# CENTRAL VISAYAS
# POWER SECTOR PROFILE

**Contents**

# I. INTRODUCTION

Electric power is indispensable to economic development. This applies to all areas of the economy: agriculture, industry, services. Studies have shown that there is a direct correlation between economic growth and increase in power demand.

Adequate and stable supply of power is very important to the economic development of Central Visayas. The region has the fifth largest economy in the country, accounting for 7 percent of the country's total output. Services account for the largest share of the economy, followed by industry. The expansion of both sectors relies heavily on sufficient power supply.

The most significant event in the Philippine energy industry in the last decade was the passage of RA 9136 also known as the Electric Power Industry Reform Act (EPIRA) of 2001. Among the major reforms embodied in the law are the restructuring of the electricity supply industry, privatization of the National Power Corporation (NPC) and the establishment of the Wholesale Electricity Spot Market (WESM). The restructuring of the electricity industry calls for the separation of the different components of the power sector namely, generation, transmission, distribution and supply. On the other hand, the privatization of NPC involves the sale of the firm's generation assets to private investors. Meanwhile, WESM is a venue where electricity made by power-producing companies are centrally coordinated and traded like any other commodity in a market of goods and prices are driven by the law of supply and demand.

These reforms are aimed at encouraging greater competition and attracting more private-sector investments in the power industry. A more competitive power industry are expected to in turn result in lower power rates and a more efficient delivery of electricity supply to the end-users.

This power sector profile is prepared to provide a comprehensive view of the power industry in the region consisting of supply, demand, transmission and distribution. Demand (except in small island grids), supply and transmission data are for the entire Visayas, in keeping with the three major islands (Luzon, Visayas, Mindanao) grouping of transmission systems by the National Grid Corporation of the Philippines (NGCP). Data on generating capacities in the Visayas were obtained from the generating plants themselves and from the NPC-Small Power Utilities Group (SPUG) for the small island grids. Data on distribution utilities are only for Central Visayas as it is possible to group the available information by region. Transmission and power demand data were obtained from the 2010 Transmission Development Plan, Final Report, of NGCP and from NPC-SPUG. Distribution data were obtained from the distribution utilities.

# II. POWER SUPPLY

## 2.1 Visayas Grid

As of the first semester of 2011, the island of Visayas hosts 37 generating plants and 3 power barges with aggregate installed capacity[1] of 2,385.61 MW. Total dependable capacity[2] is 2,001.35 MW or approximately 84.0 percent of installed output.

Among the three Visayas regions, Central Visayas has the most number of power plants (21) which altogether contribute half of the Visayas' total generating capacity. Table 1 shows a summary of the generating capacities of the power plants in the Visayas. The details are presented in Annex 1.

1 Refers to the maximum rated output of a generator under specific conditions designated by the manufacturer.

2 The maximum output that a power plant can provide under adverse conditions for a specified period of time and taking into consideration the plant's wear and tear condition.

**Table 1 GENERATING CAPACITY MIX IN VISAYAS**
**As of 1st Semester 2011**

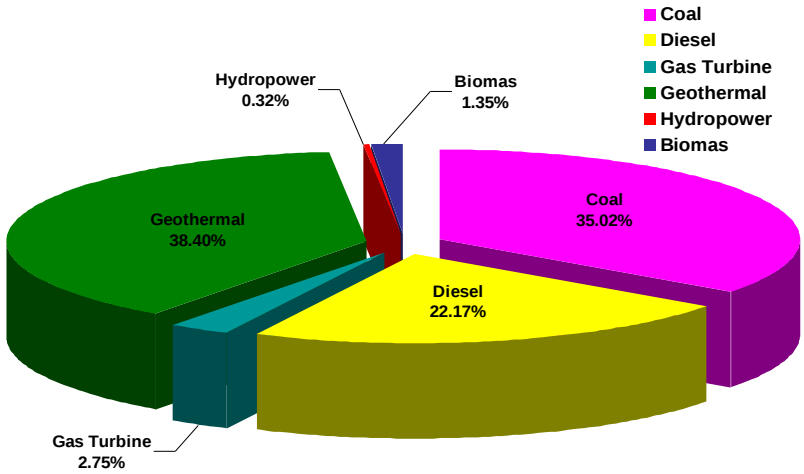
| Plant Type | Capacity (MW) | | Percent Share | |
|---|---|---|---|---|
| | Installed | Dependable | Installed | Dependable |
| Visayas | 2,385.31 | 2,001.35 | 100.00 | 100.00 |
| Coal | 782.50 | 700.80 | 32.80 | 35.02 |
| Diesel | 590.40 | 443.70 | 24.75 | 22.17 |
| Gas Turbine | 55.00 | 55.00 | 2.31 | 2.75 |
| Geothermal | 900.00 | 768.50 | 37.73 | 38.40 |
| Hydropower | 13.11 | 6.35 | 0.55 | 0.32 |
| Biomass | 44.30 | 27.00 | 1.86 | 1.35 |

Source of basic data: Power plants and DOE.

Geothermal-powered plants are the dominant power sources in the Visayas, accounting for more than one-third of the dependable capacity mix. Overall, however, fossil-fuel plants remain the major contributors to the capacity mix pie with a combined 60.0 percent share, while the remaining 40.0 percent is accounted for by renewable energy-fueled plants.

In terms of dominant capacity source by specific island in the Visayas, Cebu accounts for the bulk of coal and all of gas turbine outputs, Panay for diesel, Leyte for geothermal and Bohol for hydropower.

**Figure 1 DEPENDABLE CAPACITY MIX in VISAYAS**
**1st Semester 2011**




**Source: Generating plants and DOE**

## 2.2 Small Island Grids

The NPC Small Power Utilities Group (SPUG) is mandated by law to undertake electrification of areas not connected to the main transmission grid, also referred to as missionary areas. To carry out this mandate, SPUG operates 17 diesel-powered plants in Central Visayas: one in Siquijor, four in Cebu, and 12 in Bohol comprising the Bohol Mini Grid.

Among the small island grids in the region, Siqujior has the highest installed and dependable capacities while Bohol has the least. Table 2 presents a summary of the capacities of the small island grids in Central Visayas. The details are in Annex 2.

**Table 2 CAPACITY OF SMALL ISLAND GRIDS**
**Central Visayas, CY 2010-2030**

| Province | Capacity (MW)/Year | | | | |
|---|---|---|---|---|---|
| | 2010 | 2015 | 2020 | 2025 | 2030 |
| Siquijor | | | | | |
| Installed | 6.24 | 6.24 | 6.24 | 6.24 | 6.24 |
| Dependable | 4.05 | 4.05 | 4.05 | 4.05 | 4.05 |
| Cebu | | | | | |
| Installed | 3.35 | 5.57 | 6.90 | 7.40 | 8.60 |
| Dependable | 3.18 | 4.40 | 5.46 | 5.86 | 6.82 |
| Bohol | | | | | |
| Installed | 0.61 | 1.13 | 1.33 | 1.78 | 1.97 |
| Dependable | 0.60 | 1.03 | 1.17 | 1.60 | 1.79 |

Source: NPC SPUG Visayas.

## 2.3 Generation Capacity Addition

For the period 2010 to 2011, additional capacities for the Visayas came mainly from coal fuel plants. For 2012 to 2014, some 172 MW of generating capacity addition are expected for the Visayas, sourced from renewable energy sources. Annex 3 shows the details of the generation capacity addition in the Visayas for CY 2010 to 2014.

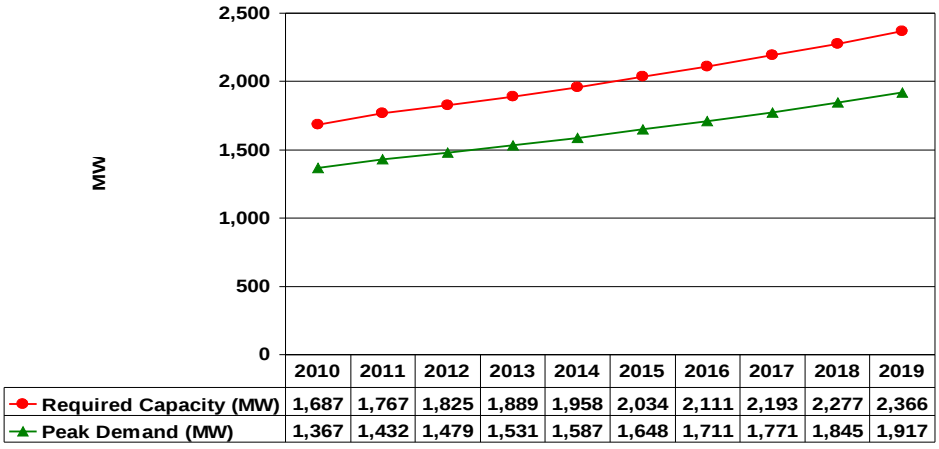
In the small island grids, diesel will remain the main power source. Table 2 shows the projected capacity additions in the island grids until 2030. Annex 4 presents the NPC-SPUG proposed projects in small island grids in the Visayas from 2012 to 2030 to meet expected demand.

# III. POWER DEMAND

## 3.1 Visayas Grid

The power demand in the Visayas is expected to rise to 1,917 MW by 2019, from 1,241 MW in 2009. Among the subgrids, Cebu manifests the highest demand and Bohol the lowest. Figure 2 shows the projected demand and required capacity in the system.

**Figure 2 PROJECTED DEMAND AND REQUIRED CAPACITY**
**Visayas, CY 2010 - 2019**

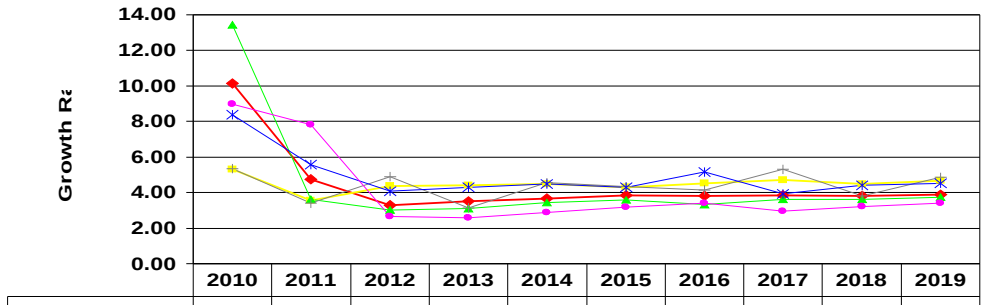



| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|
| Required Capacity (MW) | 1,687 | 1,767 | 1,825 | 1,889 | 1,958 | 2,034 | 2,111 | 2,193 | 2,277 | 2,366 |
| Peak Demand (MW) | 1,367 | 1,432 | 1,479 | 1,531 | 1,587 | 1,648 | 1,711 | 1,771 | 1,845 | 1,917 |

**Source: NGCP 2010 Transmission Development Plan, Final Report**

From 2010 to 2019, power demand is projected to grow at an average annual rate of 3.8 percent. Figure 3 shows the growth rates in demand in the Visayas by subgrid.

**Figure 3 GROWTH RATE IN PROJECTED DEMAND**
**Visayas, By SubGrid, CY 2010-2019**




| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|
| Visayas | 10.15 | 4.75 | 3.28 | 3.52 | 3.66 | 3.84 | 3.82 | 3.86 | 3.83 | 3.90 |
| Leyte Samar | 5.32 | 3.54 | 4.39 | 4.40 | 4.48 | 4.29 | 4.53 | 4.72 | 4.51 | 4.68 |
| Cebu | 13.42 | 3.63 | 3.04 | 3.10 | 3.44 | 3.60 | 3.34 | 3.62 | 3.62 | 3.73 |
| Bohol | 5.36 | 3.39 | 4.92 | 3.13 | 4.55 | 4.35 | 4.17 | 5.33 | 3.80 | 4.88 |
| Negros | 8.37 | 5.58 | 4.07 | 4.30 | 4.49 | 4.30 | 5.15 | 3.92 | 4.40 | 4.52 |
| Panay | 8.97 | 7.82 | 2.67 | 2.60 | 2.90 | 3.17 | 3.41 | 2.97 | 3.21 | 3.42 |

**Source: NGCP 2010 Transmission Development Plan, Final Report**

## 3.2 Small Island Grids

Among the small island grids, Siquijor has the highest peak demand and Bohol the lowest. There is a need to increase the generating capacity of Siquijor DPP as projected demands until 2030 are higher than the planned capacity addition. Table 3 shows the peak demands of the small island grids from 2010 to 2030. The details by power plant are in Annex 5.

**Table 3 SMALL ISLAND GRIDS PEAK DEMAND**
**Central Visayas, CY 2010-2030**

| Province | Peak Demand (MW) | | | | |
|---|---|---|---|---|---|
| | 2010 | 2015 | 2020 | 2025 | 2030 |
| Siquijor | 3.15 | 4.49 | 5.74 | 7.00 | 8.25 |
| Cebu | 2.05 | 2.96 | 3.95 | 5.06 | 6.02 |
| Bohol | 0.39 | 0.50 | 0.79 | 1.11 | 1.42 |

Source: NPC SPUG Visayas.

# IV. TRANSMISSION

## 4.1 Facilities

The power supply in the Visayas is shared through various interconnection facilities established to facilitate the sharing of resources by the different islands. The existing island interconnections are Panay-Boracay, Negros-Panay, Cebu-Mactan, Cebu-Negros, Leyte-Bohol, and Leyte-Cebu.

The Visayas transmission system is divided into four subsystems or subgrids. These are the Eastern Visayas Area composed of the islands of Leyte and Samar; Central Visayas Area composed of the islands of Cebu and Bohol; Island of Negros with Bacolod City as load center; and Western Visayas Area comprised of Panay Is.

As of December 2009, NGCP had 3,161 MVA substation capacity in the Visayas, comprising 13.2 percent of the country's total. Visayas had 4,600 circuit-kilometers (ckt-kms) transmission line length or 23.7 percent of the country's total.

**Table 4 SUMMARY OF EXISTING FACILITIES IN VISAYAS GRID AND PHILIPPINES CY 2005-2009**

| Facilities | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|
| Substation Capacity (In MVA) | | | | | |
| Philippines | 24,607 | 24,489 | 24,732 | 24,214 | 23,873 |
| Visayas | 3,371 | 3,268 | 3,171 | 3,154 | 3,161 |
| * Share to Philippines | 13.70 | 13.34 | 12.82 | 13.03 | 13.24 |
| Transmission Line Length (In ckt-km)* | | | | | |
| Philippines | 20,236 | 20,236 | 20,129 | 19,778 | 19,425 |
| Visayas | 4,807 | 4,845 | 4,856 | 4,745 | 4,600 |
| * Share to Philippines | 23.75 | 23.94 | 24.12 | 23.99 | 23.68 |

Source: NGCP 2010 Transmission Development Plan Final Report

* Decrease is due to modification and divestment of various sub-transmission assets.

### 4.2 Projects

To address existing and potential problems and issues in the Visayas Grid, NGCP has several ongoing and proposed projects. These projects are classified as generation-associated, load growth-driven, reliability and power quality, and generation-associated. Annex 6 lists the different ongoing and proposed projects.

## V. DISTRIBUTION

### 5.1 Facilities

There are 13 distribution utilities (DUs) in Central Visayas that carry out electricity distribution, three of which are private utilities (PUs) while 10 are electric cooperatives (ECS). Table 5 shows the infrastructure facilities of the DUs. As of 2010, VECO had the longest length of distribution lines among the PUs and CEBECO I among the ECs. In terms of substation capacity, VECO had the biggest among the PUs and NORECO II among the ECs.

**Table 5 FACILITIES OF DISTRIBUTION UTILITIES Central Visayas, CY 2005 and 2010**

| Distribution Utility | Length of Distribution Lines (ckt.-km) | | Substation Capacity (MVA) | |
|---|---|---|---|---|
| | 2005 | 2010 | 2005 | 2010 |
| PUs | | | | |
| BLCI | 240.30 | 250.78 | 20.00 | 30.00 |
| MECO | 116.21 | 168.51 | 50.00 | 60.00 |
| VECO | 3,546.00 | 3,081.00 | 462.00 | 606.50 |
| ECs | | | | |
| BOHECO 1 | 3,022.00 | 3,298.00 | 32.50 | 37.50 |
| BOHECO II | 2,518.26 | 3,150.23 | 25.00 | 32.50 |
| CEBECO I | 3,031.65 | 3,771.37 | 43.75 | 43.75 |
| CEBECO II | 2,357.76 | 2,958.14 | 30.00 | 75.00 |
| CEBECO III | 1,177.98 | 1,243.26 | 10.00 | 20.00 |
| NORECO I | | | | |
| NORECO II | | 3,151.03 | 62.95 | 78.75 |
| PROSIELCO | 435.65 | 453.15 | none | none |
| CELCO | 353.95 | 409.67 | none | none |
| BANELCO | 464.56 | 514.55 | 5.00 | 7.50 |

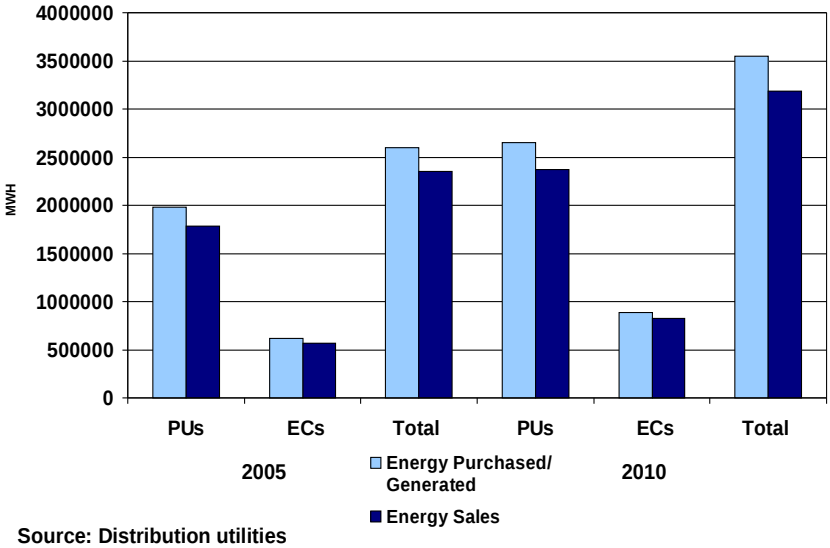
Sources: Distribution utilities.

## 5.2 Energy Purchased/Generated and Energy Sales

Figure 4 shows the total energy purchased/generated and energy sales of the DUs. In 2010, the PUs purchased/generated 2,651,917 MWh of electricity. Between 2005 and 2010, energy purchased/generated by the PUs increased at an average annual rate of 6.0 percent. During the same period, the ECs purchased/generated 960,722 MWh of electricity representing an average increase of 7.5 percent annually.

Combined energy sales of PUs in 2010 reached 2,368,641 MWh in 2010 while those of ECs was recorded at 883,034 MWh. The average annual growth in energy sales of ECs (7.5 %) outpaced that of the PUs (5.8 %).

**Figure 4 ENERGY GENERATED/PURCHASED & ENERGY SALES of Distribution Utilities in Central Visayas, CY 2005 and 2010**




Source: Distribution utilities

## 5.3 Electrification Coverage

Ten of the 13 DUs have achieved 100 percent coverage of potential barangays while only two have completely provided electricity to 100 percent of the potential households as of December 2010. NORECO I and CELCO had the least electrification coverage of potential households. Table 6 shows the electrification coverage of DUs.

**Table 6 ELECTRIFICATION COVERAGE OF DISTRIBUTION UTILITIES IN CENTRAL VISAYAS As of December 2010**

| Distribution Utility | Potential | | Electrification Coverage | | | |
|---|---|---|---|---|---|---|
| | | | Barangays | | Households | |
| | Brgys | HHs | No. | % | No. | % |
| PUs | | | | | | |
| BLCI | 15 | 18,463 | 15 | 100.00 | 17,725 | 96.00 |
| MECO | 43 | 60,532 | 43 | 100.00 | 60,532 | 100.00 |
| VECO | 232 | 297,346 | 228 | 98.28 | 295,563 | 99.40 |
| ECs | | | | | | |
| BOHECO 1 | 602 | 114,700 | 602 | 100.00 | 127,053 | 110.77 |
| BOHECO II | 491 | 102,873 | 491 | 100.00 | 95,057 | 92.40 |
| CEBECO I | 366 | 109,735 | 366 | 100.00 | 97,166 | 88.55 |
| CEBECO II | 323 | 135,500 | 323 | 100.00 | 116,980 | 86.33 |
| CEBECO III | 142 | 71,306 | 142 | 100.00 | 67,944 | 95.29 |
| NORECO I | 285 | 112,755 | 285 | 100.00 | 53,179 | 47.16 |
| NORECO II | 272 | | 268 | 98.53 | 113,308 | |
| PROSIELCO | 134 | 17,185 | 134 | 100.00 | 16,552 | 96.32 |
| CELCO | 56 | 19,445 | 56 | 100.00 | 13,222 | 68.00 |
| BANELCO | 49 | 21,885 | 48 | 97.96 | 17,094 | 78.11 |

Sources: Distribution utilities.

### 5.4 System Loss

Seven DUs registered single-digit system losses in 2010 while five posted double digit figures. CEBECO III recorded the lowest system loss and NORECO II the highest. In 2010, five DUs recorded a rise in system loss compared to their 2005 levels. Table 7 shows the system losses of the DUS in Central Visayas.

**Table 7 SYSTEM LOSS OF DISTRIBUTION UTILITIES**
**Central Visayas, CY 2005 and 2010**

| Distribution Utility | System Loss (%) | |
|---|---|---|
| | 2005 | 2010 |
| PUs | | |
| BLCI | 9.68 | 7.03 |
| MECO | 10.67 | 12.76 |
| VECO | 9.81 | 10.31 |
| ECs | | |
| BOHECO 1 | 7.84 | 6.78 |
| BOHECO II | 11.42 | 11.39 |
| CEBECO I | 8.82 | 9.25 |
| CEBECO II | 9.72 | 7.39 |
| CEBECO III | 6.80 | 5.51 |
| NORECO I | | |
| NORECO II | 11.88 | 13.40 |
| PROSIELCO | 8.95 | 9.86 |
| CELCO | 9.55 | 8.98 |
| BANELCO | 10.94 | 10.54 |

Source: Distribution utilities.

## VI. Challenges in the Power Sector

The challenges facing the power industry include the following:

6.1 Ensuring that required generating capacities are put in place

Proposed capacity additions need to go on stream to ensure that dependable capacities meet the required capacities of the system. While generating capacities emanating mostly from coal-powered plants were added in the 2010 to 2011 period, efforts need to be intensified to pursue further capacity additions in the succeeding years to meet the increasing peak demands. Beyond 2014, it is not clear where the capacity additions would come from.

6.2 Intensifying the development and utilization of renewable energy sources

The passage of RA 9513 otherwise known as the Renewable Energy Act of 2008 gave a big boost to the development of renewable energy sources. However, in the Visayas, while geothermal-powered plants are the main sources of power output, the development of other renewable energy sources remains slow and wide-scale use of the same is still to be achieved. Overall, conventional power sources (coal and oil-based plants) comprise the bulk of the capacity mix pie as opposed to renewable energy sources.

To hasten the development and utilization of RE sources, there is an urgent need for government to address the constraints to the same, viz: insufficient fiscal and financial incentives, absence of commercially viable market for RE systems, and relatively high cost of technology.

6.3 Attaining 100 percent household and barangay electrification coverage

Three DUs still have to achieve 100 percent electrification coverage of their potential barangays. Ten DUs are also still to attain 100 percent electrification coverage of their respective potential households. In fact, five of these DUs have less than 90 percent coverage of their potential households.

6.4 Improving transmission and distribution systems

Transmission and distribution systems need continuous upgrading to meet load demand projections.

6.5 Ensuring quality service and lower power rates by DUs

DUs need to achieve significant and sustained energy efficiency improvements in order to provide customers with reliable and least-cost power supply over the long term. Five DUs in the region had system losses of over 10.0 percent in 2010.

**ANNEX 1**
**GENERATING CAPACITIES OF VISAYAS POWER PLANTS BY PLANT TYPE**
**As of 1st Semester 2011**

| Power Plant | Capacity (MW) | | | Owner | Location |
|---|---|---|---|---|---|
| | Installed | Dependable | Contracted | | |
| **Coal** | **782.80** | **700.80** | **614.40** | | |
| Toledo Power Co. | 66.00 | 50.00 | 50.00 | Toledo Power Co. | Toledo City |
| Cebu Thermal PP I | 50.00 | 50.00 | 45.00 | SPC Power Corp. | Naga City |
| Cebu Thermal PP II | 56.80 | 56.80 | 50.80 | SPC Power Corp. | Naga City |
| Cebu Energy Dev't Corp | 246.00 | 216.00 | 184.00 | Cebu Energy Dev't Corp. | Toledo City |
| Kepco SPC Cebu PP | 200.00 | 184.00 | 153.10 | Kepco SPC Power Corp. | Naga City |
| Panay Energy Devt Corp. | 164.00 | 144.00 | 131.50 | Panay Energy Devt Corp. | Iloilo City |
| **Diesel** | **590.40** | **443.70** | **234.62** | | |
| Toledo Power Co. | 45.00 | 38.00 | 0.00 | Toledo Power Co. | Toledo City |
| Cebu Private Power | 70.00 | 67.00 | 61.72 | Cebu Private Power Corp. | Cebu City |
| East Asia Utilities (MEPZ I) | 48.00 | 44.00 | 27.50 | East Asia Utilities Corp. | Lapu-Lapu City |
| Cebu Diesel Power Plant I | 39.00 | 39.00 | 36.00 | SPC Power Corp. | Naga City |
| Panay Power Corp I | 72.00 | 69.00 | 15.00 | Panay Power Corp. | Iloilo City |
| Panay Power Corp II | 20.00 | 18.00 | 8.00 | Panay Power Corp. | Iloilo City |
| Panay Power Corp III | 12.50 | 11.30 | 12.50 | Panay Power Corp. | Aklan |
| Panay Power Corp IV | 5.00 | 4.50 | 5.00 | Panay Power Corp. | Aklan |
| Panay Diesel PP I | 36.50 | 18.00 | * | SPC Island Power Corp | Dingle, Iloilo |
| Panay Diesel PP III | 110.00 | 55.00 | | SPC Island Power Corp. | Dingle, Iloilo |
| Trans-Asia Oil & Energy | 3.40 | 3.20 | ** | Trans Asia Oil & Energy Dev't Corp. | Guimaras |
| Ennervantage DPP | 11.00 | 9.40 | 6.40 | | Capiz |
| Bohol Diesel PP | 22.00 | 14.30 | *** | | Tagbilaran City |
| Power Barge 101 | 32.00 | 15.00 | | NPC | Iloilo City |
| Power Barge 102 | 32.00 | 20.00 | 62.50 | NPC | Iloilo City |
| Power Barge 103 | 32.00 | 18.00 | | NPC | Estancia, Iloilo |
| **Gas Turbine** | **55.00** | **55.00** | **0.00** | | |
| Cebu Land-Based GT I | 27.50 | 27.50 | 0.00 | SPC Power Corp. | Naga City |
| Cebu Land-Based GT II | 27.50 | 27.50 | 0.00 | SPC Power Corp. | Naga City |
| **Geothermal** | **900.00** | **768.50** | **274.60** | | |
| Palinpinon Geothermal PP I | 112.50 | 106.50 | | Green Core Geothermal Inc./ | Valencia, Neg. Or. |
| Palinpinon Geothermal PP II | 80.00 | 78.00 | 219.00 | First Gen | Valencia, Neg. Or. |
| Tongonan Geothermal PP | 112.50 | 104.00 | | | Kananga, Leyte |
| EDC Unified Leyte | 595.00 | 480.00 | 55.60 | NPC | Kananga, Leyte |
| **Hydropower** | **13.11** | **6.35** | **7.50** | | |
| Mantayupan | 0.50 | 0.25 | | CEBECO I | Barili, Cebu |
| Basak | 0.50 | 0.25 | **** | CEBECO I | Badian, Cebu |
| Matutinao | 0.72 | 0.48 | | CEBECO I | Badian, Cebu |
| Amlan HEPP | 0.80 | 0.80 | | | Amlan, Neg. or. |
| Janopol | 5.00 | 1.80 | 5.00 | Janopol Mini Hydro Corp. | Balilihan, Bohol |
| Sevilla | 2.50 | 0.80 | 2.50 | Sevilla Mini Hydro Corp. | Sevilla, Bohol |
| Loboc | 1.20 | 1.20 | | | Loboc, Bohol |
| Ton-ok | 1.08 | 0.50 | ***** | SAMELCO I | Calbayog City |
| Hinabian | 0.81 | 0.27 | | SOLECO | So. Leyte |
| **Biomass** | **44.30** | **27.00** | **8.00** | | |
| CASA | 15.00 | 12.00 | 8.00 | Central Azucarera de San Antonio, Inc. | Passi City |
| San Carlos Bioenergy | 8.30 | 7.00 | | Bronzeoak Phil, Inc. | San Carlos City |
| First Farmers Biomass | 21.00 | 8.00 | | First Farmers Holding Corp. | Talisay City |
| **TOTAL VISAYAS** | **2,385.61** | **2,001.35** | **1,139.12** | | |

Sources: Power plants, except for Amlan HPP, Loboc HPP, San Carlos Bioenergy and First Farmers Biomass which were taken from DOE list for 2010.

* Under preservation.

** 65% of maximum demand of Guimelco

*** Currently negotiating for PSC with DUs.

**** Tied up to distribution system of CEBECO 1.

***** Supplies part of SAMELCO coverage.

**ANNEX 2**
**CAPACITY OF SMALL ISLAND GRIDS BY POWER PLANT**
**Central Visayas, CY 2010-2030**

| Power Plant | Capacity (MW)/Year | | | | |
|---|---|---|---|---|---|
| | 2010 | 2015 | 2020 | 2025 | 2030 |
| Siquijor DPP | | | | | |
| Installed | 6.24 | 6.24 | 6.24 | 6.24 | 6.24 |
| Dependable | 4.05 | 4.05 | 4.05 | 4.05 | 4.05 |
| Camotes DPP | | | | | |
| Installed | 2.19 | 3.88 | 4.88 | 5.38 | 6.38 |
| Dependable | 2.05 | 2.85 | 3.65 | 4.05 | 4.85 |
| Guintarcan DPP | | | | | |
| Installed | 0.26 | 0.53 | 0.53 | 0.53 | 0.63 |
| Dependable | 0.25 | 0.46 | 0.46 | 0.46 | 0.54 |
| Doong DPP | | | | | |
| Installed | 0.33 | 0.49 | 0.65 | 0.65 | 0.75 |
| Dependable | 0.33 | 0.46 | 0.59 | 0.59 | 0.67 |
| Pilar DPP | | | | | |
| Installed | 0.58 | 0.68 | 0.84 | 0.84 | 0.84 |
| Dependable | 0.56 | 0.64 | 0.77 | 0.77 | 0.77 |
| BOHOL MINI GRID | | | | | |
| Hambongan DPP | | | | | |
| Installed | 0.02 | 0.04 | 0.06 | 0.06 | 0.06 |
| Dependable | 0.02 | 0.04 | 0.05 | 0.05 | 0.05 |
| Mocaboc DPP | | | | | |
| Installed | 0.02 | 0.02 | 0.06 | 0.08 | 0.08 |
| Dependable | 0.02 | 0.02 | 0.05 | 0.07 | 0.07 |
| Cabilao DPP | | | | | |
| Installed | 0.15 | 0.25 | 0.30 | 0.35 | 0.40 |
| Dependable | 0.15 | 0.24 | 0.24 | 0.33 | 0.38 |
| Cuaming DPP | | | | | |
| Installed | 0.09 | 0.17 | 0.17 | 0.27 | 0.27 |
| Dependable | 0.08 | 0.15 | 0.15 | 0.24 | 0.24 |
| Pamilacan DPP | | | | | |
| Installed | 0.09 | 0.17 | 0.17 | 0.27 | 0.27 |
| Dependable | 0.08 | 0.15 | 0.15 | 0.24 | 0.24 |
| Balicasag DPP | | | | | |
| Installed | 0.04 | 0.09 | 0.09 | 0.13 | 0.17 |
| Dependable | 0.04 | 0.08 | 0.08 | 0.11 | 0.14 |
| Bilangbilangan DPP | | | | | |
| Installed | 0.02 | 0.04 | 0.04 | 0.04 | 0.06 |
| Dependable | 0.02 | 0.04 | 0.04 | 0.04 | 0.05 |
| Bagongbangwa DPP | | | | | |
| Installed | 0.04 | 0.08 | 0.08 | 0.08 | 0.11 |
| Dependable | 0.04 | 0.07 | 0.07 | 0.07 | 0.11 |
| Pangapasan DPP | | | | | |
| Installed | 0.04 | 0.06 | 0.06 | 0.10 | 0.12 |
| Dependable | 0.04 | 0.06 | 0.06 | 0.09 | 0.11 |
| Ubay DPP | | | | | |
| Installed | 0.02 | 0.04 | 0.06 | 0.06 | 0.07 |
| Dependable | 0.02 | 0.03 | 0.05 | 0.05 | 0.06 |
| Batasan DPP | | | | | |
| Installed | 0.06 | 0.11 | 0.17 | 0.22 | 0.22 |
| Dependable | 0.06 | 0.11 | 0.16 | 0.21 | 0.22 |
| Mantatao DPP | | | | | |
| Installed | 0.04 | 0.06 | 0.08 | 0.12 | 0.14 |
| Dependable | 0.04 | 0.05 | 0.07 | 0.10 | 0.12 |

Source: NPC SPUG Visayas.

**ANNEX 3**
**GENERATION CAPACITY ADDITION IN THE VISAYAS BY PLANT TYPE**
**CY 2010 – 2014**

| Commissioning Year | Power Plant | Capacity (MW) | Location |
|---|---|---|---|
| 2010 | Toledo Coal-Fired | 164 * | Toledo City |
| 2011 | Toledo Coal-Fired | 82* | Toledo City |
| | Kepco Coal-Fired | 200* | Naga, Cebu |
| | PEDC Coal-Fired | 164* | La Paz, Iloilo |
| 2012 | GGPC Mulit-Fuel Biomass | 35 | Mina, Iloilo |
| | Nasulo Geothermal | 20 | Nasuji, Valencia, Neg. Or |
| | San Lorenzo Wind | 54 | Guimaras Island |
| 2013 | Pulupandan Wind | 15 | Negros Occidental |
| | Villasiga Hydro | 8 | Sibalom, Antique |
| 2014 | Dauin Geothermal | 40 | Dauin, Negros Oriental |

Source: NGCP 2010 Transmission Development Plan Final Report
* Already energized.

**ANNEX 4**
**NPC-SPUG PROPOSED PROJECTS IN CENTRAL VISAYAS SMALL ISLAND GRIDS**
**CY 2012 – 2030**

| Name of Project | Location | Description and Purpose | Forecast Schedule |
|---|---|---|---|
| Cabul-an DPP | Buenavista, Bohol | -Installation of diesel power plant in Cabul-an Is.<br>-For energization of the island | 2012 |
| 2 x 750 kW | Camotes Is. Cebu | -Installation of add'l 2 x 750 kW diesel generating set in Camotes DPP<br>- To have a more reliable source of electricity in the island | 2012 |
| 1 x 163 kW | Doong Is. Cebu | -Installation of add'l 1 x 163 kW diesel generating set in Doong DPP<br>- To augment the increasing demand in the island | 2012 |
| 1 x 163 kW<br>1 x 100 kW | Guintarcan Is. Cebu | -Installation of add'l 1 x 163 kW & 1 x 100 kW diesel generating sets in Guintarcan DPP<br>- To augment the increasing demand in the island | 2012 |
| 1 x 100 kW | Pilar Is. Cebu | -Installation of add'l 1 x 100 kW diesel generating set in Pilar DPP<br>- To augment the increasing demand in the island | 2012 |
| 1 x 38 kW | Bagongbanwa,Bohol | -Installation of add'l 1 x 38 kW diesel generating set in Bagongbanwa DPP<br>- To have a more reliable source of electricity in the island | 2012 |
| 1 x 56 | Balicasag, Bohol | -Installation of add'l 1 x 56 kW diesel generating set in Balicasag DPP<br>- To have a more reliable source of electricity in the island | 2012 |
| 1 x 56 | Batasan, Bohol | -Installation of add'l 1 x 56 kW diesel generating set in Batasan DPP<br>- To have a more reliable source of electricity in the island | 2012 |
| 1 x 20 | Bilangbilangan, Bohol | -Installation of add'l 1 x 20 kW diesel generating set in Bilangbilangan DPP<br>- To have a more reliable source of electricity in the island | 2012 |
| 1 x 100 | Cabilao, Bohol | -Installation of add'l 1 x 100 kW diesel generating set in Cabilao DPP<br>- To have a more reliable source of electricity in the island | 2012 |
| 1 x 86 | Cuaming, Bohol | -Installation of add'l 1 x 86 kW diesel generating set in Cuaming DPP<br>- To have a more reliable source of electricity in the island | 2012 |
| 1 x 20 | Hambongan, Bohol | -Installation of add'l 1 x 20 kW diesel generating set in Hambongan DPP<br>- To have a more reliable source of electricity in the island | 2012 |
| 1 x 20 | Mantatao, Bohol | -Installation of add'l 1 x 20 kW diesel generating set in Mantatao DPP<br>- To have a more reliable source of electricity in the island | 2012 |
| 1 x 38 | Pamilacan, Bohol | -Installation of add'l 1 x 38 kW diesel generating set in Pamilacan DPP<br>- To have a more reliable source of electricity in the island | 2012 |

| Name of Project | Location | Description and Purpose | Forecast Schedule |
|---|---|---|---|
| 1 x 20 | Pangapasan, Bohol | -Installation of add'l 1 x 20 kW diesel generating set in Pangapasan DPP<br>- To have a more reliable source of electricity in the island | 2012 |
| 1 x 20 | Ubay, Bohol | -Installation of add'l 1 x 20 kW diesel generating set in Ubay DPP<br>- To have a more reliable source of electricity in the island | 2012 |
| 1 x 750 kW | Camotes Is. Cebu | -Installation of add'l 1 x 750 kW diesel generating set in Camotes DPP<br>- To augment the increasing demand in the island | 2014 |
| 1 x 38 | Pamilacan, Bohol | -Installation of add'l 1 x 38 kW diesel generating set in Pamilacan DPP<br>- To augment the increasing demand in the island | 2015 |
| 1 x 163 | Pilar Is., Cebu | -Installation of add'l 1 x 163 kW diesel generating set in Pilar DPP<br>- To augment the increasing demand in the island | 2016 |
| 1 x 1000 kW | Camotes Is., Cebu | -Installation of add'l 1 x 1000 kW diesel generating set in Camotes DPP<br>- To augment the increasing demand in the island | 2018 |
| 1 x 163 | Doong Is., Cebu | -Installation of add'l 1 x 163 kW diesel generating set in Doong DPP<br>- To augment the increasing demand in the island | 2018 |
| 1 x 20 | Mocaboc Is., Bohol | -Installation of add'l 1 x 20 kW diesel generating set in Mocaboc DPP<br>- To augment the increasing demand in the island | 2018 |
| 1 x 20 | Mantatao Is., Bohol | -Installation of add'l 1 x 20 kW diesel generating set in Mantatao DPP<br>- To augment the increasing demand in the island | 2019 |
| 1 x 20 | Ubay Is., Bohol | -Installation of add'l 1 x 20 kW diesel generating set in Ubay DPP<br>- To augment the increasing demand in the island | 2019 |
| 1 x 56 | Batasan, Bohol | -Installation of add'l 1 x 56 kW diesel generating set in Batasan DPP<br>- To augment the increasing demand in the island | 2020 |
| 1 x 50 | Cabilao Is., Bohol | -Installation of add'l 1 x 50 kW diesel generating set in Cabilao DPP<br>- To augment the increasing demand in the island | 2020 |
| 1 x 20 | Hambongan Is., Bohol | -Installation of add'l 1 x 20 kW diesel generating set in Hambongan DPP<br>- To augment the increasing demand in the island | 2020 |
| 1 x 20 | Mocaboc Is., Bohol | -Installation of add'l 1 x 20 kW diesel generating set in Macaboc DPP<br>- To augment the increasing demand in the island | 2020 |
| | Cuaming Is., Bohol | -Installation of add'l 1 x 50 kW diesel generating set in Cuaming DPP<br>- To augment the increasing demand in the island | 2022 |

| Name of Project | Location | Description and Purpose | Forecast Schedule |
|---|---|---|---|
| 1 x 38 | Balicasag Is., Bohol | -Installation of add'l 1 x 38 kW diesel generating set in Balicasag DPP<br>- To augment the increasing demand in the island | 2022 |
| 1 x 37 | Pangapasan Is., Bohol | -Installation of add'l 1 x 37 kW diesel generating set in Balicasag DPP<br>- To augment the increasing demand in the island | 2022 |
| 1 x 50 | Cabilao Is., Bohol | -Installation of add'l 1 x 50 kW diesel generating set in Cabilao DPP<br>- To augment the increasing demand in the island | 2023 |
| 1 x 38 | Mantatao Is., Bohol | -Installation of add'l 1 x 38 kW diesel generating set in Mantatao DPP<br>- To augment the increasing demand in the island | 2023 |
| 1 x 50 | Camotes Is., Cebu | -Installation of add'l 1 x 500 kW diesel generating set in Camotes DPP<br>- To augment the increasing demand in the island | 2024 |
| 1 x 20 | Mocaboc, Bohol | -Installation of add'l 1 x 20 kW diesel generating set in Mocaboc DPP<br>- To augment the increasing demand in the island | 2024 |
| 1 x 50 | Cuaming, Bohol | -Installation of add'l 1 x 50 kW diesel generating set in Cuaming DPP<br>- To augment the increasing demand in the island | 2025 |
| 1 x 56 | Batasan, Bohol | -Installation of add'l 1 x 56 kW diesel generating set in Batasan DPP<br>- To augment the increasing demand in the island | 2025 |
| 1 x 100 | Guintarcan, Cebu | -Installation of add'l 1 x 100 kW diesel generating set in Guintarcan DPP<br>- To augment the increasing demand in the island | 2026 |
| 1 x 100 | Doong, Cebu | -Installation of add'l 1 x 100 kW diesel generating set in Doong DPP<br>- To augment the increasing demand in the island | 2026 |
| 1 x 38 | Pamilacan, Bohol | -Installation of add'l 1 x 38 kW diesel generating set in Pamilacan DPP<br>- To augment the increasing demand in the island | 2026 |
| 1 x 37 | Bagongbangwa, Bohol | -Installation of add'l 1 x 37 kW diesel generating set in Bagongbangwa DPP<br>- To augment the increasing demand in the island | 2026 |
| 1 x 20 | Mantatao, Bohol | -Installation of add'l 1 x 20 kW diesel generating set in Mantatao DPP<br>- To augment the increasing demand in the island | 2026 |
| 1 x 500 | Camotes, Cebu | -Installation of add'l 1 x 500 kW diesel generating set in Camotes DPP<br>- To augment the increasing demand in the island | 2027 |
| 1 x 50 | Cabilao, Bohol | -Installation of add'l 1 x 50 kW diesel generating set in Caabilao DPP<br>- To augment the increasing demand in the island | 2027 |

| Name of Project | Location | Description and Purpose | Forecast Schedule |
|---|---|---|---|
| 1 x 12 | Ubay, Bohol | -Installation of add'l 1 x 12 kW diesel generating set in Ubay DPP<br>- To augment the increasing demand in the island | 2028 |
| 1 x 38 | Balicasag, Bohol | -Installation of add'l 1 x 38 kW diesel generating set in Balicasag DPP<br>- To augment the increasing demand in the island | 2029 |
| 1 x 20 | Bilangbilangan, Bohol | -Installation of add'l 1 x 20 kW diesel generating set in Bilangbilangan DPP<br>- To augment the increasing demand in the island | 2029 |
| 1 x 20 | Pangapasan, Bohol | -Installation of add'l 1 x 20 kW diesel generating set in Pangapasan DPP<br>- To augment the increasing demand in the island | 2029 |
| 1 x 20 | Batasan, Bohol | -Installation of add'l 1 x 20 kW diesel generating set in Batasan DPP<br>- To augment the increasing demand in the island | 2029 |
| 1 x 500 | Camotes, Cebu | -Installation of add'l 1 x 500 kW diesel generating set in Camotes DPP<br>- To augment the increasing demand in the island | 2030 |

Source: NPC SPUG Visayas

*Data are taken from the office of Strategic Planning Division of SPUG H.O.*

*Outlook for 2020 to 2030 is yet to be included in the MEP that will cover the said period.*

**ANNEX 5**
**SMALL ISLAND GRIDS PEAK DEMAND BY POWER PLANT**
**Central Visayas, CY 2010-2030**

| Power Plant | Peak Demand (MW) | | | | |
|---|---|---|---|---|---|
| | 2010 | 2015 | 2020 | 2025 | 2030 |
| Siquijor DPP | 3.15 | 4.49 | 5.74 | 7.00 | 8.25 |
| Camotes DPP | 1.67 | 2.39 | 3.14 | 3.89 | 4.65 |
| Guintarcan DPP | 0.07 | 0.11 | 0.15 | 0.18 | 0.22 |
| Doong DPP | 0.13 | 0.19 | 0.26 | 0.33 | 0.40 |
| Pilar DPP | 0.19 | 0.28 | 0.41 | 0.66 | 0.76 |
| BOHOL MINI GRID | | | | | |
| Hambongan DPP | 0.01 | 0.02 | 0.02 | 0.03 | 0.04 |
| Mocaboc DPP | 0.01 | 0.02 | 0.03 | 0.03 | 0.05 |
| Cabilao DPP | 0.12 | 0.18 | 0.27 | 0.33 | 0.37 |
| Cuaming DPP | 0.08 | 0.09 | 0.13 | 0.20 | 0.24 |
| Pamilacan DPP | 0.03 | 0.02 | 0.06 | 0.09 | 0.14 |
| Balicasag DPP | 0.04 | 0.04 | 0.06 | 0.08 | 0.11 |
| Bilangbilangan DPP | 0.00 | 0.01 | 0.01 | 0.02 | 0.03 |
| Bagongbangwa DPP | 0.02 | 0.03 | 0.04 | 0.06 | 0.08 |
| Pangapasan DPP | 0.01 | 0.02 | 0.03 | 0.04 | 0.06 |
| Ubay DPP | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 |
| Batasan DPP | 0.05 | 0.06 | 0.10 | 0.14 | 0.18 |
| Mantatao DPP | 0.02 | 0.03 | 0.05 | 0.08 | 0.11 |

Source: NPC SPUG Visayas.

**ANNEX 6**
**ONGOING AND PROPOSED NGCP PROJECTS IN VISAYAS**

**Ongoing Projects**

| Project Name | Description/Purpose | Estimated Time of Completion |
|---|---|---|
| Generation-Associated Projects | | |
| Colon Substation | The Colon Substation is intended to provide a termination point for the Cebu-Negros Uprating. The substation will also establish the asset boundary between NGCP assets and the power plant by separating the control of Salcon Power Complex from NGCP . In addition, the substation will serve as the receiving station of the KEPCO 200 MW coal-fired power plant as the Naga substation is already congested and can hardly accommodate any expansion. | |
| Load-Growth Driven Projects | | |
| Bohol Backbone Transmission | The project involves the installation/construction of a total of 96 kilometers of 138 kV overhead transmission line utilizing steel tower structures and the installation of a 100 MVA power transformer at the new Corella Substation. In addition, the Ubay Substation will be upgraded. The proposed Ubay-Corella 138 kV line is necessary to prevent the overloading of Ubay-Trinidad 69 kV line during outage of Ubay-Alicia 69 kV transmission line, and vice-versa, starting 2011. On the other hand, the new substation in Corella will provide a new delivery point in Bohol and prevent the overloading of Ubay Substation starting 2011. | 2012 |
| Negros V Transmission Line | This project is intended to accommodate increasing power demand in the northeastern part of Negros Island by building a 69kV transmission loop from Cadiz to Amlan and to ensure the security of power supply to western Negros. | 2013 |
| Negros - Panay Interconnection Uprating (Phase 1) | Phase I of this project of the network upgrading in Panay side is recommended to help improve the voltage profile in Panay and in Negros Occidental. Even with the additional generation in Panay, the high impedance of the single-circuit Dingle-Barotac Viejo 138 kV line will limit the voltage regulation particularly in Negros. It should be noted that Panay and Negros have been prone to voltage variations. Phase I aims to accommodate load growth and address the low voltage problems and improve the system reliability and operational flexibility of the Panay Grid. NGCP has already bid out Phase I on 5 April 2010 and subsequently awarded the project to the qualified contractor on 25 May 2010. | 2011 |

| | | |
|---|---|---|
| Northern Panay Backbone | The project involves the installation/construction of a total of 97 kilometers of 138 kV and 69 kV overhead transmission line utilizing steel tower structures and aims to : 1) accommodate load growth and address the low voltage problem; 2) improve the system reliability and operational flexibility; and 3) extend service to unelectrified areas. | 2011 |
| Paranas-Calbayog Transmission Line | To support the long term power requirements of Samar and improve the delivery of quality and reliable power in the island, NGCP is constructing the 138 kV Paranas-Calbayog transmission line. The new line will replace the old 69 kV woodpole transmission line and will address the overloading of Paranas Substation. | 2011 |
| Southern Panay Backbone | The project is part of the Panay Power Transmission Backbone which involves the installation/construction of a total of 97 kilometers of 138 kV and 69 kV overhead transmission line utilizing steel tower structures, The new transmission backbone will accommodate load growth and address the low voltage problem in southern Panay. In particular, the new facilities will avert the overloading of the Sta. Barbara-Sibalom 69 kV transmission line and the Sta. Barbara Substation. | 2012 |
| Reliability and Power Quality Projects | | |
| Visayas Power Circuit Breaker (PCB) Replacement | The purpose of this project is to replace old/antiquated PCBs installed in a number of substation facilities including PCBs which will become inadequate in terms of their technical capability (duties, mechanical, etc.). Under this project, the PCBs in the following substations will be replaced: Amlan, Bacolod, Compostela, Dingle, Mabinay, Panitan and Sta. Barbara. | 2011 |

Source: NGCP 2010 Transmission Development Plan Final Report

**Projects in the Visayas for 2011-2015**

| Project Name | Description/Purpose | Estimated Time of Completion |
|---|---|---|
| Generation-Associated Project | | |
| Calung-calung-Toledo-Colon 138 kV Transmission Line | Upon the completion of CEDC 3X82 MW coal-fired power plant in 2010, Calung-calung-Toledo-Colon transmission lines need to be reinforced in order to accommodate the said power plant. The project involves the construction of 9.5 kilometers Calung-calung-Toledo and 17.6 kilometers Toledo-Colon line, with 138 kV steel tower, double circuit, single-strung overhead transmission line. This project also involves the line extension and termination of VECO's 138 kV line from CEDC to NGCP's Colon Substation. | 2013 |

| | | |
|---|---|---|
| | The reinforcement will cater the estimated 40 MW injected power to the grid by the 100 MW embedded generator connected at Toledo Substation. The other 60 MW will be consumed by the embedded loads with modest growth rates,The project also entails the expansion of Calung-calung, Toledo and Colon substations. | |
| Load Growth-Driven Projects | | |
| Colon-Cebu Transmission Line | The transmission corridor is composed of a double circuit transmission line with a I-795 MCM conductor per circuit, with Quiot Substation cutting in at one circuit. Evidently, a cut-in substation presents an unbalance loading between the two circuits. With two sizable coal plants (3X82 MW CEDC Coal-Fired Power Plant and 2X100 MW Kepco Coal_fired Power Plant) coming in in Cebu to inject power to the Colon Substation, and with the expected increase in demand at the Cebu load centers (Cebu, Mandaue and Mactan substations in particular) the Colon-Cebu transmission corridor will be overloaded. The Colon-Quiot line will carry the most power. The project involves the construction of 138 kV double circuit transmission line that utilizes two bundle of 795 MCM conductor per circuit from Colon directly to Cebu. The new line will only be designed at 138 kV. A 230 kV transmission line from Compostela to Colon will be proposed to reinforce the future backbone of Cebu. | 2012 |
| Visayas Substation Expansion I | The demand in the Visayas Grid is expected to grow at an Annual Average Compounded Growth Rate of 4.44 % from 2010-2019 based on NGCP's latest high demand projection. Three substations were identified to become overloaded under normal condition, namely Ormoc (Leyte), Calung-calung, Cebu, and Kabankalan (Negros) substations. The project involves the installation of one (1) unit of 50 MVA transformer for each substation. | 2011 |
| Reliability and Power Quality Projects | | |
| Cebu-Mandaue-Lapu-Lapu Transmission Line | The existing Cebu-Mandaue -Lapu-Lapu transmission line is the transmission corridor carrying the power supply to the two major substations, namely Mandaue and Lapu-Lapu, which serve the load center of Metro Cebu. Cebu-Mandaue | 2015 |

| | | |
|---|---|---|
| | transmission line is a double circuit line utilizing 3-1400 mm2 XLPE underground cable per circuit. On the other hand, Mandaue-Lapu-Lapu is a double circuit utilizing 3-500 mm2 XLPE underground cable per circuit. This transmission corridor is expected to be overloaded during the single outage contingency by 2011 with the Cebu-Mandaue 138 kV line carrying a heavier power flow compared to the Mandaue-Lapu-Lapu 138kV line. This project involves the construction of a third circuit utilizing the same conductor as the existing cables to comply with the N-1 provision of the Grid Code. With this project, the reliability of power supply to Mandaue and Lapu-Lau load center substations will be improved. | |
| Culasi-Sibalom 69 kV Transmission Line | Approximately 86 kilometers in length, the transmission line will provide alternate power source to Sibalom Substation, as well as connect North and South Panay on the western side. | 2014 |
| Ormoc-Babatngon Transmission Line | Leyte-Samar corridor is composed of Ormoc-Babatngon 138 kV, a single circuit line and Babatngon-Paranas 138 kV, a double circuit line. Since the Ormoc-Babatngon 138 kV is a single circuit line, an out age of this line will result in blackout in Samar. Samar has no internal generation and is dependent from the geothermal generation in Leyte. To prevent this and at the same time comply with N-I provision of the Grid Code, the Ormoc - Babatngon 138 kV has to be expanded to double circuit line. This project involves the construction of 78.54 km of 138 kV steel tower overhead transmission line utilizing I-795 MCM ACSR conductor as second circuit of the existing Ormoc-Babatngon 138 kV line. This project also involves the expansion of Ormoc and Babatngon substations. | 2014 |
| Sta. Rita-Quinapundan 69 kV Transmission Line | The proposed line is intended primarily to make Quinapundan Substation closer to its power source and thus provide power that is more reliable. | 2014 |
| Ormoc-Maasin Transmission Line | The Leyte-Bohol corridor includes the Ormoc-Maasin 138 kV line, Maasin-Guadalupe CTS 138 kV line, the Guadalupe CTS-CP Garcia CTS submarine cable (Leyte-Bohol interconnection) and the CP Garcia CTS-Ubay SS 138 kV line. All these lines in the corridor, the Ormoc-Maasin 138 kV in particular, are all single circuit lines. An outage of the Ormoc-Maasin 138 kV line | 2014 |

| | | |
|---|---|---|
| | will result in power outage in Bohol as well as Southern Leyte. An initial step to prevent it is the expansion of the Ormoc - Maasin 138 kV to double circuit line. This will also make the line compliant to N-I provision of the Grid Code. | |
| Visayas Substation Reliability I | This project entails the installation of 650 MVA substation capacity to address overloading of various substations during N-I. These transformers will improve system security and reliability of the grid. | Compostela S/S – 2011<br>2013 |
| Visayas Substation Reliability II | This project involves the installation of additional transformers to address overloading of various substations during N-I. This project is intended to provide additional capacity additions to various substations to address the overloading during N-I condition or outage of one transformer. This will ensure the reliability of the substations and comply with the N-I provision of the Grid Code. | 2014 |

Source: NGCP 2010 Transmission Development Plan Final Report

**Projects Beyond 2015 (Indicative Projects) in Visayas**

| Project Name | Description/Purpose |
|---|---|
| Amlan-Mabinay Transmission Line | To provide N-1 provision to the Negros backbone during low generation at Panay island |
| Mabinay-Kabankalan-Bacolod Transmission Line | To provide N-1 provision to the Negros transmission backbone during low generation at Panay island |
| Visayas Substation Reliability III | To address overloading of various substations during N-1 |
| Visayas Substation Reliability IV | To address overloading of various substations during N-1 |
| Visayas Voltage Improvement I | To maintain the voltage level at various substations within the Grid Code prescribed limits by installing capacitors. |

Source: NGCP 2010 Transmission Development Plan Final Report