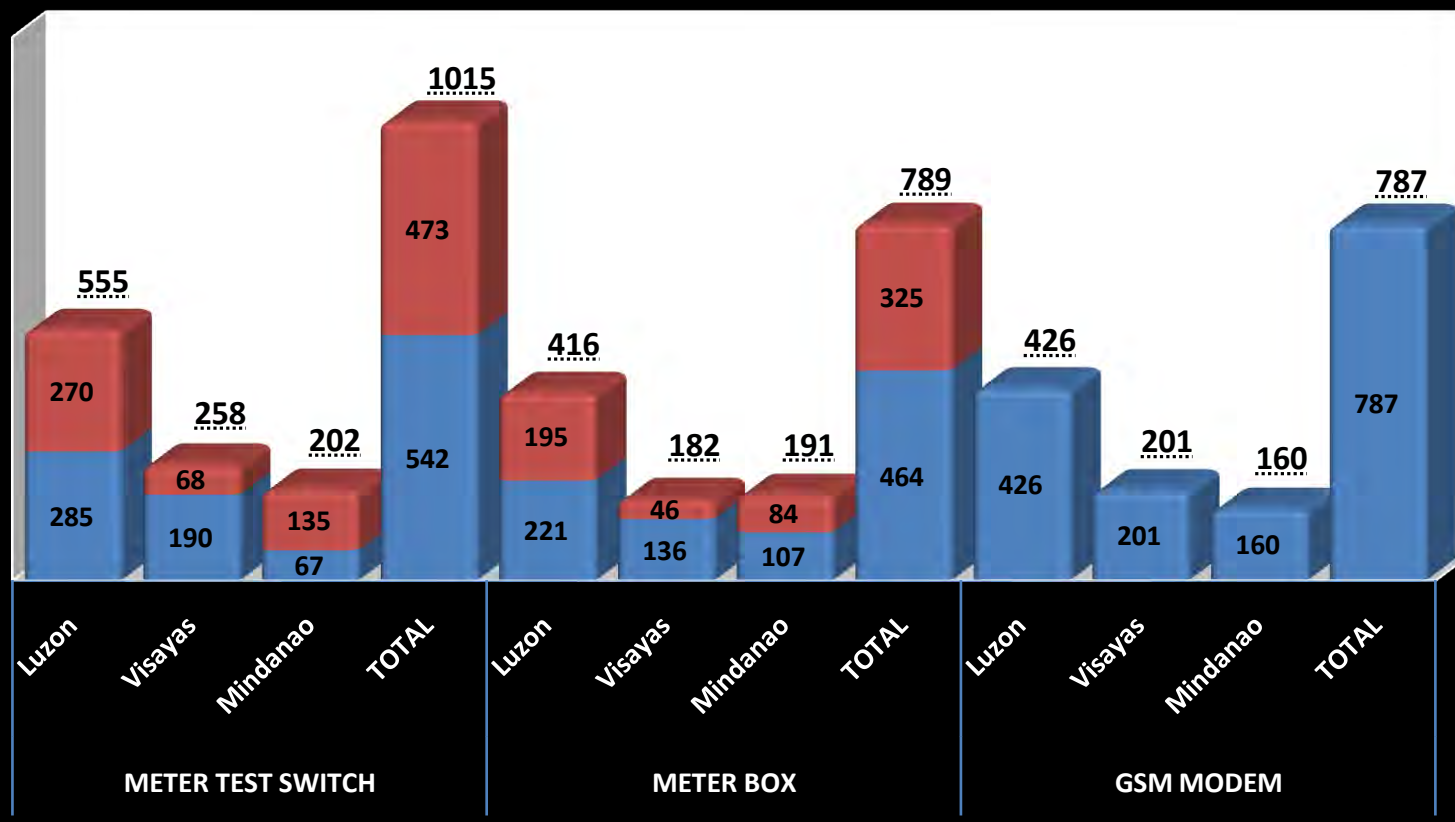


Metering Asset Profile



METER ACCESSORIES

■ <9 ■ >9





Metering CAPEX Program



1. EXPANSION

- Installation/commissioning to Service Metering Facilities for New Connection Points of Generators and Loads

2. RELOCATION/CONSOLIDATION OF METERING POINTS AT NEW CONNECTION POINTS

3. UPGRADE OF METERING FACILITIES

- WESM Readiness in Mindanao
- Installation of Alternate Meters
- Compliance with Grid Code Requirements

4. REHABILITATION OF METERING FACILITIES

5. REPLACEMENT OF FAILED AND OBSOLETE/FULLY AGED METERING ASSETS

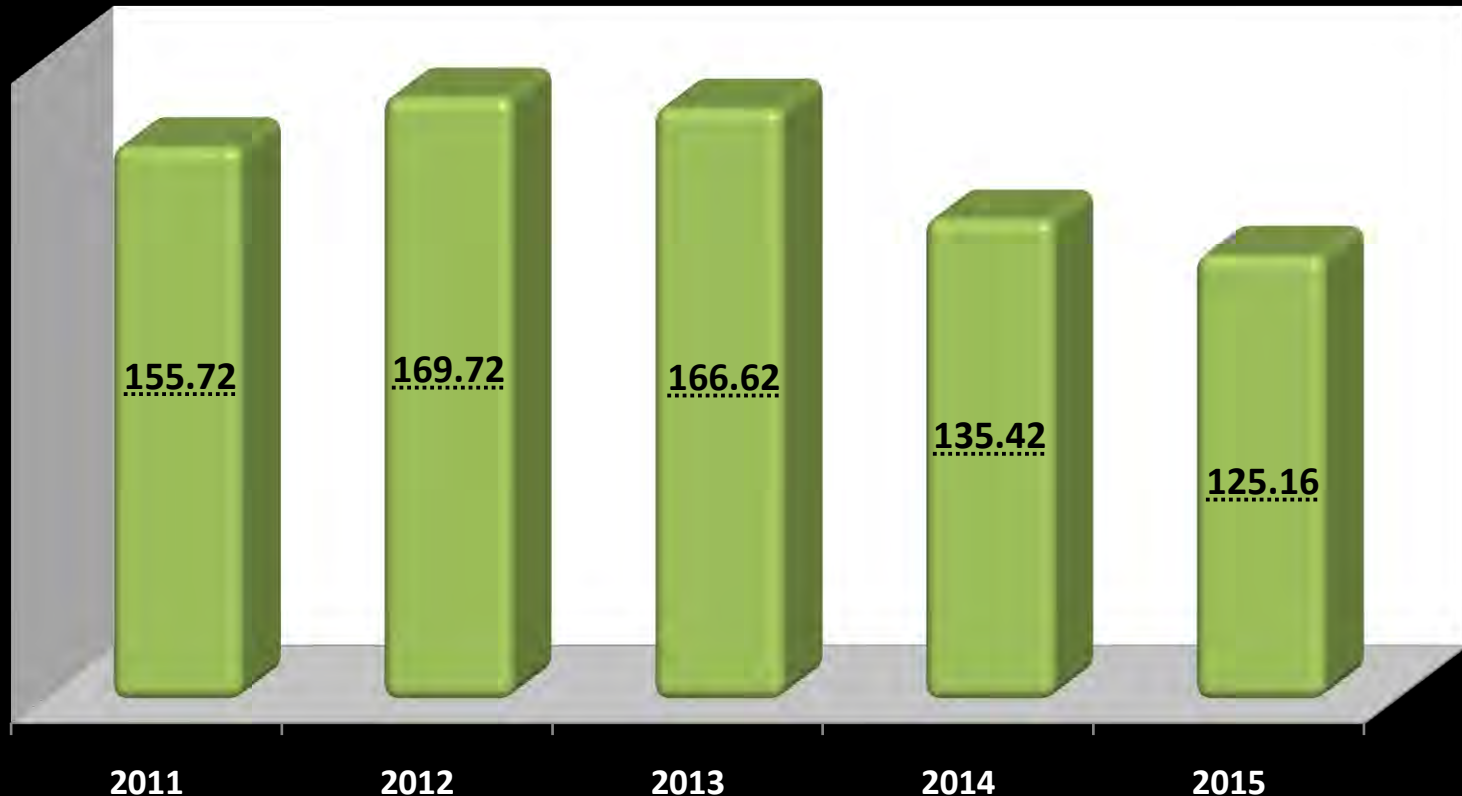
- Instrument Transformers & Meters, etc.
- AMR System
- Meter Laboratory & Calibration/Testing Equipment

6. INSTALLATION OF REVENUE-CLASS SUBSTATION METERING FACILITIES

Metering CAPEX Program



ERC Approved 3rd Reg. CAPEX (Gross)



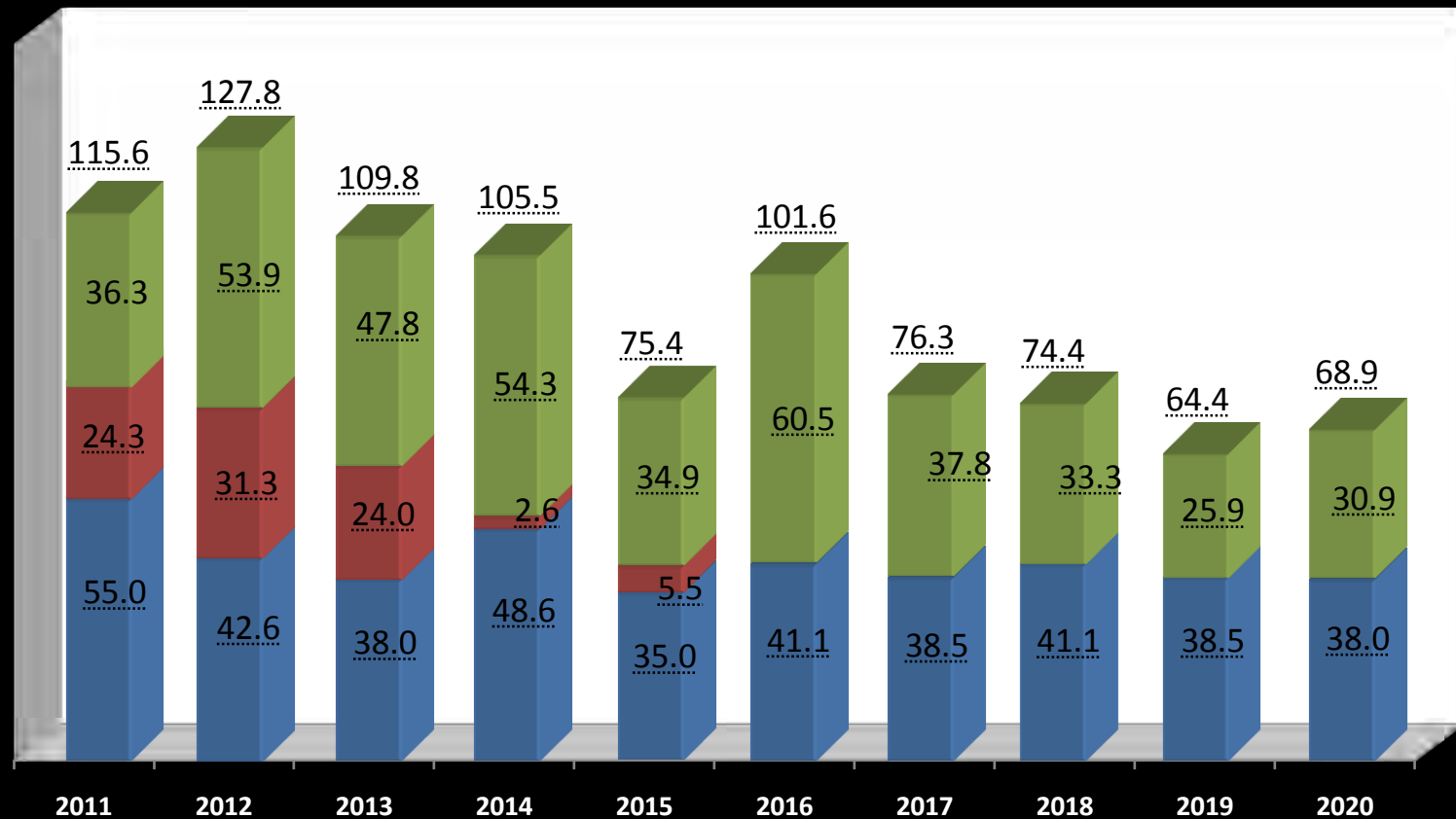
Metering CAPEX Program



METERING CAPEX PROJECTS

(Php Million)

Expansion Relocation/Rehab/Upgrade Replacement

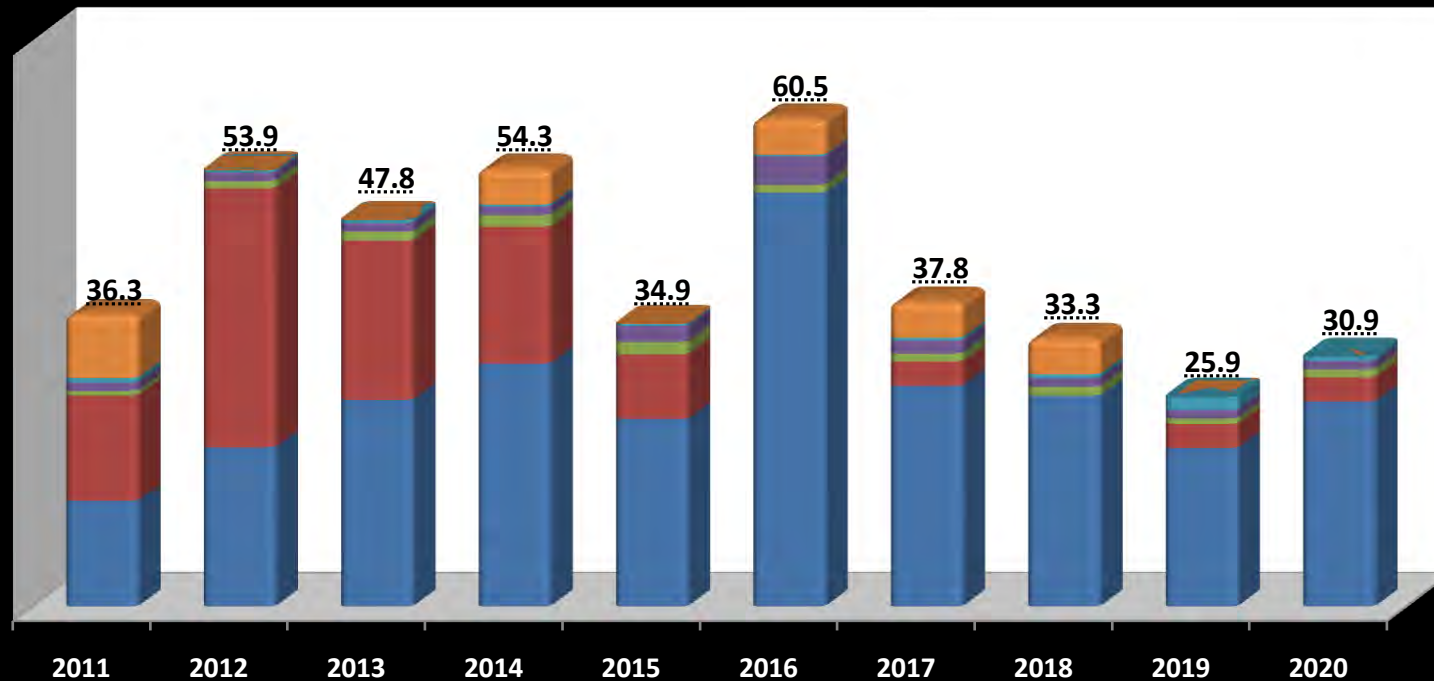


Metering CAPEX Program



PROGRAM REPLACEMENT OF METERING ASSETS (Php Million)

- Instrument transformers
- Revenue Meters
- Meter Box
- GSM Modem
- Meter Test Switch
- Laboratory and Field Equipment



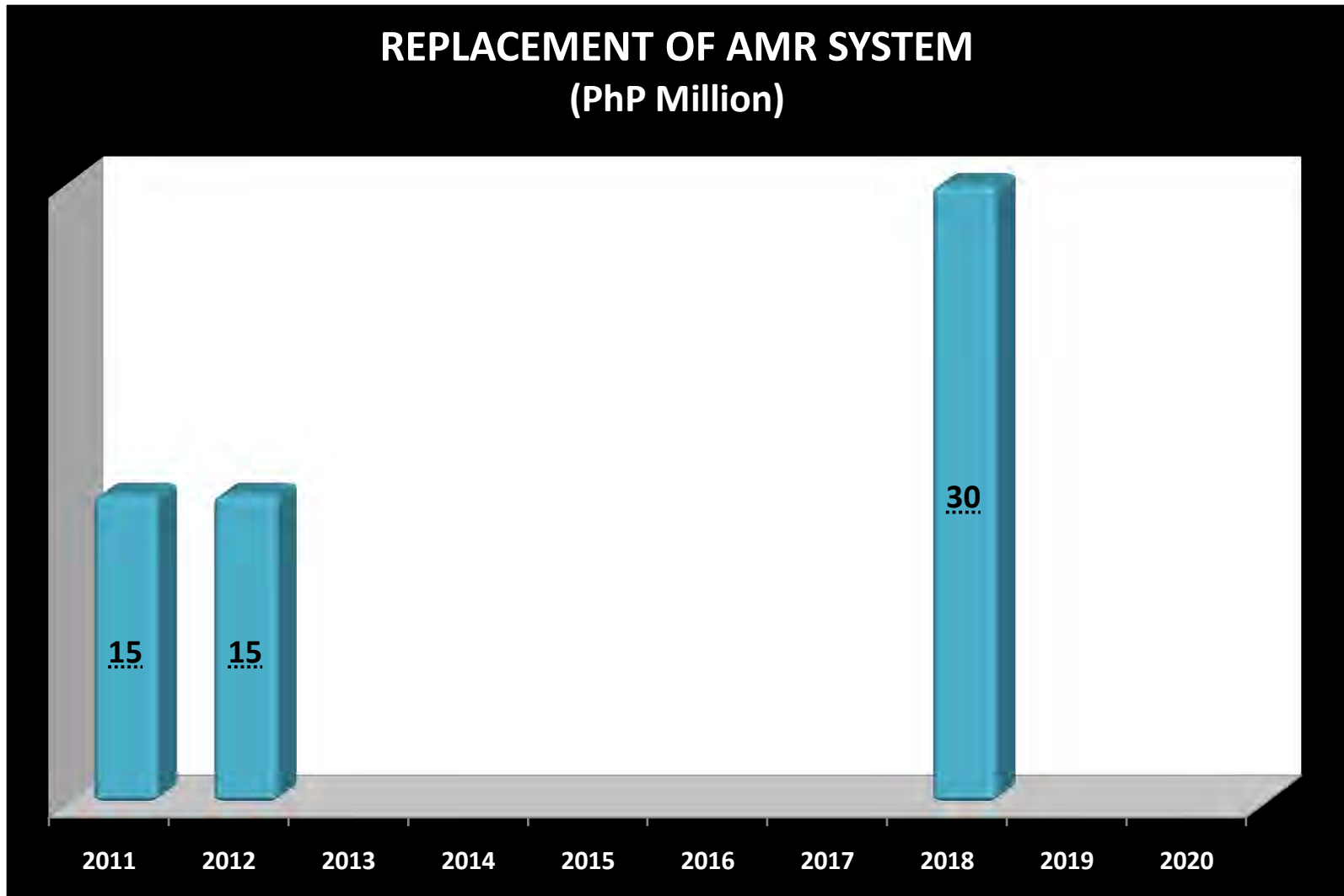
[Regulatory Asset Life](#)

[Details](#)

Metering CAPEX Program



**REPLACEMENT OF AMR SYSTEM
(PhP Million)**



BUDGET ALLOCATION 2011-2020



CAPEX PROGRAM	BREAKDOWN FOR LUZON, VISAYAS AND MINDANAO (PERCENTAGE)										
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Expansion (M)	55.0	42.6	38.0	48.6	35.0	41.1	38.5	41.1	38.5	38.0	416.4
Luzon	45%	51%	52%	58%	46%	44%	45%	40%	43%	44%	47%
Visayas	27%	21%	25%	18%	17%	22%	26%	25%	26%	25%	24%
Mindanao	28%	28%	23%	24%	37%	34%	29%	35%	31%	31%	29%
Relocation/ Rehab/ Upgrade (M)	24.3	31.3	24.0	2.6	5.5	-	-	-	-	-	87.7
Luzon	60%	44%	57%	25%	87%	-	-	-	-	-	54%
Visayas	14%	32%	11%	25%	0%	-	-	-	-	-	20%
Mindanao	26%	24%	32%	50%	13%	-	-	-	-	-	26%
Replacement (M)	115.6	127.8	109.8	105.5	75.4	101.6	76.3	74.4	64.4	68.9	919.7
Luzon	46%	55%	76%	94%	40%	40%	36%	40%	39%	40%	52%
Visayas	26%	20%	14%	3%	31%	30%	25%	30%	32%	31%	25%
Mindanao	28%	25%	10%	3%	29%	30%	39%	30%	29%	29%	23%



End of Presentation

Regulatory Asset Life



Asset Categories	Primary Trigger	Secondary Trigger/s
1. Instrument Transformers	End of Asset Life (30 years)	Asset Condition/Failure Rate
2. Lightning Arresters	End of Asset Life (30 years)	Asset Condition/Failure Rate
3. Electronic Billing Meters	End of Asset Life (10/15 years)	Obsolescence/Failure Rate
4. GSM Modems	End of Asset Life (10 years)	Obsolescence/Failure Rate
5. Mounting Structures	End of Asset Life (25 years)	Condition
6. Meter Boxes & conduits	End of Asset Life (15 years)	Condition
7. AMR System Hardware	End of Asset Life (5 years)	Obsolescence
8. AMR System Software	End of Asset Life (7 years)	Obsolescence
9. Laboratory Equipment	End of Asset Life (12 years)	Condition/Technology Advancement
10. Field Testing Equipment	End of Asset Life (10 years)	Condition/Technology Advancement
11. Office Equipment	End of Asset Life (5 years)	Asset Condition/Failure Rate

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Expansion 2011-2020



PROGRAMS/ PROJECT NAME	GRID	PROJECT SCHEDULE	REMARKS
I. EXPANSION			
A. New Metering facilities for Load Customers			
A1. Full Metering	LVM	2011-2020	137 Metering Points
B2. Meter Only	LVM	2011-2020	233 Metering Points
B. New Metering Facilities for Generator Customers			
B1. Full Metering	LVM	2011-2020	35 Metering Points
B2. Meter Only	LVM	2011-2020	51 Metering Points
C. Revenue metering for Renewable Energy (RE) Generators (Meter Only) – 42 Metering Points			
D. Installation of revenue meters for NGCP S/S Station Service			
1. Luzon (NLN, NLS, SLN, SLS)	L	2011	87 Metering Points
2. Visayas (East & West)	V	2011	42 Metering Points
3. Mindanao (North & South)	M	2011	33 Metering Points

Rehab/Upgrading/Relocation 2011-2020



PROGRAMS/ PROJECT NAME	GRID	PROJECT SCHEDULE	REMARKS
II. REHABILITATION, UPGRADING & RELOCATION			
A. Relocation of Metering Installation to the prescribed connection point			
A1. Full Metering	LVM	2011-2020	50 Metering Points
A1. Meter Only	LVM	2011-2020	44 Metering Points
B. Rehabilitation of Metering Structure	LVM	2011-2020	6 Metering Points
C. Installation of back-up meters			
1. Luzon (NLN, NLS, SLN, SLS)	L	2011-2013	513 Metering Points
2. Visayas (East & West)	V	2011-2013	241 Metering Points
3. Mindanao (North & South)	M	2011-2013	192 Metering Points
D. Upgrade of metering facilities			
D1. Conversion from 2 1/2, 2-element to 3-element metering scheme – 20 Metering Points			
D2. Upgrade to dedicated CTPT – 3 Metering Points			

Replacement 2011-2020



PROGRAMS/ PROJECT NAME	GRID	PROJECT SCHEDULE	REMARKS
III. REPLACEMENT PROGRAM			
A. Replacement of underrated and/or overrated Current Transformers – 9 Metering Points			
B. Replacement of CTs and/or PTs with oil leak – 5 Metering Points			
C. Replacement of non-revenue class CTs and/or PTs with revenue accuracy class – 4 Metering Pts			
D. Metering equipment, devices, accessories and Test equipment			
D1. Revenue Meters	LVM	2011-2020	1212 units
D2. Instrument Transformers	LVM	2011-2020	473 sets
D3. GSM Modem	LVM	2011-2020	1027 units
D4. Meter Box	LVM	2011-2020	465 pieces
D5. Spares	LVM	2011-2020	3% of Installed Equipment
D6. Laboratory and Field Equipment	LVM	2011-2020	18 units

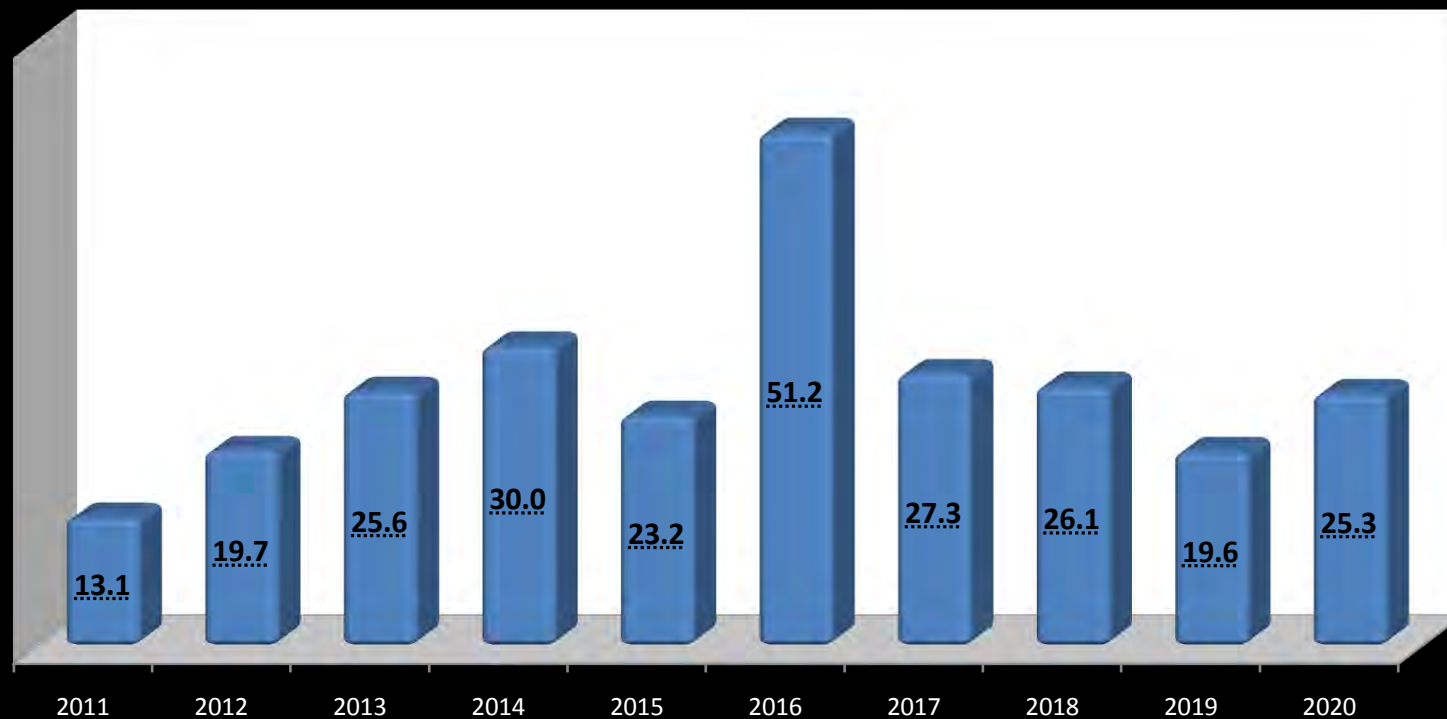
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Metering CAPEX Program



PROGRAM REPLACEMENT OF METERING ASSETS (PhP Million)

■ Instrument transformers

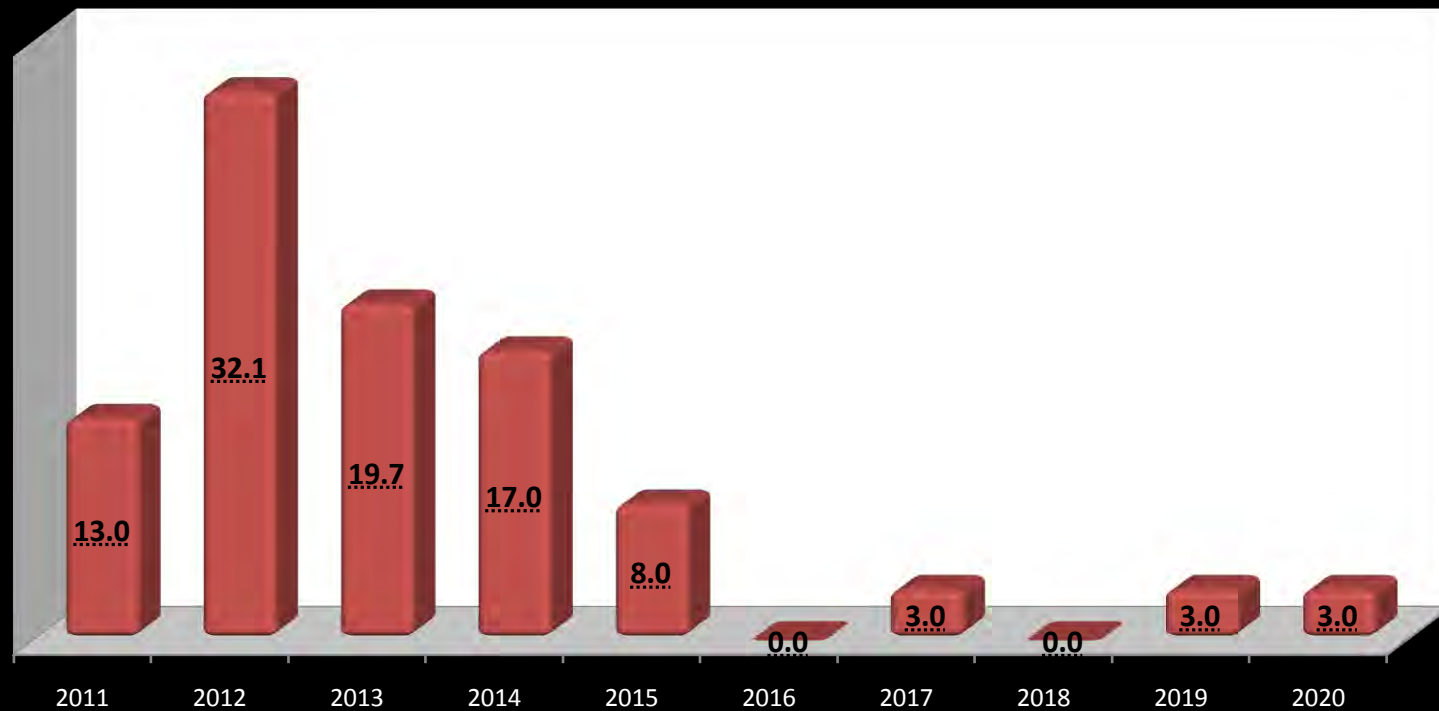


Metering CAPEX Program



PROGRAM REPLACEMENT OF METERING ASSETS (PhP Million)

■ Revenue Meters

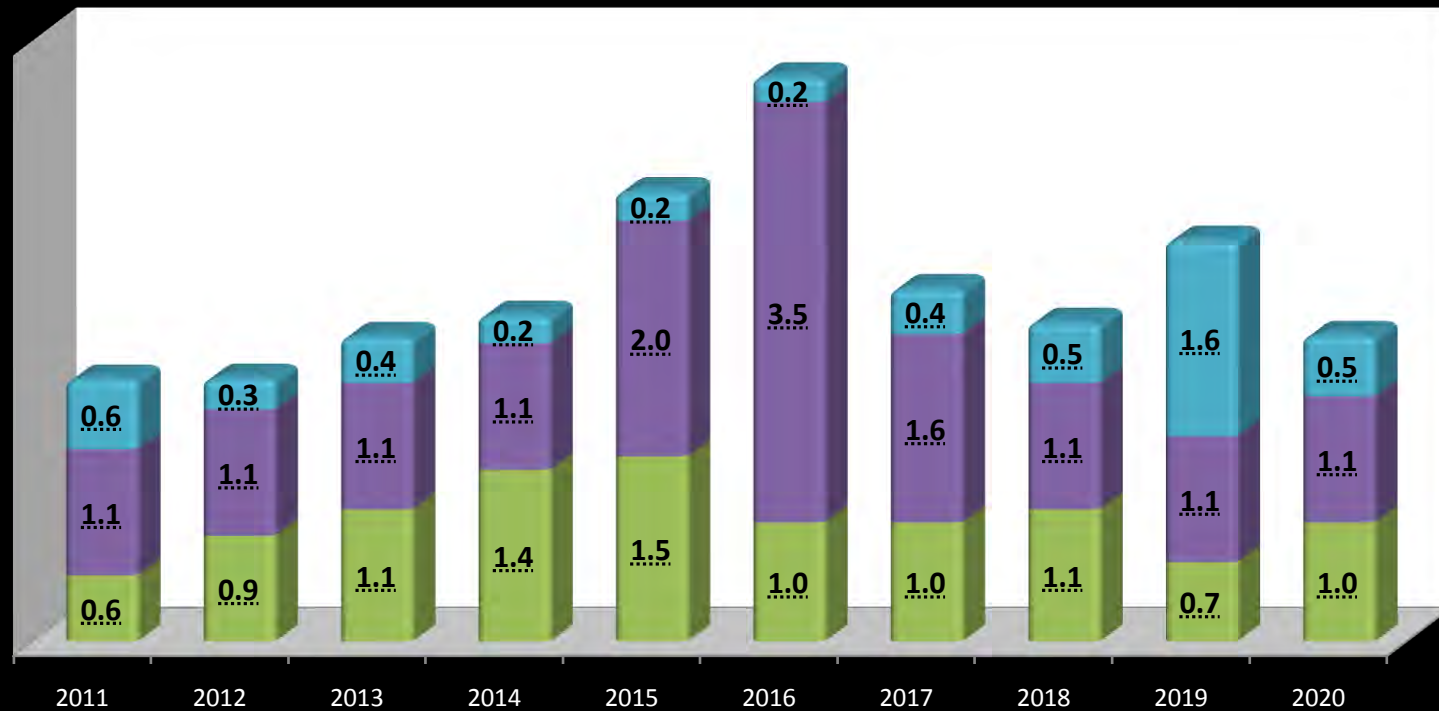


Metering CAPEX Program



PROGRAM REPLACEMENT OF METERING ASSETS (PhP Million)

■ Meter Box ■ GSM Modem ■ Meter Test Switch

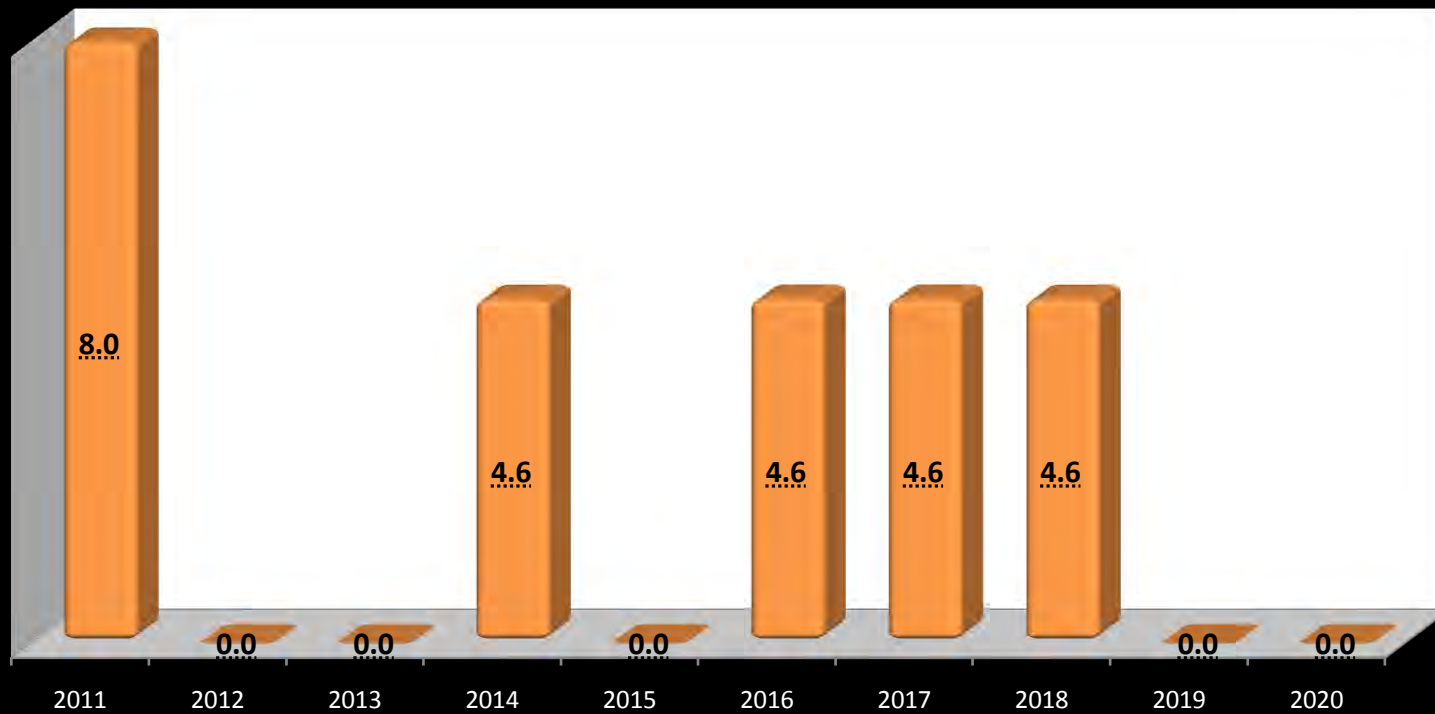


Metering CAPEX Program



PROGRAM REPLACEMENT OF METERING ASSETS (PhP Million)

■ Laboratory and Field Equipment



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