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TERMINAL REPORT

Technical Assistance to DOE for Enhancing Private Sector Participation in New and Renewable Energy Investments for Off-Grid Rural Electrification (TASK 3 – Identifying Market Packages)

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Executive Summary

Introduction

1. Rural electrification is given the needed impetus under the Medium Term Philippine Development Plan (1999-2004) with the past and the present administration's thrust of attaining 100% electrification of barangays by year 2004.
2. The Department of Energy spearheads the implementation of the "O-Ilaw Program". As of December 2000, there are still about 8,245 non-electrified barangays in the country. For the period 1999 - 2000, there are about 2,000 additional barangays electrified. In order to achieve 100% barangay electrification by year 2004, the sector targets about 2,000 barangays energized per year.
3. To further elevate the level of efforts on rural electrification, specifically for remote and isolated barangays, the DOE intends to intensify private sector involvement and mobilize the various local government units in undertaking rural energy investments under a market-based scenario. The USAID Technical Assistance (TA) to the DOE for Enhancing Private Sector Participation in Renewable Energy Investments for Off-grid Rural Electrification aims to provide immediate institutional support to the DOE.
4. In facilitating the entry of the private sector in RE investments for off-grid rural electrification, the DOE must show that RE markets exist and that RE investments are viable.
5. The primary objective of Task 3 is to systematically group non-electrified barangays in the country to constitute several market packages with sufficient critical mass of base customer that may potentially be the showcase of viable RE investments by the private sector.

The Screening and Prioritization of Market Packages: Conceptual Framework

6. The market package is redefined in the study from a cluster of ten or more non-electrified barangays to a municipal-based grouping of all non-electrified barangays in that municipality.
7. The criteria used in identifying and prioritizing market packages are enumerated below and will be adequately discussed in the report:
 - *Level of energization*
 - *Aggregate population of non-electrified households*
 - *Household financial indicators*
 - ✓ Household annual income
 - ✓ Household annual disposable income
 - ✓ Household monthly energy expenditures

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- *LGU Financial Capacity* as indicated by the municipality classification by DOF
- *Household population density*
- *Security condition.*

8. The general framework of the screening and prioritization process is shown in the table below:

Stages	Population/Sample	Criteria
1 Regional Shortlisting	Whole Philippines	Regional Energization Status Peace and Order Condition
2 Municipal Shortlisting		
- 1 st Level	565 Municipalities/Cities	Municipal Energization Index
- 2 nd Level	259 Municipalities	10 or more non-electrified barangays
- 3 rd Level	163 Municipalities	MA sample municipality
3. Prioritization	87 Municipalities	No. of HHs in non-electrified barangays HH monthly energy expenditures HH annual income HH annual disposable income Household population density Municipal financial capacity

The Long-list (87) and the 25 Prioritized Market Packages

9. Briefly discussed below are observations on the 87 Long list of municipal market packages:

Region 2

- The ECs that cover the nine municipality market packages are CAGELCO I, ISELCO II and NUVELCO;
- The levels of energization in the coverage areas of the ECs are in the range of 70% - 75%;
- The number of non-electrified barangays in the candidate market packages are between 11 - 25 barangays;
- The level of energization in each of the municipalities is very low compared to the ECs overall level of energization, i.e., between 8% - 56%;

Region 5

- The ECs that cover the twenty-one (21) municipality market packages are CASURECO I, CASURECO IV, ALECO, MASELCO, and SORECO II;
- The levels of energization in the coverage areas of the ECs are in the range of 32% - 88%;
- The number of non-electrified barangays in the market packages are between 11 - 31 barangays;
- The levels of energization in the municipality market packages are in the ranges of 3% - 73%;

Region 6

- The ECs that cover the 18 candidate municipality market packages are AKELCO, ANTECO, CAPELCO, ILECO I, ILECO II, ILECO III and VRESCO;
- The levels of energization in the coverage areas of the ECs are in the range of 64% - 85%;
- The number of non-electrified barangays in the candidate market packages are between 10 - 46 barangays;
- The levels of energization in the municipality market packages are in the ranges of 12% - 75%;

Region 8

- The ECs that cover the 28 municipality market packages are LEYECO I, NORSAMELCO, ESAMELCO, SAMELCO I, SAMELCO II, and SOLECO;
- The levels of energization in the coverage areas of the ECs are in the range of 44% - 78%;
- The number of non-electrified barangays in the candidate market packages are between 10 - 49 barangays;
- The levels of energization in the municipality market packages are in the ranges of 8% - 71%;

Region 9

- The ECs that cover the eleven (11) municipality market packages are ZANECO, ZAMSURECO I, and ZAMSURECO II;
- The levels of energization in the coverage areas of the ECs are in the range of 49% - 60%;
- The number of non-electrified barangays in the candidate market packages are between 10 - 34 barangays;
- The levels of energization in the municipality market packages are in the ranges of 7% - 67%;

10. The 25 prioritized market packages are shown in the table and are briefly described:

Number of Households

- The minimum number of households in the non-electrified barangays in the prioritized market packages is 2,110 households found in Dueñas, Iloilo while the municipal market package with the biggest size is the Calatrava, Negros Occidental which numbered about 5,810 households.
- The median household size is about 3 - 4 persons.
- This is a comfortable market size for private sector investors not to mention other consuming sectors, such as the local industry, commercial and service establishments.

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M.P. #	Region	Province	Municipality	Electric Cooperative	
1	2	Cagayan	Baggao	CAGELCO I	
2			Isabela	Benito Soliven	ISELCO II
3		San Mariano			
4	5	Albay	Bacacay	ALECO	
5			Libon		
6			Oas		
7			Rapu-Rapu		
8		Masbate	Balud	MASELCO	
9			Cataingan		
10			Esperanza		
11			Mandaon		
12			Masbate		
13			Milagros		
14			Palanas		
15		6	Capiz	Dumarao	CAPELCO
16			Iloilo	Dueñas	ILECO II
17			Negros Occ	Calatrava	VRESCO
18	8	N. Samar	Catubig	NORSAMELCO	
19			Las Nanas		
20			Laoang		
21		W. Samar	Tarangnan	SAMELCO I	
22			Daram	SAMELCO II	
23		E. Samar	Guiuan	ESAMELCO	
24		9	Zamboanga Norte	Sergio Osmeña	ZANECO
25	Sibuco			ZAMSURECO II	

Average Annual Household Income

- Sergio Osmeña, Zamboanga Norte has the lowest average annual household income of about PhP 22,529.00 while Baggao, Cagayan reported the highest average annual household income of PhP 76,270.00.
- There are three municipality market packages with average annual household income below PhP 30,000.00 and these are Calatrava, Negros Occidental (PhP 28,892.82), Cataingan, Masbate (PhP 29,504.50) and Sergio Osmeña, Zamboanga Norte.
- The median average annual household income is about PhP 39,000.00.

Average Household Energy Expenditures

- The average monthly household energy expenditures range from a minimum of PhP 53.64 (Sergio Osmeña, Zamboanga Norte) to a maximum of PhP 251.54 (Esperanza, Masbate).
- The median average monthly household energy expenditures is roughly PhP 148.00.

Average Annual Household Disposable Income

- Surprisingly, data from the Market Assessment survey showed that households have savings which can be spent to cover additional cost for improved supply and services of electricity. The minimum HH disposable income recorded is PhP 1,122.84 (Cataingan, Masbate) and the highest HH disposable income gathered is PhP 31,976.36 (Benito Soliven, Isabela).
- The median is about PhP 10,000.00 per annum.

Household Population Density (HPD)

- Baggao, Cagayan is relatively the least dense among the 25 priority market packages. There are about four households for every square kilometer.
- Guiuan, Eastern Samar is comparatively the most dense with a HPD of 65 households per square kilometer.

Municipal Financial Capacity (Class)

- Almost half of the priority market packages are classified as fourth class municipality (Annual Income of PhP 8M or more but less than PhP 12M);
- Baggao, Cagayan and San Mariano, Isabela are first class municipalities and based on DOF classification, these municipalities have an average annual income of more than PhP 20M.
- Calatrava, Negros Occidental and Masbate, Masbate are second class municipalities (Annual Income of PhP 16M or more but less than PhP 20M).
- There are five municipalities that are classified as third class municipalities (annual income PhP 12M or more but less than PhP 16M);
- The remaining five municipalities are classified as fifth class municipalities (annual income PhP 4M or more but less than PhP 8M).

Mentoring of DOE Staff on Rural Electrification Market Packaging

11. One of the deliverables of Task 3 is the mentoring of a DOE-EUMB/NCED staff in identifying rural electrification market packages. Specifically, Task 3 focuses on five regions and there are still a large number of non-electrified barangays that need to be clustered together to be attractive to the private sector. Thus, the intent of this deliverable is to provide the DOE staff adequate appreciation and skills in handling/processing vast information to continue with the rural electrification market packaging. Rodel Padrique was assigned to work with the consultant. He participated in most of the meetings and consultations and particularly in processing the information.
12. To facilitate systematic use of the information gathered, a database program was developed. The DOE staff provided vital inputs in developing the program.
13. A special database system for the conduct of the market package identification and prioritization was developed. The computer database program based on Microsoft ACCESS 97 contained all the secondary data used in the identification and analysis of the market packages. Aptly called “Market Package (MKTPACK) for Off-grid Electrification”, the program was used to conduct the prioritization of the 25 market packages.

Conclusions

Task 3 : Identifying the Market Packages
by *Arlene S.M Lafrades*

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14. Preliminary review and assessment of relevant statistics show that non-electrified barangays can be clustered and grouped into market packages that may be potentially attractive to private investors.
15. Due to the very large service area coverage of certain electric cooperatives, there are municipalities with very high economic growth potentials that have remained poorly energized. Examples of these municipalities are Baggao, Cagayan and San Mariano, Isabela.
16. Targeted and coordinated efforts to address rural off-grid electrification may lead to the expeditious provision of electricity services to the non-electrified barangays. A consultation with officials of concerned electric cooperatives revealed their willingness to waive or better yet, to collaborate with a third party to facilitate the energization of the remaining non-electrified barangays in their area coverage.

Recommendations

17. A market package is redefined in this paper as a municipality-based grouping of all non-electrified barangays in that municipality. If a waiver can be successfully secured from the concerned EC, the municipality will then be under two service providers, the EC and the new private investor.

Hypothetically, it will be more efficient to put a service area (a municipality) under one management. Municipalities which have been electrified by the ECs (one barangay electrified) simply to comply with the thrust of 100% energization at the municipal level may see the prospects of service expansion as dim.

It is viewed, therefore, that there is merit in certain municipalities for the EC to waive its rights over the whole municipality. Asset disposal/turn over, among other concerns, may be a barrier.

It is recommended that a policy study be done to look into the legal and operational aspect of turning over the whole municipality to the new energy delivery partner.

18. There are 163 short-listed municipal market packages that may be potentially attractive to private sector investors. However, due to time limitations and the availability of salient information, only 87 (out of the 163 market packages) were further characterized.

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It is recommended that a characterization of the remaining 76 municipal market packages be done. This can be done two ways:

- *Using the NSO FIES data sets but data extracted to the barangay and municipal levels;*
- *Conduct of a mini- survey that can be done by the Affiliated Noncon Energy Centers.*

19. *It is recommended that methodology of identifying market packages be also applied to the other regions that have not been covered by this Task.*

List of Abbreviations and Acronyms

AKELCO	Aklan Electric Cooperative
ALECO	Albay Electric Cooperative
ANTECO	Antique Electric Cooperative
ARMM	Autonomous Region of Muslim Mindanao
CAGELCO	Cagayan Electric Cooperative
CAPELCO	Capiz Electric Cooperative
CASURECO	Camarines Sur Electric Cooperative
CTP	Capacity to pay
DOE	Department of Energy
DOE-NCED	DOE-Nonconventional Energy Division
DOF	Department of Finance
DORELCO	Don Orestes Romualdez Electric Cooperative
EC	Electric cooperative
ESAMELCO	Eastern Samar Electric Cooperative
FIES	Family Indome and Expenditures Survey
HH	Household
HPD	Household Population Density
ILECO	Iloilo Electric Cooperative
IPP	Independent power producer
IRA	Internal revenue allotment
ISELCO	Isabela Electric Cooperative
kW	Kilowatt
kWh	Kilowatt-hour
LE	Level of energization
LEYECO	Leyte Electric Cooperative
LGU	Local Government Unit
MA	Market Assessment
MASELCO	Masbate Electric Cooperative
MEI	Municipal energization index
MKTPACK	Market Package
NCED	
NEA	National Electrification Administration
NORSAMELCO	Northern Samar Electric Cooperative
NRE	New and renewable energy
NSCB	National Survey Coordination Board
NSO	National Statistics Office
NUVELCO	Nueva Viscaya Electric Cooperative
PhP	Philippine peso
RE	Renewable energy
SAMELCO	Samar Electric Cooperative
SOLECO	Southern Leyte Electric Cooperative

List of Abbreviations and Acronyms

SORECO	Sorsogon Electric Cooperative
USAID	United States Agency for International Development
VRESCO	V-M-C Rural Electric Service Cooperative, Inc.
WB	World Bank
WTP	Willingness to pay
W/m ²	Watt per meter squared
ZAMSURECO	Zamboanga del Sur Electric Cooperative
ZANECO	Zamboanga del Norte Electric Cooperative

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CHAPTER 1

INTRODUCTION

1. Rural electrification is given the needed impetus under the Medium Term Philippine Development Plan (1999-2004) with the past and the present administration's thrust of attaining 100% electrification of barangays by year 2004.
2. The remaining task of rural electrification is still enormous requiring huge capital investments for the rehabilitation/upgrade of distribution lines, extension of wires to remote areas and installation of isolated systems, all against the backdrop of tight budgetary capacity of the government. As of December 2000, there are still about 8,245 non-electrified barangays in the country. About 99% percent of the total non-electrified barangays, i.e. 8,127 non-electrified barangays, are within the service areas of the electric cooperatives. Due to the archipelagic configuration of the country, decentralized electrification (off main grid) is expected to be the cost-effective option for about 40% of the non- electrified barangays. In many instances, new and renewable energy (NRE) sources have the potential for being the cost-effective off-grid options.
3. The Department of Energy spearheads the implementation of the "O-IIaw Program". The program centerpiece is the National Electrification Administration (NEA) regular rural electrification program through the electric cooperatives with complementary programs namely IPP Program and the "Adopt a Barangay" Program. For the period 1999 - 2000, there are about 2,000 additional barangays electrified. To achieve 100% barangay electrification by year 2004, the sector targets about 2,000 barangays energized per year.
4. To further elevate the level of efforts on rural electrification, specifically for remote and isolated barangays, the DOE intends to intensify private sector involvement and mobilize the various local government units in undertaking rural energy investments under a market-based scenario.
5. The USAID Technical Assistance (TA) to the DOE for Enhancing Private Sector Participation in Renewable Energy Investments for Off-grid Rural Electrification aims to provide immediate institutional support to the DOE. The TA shall pursue targeted and well-defined coordination activities with the electric cooperatives, local government units, and the private sector players to enable the DOE to set the stage for a longer term program of transforming RE-based off-grid rural electrification into a viable business portfolio for the private sector investors.
6. The TA has six major task areas namely:
 - Task 1 : Facilitating Policy Reform and Development in Electricity Franchising

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- Task 2 : Coordination and Consultation with LGUs
 - **Task 3 : Identifying the Market Packages**
 - Task 4 : Project Evaluation, Prioritization and Financing
 - Task 5 : Coordination and Consultation with Private Sector and Civil Society
 - Task 6 : Research, Analysis & Packaging of Critical RE Investment Information
7. The scope of work of Task 3: Identifying the market Packages are as follows:
- Formulate a consensus-based "market packaging methodology" for defining off-grid rural electrification markets;
 - Identify at least 50 market packages and from its long list, prioritize 25 renewable energy (RE) - based market packages;
 - Prepare individual "market briefs" for the 25 RE-based market packages.
8. The Task 3 activities entailed processing of various relevant information. For a systematic and organized processing of data to identify market packages, a database program using MS Access was developed.

OBJECTIVE/S

9. In facilitating the entry of the private sector in RE investments for off-grid rural electrification, the DOE must show that RE markets exist and that RE investments are viable.
10. The primary objective of Task 3 is to systematically group non-electrified barangays in the country to constitute several market packages with sufficient critical mass of base customer that may potentially be the showcase of viable RE investments by the private sector. Proper consultations with relevant players will be done.

CHAPTER 2

11. This chapter shall present the methodology formulated to define and prioritize market packages. This shall discuss the set of criteria and operating guidelines used to identify the long list of market packages and from the long list, prioritize market packages.
12. The methodology presented is a result of many consultations and meetings with various officials of relevant agencies and associations.

Basic Assumptions

13. Several completed and on-going activities provide basic empirical data that were used as assumptions and bases for defining the criteria and developing the methodology for identifying the market packages. The salient information are below:

Non-electrified Barangay Profile:

- Average number of household : 170 households
- Range of number of household : 20 - 500 households
- Average household size : 5 - 6 persons/HH
- Average population : 1,000 inhabitants
- Average rural barangay land area : 6 - 7 square kilometers
- Household segmentation by annual income
 - ✓ 50% of households : less than PhP30,000.00
 - ✓ 30% of households : PhP30,000.00-PhP45,000.00
 - ✓ 20% of households : above PhP45,000.00

Renewable Energy Service Company Operation

- Min. customer base : 600 households
- Min. market package HH population : 1, 700 HH

Rural Electrification Market Penetration

- Market penetration rate : 35 percent

14. The initial definition of a market package is a cluster of ten or more non-electrified barangays with adequate number of base customer that can be considered a viable market for a private operation. The task recommends that the market package geographical boundaries be changed from merely aggregate geographical boundaries of ten or more non-electrified barangays to definite municipal boundaries. The market package shall then be comprised of all non-electrified barangays in the candidate municipalities. The merits of this new definition are:
- *Greater chances of achieving electrification target.* All the non-electrified barangays in a candidate municipality will have equal chances of being

electrified. If the first definition of a market package be used, there will be cases where some isolated non-electrified barangays in the candidate municipality will not be included in the package and will still remain under the EC franchise. The potential for these left-out non-electrified barangays to be electrified is nil.

- *Economy of scale of operation for private sector/civil society cum LGU partnership.* Application of the new definition shall result to bigger market packages; i.e. a market package may be comprised of 25 or even more non-electrified barangays. The bigger the potential market, the rural energy project operator will have greater mix of options to make the operation viable and sustainable.
- *Assist EC in achieving greater efficiency.* The off-grid municipalities are often times far from the main grid and do not have the adequate number of base customer to justify extending the lines to them. Assigning the non-electrified barangays in these off-grid municipalities to a new operator will relieve the EC of its responsibility and may then concentrate its efforts to its remaining coverage area.

15. In a consultative meeting with the General Managers of ECs of Regions 2, 5, 6, 8, and 9, it was cited that a market package may even be composed of non-electrified barangays in two or more municipalities depending on certain characteristics of the areas. This may be validated in the more detailed investigation that will be done following this technical assistance.

Criteria for Identifying Market Packages

16. The various initiatives in rural electrification promote the optimization of government and private partnership. Specifically, this task shall establish criteria in identifying market packages that address the thrust and requirements of both sectors.
17. On the government side, the major consideration is to improve the access to energy services of regions/municipalities in order to stir economic development and consequently uplift the social and economic conditions of the population. The level of energization will be used as a criterion to address this government objective. Likewise, in line with the vision of increasing involvement of various LGUs in rural energy investment through provision of policy support and leveraging funds sourced from local counterpart funding and/or servicing any bank loan, financial soundness of the LGU as measured by its annual income or its IRA will be a major consideration.
18. The salient elements of a market package that would be critical for private investment decision are level of demand (existing and potential for growth), household income, energy expenditures and disposable income, market configuration (e.g. household population density). The easing out of the candidate

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market package from the electric cooperative franchise area is also a major legal concern of private investors and this will be addressed by Task 1 of this TA.

19. The criteria to be used in identifying and prioritizing market packages are briefly presented below. The specific application of these criteria will be discussed at length in the next section.

- *Level of energization.* In ensuring social equity through access to energy services, regions and municipalities with very low levels of energization will be prioritized for this undertaking.
- *Aggregate population of non-electrified households.* To achieve economy of scale of operation and attract private sector interest, priority should be given to market packages with higher aggregate household population in non-electrified barangays.
- *Household financial indicators.* The household financial indicators shall include household income, energy expenditures and disposable income. The primary source of information for these indicators is the recently completed survey, the "Market Assessment for Rural Electrification". These indicators will be treated independently to present clear insights on the financial capacity of the target non-electrified household population.

Households with average annual income belonging to the upper 50% (national) of the market segmentation pyramid (Income distribution classification scheme based on NSCB, 2000 Philippine Poverty Statistics) will be prioritized. Based on the MA report, non-electrified households belonging to this category have an average annual income of PhP 30,000.00 and above. It is assumed that these households will be able to afford connection fees and the monthly tariffs.

Likewise, households with higher current energy expenditures are likely to be the potential market for electrification systems which offers better quality and longer services, at least at their current level of expenditures or even a little higher. The national average household energy expenditures is computed at PhP 179.98 per month. For the households in income classes "poor" and "less poor", the average household energy expenditures are PhP 285.00 and PhP 647.88 per month, respectively. These figures, however, should be checked and corrected for households operating diesel genset for commercial purposes.

Household disposable income is a derived information based on the survey raw data, household total income less household total expenditures. Households with relatively higher disposable income (or savings) will have the capacity, even so the willingness, to pay higher than their current energy expenditures for improved energy/electricity services.

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- *LGU Financial Capacity.* To be used as a guide for assessing financial capacity of LGUs is the Department of Finance DO No. 24-97 issued on March 26, 1997 prescribing new income brackets for the reclassification of provinces, cities and municipalities and amending DO NO. 35-95 issued May 25, 1995. The income classification of provinces, cities and municipalities shall among other purposes, serve as basis for the *determination of administrative and statutory aids, financial grants and other forms of assistance to local governments.* The new classification of municipalities shall be based on the following income brackets (based on LGUs financial statements for CYs 1992-1995):

Table 1. Classification of Municipalities, Average Annual Income

Class	Average Annual Income
First	P 20M or more
Second	P 16M or more but less than P 20M
Third	P 12M or more but less than P 16M
Fourth	P 8M or more but less than P 12M
Fifth	P 4M or more but less than P 8M
Sixth	Below P 4M

Financing institutions use this classification among other criteria to evaluate the credit worthiness of LGUs.

- *Security condition.* Priority will be given to areas with relative good security environment.

Identifying Rural Electrification Market Packages: Conceptual Framework

20. The framework presents criteria, assumptions and the processes of screening/shortlisting at various level, i.e, regional, and municipal, to identify the potential market packages that may be subject for further study and for offering to the private sectors and the various LGUs. Likewise, the framework shall discuss the criteria to be used in ranking the market packages as to its potential attractiveness for future rural electrification investment.

Regional Shortlisting

21. The 8,127 non-electrified barangays are not proportionately distributed in the country. There are regions that are still poorly energized and this is one of the many factors that cause slow economic development in the area. The regional distribution of non-electrified barangays in the country is shown in Table 2.

22. To ensure equity to access to energy/electricity services among regions, there is a need to reduce the level of regional disparity in terms of number of non-electrified

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barangays. The first five regions with very high number of non-electrified barangays will be prioritized.

**Table 2. Regional Profile of Non-electrified Barangays in EC Service Areas
December 2000**

Region "A"	Total No. of Barangays in EC Areas "B"	Number of Non- electrified Barangays "C"	Regional Share To Total Non-electrified Barangays "D" = "C"/8,127 *100	Priority Ranking
1	3,033	61	0.75	15
2	2,377	468	5.76	7
3	2,097	76	0.94	14
4	3,513	604	7.43	6
5	3,408	849	10.45	4
6	3,869	805	9.91	5
7	2,715	429	5.28	9
8	4,388	1,298	15.97	1
9	2,145	911	11.21	3
10	1,437	211	2.60	12
11	1,270	292	3.59	10
12	1,054	441	5.43	8
ARMM	2,357	1,260	15.50	2
CAR	1,106	209	2.57	13
CARAGA	1,306	213	2.62	11
Grand Total	36,095	8,127	100.00	

Source: NEA Planning Department

Municipal Short-listing

23. All municipalities in the prioritized regions will be included in the second level short-listing (Municipal Short-listing). The process will have three levels of screening using the following parameters:
 - Municipal Energization Index
 - Municipalities with ten (10) or more non-electrified barangays
 - MA Survey Municipality
24. The 1st Level Screening uses the Municipal Energization Index (a ratio of the Municipal % Energization to that of the National % Energization) as the screening tool.
25. Originally, the parameter used is the ratio of the Municipal % Energization to that of the Electric Cooperative % Energization in its service area.
26. The NEA Red Book Schedule of Electrification by grid up to year 2004 is arguably very optimistic. Since the intent of the TA is to identify off-grid market packages, the first level screening aims to identify the off-grid municipalities in the prioritized regions. To date, there is no clear definition/delineation which municipalities are on-grid and off-grid.

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27. The indicator/criteria that can be used to identify off-grid municipalities are the levels of energization of the electric cooperative for its whole coverage areas and that of the specific municipalities identified. Municipalities with very low level of energization compared to the level of energization of the appropriate EC will be considered off-grid municipalities. It is hypothesized that municipalities with lower level of energization vis-à-vis EC level of energization (whole coverage area) are municipalities that are least prioritized for electrification due to factors such as long distance from the main grid, bad terrain, lack of adequate number of base customer, among others. Municipalities with level of energization lower than the EC level of energization will be prioritized

28. In a consultation with top officials of electric cooperatives, it was validated that this screening tool is useful. Most of the short-listed municipalities that have been identified using this method have been confirmed by the EC officials to be good candidates as off-grid market packages.

29. However, an analysis of the resulting list of municipalities short-listed showed that there are municipalities with comparatively low level of energization that are screened out while there are municipalities with relatively high level of energization that are included in the list of potential market packages. The indicator/criteria failed to take into account the wide variation of level of energization of electric cooperatives.

30. This observation led to the use of the Municipal Energization Index (MEI). All municipalities with MEI less than 1.0 are potential candidates

31. The 2nd Level Screening shall take into account that a "potentially attractive market package" must be of sufficient size. Based on the empirical data earlier cited, a market package of ten or more non-electrified barangays may constitute a potentially attractive market for private investment.

32. Municipalities with ten or more non-electrified barangays scheduled for electrification (per NEA Red Book) within the period 2001 - 2004 will be short-listed and are candidate market packages.

33. Also, a consensus (as a result of various consultations with officials of DOE-NCED and NEA) is reached that barangays electrified through privately-owned or LGU-owned diesel gensets will be included in the market package. The NEA Red Book identifies some barangays as being energized by gensets. The MA survey further noted that there are many barangays reported as non-electrified in the RED Book but are actually electrified through gensets. Barangays that are reported energized through NRE systems are not included in the package. However, in the operationalization of these initiatives, the concerned EC will have the option to

- include these NRE-based barangays among the non-electrified barangays that are due for franchise right waiver.
34. The 3rd Level Screening is preparatory to the prioritization of market packages. Generally, the municipalities that have passed the 1st and 2nd level screening are already candidate market packages that may be potentially attractive to the private sector given the size of the package in terms of number of non-electrified barangays. However, further characterization of these market packages should be done to make the offering to the private sectors successful. In the earlier section, characteristics such as aggregate number of non-electrified households, their average household income, household energy expenditures, household disposable income, among others are important to examine.
35. Primary source of information needed to characterize the market packages is the recently completed "Market Assessment for Rural Electrification", co-financed by DOE, USAID, and World bank. The survey provide raw data on the household income, household total expenditures, capacity to pay (household energy expenditures), among others, up to the level of the barangay. The 1995 Family Income and Expenditure Survey (FIES) of NSO also presents data on household income and expenditures for energy/electricity. However, the data will be of a different time frame and the level of disaggregation that is readily available would be at regional or the provincial level. Extracting data up to the municipal and barangay levels by NSO is possible but will take some time.
36. The 3rd level screening, therefore, shall consider only the municipalities that have been covered in the Market Assessment survey.
37. All municipalities that passed the three level screening shall constitute the long list of potential market packages.

Prioritization of RE-Based Market Packages: Conceptual Framework

38. Most, if not all, short-listed municipalities are potentially RE-based market packages due to the following characteristics:
- Long distance from the primary tapping point;
 - Poor access road and rough terrain
 - Dispersed settlements
 - Low energy use (typically < 1 kWh/day)
39. The short-listed municipalities were presented in a consultation to the officers of the electric cooperatives namely:
- ANTECO
 - CAGELCO I
 - CAGELCO II
 - DORELCO

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- ILECO I
- ILECO III
- ISELCO II
- MASELCO
- NUVELCO
- SAMELCO I
- SAMELCO II
- VRESKO
- ZAMZURECO
- ZANECO

The general sentiment was that there is willingness to waive or partner with a third party to pursue electrification in those areas using off-grid electrification systems. Under the current arrangements, grid expansion for most of the short-listed municipalities will have negative impact on the technical efficiency of the ECs due primarily to systems losses.

40. The prioritization of market packages shall be based on the following parameters:
 - Level of demand (in terms of aggregate number of households in non-electrified barangays)
 - Household energy expenditures
 - Household disposable income
 - Household total income
 - Household population density
 - Municipality financial capacity
41. The primary indicator for the level of demand is the total number of households in the non-electrified barangays in the market packages. The non-electrified barangays scheduled for electrification for year 2001 - 2004 comprise the market package. The household population data are based on the NSO 1995 census of population.
42. The household population for 2000 will be estimated using the municipal statistic on population growth and the average household size. This information, however, will be presented in the market briefs of the prioritized NRE-based market packages.
43. The household financial indicators, which include household energy expenditures, disposable income and the total income, will primarily be taken from the raw data of the Market Assessment survey. There are about one to four barangays surveyed in the municipalities covered in the MA. The simple averages of the barangay data generated from the MA are used as basic statistics for the market packages.

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44. The household population density is defined as the ratio of the household population in the non-electrified barangays to that of the municipal land area. This indicator is particularly important for mini/micro-grid systems.
45. The municipality financial capacity, using the DOF classification, shall provide insights on the readiness of the local government units to pursue joint-venture undertakings with the private investors.
46. The data points for each of the parameters will be equal to the number of municipalities short-listed.
47. The assignment of weights for each of the criteria put greater emphasis on private sector investment decision parameters. Furthermore, sensitivity analysis can be done by changing the weight assignments to the criteria depending on the objective of the activity. For the purpose of this study, following weights are given to the parameters/attributes as follows:
- | | | |
|----------------------------------------------|---|-----------|
| ▪ Number of HHs in non-electrified barangays | : | 25 points |
| ▪ Household energy expenditures | : | 15 points |
| ▪ Household annual disposable income | : | 15 points |
| ▪ Household annual income | : | 10 points |
| ▪ Household population density | : | 15 points |
| ▪ Municipal financial capacity | : | 20 points |
48. There are various ways of assigning weights to the criteria/attributes. One is by identifying ranges (referred to as "class" in statistics) for each of the attributes and assigning point rating for each of the classes. The first run was done using this method. However, results are not good because several packages garnered the same point rating.
49. It is important that for each of the data points for the attributes to have distinct and unique point ratings to be able to do good prioritization. For simplicity, linear functions (i.e. $y = mx + b$) for each of the attributes were established.
50. Extreme values will be grouped as either low range group (10% of the lower data points) and high range group (10% of the higher data points) with corresponding point value.
51. The 25 market packages with the highest rating shall correspond to the 25 prioritized RE-based market packages.

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Table 3. Identification of Market Packages (Screening and Prioritization)

Stages	Population/Sample	Criteria
1 Regional Shortlisting	Whole Philippines	Regional Energization Status Peace and Order Condition
2 Municipal Shortlisting		
- 1 st Level	565 Municipalities/Cities	Municipal Energization Index
- 2 nd Level	259 Municipalities	10 or more non-electrified barangays
- 3 rd Level	163 Municipalities	Market Assessment sample municipality
3. Prioritization	87 Municipalities	No. of HHs in non-electrified barangays
		HH monthly energy expenditures
		HH annual income
		HH annual disposable income
		Household population density
		Municipal financial capacity

CHAPTER 3

52. This chapter shall present and analyze the results of the application of the methodology discussed in the previous chapter.
53. The characteristics of the market packages, both in the long list and the twenty-five prioritized market packages, will be discussed.

Identification of Market Packages

Regional Short-listing

54. The prioritized regions based on the ranking shown in Table 2 are as follows:
- Eastern Visayas Region (Region 8)
 - Autonomous Region of Muslim Mindanao (ARMM)
 - Western Mindanao Region (Region 9)
 - Bicol Region (Region 5)
 - Western Visayas Region (Region 6)
55. Considering the very volatile peace and order situation of the region (a major decision area for private investors), ARMM is substituted with other candidate regions. Region 4, ranked number 6, was not considered as a substitute region for ARMM because of the numerous on-going efforts in energy development in the region.
56. Region 2 is the next and best candidate replacement for ARMM as indicated by the NEA Proposed Barangay Electrification Schedule (2000-2004), commonly referred to as the "NEA Red Book", for having vast potential for NRE-based rural electrification.
57. The final short-listed regions, therefore, are:
- Eastern Visayas Region (Region 8)
 - Western Mindanao Region (Region 9)
 - Bicol Region (Region 5)
 - Western Visayas Region (Region 6)
 - Cagayan Valley Region (Region 2)
58. The five prioritized regions account for about 4,331 non-electrified barangays in the country and this represent a little more than half the total number of non-electrified barangays in the country.

Municipal Screening and Short-listing

59. The objective of the municipal screening and short-listing is to identify potential off-grid market packages based on the new definition, i.e., a "municipal market package" and that will be potentially attractive to the private sector investors.
60. There are about 565 municipalities/cities in the EC coverage areas in Regions 2, 5, 6, 8, and 9 and the breakdown is as follows:
- Region 2 : 97 Municipalities/Cities
 - Region 5 : 113 Municipalities/Cities
 - Region 6 : 132 Municipalities/Cities
 - Region 8 : 143 Municipalities/Cities
 - Region 9 : 80 Municipalities/Cities
61. The 1st level screening shall eliminate municipalities with Municipal Energization Index of one and above (MEI = 1, >1). The National % Energization as of December 2000 is 77%.
62. Municipalities in Regions 2, 5, 6, 8, and 9 with MEI = 1, >1 are shown in Annex A-1. Based on this screening process, the 565 municipalities/cities are trimmed down to 259 municipalities. The regional breakdown of these municipalities are as follows:
- Region 2 : 29 Municipalities
 - Region 5 : 46 Municipalities
 - Region 6 : 44 Municipalities
 - Region 8 : 77 Municipalities
 - Region 9 : 63 Municipalities
63. The 259 municipalities are within the area coverage of 38 ECs with the following level of energization (L.E.) profile:
- 75% < L.E. : 23 ECs
 - 50% - 75% : 11 ECs
 - L.E. < 50% : 4 ECs
64. The four ECs with very low level of energization are MASELCO (32%), TISELCO (40%), NORSAMELCO (44%) and ZAMSURECO II (49%).
65. About 61 municipalities (of the 259 short-listed municipalities) are found in the service areas of the four ECs with very low level of energization. These represent almost a quarter of the short-listed municipality market packages. The range of level of energization in these municipalities is 2% - 75%. More concretely, below is a profile of the level of energization of the 61 municipalities:
- 75% < L.E. : zero Municipality
 - 61% - 75% : 7 Municipalities

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- 50% - 60% : 9 Municipalities
- L.E. < 50% : 45 Municipalities

66. From a national perspective, the level of energization at the municipality has wide variation from the lowest of 3% to the highest 100%. It is worthwhile to note that there are incidence of municipalities of very low level of energization (< 40%) in ECs with level of energization higher than 75%. As disclosed by the EC officials during the consultative meeting with them, these municipalities are very far from the main tapping point, have bad terrain (no access road), or have poor security conditions. Extension of grid lines to these municipalities, in fact, lowers their technical efficiency due to higher system losses.
67. The 2nd level Screening takes into account the potential size of municipal market packages. Based on this screening process, the 259 municipalities are trimmed down to 163 municipalities and the breakdown is as follows:
- Region 2 : 15 Municipalities
 - Region 5 : 32 Municipalities
 - Region 6 : 25 Municipalities
 - Region 8 : 50 Municipalities
 - Region 9 : 41 Municipalities
68. The common sizes of municipal market packages that are shortlisted are in the range of 10 -15 non-electrified barangays (count: 77 municipalities). There are about 39 municipalities which have about 16 - 20 non-electrified barangays still waiting to be served. Municipalities with 21 - 25 non-electrified barangays are about 22 municipalities. The bigger potential market packages, on the other hand, numbered about 25 municipalities (having more than 25 non-electrified barangays in the market package) with Sindangan, Zamboanga del Norte having the biggest size (coverage barangays of 52, electrified 1 barangay and 51 barangays scheduled for electrification during the period 2001 - 2004.
69. The number of non-electrified barangays in the market packages may still be reduced due to some energization activities to be carried in the current year. However, no substantial reduction in the market package size is expected due to very scarce resources available for such undertaking.
70. The 163 short-listed municipal market packages can be loosely considered as potentially attractive market packages to the private sector investors based on the market size.
71. The result of the 3rd level screening is the long list of market packages which numbered about 87 market packages. Annex A-1 presents the basic information and process in carrying out the municipal screening and short-listing. It also identifies the 87 market packages, the long list of market packages as required by the Terms of the Reference for Task 3.

72. Annex A-2 presents the basic statistics of the short-listed 87 market packages. Briefly discussed below are observations on the 87 market packages:

Region 2

- The ECs that cover the nine municipality market packages are CAGELCO I, ISELCO II and NUVELCO;
- The levels of energization in the coverage areas of the ECs are in the range of 70% - 75%;
- The number of non-electrified barangays in the candidate market packages are between 11 - 25 barangays;
- The level of energization in each of the municipalities is very low compared to the ECs overall level of energization, i.e., between 8% - 56%;

Region 5

- The ECs that cover the twenty-one (21) municipality market packages are CASURECO I, CASURECO IV, ALECO, MASELCO, and SORECO II;
- The levels of energization in the coverage areas of the ECs are in the range of 32% - 88%;
- The number of non-electrified barangays in the market packages are between 11 - 31 barangays;
- The levels of energization in the municipality market packages are in the ranges of 3% - 73%;

Region 6

- The ECs that cover the 18 candidate municipality market packages are AKELCO, ANTECO, CAPELCO, ILECO I, ILECO II, ILECO III and VRESCO;
- The levels of energization in the coverage areas of the ECs are in the range of 64% - 85%;
- The number of non-electrified barangays in the candidate market packages are between 10 - 46 barangays;
- The levels of energization in the municipality market packages are in the ranges of 12% - 75%;

Region 8

- The ECs that cover the 28 municipality market packages are LEYECO I, NORSAMELCO, ESAMELCO, SAMELCO I, SAMELCO II, and SOLECO;
- The levels of energization in the coverage areas of the ECs are in the range of 44% - 78%;
- The number of non-electrified barangays in the candidate market packages are between 10 - 49 barangays;
- The levels of energization in the municipality market packages are in the ranges of 8% - 71%;

Region 9

- The ECs that cover the eleven (11) municipality market packages are ZANECO, ZAMSURECO I, and ZAMSURECO II;
- The levels of energization in the coverage areas of the ECs are in the range of 49% - 60%;
- The number of non-electrified barangays in the candidate market packages are between 10 - 34 barangays;
- The levels of energization in the municipality market packages are in the ranges of 7% - 67%;

Prioritization of Market Packages

73. The 87 screened and short-listed municipal market packages are subjected to further characterization from which the 25 prioritized NRE-based market packages will be identified. Annex A-3 provides an overview of the prioritization process and identifies the top 25 market packages.

74. The 25 prioritized market packages are shown in Table 4. The regional breakdown of the 25 market packages is as follows:

- Region 2 : 3 Municipal Market Packages
- Region 5 : 11 Municipal Market Packages
- Region 6 : 3 Municipal Market Packages
- Region 8 : 6 Municipal Market Packages
- Region 9 : 2 Municipal Market Packages

75. Annex A-4 summarizes the relevant characteristics of the 25 prioritized market packages. Briefly, below is the profile of the 25 prioritized market packages:

Number of Households

- The minimum number of households in the non-electrified barangays in the prioritized market packages is 2,110 households found in Dueñas, Iloilo while the municipal market package with the biggest size is the Calatrava, Negros Occidental which numbered about 5,810 households.
- The median household size is about 3 - 4 persons.
- This is a comfortable market size for private sector investors not to mention other consuming sectors, such as the local industry, commercial and service establishments.

Average Annual Household Income

- Sergio Osmeña, Zamboanga Norte has the lowest average annual household income of about PhP 22,529.00 while Baggao, Cagayan reported the highest average annual household income of PhP 76,270.00.

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- There are three municipality market packages with average annual household income below PhP 30,000.00 and these are Calatrava, Negros Occidental (PhP 28,892.82), Cataingan, Masbate (PhP 29,504.50) and Sergio Osmeña, Zamboanga Norte.
- The median average annual household income is about PhP 39,000.00.

Table 4. 25 Prioritized NRE-Based Market Packages

M.P. #	Region	Province	Municipality	Electric Cooperative
1	2	Cagayan	Baggao	CAGELCO I
2		Isabela	Benito Soliven	ISELCO II
3			San Mariano	
4	5	Albay	Bacacay	ALECO
5			Libon	
6			Oas	
7			Rapu-Rapu	
8		Masbate	Balud	MASELCO
9			Cataingan	
10			Esperanza	
11	Mandaon			
12	Masbate			
13	Milagros			
14		Palanas		
15	6	Capiz	Dumarao	CAPELCO
16		Iloilo	Dueñas	ILECO II
17		Negros Occ	Calatrava	VRESCO
18	8	N. Samar	Catubig	NORSAMELCO
19			Las Nanas	
20			Laoang	
21		W. Samar	Tarangnan	SAMELCO I
22			Daram	SAMELCO II
23		E. Samar	Guiuan	ESAMELCO
24		9	Zamboanga	Sergio Osmeña
25	Norte		Sibuco	ZAMSURECO II

Average Household Energy Expenditures

- The average monthly household energy expenditures range from a minimum of PhP 53.64 (Sergio Osmeña, Zamboanga Norte) to a maximum of PhP 251.54 (Esperanza, Masbate).
- The median average monthly household energy expenditures is roughly PhP 148.00.

Average Annual Household Disposable Income

- Surprisingly, data from the Market Assessment survey showed that households have savings which can be spent to cover additional cost for improved supply and services of electricity. The minimum HH disposable income recorded is PhP 1,122.84 (Cataingan, Masbate) and the highest HH disposable income gathered is PhP 31,976.36 (Benito Soliven, Isabela).
- The median is about PhP 10,000.00 per annum.

Household Population Density (HPD)

- Baggao, Cagayan is relatively the least dense among the 25 priority market packages. There are about four households for every square kilometer.
- Guiuan, Eastern Samar is comparatively the most dense with a HPD of 65 households per square kilometer.

Municipal Financial Capacity (Class)

- Almost half of the priority market packages are classified as fourth class municipality (Annual Income of PhP 8M or more but less than PhP 12M);
- Baggao, Cagayan and San Mariano, Isabela are first class municipalities and based on DOF classification, these municipalities have an average annual income of more than PhP 20M.
- Calatrava, Negros Occidental and Masbate, Masbate are second class municipalities (Annual Income of PhP 16M or more but less than PhP 20M).
- There are five municipalities that are classified as third class municipalities (annual income PhP 12M or more but less than PhP 16M);
- The remaining five municipalities are classified as fifth class municipalities (annual income PhP 4M or more but less than PhP 8M).

CHAPTER 4

76. This chapter presents the individual market briefs/info kits for the 25 prioritized market packages.
77. The market briefs are presented by province. The twenty-five municipal market packages are in eleven provinces namely:
- Cagayan
 - Isabela
 - Albay
 - Masbate
 - Capiz
 - Iloilo
 - Negros Occidental
 - Northern Samar
 - Western samar
 - Eastern Samar
 - Zamboanga Norte
78. The information included in the kit are:
- Provincial map showing the municipality/ies identified among the 25 prioritized market packages
 - Provincial renewable energy resource maps which include solar, wind and hydro
 - Municipal maps showing the energized and non-energized barangays
 - Municipal Market Brief template which contain basic geo-physical and socio-economic characteristics of the municipal market packages
79. Below are some explanations on the information found in the market briefs:
- Under the Demographic Profile, the household population (1995) and the projected household population (2000) are data specific to the non-energized barangays. The other information, on the other hand, are municipal data
 - Under the Macro-economic Indicators, the information are taken from the Market Assessment Survey.
 - Under the Natural Resources, Renewable Energy Resources and the Economic Activities, all data provided are municipal data.
 - Under Infrastructure and Utilities, the energization status is at the municipal level while the power tariff rates are provincial data.

MARKET PACKAGES

Cagayan

M.P. # 1 : Baggao

Cagayan



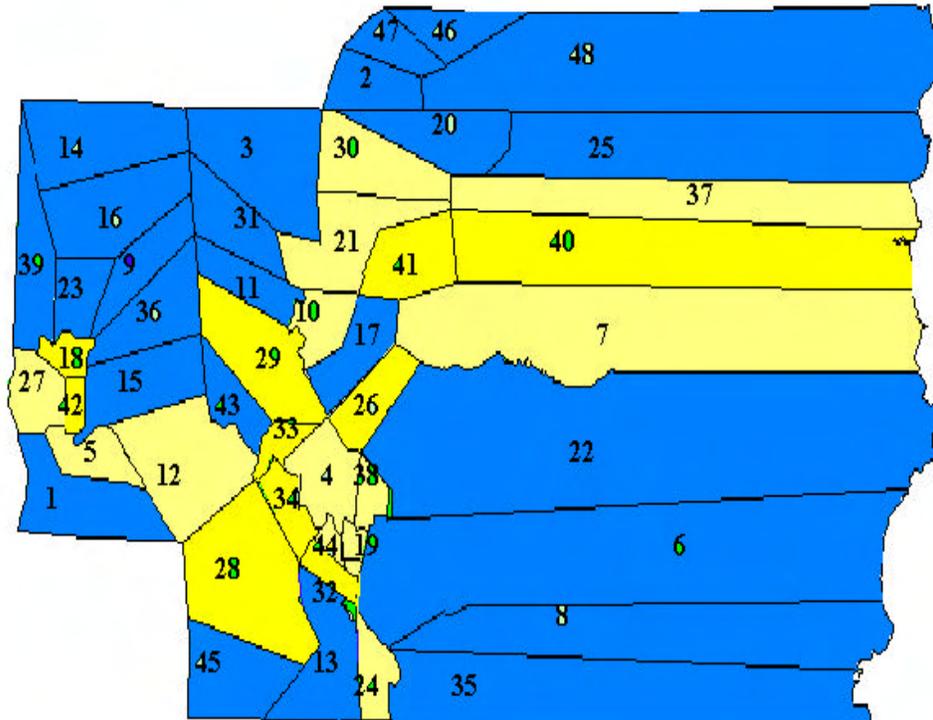
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BAGGAO, CAGAYAN Market Package No. 1		1 of 2																										
General Information																												
Political Subdivisions <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	Forty-eight (48) barangays Twenty-three (23) barangays Twenty-five (25) barangays and these are: <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">✓ Adaoag</td> <td style="width: 50%;">✓ Carupian</td> </tr> <tr> <td>✓ Agaman Proper</td> <td>✓ Catugay</td> </tr> <tr> <td>✓ Agaman Norte</td> <td>✓ C. Versoza</td> </tr> <tr> <td>✓ Agaman Sur</td> <td>✓ Dalin</td> </tr> <tr> <td>✓ Alba</td> <td>✓ Hacienda Intal</td> </tr> <tr> <td>✓ Asinga Via</td> <td>✓ Ibulo</td> </tr> <tr> <td>✓ Bacagan</td> <td>✓ J. Pallagao</td> </tr> <tr> <td>✓ Bagunot</td> <td>✓ Mabini</td> </tr> <tr> <td>✓ Barsat West</td> <td>✓ San Antonio</td> </tr> <tr> <td>✓ Bitag Pequeno</td> <td>✓ San Miguel</td> </tr> <tr> <td>✓ Bunugan</td> <td>✓ San Vicente</td> </tr> <tr> <td>✓ Canagatan</td> <td>✓ Taguing</td> </tr> <tr> <td></td> <td>✓ Taytay</td> </tr> </table>		✓ Adaoag	✓ Carupian	✓ Agaman Proper	✓ Catugay	✓ Agaman Norte	✓ C. Versoza	✓ Agaman Sur	✓ Dalin	✓ Alba	✓ Hacienda Intal	✓ Asinga Via	✓ Ibulo	✓ Bacagan	✓ J. Pallagao	✓ Bagunot	✓ Mabini	✓ Barsat West	✓ San Antonio	✓ Bitag Pequeno	✓ San Miguel	✓ Bunugan	✓ San Vicente	✓ Canagatan	✓ Taguing		✓ Taytay
✓ Adaoag	✓ Carupian																											
✓ Agaman Proper	✓ Catugay																											
✓ Agaman Norte	✓ C. Versoza																											
✓ Agaman Sur	✓ Dalin																											
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✓ Asinga Via	✓ Ibulo																											
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✓ Bunugan	✓ San Vicente																											
✓ Canagatan	✓ Taguing																											
	✓ Taytay																											
Demographic Profile																												
Household Population (1995)	▪ 3,750 Households																											
Projected HH Population (2000)	▪ 4,080 Households																											
Ave. Annual Pop'n Growth Rate	▪ 1.7 (1990 - 1995)																											
Population Density (1995)	▪ 4.07 HH/km ²																											
Ave. HH Size	▪ 5.03 persons																											
Macro-economic Indicators																												
Ave. Annual HH Income	▪ PhP 76,270.00																											
Ave. Annual HH Expenditures	▪ PhP 49,211.11																											
Ave. Annual HH Disp. Income	▪ PhP 27,058.89																											
Ave. HH Energy Expenditures	▪ PhP 128.84/month																											
Municipality Income Class	▪ First Class																											
Natural Resources																												
Land Area (DILG)	▪ 920 km ²																											
Land Capability Slope Distribution (Topography)	▪ Inland and relatively flat lands																											

**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

BAGGAO, CAGAYAN Market Package No. 1		2 of 2
Renewable Energy Resources		
Solar Energy	<ul style="list-style-type: none"> ▪ 5 kWhr/m²/day 	
Wind Energy ✓ Wind power density	<ul style="list-style-type: none"> ▪ 200 W/m² (predominant) ▪ 600 W/m² (pocket areas) 	
Hydro Power	<ul style="list-style-type: none"> ▪ 50 Watts (predominant) ▪ 300 - 1,500 Watts (pocket areas) 	
Economic Activities		
Predominant Economic Activities	<ul style="list-style-type: none"> ▪ Farming 	
Other Livelihood Activities	<ul style="list-style-type: none"> ▪ Furniture making 	
Utilities		
Power	<ul style="list-style-type: none"> ▪ Electric Cooperative ▪ Municipal Energy Status ▪ Power Tariff (Basic Rates as of December 2000) <ul style="list-style-type: none"> ✓ Residential ✓ Commercial ✓ Industry <ul style="list-style-type: none"> - Demand Charge - Energy Charge ▪ Estimated Cost of Grid Extension 	
	<ul style="list-style-type: none"> ▪ CAGELCO I ▪ 48 % ▪ PhP 47.58 for first 15 kWhr PhP 3.1720/kWhr (in excess of 15 kWhr) ▪ PhP 64.44 for first 20 kWhr PhP 3.222/kWhr (in excess of 20 kWhr) ▪ PhP 15.00/kW ▪ PhP 3.1720/kWhr ▪ PhP 30,404,172.00 	
Social Services		
Education (Schools)	At least 25 elementary schools	

BAGGAO, CAGAYAN



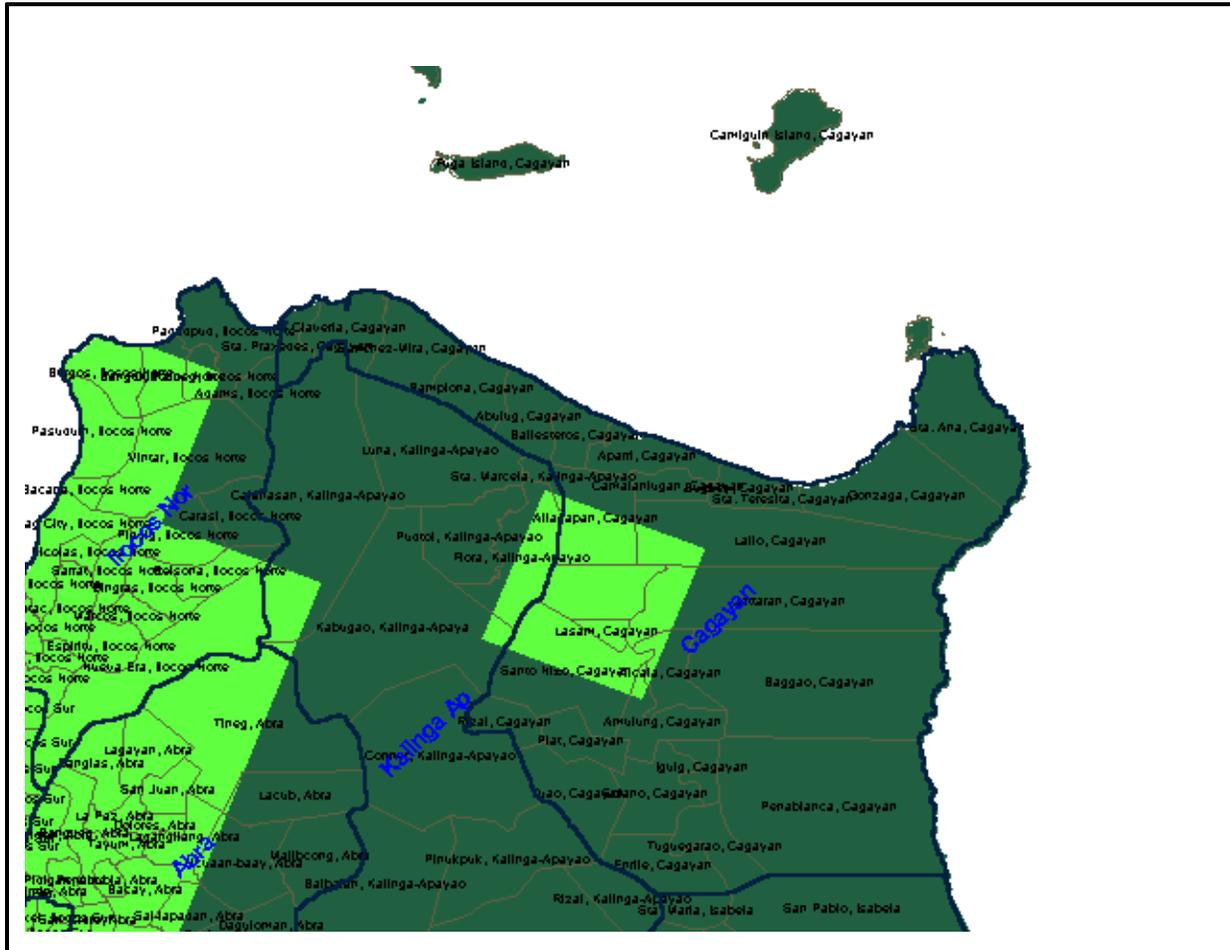
1. Adaoag
2. Agaman (Proper)
3. Alba
4. Annatayan
5. Asassi
6. Asinga-Via
7. Awalan
8. Bacagan
9. Bagunot
10. Barsat East
11. Barsat West
12. Bitag Grande
13. Bitag Pequeno
14. Bunugan
15. Canagatan
16. Carupian
17. Catugay
18. Poblacion
19. Dabac Grande
20. Dalin
21. Dalla
22. Hacienda Intal
23. Ibulo

24. Imurong
25. J. Pallago
26. Lasilat
27. Masical
28. Mocag
29. Nangalinan
30. Remus
31. San Antonio
32. San Francisco
33. San Isidro
34. San Jose
35. San Miguel
36. San Vicente
37. Santa Margarita
38. Santor
39. Taguing
40. Taguntongan
41. Tallang
42. Temblique
43. Taytay
44. Tungel
45. Mabini
46. Agaman Norte
47. Agaman Sur
48. C. Versosa

LEGEND

- ENERGIZED
- UNENERGIZED

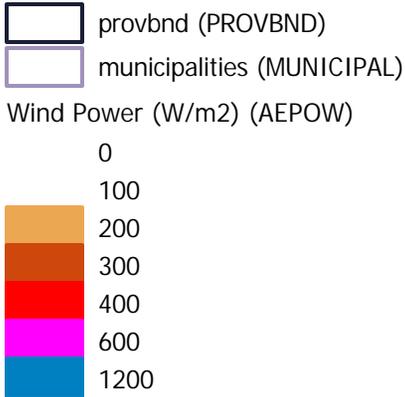
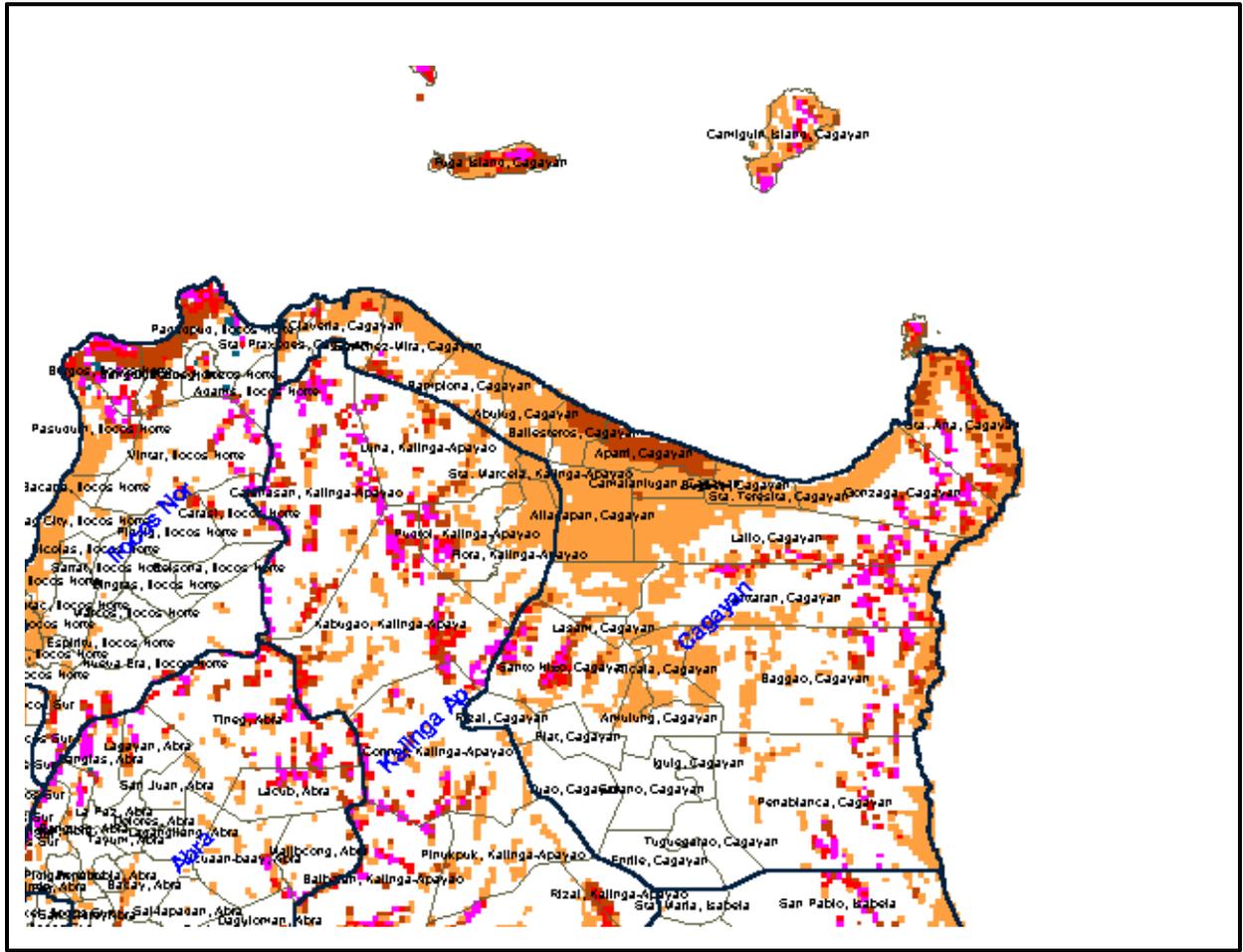
SOLAR POWER (CAGAYAN)



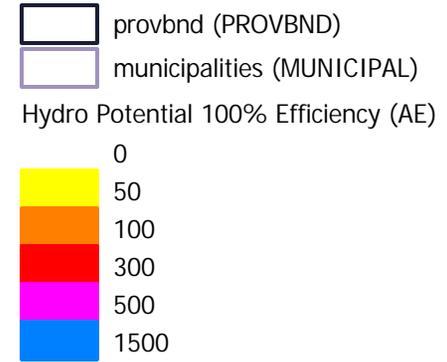
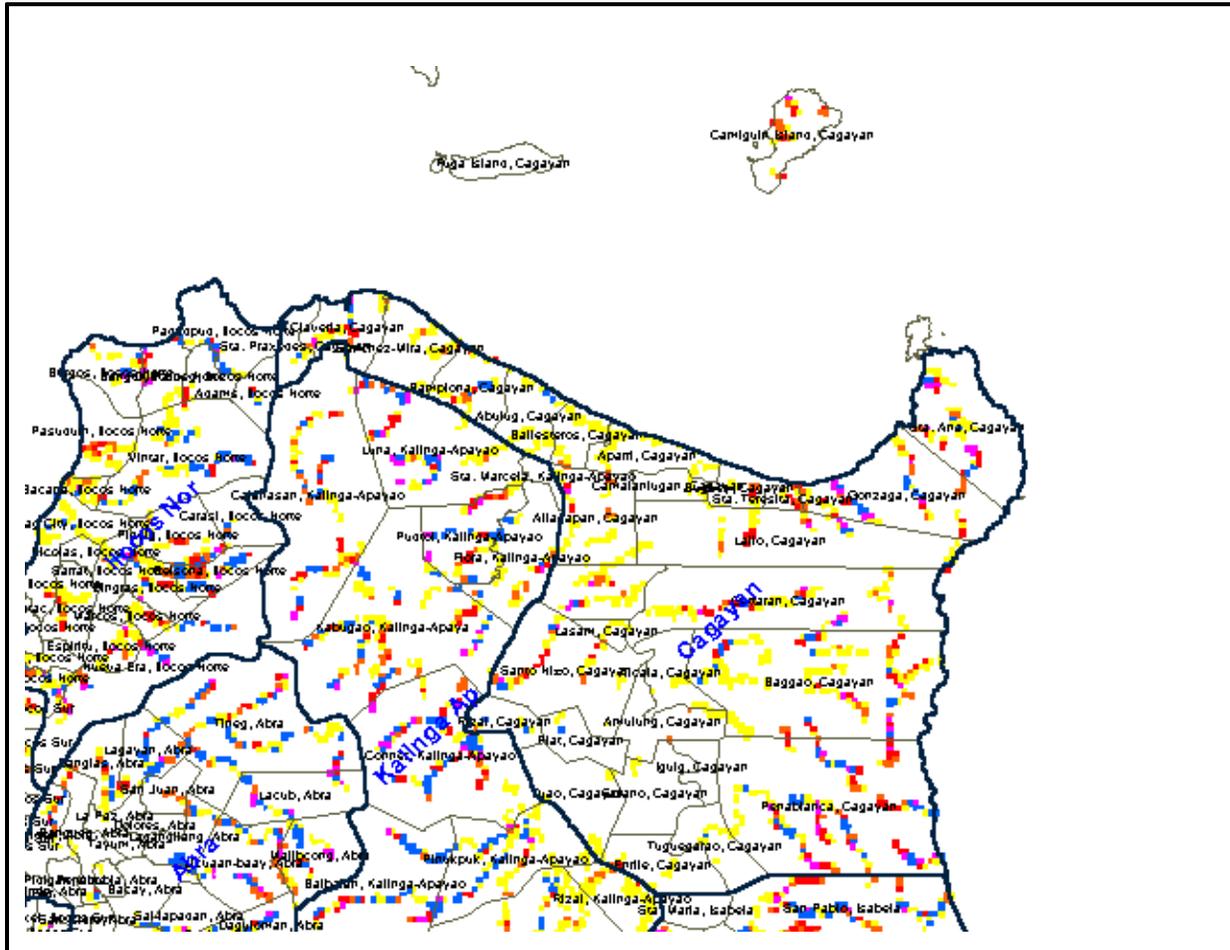
provbnd (PROVBND)
municipalities (MUNICIPAL)
Annual (kWhr/m2/day) Global Horizontal (AGANN)
5
6



WIND POWER POTENTIAL (CAGAYAN)



HYDRO POWER POTENTIAL (CAGAYAN)



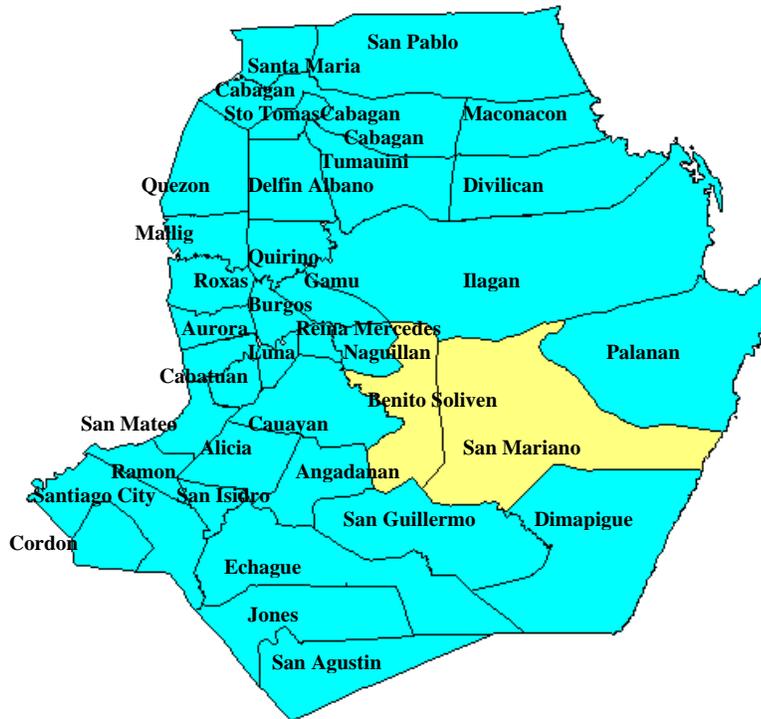
MARKET PACKAGES

Isabela

M.P. # 2: Benito Soliven

M.P. # 3: San Mariano

ISABELA



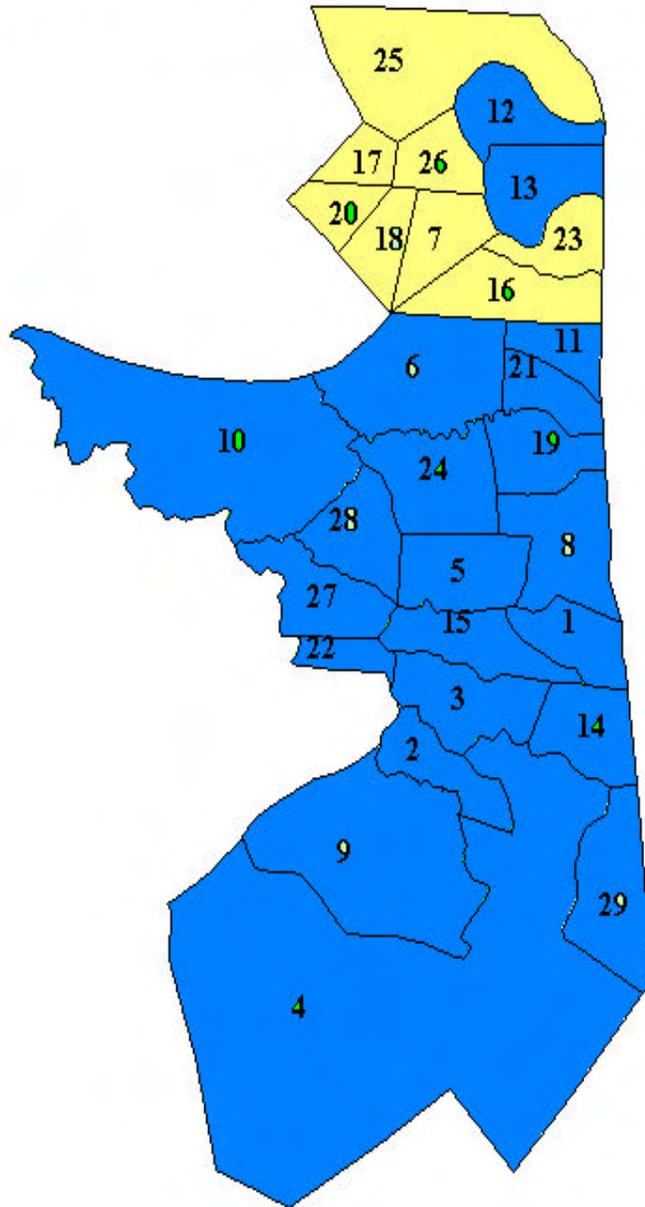
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

BENITO SOLIVEN, ISABELA		1 of 2		
Market Package No. 2				
General Information				
Political Subdivisions <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	Twenty-nine (29) barangays Eight (8) barangays Twenty-one (21) barangays and these are: <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Andabuen ✓ Ara ✓ Balliao ✓ Binogtongan ✓ Capuseran ✓ Dagupan ✓ Danipa ✓ Gomez ✓ Guilingan ✓ La Salette </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Makindol ✓ Maluno Norte ✓ Maluno Sur ✓ Nacalma ✓ New Magsaysay ✓ Placer ✓ San Francisco ✓ Santiago ✓ Sevellana ✓ Sinipit ✓ Villa Luz </td> </tr> </table>		<ul style="list-style-type: none"> ✓ Andabuen ✓ Ara ✓ Balliao ✓ Binogtongan ✓ Capuseran ✓ Dagupan ✓ Danipa ✓ Gomez ✓ Guilingan ✓ La Salette 	<ul style="list-style-type: none"> ✓ Makindol ✓ Maluno Norte ✓ Maluno Sur ✓ Nacalma ✓ New Magsaysay ✓ Placer ✓ San Francisco ✓ Santiago ✓ Sevellana ✓ Sinipit ✓ Villa Luz
<ul style="list-style-type: none"> ✓ Andabuen ✓ Ara ✓ Balliao ✓ Binogtongan ✓ Capuseran ✓ Dagupan ✓ Danipa ✓ Gomez ✓ Guilingan ✓ La Salette 	<ul style="list-style-type: none"> ✓ Makindol ✓ Maluno Norte ✓ Maluno Sur ✓ Nacalma ✓ New Magsaysay ✓ Placer ✓ San Francisco ✓ Santiago ✓ Sevellana ✓ Sinipit ✓ Villa Luz 			
Demographic Profile				
Household Population (1995)	▪ 2,267 Households			
Projected HH Population (2000)	▪ 2,317 Households			
Ave. Annual Pop'n Growth Rate	▪ 0.44 (1990 - 1995)			
Population Density (1995)	▪ 13.59 HH/km ²			
Ave. HH Size	▪ 4.94 persons			
Macro-economic Indicators				
Ave. Annual HH Income	▪ PhP 58,991.31			
Ave. Annual HH Expenditures	▪ PhP 27,014.95			
Ave. Annual HH Disp. Income	▪ PhP 31,976.36			
Ave. HH Energy Expenditures	▪ PhP 119.05/month			
Municipality Income Class	▪ Fifth Class			
Natural Resources				
Land Area (DENR, 1998)	▪ 166.8 km ²			
Land Capability Slope Distribution (Topography)	▪ Upland			
Renewable Energy Resources				
Solar Energy	▪ 5 kWhr/m ² /day			
Wind Energy ✓ Wind power density	▪ 200 W/m ²			
Hydro Power	▪ 50 Watts			

**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

BENITO SOLIVEN, ISABELA Market Package No. 2		2 of 2
Economic Activities		
Predominant Economic Activities	<ul style="list-style-type: none"> ▪ Farming 	
Other Livelihood Activities	<ul style="list-style-type: none"> ▪ Food processing (banana chips) ▪ Furniture making/narra parquet 	
Utilities		
Power	<ul style="list-style-type: none"> ▪ ISELCO II ▪ 28 % ▪ PhP 45.02 for first 12 kWhr ▪ PhP 3.7513/kWhr (in excess of 12 kWhr) ▪ PhP 76.026 for first 20 kWhr ▪ PhP 3.8013/kWhr (in excess of 20 kWhr) ▪ PhP 380.13/kW ▪ PhP 3.8013/kWhr ▪ PhP 17,162,632.00 	
<ul style="list-style-type: none"> ▪ Electric Cooperative ▪ Municipal Energ'n Status ▪ Power Tariff (Basic Rates as of December 2000) <ul style="list-style-type: none"> ✓ Residential ✓ Commercial ✓ Industry <ul style="list-style-type: none"> - Demand Charge - Energy Charge ✓ Estimated Cost of Grid Extension 		
Social Services		
Education (Schools)	<ul style="list-style-type: none"> ▪ at least 21 elementary schools 	

BENITO SOLIVEN, ISABELA



1. Andabuen
2. Ara
3. Binogtungan
4. Capuseran
5. Dagupan
6. Danipa
7. Distric II
8. Gomez
9. Guilingan
10. La Salette
11. Makindol
12. Maluno Norte
13. Maluno Sur
14. Nacalma
15. New Magsaysay
16. District I
17. Punit
18. San Carlos
19. San Francisco
20. Santa Cruz
21. Sevillana
22. Sinipit
23. Lucban
24. Villaluz
25. Yeban Norte
26. Yeban Sur
27. Santiago
28. Placer
29. Balliao

LEGEND :

-  ENERGIZED
-  UNENERGIZED

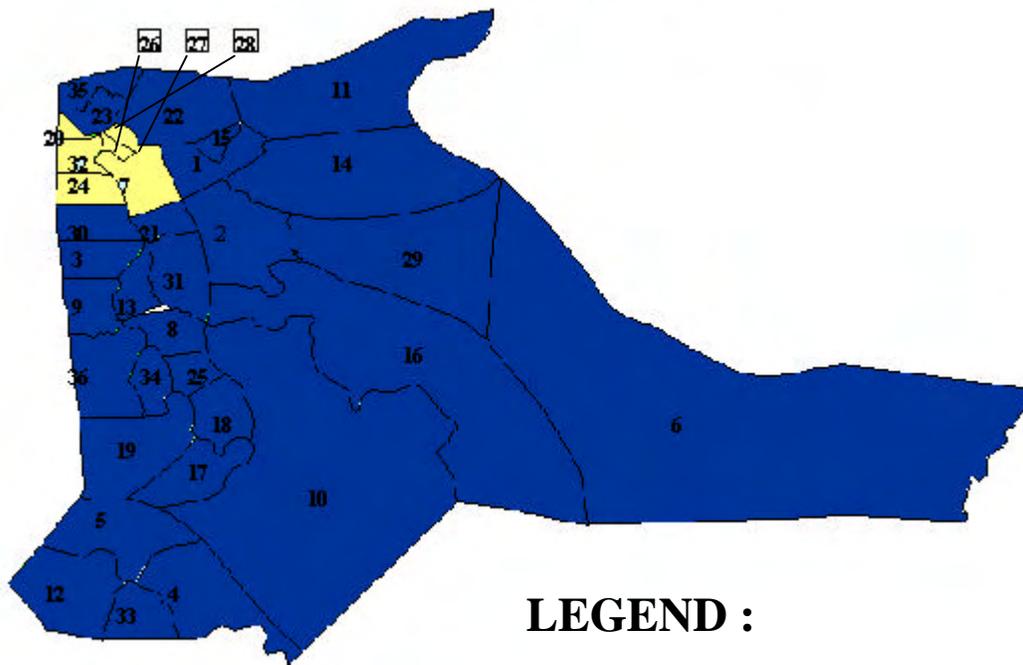
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

SAN MARIANO, ISABELA		1 of 2		
Market Package No. 3				
General Information				
Political Subdivisions <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	Thirty-six (36) barangays Twelve (12) barangays Twenty-four (24) barangays and these are <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Alibadabad ✓ Balagan ✓ Buyasan ✓ Cadsalan ✓ Casala ✓ Daragutan east ✓ Daragutan West ✓ Del Pilar ✓ Dicamay ✓ Dibuluan ✓ Dipusu ✓ Disulap </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Gangalan ✓ Ibujan ✓ Libertad ✓ Marannao ✓ Macayucayu ✓ Old San Mariano ✓ Panninan ✓ San Jose ✓ San Pedro ✓ Tappa ✓ Ueg ✓ Zamora </td> </tr> </table>		<ul style="list-style-type: none"> ✓ Alibadabad ✓ Balagan ✓ Buyasan ✓ Cadsalan ✓ Casala ✓ Daragutan east ✓ Daragutan West ✓ Del Pilar ✓ Dicamay ✓ Dibuluan ✓ Dipusu ✓ Disulap 	<ul style="list-style-type: none"> ✓ Gangalan ✓ Ibujan ✓ Libertad ✓ Marannao ✓ Macayucayu ✓ Old San Mariano ✓ Panninan ✓ San Jose ✓ San Pedro ✓ Tappa ✓ Ueg ✓ Zamora
<ul style="list-style-type: none"> ✓ Alibadabad ✓ Balagan ✓ Buyasan ✓ Cadsalan ✓ Casala ✓ Daragutan east ✓ Daragutan West ✓ Del Pilar ✓ Dicamay ✓ Dibuluan ✓ Dipusu ✓ Disulap 	<ul style="list-style-type: none"> ✓ Gangalan ✓ Ibujan ✓ Libertad ✓ Marannao ✓ Macayucayu ✓ Old San Mariano ✓ Panninan ✓ San Jose ✓ San Pedro ✓ Tappa ✓ Ueg ✓ Zamora 			
Demographic Profile				
Household Population (1995)	▪ 3,133 Households			
Projected HH Population (2000)	▪ 3,273 Households			
Ave. Annual Pop'n Growth Rate	▪ 0.88 (1990 - 1995)			
Population Density (1995)	▪ 2.13 HH/km ²			
Ave. HH Size	▪ 5.2 persons			
Macro-economic Indicators				
Ave. Annual HH Income	▪ PhP 63,622.67			
Ave. Annual HH Expenditures	▪ PhP 33,217.84			
Ave. Annual HH Disp. Income	▪ PhP 30,404.83			
Ave. HH Energy Expenditures	▪ PhP 155.46/month			
Municipality Income Class	▪ First Class			
Natural Resources				
Land Area (DILG)	▪ 1,469.50 km ²			
Land Capability Slope Distribution (Topography)	▪ Upland			
Renewable Energy Resources				
Solar Energy	▪ 5 kWhr/m ² /day			
Wind Energy	<ul style="list-style-type: none"> ▪ 200 W/m² ▪ 600 W/m² 			
✓ Wind power density				
Hydro Power	▪ 50 - 1,500 Watts			

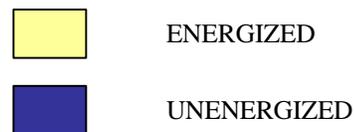
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

SAN MARIANO, ISABELA Market Package No. 3		2 of 2
Economic Activities		
Predominant Economic Activities	<ul style="list-style-type: none"> ▪ farming 	
Other Livelihood Activities	<ul style="list-style-type: none"> ▪ Food processing (banana chips) ▪ Furniture making 	
Utilities		
Power	<ul style="list-style-type: none"> ▪ Electric Cooperative ▪ Municipal Energ'n Status ▪ Power Tariff (Basic Rates as of December 2000) <ul style="list-style-type: none"> ✓ Residential ✓ Commercial ✓ Industry <ul style="list-style-type: none"> - Demand Charge - Energy Charge <ul style="list-style-type: none"> ▪ Estimated Cost of Grid Extension 	
	<ul style="list-style-type: none"> ▪ ISELCO II ▪ 33 % ▪ PhP 45.02 for first 12 kWhr PhP 3.7513/kWhr (in excess of 12 kWhr) ▪ PhP 76.026 for first 20 kWhr PhP 3.8013/kWhr (in excess of 20 kWhr) ▪ PhP 380.13/kW ▪ PhP 3.8013/kWhr ▪ PhP 36,233,550.00 	
Social Services		
Education (Schools)	<ul style="list-style-type: none"> ▪ At least 24 elementary schools 	

SAN MARIANO, ISABELA



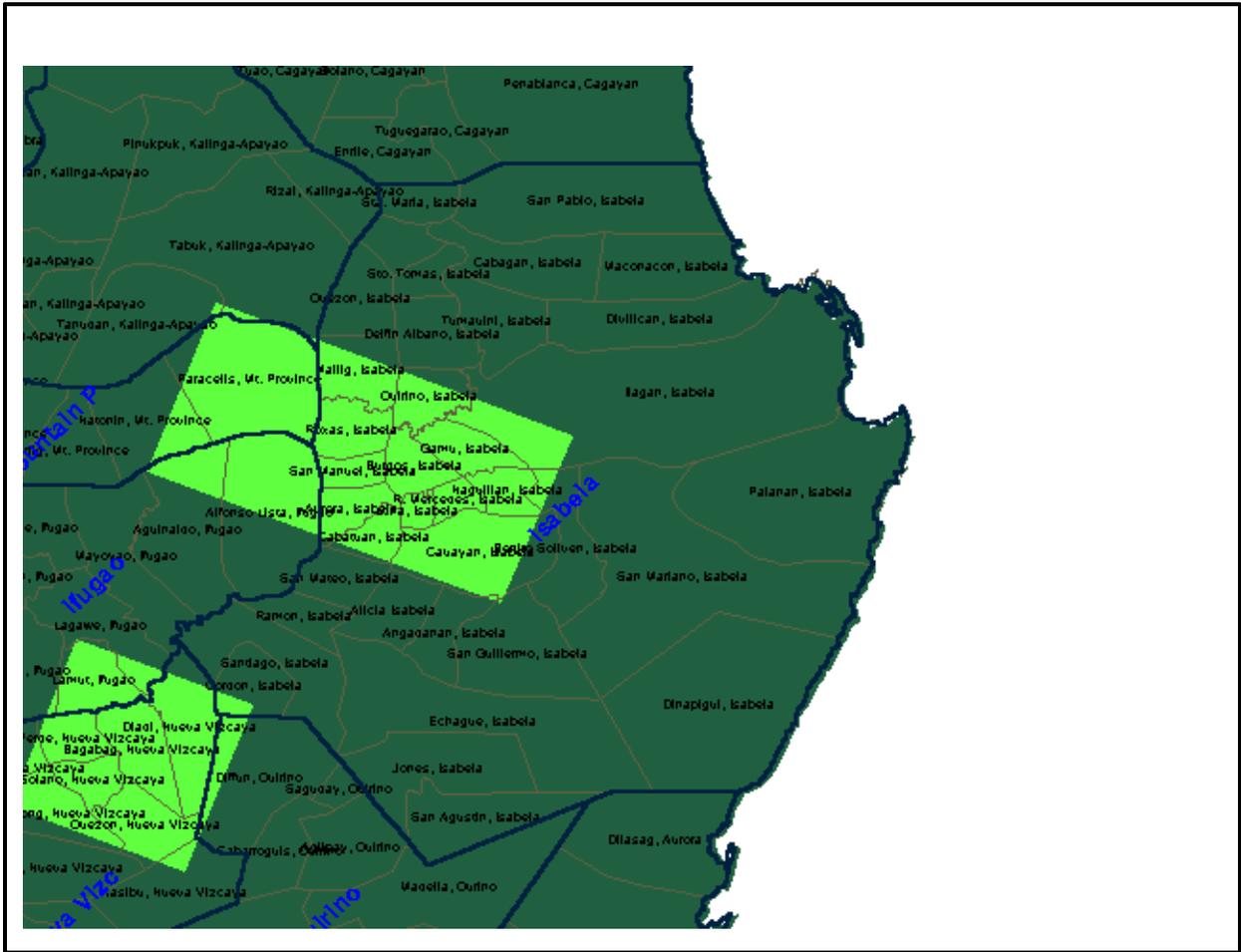
LEGEND :



- 1. Alibadabad
- 2. Binatug
- 3. Bitabian
- 4. Buyasan
- 5. Cadsalan
- 6. Casala
- 7. Cataguing
- 8. Daragutan East
- 9. Daragutan West
- 10. Del Pilar
- 11. Dibuluan
- 12. Dicamay
- 13. Dipuso
- 14. Disulap
- 15. Disusuan
- 16. Gangalan
- 17. Ibutan
- 18. Libertad

- 19. Macayucayu
- 20. Mallabo
- 21. Marannao
- 22. Minanga
- 23. Old San Mariano
- 24. Palutan
- 25. Panninan
- 26. Zone I
- 27. Zone II
- 28. Zone III
- 29. San Jose
- 30. San Pablo
- 31. San Pedro
- 32. Sta. Felomena
- 33. Tappa
- 34. Ueg
- 35. Zamora
- 36. Balagan

SOLAR POWER POTENTIAL (ISABELA)



provbnd (PROVBND)
municipalities (MUNICIPAL)

Annual (kWhr/m2/day) Global Horizontal (AHANN)

5
6



MARKET PACKAGES

Albay

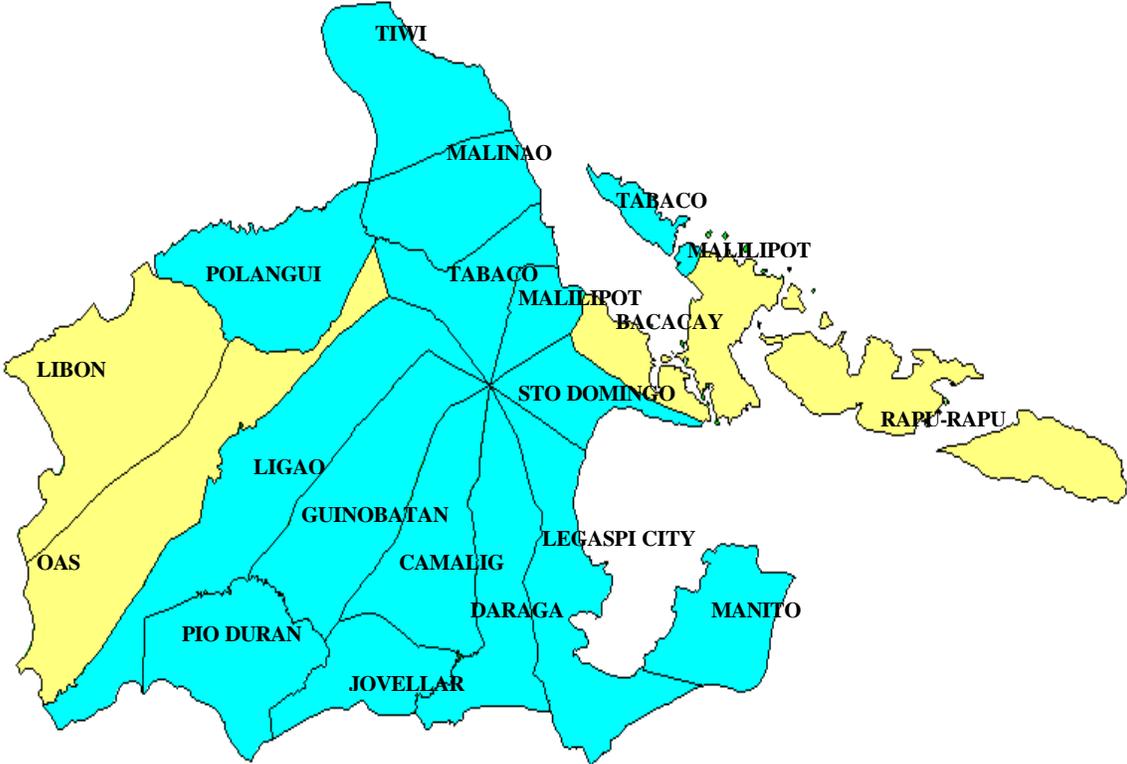
M.P. # 4 : Bacacay

M.P. # 5 : Libon

M.P. # 6 : Oas

M.P. # 7 : Rapu-Rapu

Albay



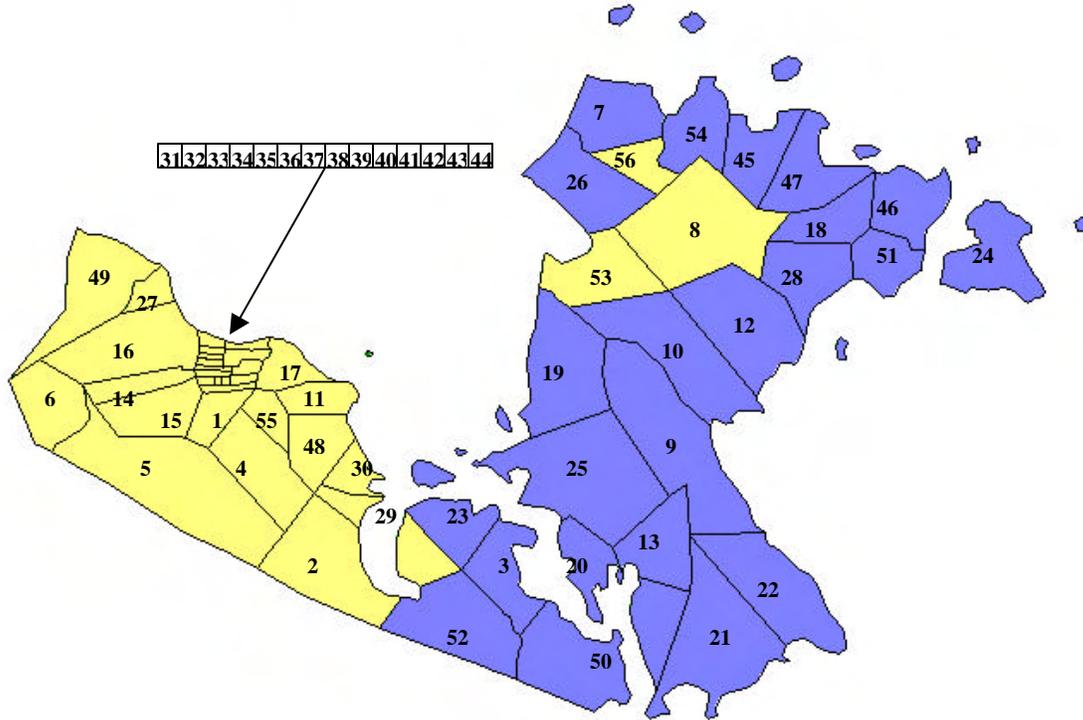
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

BACACAY, ALBAY Market Package No. 4		1 of 2																						
General Information																								
Political Subdivisions <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	Fifty-six (56) barangays Thirty-four (34) barangays Twenty-two (22) barangays and these are <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">✓ Bariw</td> <td style="width: 50%;">✓ Misibis</td> </tr> <tr> <td>✓ Buang</td> <td>✓ Namanday</td> </tr> <tr> <td>✓ Busdac</td> <td>✓ Nahapunan</td> </tr> <tr> <td>✓ Cagraray</td> <td>✓ Namantao</td> </tr> <tr> <td>✓ Cagbulacao</td> <td>✓ Pigcobohan</td> </tr> <tr> <td>✓ Cawayan</td> <td>✓ Ponco</td> </tr> <tr> <td>✓ Damacan</td> <td>✓ San Pablo</td> </tr> <tr> <td>✓ Langaton</td> <td>✓ Sula</td> </tr> <tr> <td>✓ Manaet</td> <td>✓ Tambungan</td> </tr> <tr> <td>✓ Mapulangdaga</td> <td>✓ Tambilagao</td> </tr> <tr> <td>✓ Mataas</td> <td>✓ Uson</td> </tr> </table>		✓ Bariw	✓ Misibis	✓ Buang	✓ Namanday	✓ Busdac	✓ Nahapunan	✓ Cagraray	✓ Namantao	✓ Cagbulacao	✓ Pigcobohan	✓ Cawayan	✓ Ponco	✓ Damacan	✓ San Pablo	✓ Langaton	✓ Sula	✓ Manaet	✓ Tambungan	✓ Mapulangdaga	✓ Tambilagao	✓ Mataas	✓ Uson
✓ Bariw	✓ Misibis																							
✓ Buang	✓ Namanday																							
✓ Busdac	✓ Nahapunan																							
✓ Cagraray	✓ Namantao																							
✓ Cagbulacao	✓ Pigcobohan																							
✓ Cawayan	✓ Ponco																							
✓ Damacan	✓ San Pablo																							
✓ Langaton	✓ Sula																							
✓ Manaet	✓ Tambungan																							
✓ Mapulangdaga	✓ Tambilagao																							
✓ Mataas	✓ Uson																							
Climate	<ul style="list-style-type: none"> ▪ Two pronounced seasons - the rainy and dry seasons ▪ Rainy season: June - December Dry season : January - May 																							
Demographic Profile																								
Household Population (1995)	▪ 3,537 Households																							
Projected HH Population (2000)	▪ 4,077 Households																							
Ave. Annual Pop'n Growth Rate	▪ 2.88 %																							
Population Density (1995)	▪ 31.52 HH/km ²																							
Ave. HH Size	▪ 5.48																							
Macro-economic Indicators																								
Ave. Annual HH Income	▪ PhP 40,320.18																							
Ave. Annual HH Expenditures	▪ PhP 35,315.87																							
Ave. Annual HH Disp. Income	▪ PhP 5,004.31																							
Ave. HH Energy Expenditures	▪ PhP 193.00/month																							
Municipality Income Class	▪ Fourth (4 th) Class																							
Natural Resources																								
Land Area (DILG)	▪ 112.2 km ²																							
Land Use (DILG)	<ul style="list-style-type: none"> ▪ Built-up Area : 4.92 km² (4.4%) ▪ Agriculture : 68.93 km² (61.4%) ▪ Forest : 28.17 km² (25.1%) ▪ Swamps/Marshes : 10.18 km² (9.1%) 																							

**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

BACACAY, ALBAY Market Package No. 4		2 of 2
Renewable Energy Resources		
Solar Energy	<ul style="list-style-type: none"> ▪ 5 kWhr/m²/day 	
Hydro Power	<ul style="list-style-type: none"> ▪ 100 Watts 	
Economic Activities		
Predominant Economic Activities	<ul style="list-style-type: none"> ▪ Fishing and farming 	
Other Livelihood Activities	<ul style="list-style-type: none"> ▪ Mat & basket weaving ▪ Marble craft ▪ Animal raising 	
Utilities		
Power	<ul style="list-style-type: none"> ▪ Electric Cooperative ▪ Municipal Energ'n Status ▪ Power Tariff (Basic Rates as of December 2000) <ul style="list-style-type: none"> ✓ Residential ✓ Commercial ✓ Industry <ul style="list-style-type: none"> - Demand Charge - Energy Charge <ul style="list-style-type: none"> ▪ Estimated Cost of Grid Extension 	
	<ul style="list-style-type: none"> ▪ ALECO ▪ 61 % ▪ PhP 52.37 for first 15 kWhr PhP 3.4913/kWhr (in excess of 15 kWhr) ▪ PhP 70.43 for first 20 kWhr PhP 3.5213/kWhr (in excess of 20 kWhr) ▪ PhP 18.00/kW ▪ PhP 3.4813/kWhr ▪ PhP 23,770,012.01 	
Social Services		
Education (Schools)	<ul style="list-style-type: none"> ▪ At least 22 elementary schools 	

BACACAY, ALBAY



1. Baclayon
2. Banao
3. Bariw
4. Basud
5. Bayandong
6. Bonga (upper)
7. Buang
8. Cabasan
9. Cagbulacao
10. Cagararay
11. Cajogutan
12. Cawayan
13. Damacan
14. Gubat Ilawod
15. Gubat Iraya
16. Hindi
17. Igang
18. Langaton
19. Manaet
20. Mapulang Daga
21. Mataas
22. Misibis
23. Nahapunan
24. Namanday
25. Namantao
26. Napao
27. Panrayon
28. Pigcobohan

29. Pili Ilawod
30. Pili Ilaya
31. Barangay 1
32. Barangay 10
33. Barangay 11
34. Barangay 12
35. Barangay 13
36. Barangay 14
37. Barangay 2
38. Barangay 3
39. Barangay 4
40. Barangay 5
41. Barangay 6
42. Barangay 7
43. Barangay 8
44. Barangay 9
45. Ponco (Lower Bonga)
46. Busdac (San Jose)
47. San Pablo
48. San Pedro
49. Sogod
50. Sula
51. Tambilagao (Tambognon)
52. Tambongon (Tambilagao)
53. Tanagan
54. Uson
55. Vinitahan (Mainland)
56. Vinitahan (Island)

LEGEND :

ENERGIZED

UNENERGIZED

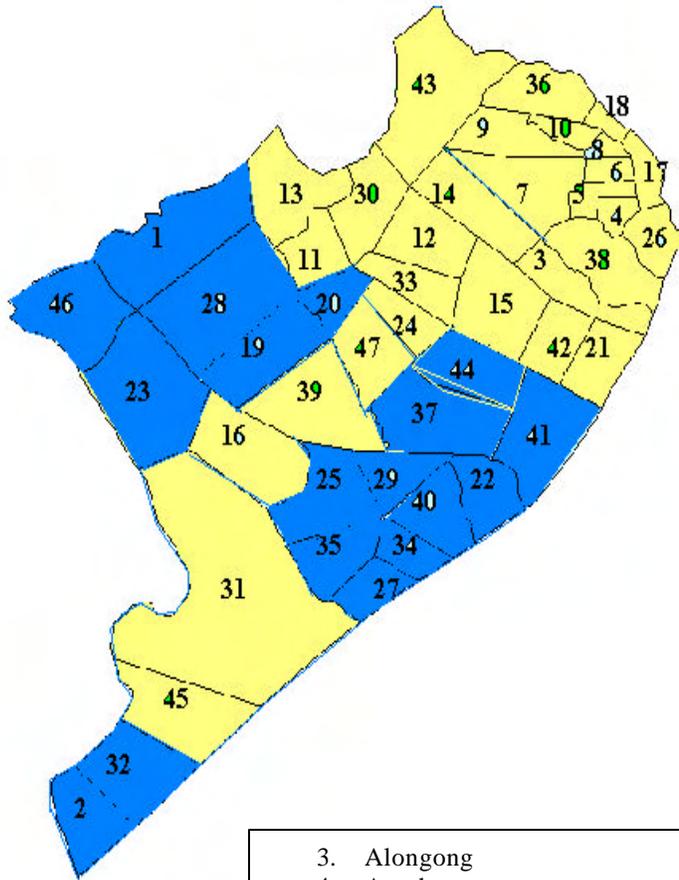
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

LIBON, ALBAY Market Package No. 5		1 of 2																		
General Information																				
Political Subdivisions <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	Forty-seven (47) barangays Twenty-nine (29) barangays Eighteen (18) barangays and these are <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">✓ Alongon</td> <td style="width: 50%;">✓ Natasan</td> </tr> <tr> <td>✓ Apud</td> <td>✓ Rawis</td> </tr> <tr> <td>✓ Harigue</td> <td>✓ Salvacion</td> </tr> <tr> <td>✓ Libtong</td> <td>✓ Sampongan</td> </tr> <tr> <td>✓ Mabayawas</td> <td>✓ San Antonio</td> </tr> <tr> <td>✓ Macabugos</td> <td>✓ San Pascual</td> </tr> <tr> <td>✓ Malabiga</td> <td>✓ San Ramon</td> </tr> <tr> <td>✓ Matara</td> <td>✓ Sto. Niño</td> </tr> <tr> <td>✓ Molosbolos</td> <td>✓ Tambo</td> </tr> </table>		✓ Alongon	✓ Natasan	✓ Apud	✓ Rawis	✓ Harigue	✓ Salvacion	✓ Libtong	✓ Sampongan	✓ Mabayawas	✓ San Antonio	✓ Macabugos	✓ San Pascual	✓ Malabiga	✓ San Ramon	✓ Matara	✓ Sto. Niño	✓ Molosbolos	✓ Tambo
✓ Alongon	✓ Natasan																			
✓ Apud	✓ Rawis																			
✓ Harigue	✓ Salvacion																			
✓ Libtong	✓ Sampongan																			
✓ Mabayawas	✓ San Antonio																			
✓ Macabugos	✓ San Pascual																			
✓ Malabiga	✓ San Ramon																			
✓ Matara	✓ Sto. Niño																			
✓ Molosbolos	✓ Tambo																			
Climate	<ul style="list-style-type: none"> ▪ Wet and dry season ▪ Rainy season: May to November Dry season : December to April ▪ Climatological Data <ul style="list-style-type: none"> ✓ Total rainfall : 2,218 mm (annual) ✓ Ave. Temperature : 27.3⁰C 																			
Demographic Profile																				
Household Population (1995)	▪ 3,230 Households																			
Projected HH Population (2000)	▪ 3,410 Households																			
Ave. Annual Pop'n Growth Rate	▪ 1.09 %																			
Population Density (1995)	▪ 12.56 HH/km ²																			
Ave. HH Size	▪ 5.46 persons																			
Macro-economic Indicators																				
Ave. Annual HH Income	▪ PhP 32,850.14																			
Ave. Annual HH Expenditures	▪ PhP 27,145.00																			
Ave. Annual HH Disp. Income	▪ PhP 5,705.14																			
Ave. HH Energy Expenditures	▪ PhP 108.30/month																			
Municipality Internal Allotment (in Philippine pesos)	<ul style="list-style-type: none"> ▪ Total Income <ul style="list-style-type: none"> ✓ PhP 37,118,146.19 (1999) ✓ PhP 33,147,513.22 (1998) ▪ IRA <ul style="list-style-type: none"> ✓ PhP 32,709,864.00 (1999) ✓ PhP 26,231,415.00 (1998) 																			
Municipality Income Class	Third (3 rd) Class																			

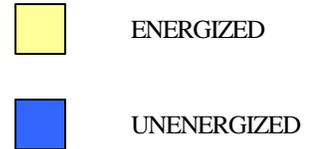
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

LIBON, ALBAY Market Package No. 5		2 of 2
Natural Resources		
Land Area (DILG)	<ul style="list-style-type: none"> ▪ 257.08 km² 	
Land Capability Slope Distribution (Topography)	<ul style="list-style-type: none"> ▪ Characterized by complex geographical features with mountains of various ranges and shapes; ▪ Two thirds of land area are low lying mountain ranges and rugged terrains which spread over the entire landscape of the western portion; ▪ Eastern part is a rich and fertile lowlands with creeks and inland rivers from southern Albay and are drained to Libon Bato Lake 	
Land Use (DENR, 1997)	<ul style="list-style-type: none"> ▪ Residential : 16.38 km² ▪ Commercial : 0.07 km² ▪ Industrial : 0.02 km² ▪ Agricultural : 193.56 km² ▪ Educational : 0.64 km² 	
Renewable Energy Resources		
Solar Energy	<ul style="list-style-type: none"> ▪ 6 kWhr/m²/day 	
Hydro Power	<ul style="list-style-type: none"> ▪ 50 Watts 	
Economic Activities		
Predominant Economic Activities	<ul style="list-style-type: none"> ▪ The area's economy is basically agricultural with rice and coconut as the predominant crops. It has rich volcanic soil. 	
Utilities		
Power	<ul style="list-style-type: none"> ▪ Electric Cooperative ▪ Municipal Energ'n Status ▪ Power Tariff (Basic Rates as of December 2000) <ul style="list-style-type: none"> ✓ Residential ✓ Commercial ✓ Industry <ul style="list-style-type: none"> - Demand Charge - Energy Charge ▪ Estimated Cost of Grid Extension 	
	<ul style="list-style-type: none"> ▪ ALECO ▪ 62 % ▪ PhP 52.37 for first 15 kWhr PhP 3.4913/kWhr (in excess of 15 kWhr) ▪ PhP 70.43 for first 20 kWhr PhP 3.5213/kWhr (in excess of 20 kWhr) ▪ PhP 18.00/kW ▪ PhP 3.4813/kWhr ▪ PhP 22,600,622.00 	

LIBON, ALBAY



LEGEND :



- 3. Alongong
- 4. Apud
- 5. Bacolod
- 6. Zone I (Pob)
- 7. Zone II (Pob)
- 8. Zone III (Pob)
- 9. Zone IV (Pob)
- 10. Zone V (Pob)
- 11. Zone VI (Pob)
- 12. Zone VII (Pob)
- 13. Bariw
- 14. Bonbon
- 15. Buga
- 16. Bulusan
- 17. Burabod
- 18. Caguscos
- 19. East Carisac
- 20. West CARisac
- 21. Harique
- 22. Libtong
- 23. Linao
- 24. Mabayawas
- 25. Macabugos

- 24. Magallang
- 1. Malabiga
- 2. Marayag
- 27. Matara
- 28. Molosbolos
- 29. Natasan
- 30. Nogpo
- 31. Pantao
- 32. Rawis
- 33. Sagrada Familia
- 34. Salvacion
- 35. Sampongan
- 36. San Agustin
- 37. San Antonio
- 38. San Isidro
- 39. San Jose
- 40. San Pascual
- 41. San Ramon
- 42. San Vicente
- 43. Santa Cruz
- 44. Nini Jesus (Sto Nino Jesus)
- 45. Talin-Talin
- 46. Tambo
- 47. Villa Petrona

**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

OAS, ALBAY Market Package No. 6		1 of 3																										
General Information																												
Political Subdivisions <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	Fifty-three (53) barangays Twenty-nine (28) barangays Twenty-four (25) barangays and these are <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">✓ Badbad</td> <td style="width: 50%;">✓ Maramba</td> </tr> <tr> <td>✓ Badian</td> <td>✓ Mayag</td> </tr> <tr> <td>✓ Banao</td> <td>✓ Moroponros</td> </tr> <tr> <td>✓ Banglawon</td> <td>✓ Nagas</td> </tr> <tr> <td>✓ Bogtong</td> <td>✓ Ramay</td> </tr> <tr> <td>✓ Cadawag</td> <td>✓ San Antonio</td> </tr> <tr> <td>✓ Cagmanaba</td> <td>✓ San Miguel</td> </tr> <tr> <td>✓ Calaguimit</td> <td>✓ San Pascual</td> </tr> <tr> <td>✓ Calpi</td> <td>✓ Tablon</td> </tr> <tr> <td>✓ Casinagan</td> <td>✓ Talisay</td> </tr> <tr> <td>✓ Culiati</td> <td>✓ Tapel</td> </tr> <tr> <td>✓ Del Rosario</td> <td>✓ Tobgon</td> </tr> <tr> <td>✓ Gumabao</td> <td></td> </tr> </table>		✓ Badbad	✓ Maramba	✓ Badian	✓ Mayag	✓ Banao	✓ Moroponros	✓ Banglawon	✓ Nagas	✓ Bogtong	✓ Ramay	✓ Cadawag	✓ San Antonio	✓ Cagmanaba	✓ San Miguel	✓ Calaguimit	✓ San Pascual	✓ Calpi	✓ Tablon	✓ Casinagan	✓ Talisay	✓ Culiati	✓ Tapel	✓ Del Rosario	✓ Tobgon	✓ Gumabao	
✓ Badbad	✓ Maramba																											
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✓ Casinagan	✓ Talisay																											
✓ Culiati	✓ Tapel																											
✓ Del Rosario	✓ Tobgon																											
✓ Gumabao																												
Climate	<ul style="list-style-type: none"> ▪ Two pronounced seasons: wet and dry seasons ▪ Rainy season: June - December Dry season : January - May 																											
Demographic Profile																												
Household Population (1995)	▪ 4,226 Households																											
Projected HH Population (2000)	▪ 4,508 Households																											
Ave. Annual Pop'n Growth Rate	▪ 1.3 %																											
Population Density (1995)	▪ 14.85HH/km ²																											
Ave. HH Size	▪ 5.24 persons																											
Macro-economic Indicators																												
Ave. Annual HH Income	▪ PhP 34,743.15																											
Ave. Annual HH Expenditures	▪ PhP 25,172.32																											
Ave. Annual HH Disp. Income	▪ PhP 9,570.83																											
Ave. HH Energy Expenditures	▪ PhP 114.35/month																											
Municipality Internal Allotment (in Philippine pesos)	<ul style="list-style-type: none"> ▪ Total Income ✓ PhP 33,859,241.46 (1999) ✓ PhP 27,549,978.99 (1998) 																											
Municipality Income Class	Third (3 rd) Class																											

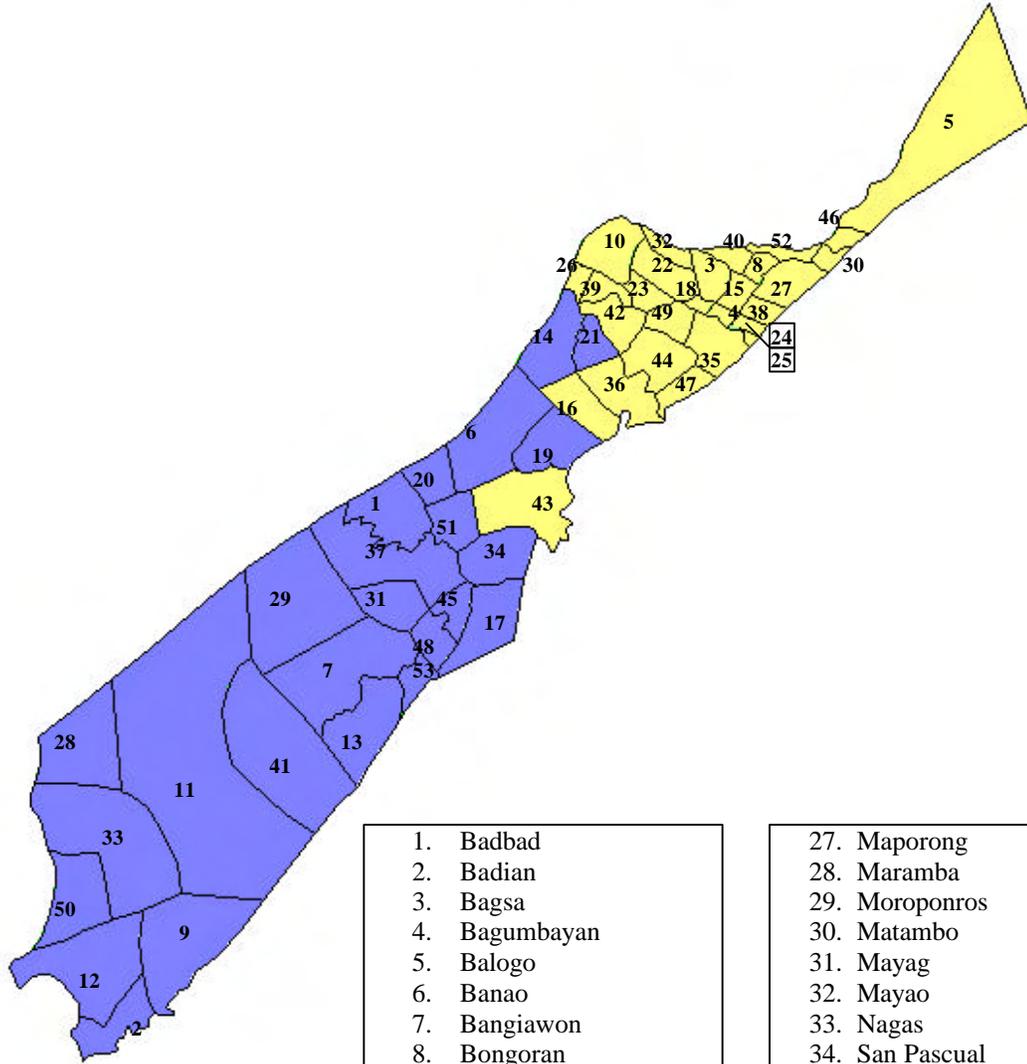
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

OAS, ALBAY Market Package No. 6		2 of 3
Natural Resources		
Land Area (DILG, Annual Report)	<ul style="list-style-type: none"> ▪ 284.5 km² 	
Land Capability Slope Distribution (Topography)	<ul style="list-style-type: none"> ▪ 0 - 3% : 22 % (level to nearly level) ▪ 3 - 8% : 16 % (very gently sloping) ▪ 8 - 15% : 15 % (Gently sloping) ▪ 15 - 30% : 6 % (Moderately sloping) ▪ above 30% : 41 % (Strongly sloping) 	
Land Use	<ul style="list-style-type: none"> ▪ 265 km² devoted for agriculture <ul style="list-style-type: none"> ✓ 210 km² for commercial crops (coconut, citrus, abaca, and other fruit bearing trees) ✓ 55 km² for rice, corn, vegetables and rootcrops 	
Water Bodies	<p>Oas has fresh and sea water bodies. The west coast district lies along the Burias Pass. Fresh water bodies emanate from the Mayon Volcano and pass through the fertile plains of Oas, enabling farmers and planters to have adequate supply of irrigated water.</p>	
Renewable Energy Resources		
Solar Energy	<ul style="list-style-type: none"> ▪ 6 kWhr/m²/day 	
Hydro Power	<ul style="list-style-type: none"> ▪ 50 Watts 	
Economic Activities		
Predominant Economic Activities	<ul style="list-style-type: none"> ▪ Farming ▪ Production of leading agricultural crops (annual) <ul style="list-style-type: none"> ✓ Rice : 22,542 MT ✓ Corn : 3,875 MT ✓ Coconut : 438,704 MT ✓ Rootcrops : 1,620 MT ✓ Vegetables : 264 MT ▪ Livestocks & Poultry/# of Heads <ul style="list-style-type: none"> ✓ Swine : 4,460 ✓ Chicken : 7,123 ✓ Ducks : 5,400 ✓ Carabao : 2,840 ✓ Others : 499 	

**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

OAS, ALBAY Market Package No. 6		3 of 3
Other Livelihood Activities	<ul style="list-style-type: none"> ▪ Cottage industry primarily agas handicraft ▪ Village level fish processing ▪ Sea weed production ▪ Furniture making ▪ Coconut processing (vinegar) 	
Utilities		
Power <ul style="list-style-type: none"> ▪ Electric Cooperative ▪ Municipal Energ'n Status ▪ Power Tariff (Basic Rates as of December 2000) <ul style="list-style-type: none"> ✓ Residential ✓ Commercial ✓ Industry <ul style="list-style-type: none"> - Demand Charge - Energy Charge ▪ Estimated Cost of Grid Extension 	<ul style="list-style-type: none"> ▪ ALECO ▪ 53 % ▪ PhP 52.37 for first 15 kWhr PhP 3.4913/kWhr (in excess of 15 kWhr) ▪ PhP 70.43 for first 20 kWhr PhP 3.5213/kWhr (in excess of 20 kWhr) ▪ PhP 18.00/kW ▪ PhP 3.4813/kWhr ▪ PhP 33,274,420.00 (excluding Tobgon) 	
Social Services		
Education (Schools) <ul style="list-style-type: none"> ▪ Elementary ▪ Secondary 	<ul style="list-style-type: none"> ▪ 41 elementary schools (38 are in the rural areas) ▪ 7 secondary schools (4 are located in rural areas) 	

OAS, ALBAY



LEGEND :

- ENERGIZED
- UNENERGIZED

1. Badbad
2. Badian
3. Bagsa
4. Bagumbayan
5. Balogo
6. Banao
7. Bangiawon
8. Bongoran
9. Bogtong
10. Busac
11. Cadawag
12. Cagmanaba
13. Calaguimit
14. Calpi
15. Calzada
16. Camagong
17. Casinagan
18. Centro Poblacion
19. Coliat
20. Del Rosario
21. Gumabao
22. Ilaor Norte
23. Ilaor Sur
24. Iraya Norte
25. Iraya Sur
26. Manga

27. Maporong
28. Maramba
29. Moroponros
30. Matambo
31. Mayag
32. Mayao
33. Nagas
34. San Pascual
35. Obaliw-Rinas
36. Pistola
37. Ramay
38. Rizal
39. Saban
40. San Agustin
41. San Antonio
42. San Isidro
43. San Jose
44. San Juan
45. San Miguel
46. San Ramon
47. San Vicente (Suca)
48. Talisay
49. Talongog
50. Tapel
51. Tobgon
52. Tobog
53. Tablon

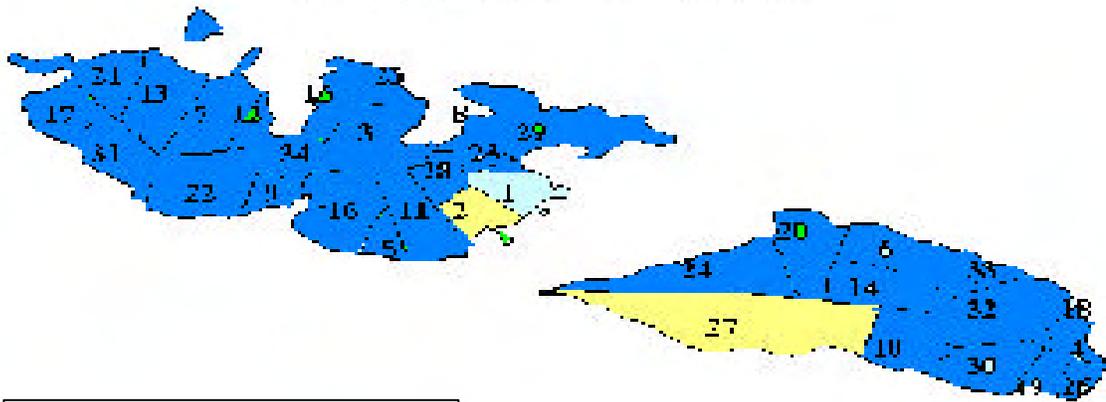
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

RAPU-RAPU , ALBAY Market Package No. 7		1 of 2		
General Information				
Political Subdivisions <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	Thirty-four (34) barangays Three (3) barangays Thrity-one (31) barangays and these are <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Bilbao ✓ Binosawan ✓ Bogtong ✓ Buenavista ✓ Buhatan ✓ Calanaga ✓ Caracaran ✓ Carogcog ✓ Dapdap ✓ Gaba ✓ Galicia ✓ Guadalupe ✓ Hamorawon ✓ Lagundi ✓ Ligan ✓ Linao </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Malobago ✓ Mananao ✓ Mancao ✓ Manila ✓ Masaga ✓ Morocborocan ✓ Nagcalsot ✓ Pagcolbon ✓ Sagrada ✓ Santa Barbara ✓ San Ramon ✓ Tinocawan ✓ Tinopan ✓ Viga ✓ VillaHermosa </td> </tr> </table>		<ul style="list-style-type: none"> ✓ Bilbao ✓ Binosawan ✓ Bogtong ✓ Buenavista ✓ Buhatan ✓ Calanaga ✓ Caracaran ✓ Carogcog ✓ Dapdap ✓ Gaba ✓ Galicia ✓ Guadalupe ✓ Hamorawon ✓ Lagundi ✓ Ligan ✓ Linao 	<ul style="list-style-type: none"> ✓ Malobago ✓ Mananao ✓ Mancao ✓ Manila ✓ Masaga ✓ Morocborocan ✓ Nagcalsot ✓ Pagcolbon ✓ Sagrada ✓ Santa Barbara ✓ San Ramon ✓ Tinocawan ✓ Tinopan ✓ Viga ✓ VillaHermosa
<ul style="list-style-type: none"> ✓ Bilbao ✓ Binosawan ✓ Bogtong ✓ Buenavista ✓ Buhatan ✓ Calanaga ✓ Caracaran ✓ Carogcog ✓ Dapdap ✓ Gaba ✓ Galicia ✓ Guadalupe ✓ Hamorawon ✓ Lagundi ✓ Ligan ✓ Linao 	<ul style="list-style-type: none"> ✓ Malobago ✓ Mananao ✓ Mancao ✓ Manila ✓ Masaga ✓ Morocborocan ✓ Nagcalsot ✓ Pagcolbon ✓ Sagrada ✓ Santa Barbara ✓ San Ramon ✓ Tinocawan ✓ Tinopan ✓ Viga ✓ VillaHermosa 			
Climate	<ul style="list-style-type: none"> ▪ No definite dry season but very pronounced rainy season ▪ Rainy season: November - January ▪ Dry season : no data 			
Demographic Profile				
Household Population (1995)	▪ 4,181 Households			
Projected HH Population (2000)	▪ 4,607 Households			
Ave. Annual Pop'n Growth Rate	▪ 1.96 %			
Population Density (1995)	▪ 25.84 HH/km ²			
Ave. HH Size	▪ 5.40 persons			
Macro-economic Indicators				
Ave. Annual HH Income	▪ PhP 37,846.15			
Ave. Annual HH Expenditures	▪ PhP 33,479.46			
Ave. Annual HH Disp. Income	▪ PhP 4,366.69			
Ave. HH Energy Expenditures	▪ PhP 151.54/month			

**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

RAPU-RAPU , ALBAY Market Package No. 7		2 of 2
Municipality Internal Allotment (in Philippine pesos)	<ul style="list-style-type: none"> ▪ Total Income <ul style="list-style-type: none"> ✓ PhP 19,956,287.91 (1999) ✓ PhP 16,199,501.40 (1998) ▪ IRA <ul style="list-style-type: none"> ✓ PhP 19,476,561.00 (1999) ✓ PhP 15,730,172.00 (1998) 	
Municipality Income Class	<ul style="list-style-type: none"> ▪ Fourth (4th) Class 	
Natural Resources		
Land Area (DILG)	<ul style="list-style-type: none"> ▪ 161.8 km² 	
Land Capability Slope Distribution (Topography)	<ul style="list-style-type: none"> ▪ relatively lowlands and coastal 	
Renewable Energy Resources		
Solar Energy	<ul style="list-style-type: none"> ▪ 5 kWhr/m²/day 	
Hydro Power	<ul style="list-style-type: none"> ▪ 50 Watts 	
Economic Activities		
Predominant Economic Activities	<ul style="list-style-type: none"> ▪ The primary source of income of the people depends on agriculture; about 50% are farmers, 35% fishermen, and 15% employed in the government and private sectors 	
Utilities		
Power <ul style="list-style-type: none"> ▪ Electric Cooperative ▪ Municipal Energ'n Status ▪ Power Tariff (Basic Rates as of December 2000) <ul style="list-style-type: none"> ✓ Residential ✓ Commercial ✓ Industry <ul style="list-style-type: none"> - Demand Charge - Energy Charge ▪ Estimated Cost of Grid Extension 	<ul style="list-style-type: none"> ▪ ALECO ▪ 9 % ▪ PhP 52.37 for first 15 kWhr PhP 3.4913/kWhr (in excess of 15 kWhr) ▪ PhP 70.43 for first 20 kWhr PhP 3.5213/kWhr (in excess of 20 kWhr) ▪ PhP 18.00/kW ▪ PhP 3.4813/kWhr ▪ PhP 51,754,506.00 (excluding Sta. Barbara, Tinocawan, Tinopan) 	
Social Services		
Education (Schools)	<ul style="list-style-type: none"> ▪ At least 31 elementary schools 	

RAPU-RAPU, ALBAY

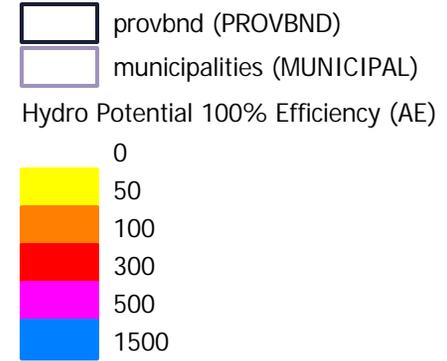
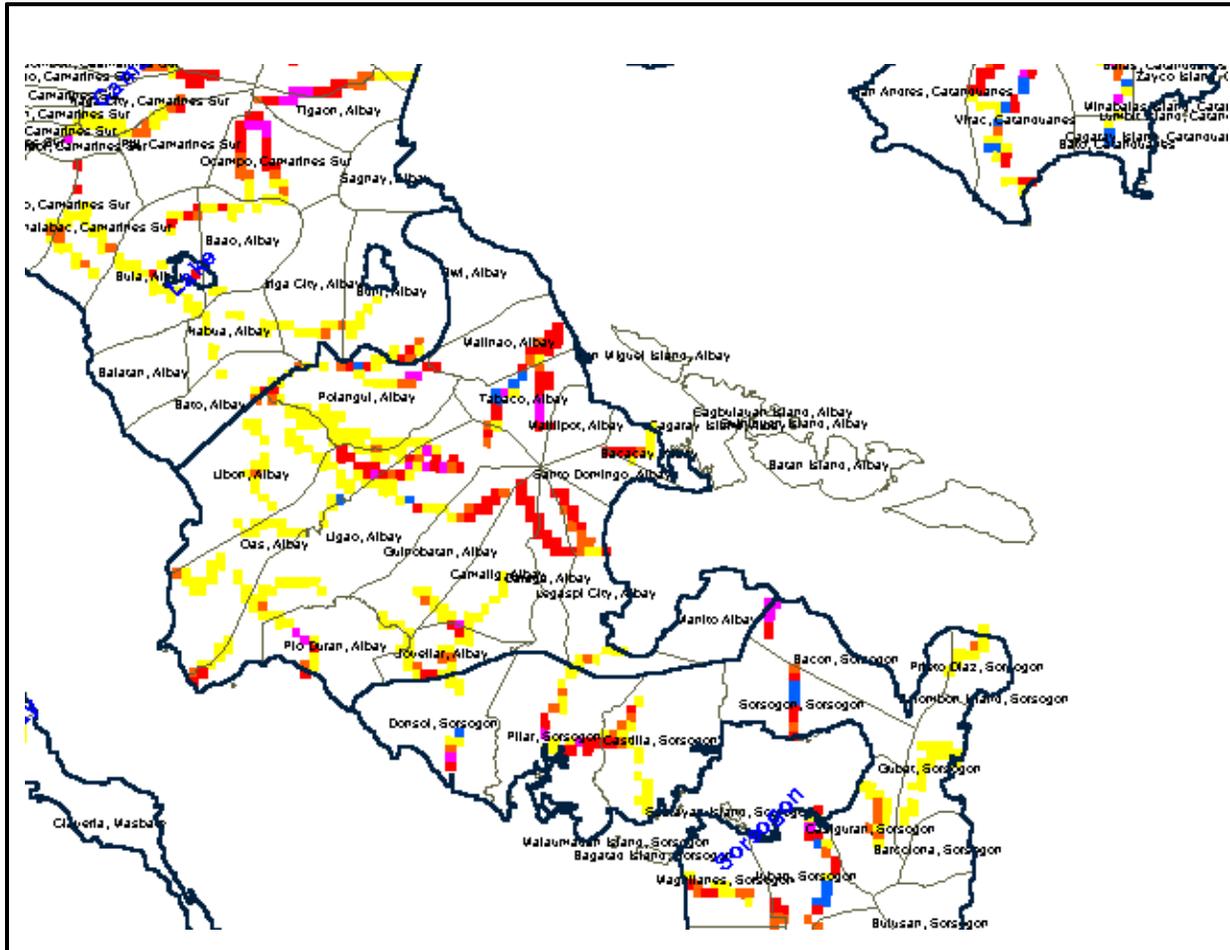


1. Bagaobawan
2. Batan
3. Bilbao
4. Binosawan
5. Bogtong
6. Buenavista
7. Buhatan
8. Calanaga
9. Caracaran
10. Carogcog
11. Dapdap
12. Gaba
13. Galicia
14. Guadalupe
15. Hamorawon
16. Lagundi
17. Liguan
18. Linao
19. Malobago
20. Mananao
21. Mancao
22. Manila
23. Masaga
24. Morocborocan
25. Nagcalsot
26. Pagcolbon
27. Poblacion
28. Sagrada
29. San Ramon
30. Santa Barbara
31. Tinocawan
32. Tinopan
33. Viga
34. Villahermosa

LEGEND :

-  ENERGIZED
-  UNENERGIZED

HYDRO POWER POTENTIAL (ALBAY)

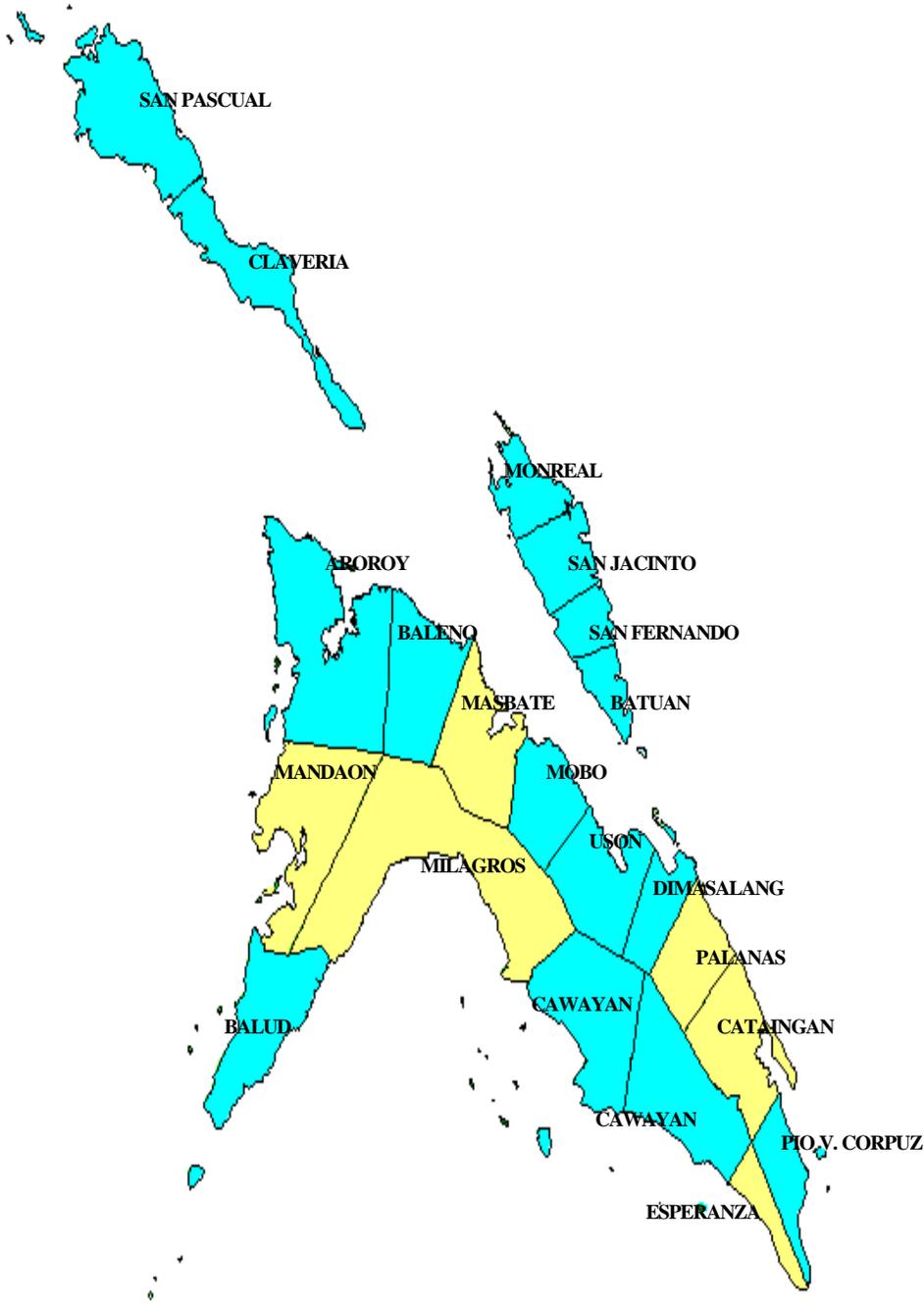


MARKET PACKAGES

Masbate

- M.P. # 8 : Balud
- M.P. # 9 : Cataingan
- M.P. # 10 : Esperanza
- M.P. # 11 : Mandaon
- M.P. # 12 : Masbate
- M.P. # 13 : Milagros
- M.P. # 14 : Palanas

Masbate



**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

BALUD, MASBATE Market Package No. 8		1 of 3		
General Information				
<p>Political Subdivisions</p> <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	<p>Thirty - two (32) barangays One (1) barangay</p> <p>Thirty - one (31) barangays and these are</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Baybay ✓ Bungcanaway ✓ Calumpang ✓ Cantil ✓ Casamongan ✓ Dau ✓ Danao ✓ Ilaya ✓ Jangan ✓ Jintotolo ✓ Guinbanwahan ✓ Mabuhay ✓ Mapili ✓ Mapitogo ✓ Panguiranan ✓ Paho </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Palani ✓ Panubigan ✓ Pulangduta ✓ Quinyangan Diot ✓ Quinyangan Tunga ✓ Salvacion ✓ Sampad ✓ San Andres ✓ San Antonio ✓ Sapatos Island ✓ Talisay ✓ Tonga ✓ Ubo ✓ Victoria ✓ Villa Alvarez </td> </tr> </table>		<ul style="list-style-type: none"> ✓ Baybay ✓ Bungcanaway ✓ Calumpang ✓ Cantil ✓ Casamongan ✓ Dau ✓ Danao ✓ Ilaya ✓ Jangan ✓ Jintotolo ✓ Guinbanwahan ✓ Mabuhay ✓ Mapili ✓ Mapitogo ✓ Panguiranan ✓ Paho 	<ul style="list-style-type: none"> ✓ Palani ✓ Panubigan ✓ Pulangduta ✓ Quinyangan Diot ✓ Quinyangan Tunga ✓ Salvacion ✓ Sampad ✓ San Andres ✓ San Antonio ✓ Sapatos Island ✓ Talisay ✓ Tonga ✓ Ubo ✓ Victoria ✓ Villa Alvarez
<ul style="list-style-type: none"> ✓ Baybay ✓ Bungcanaway ✓ Calumpang ✓ Cantil ✓ Casamongan ✓ Dau ✓ Danao ✓ Ilaya ✓ Jangan ✓ Jintotolo ✓ Guinbanwahan ✓ Mabuhay ✓ Mapili ✓ Mapitogo ✓ Panguiranan ✓ Paho 	<ul style="list-style-type: none"> ✓ Palani ✓ Panubigan ✓ Pulangduta ✓ Quinyangan Diot ✓ Quinyangan Tunga ✓ Salvacion ✓ Sampad ✓ San Andres ✓ San Antonio ✓ Sapatos Island ✓ Talisay ✓ Tonga ✓ Ubo ✓ Victoria ✓ Villa Alvarez 			
<p>Climate</p>	<ul style="list-style-type: none"> ▪ No very pronounced maximum rain period, with a short dry season ▪ Climatological Data (1998) <ul style="list-style-type: none"> ✓ Total rainfall : 1462.7 mm ✓ No. of rainy days : 147 days ✓ Ave. Temperature : 29.6⁰C 			
Demographic Profile				
<p>Household Population (1995)</p>	<ul style="list-style-type: none"> ▪ 5,377 Households 			
<p>Projected HH Population (2000)</p>	<ul style="list-style-type: none"> ▪ 5,693 Households 			
<p>Ave. Annual Pop'n Growth Rate</p>	<ul style="list-style-type: none"> ▪ 1.3 (1990 - 1995) 			
<p>Ave. HH Size</p>	<ul style="list-style-type: none"> ▪ 5.2 persons 			
<p>HH Population Density</p>	<ul style="list-style-type: none"> ▪ 22.76 HH/km² 			
Macro-economic Indicators				
<p>Ave. Annual HH Income</p>	<ul style="list-style-type: none"> ▪ PhP 40,974.30 			
<p>Ave. Annual HH Expenditures</p>	<ul style="list-style-type: none"> ▪ PhP 29,058.72 			
<p>Ave. Annual HH Disp.Income</p>	<ul style="list-style-type: none"> ▪ PhP 11,915.58 			
<p>Ave. HH Energy Expenditures</p>	<ul style="list-style-type: none"> ▪ PhP 186.08/month 			
<p>Municipality Income Class</p>	<ul style="list-style-type: none"> ▪ Fourth 			

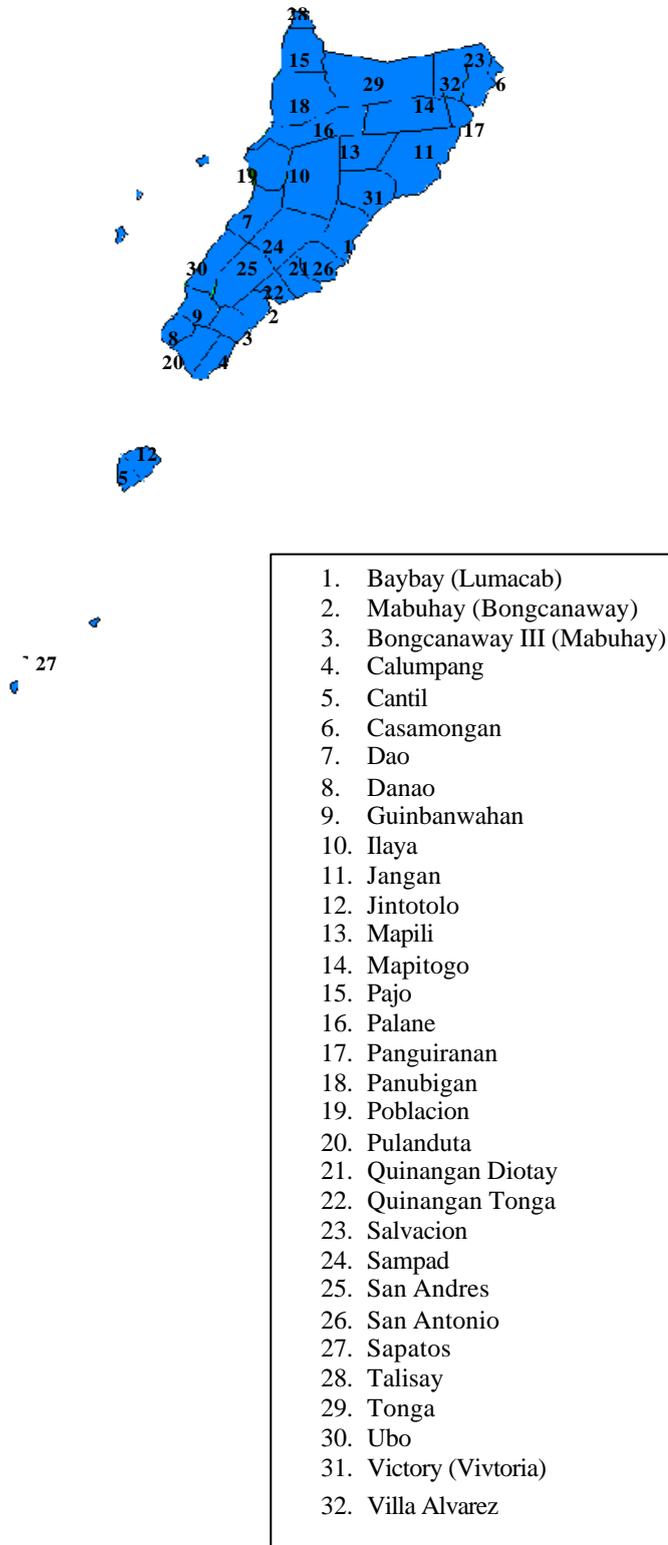
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

BALUD, MASBATE Market Package No. 8		2 of 3
Natural Resources		
Land Area	<ul style="list-style-type: none"> ▪ 203.10 km² 	
Land Capability Slope Distribution	<ul style="list-style-type: none"> ▪ 0 - 3% : 21.40% (level to nearly level) ▪ 3 - 5% : 9.76% (very gently sloping) ▪ 5 - 8% : 3.25% (Gently sloping) ▪ 8 - 15% : 2.44% (Moderately sloping) ▪ 15 - 25% : 63.42% (Strongly sloping) 	
Land Use	<ul style="list-style-type: none"> ▪ Pasture land : 160 km² ▪ Irrigated land : 2.03km² ▪ Fishponds : 11km² 	
Renewable Energy Resources		
Solar Energy	<ul style="list-style-type: none"> ▪ 5kWhr/m²/day 	
Wind Energy	<ul style="list-style-type: none"> ✓ Wind power density ✓ Wind Speed 	
Hydro Power	<ul style="list-style-type: none"> ▪ 50 Watts 	
Economic Activities		
Predominant Economic Activities	<ul style="list-style-type: none"> ▪ Farming and fishing 	
Livestock	<ul style="list-style-type: none"> ▪ Cattle Population ✓ 190 (backyard) ✓ 330 (semi-commercial) ✓ 5,200 (commercial) 	
Coconut	<ul style="list-style-type: none"> ▪ Total Number of trees ▪ Ave. nut prod/tree/year ▪ Number of coco farms ▪ Average farm size 	
Trade	<ul style="list-style-type: none"> ▪ Industry Sector ▪ Services Sector 	
Other Livelihood Activities	<ul style="list-style-type: none"> ▪ Fish processing ▪ Sea weed production 	

**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

BALUD, MASBATE Market Package No. 8		3 of 3
Utilities		
Power <ul style="list-style-type: none"> ▪ Electric Cooperative ▪ Municipal Energ'n Status ▪ Power Tariff (Basic Rates as of December 2000) <ul style="list-style-type: none"> ✓ Residential ✓ Commercial ✓ Industry <ul style="list-style-type: none"> - Demand Charge - Energy Charge 	<ul style="list-style-type: none"> ▪ MASELCO ▪ 3% ▪ PhP 22.83 for first 6 kWhr PhP 3.8054/kWhr (in excess of 6 kWhr) ▪ PhP 38.15 for first 10 kWhr PhP 3.8154/kWhr (in excess of 10 kWhr) ▪ No data ▪ PhP 3.8154/kWhr 	
Social Services		
Education (Schools)	<ul style="list-style-type: none"> ▪ at least 31 schools 	

BALUD, MASBATE



**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

CATAINGAN, MASBATE		1 of 3																												
Market Package No. 9																														
General Information																														
<p>Political Subdivisions</p> <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	<p>Thirty - six (36) barangays Eight (8) barangay</p> <p>Twenty-eight (28) barangays and these are</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">✓ Abaca</td> <td style="width: 50%;">✓ Malobago</td> </tr> <tr> <td>✓ Aguada</td> <td>✓ Matayum</td> </tr> <tr> <td>✓ Badiang</td> <td>✓ Matubinao</td> </tr> <tr> <td>✓ Bagumbayan</td> <td>✓ Mintac</td> </tr> <tr> <td>✓ Chimnea</td> <td>✓ Nadawisan</td> </tr> <tr> <td>✓ Cadulawan</td> <td>✓ Osmeña</td> </tr> <tr> <td>✓ Cagbatang</td> <td>✓ Pitogo</td> </tr> <tr> <td>✓ Concepcion</td> <td>✓ San Isidro</td> </tr> <tr> <td>✓ Divisoria</td> <td>✓ San Jose</td> </tr> <tr> <td>✓ Estampar</td> <td>✓ San Pedro</td> </tr> <tr> <td>✓ Leong</td> <td>✓ San Rafael</td> </tr> <tr> <td>✓ Libtong</td> <td>✓ Tagboan</td> </tr> <tr> <td>✓ Maanahao</td> <td>✓ Toybo</td> </tr> <tr> <td>✓ Madamba</td> <td>✓ Villa Pogado</td> </tr> </table>		✓ Abaca	✓ Malobago	✓ Aguada	✓ Matayum	✓ Badiang	✓ Matubinao	✓ Bagumbayan	✓ Mintac	✓ Chimnea	✓ Nadawisan	✓ Cadulawan	✓ Osmeña	✓ Cagbatang	✓ Pitogo	✓ Concepcion	✓ San Isidro	✓ Divisoria	✓ San Jose	✓ Estampar	✓ San Pedro	✓ Leong	✓ San Rafael	✓ Libtong	✓ Tagboan	✓ Maanahao	✓ Toybo	✓ Madamba	✓ Villa Pogado
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✓ Libtong	✓ Tagboan																													
✓ Maanahao	✓ Toybo																													
✓ Madamba	✓ Villa Pogado																													
<p>Climate</p>	<ul style="list-style-type: none"> ▪ No very pronounced maximum rain period, with a short dry season ▪ Climatological Data (1998) <ul style="list-style-type: none"> ✓ Total rainfall : 1462.7 mm ✓ No. of rainy days : 147 days ✓ Ave. Temperature : 29.6⁰C 																													
Demographic Profile																														
Household Population (1995)	▪ 5,170 Households																													
Projected HH Population (2000)	▪ 5,488 HH																													
Ave. Annual Pop'n Growth Rate	▪ 1.2 (1990 - 1995)																													
Ave. HH Size	▪ 4.8 persons																													
HH Population Density	▪ 25.29 HH/km ²																													
Macro-economic Indicators																														
Ave. Annual HH Income	▪ PhP 29,504.50																													
Ave. Annual HH Expenditures	▪ PhP 28,381.66																													
Ave. Annual HH Disp.Income	▪ PhP 1,122.84																													
Ave. HH Energy Expenditures	▪ PhP 102.85/month																													
Municipality Income Class	▪ Fourth																													

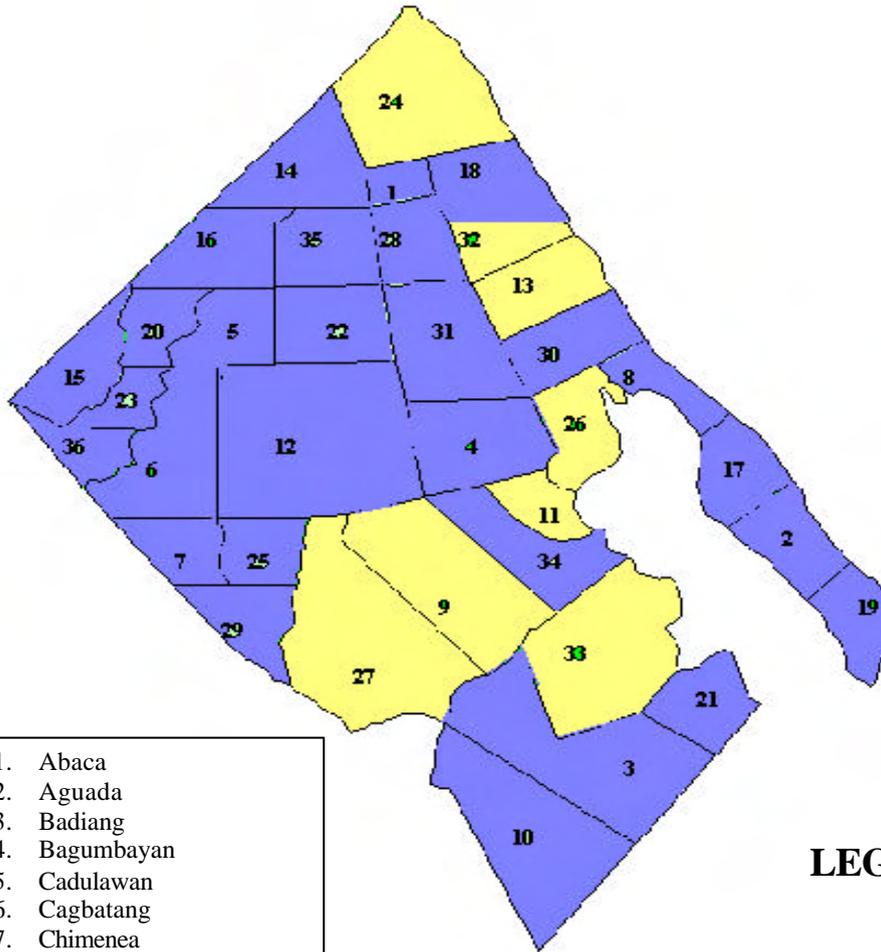
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

CATAINGAN, MASBATE		2 of 3
Market Package No. 9		
Natural Resources		
Land Area	<ul style="list-style-type: none"> ▪ 204.40 km² 	
Land Capability Slope Distribution	<ul style="list-style-type: none"> ▪ 0 - 3% : 10.00% (level to nearly level) ▪ 3 - 5% : 20.67% (very gently sloping) ▪ 5 - 8% : 30.67% (Gently sloping) ▪ 8 - 15% : 8.67% (Moderately sloping) ▪ 15 - 25% : 30.00% (Strongly sloping) 	
Land Use	<ul style="list-style-type: none"> ▪ Cultivated Croplands : 121 km² ▪ Irrigated land : 1.45km² ▪ Fishponds : 1km² 	
Renewable Energy Resources		
Solar Energy	<ul style="list-style-type: none"> ▪ 5kWhr/m²/day 	
Wind Energy	<ul style="list-style-type: none"> ▪ 200-400 W/m² 	
✓ Wind power density	<ul style="list-style-type: none"> ▪ 5.6 - 7.0 m/s 	
✓ Wind Speed		
Hydro Power	<ul style="list-style-type: none"> ▪ 50 watts 	
Economic Activities		
Predominant Economic Activities	<ul style="list-style-type: none"> ▪ Farming 	
Livestock	<ul style="list-style-type: none"> ▪ Cattle Population ✓ 2,001 (backyard) ✓ 200 (semi-commercial) 	
Coconut	<ul style="list-style-type: none"> ▪ Total Number of trees : 886,426 ▪ Ave. nut prod/tree/year : 24 ▪ Number of coco farms : 264 ▪ Average farm size : 3.00 hectares 	
Trade	No. of establishments	
▪ Industry Sector	<ul style="list-style-type: none"> ▪ 33 	
▪ Services Sector	<ul style="list-style-type: none"> ▪ 12 	
Other Livelihood Activities	<ul style="list-style-type: none"> ▪ Mat weaving ▪ Fish culture/drying ▪ Coconut processing 	

**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

CATAINGAN, MASBATE		3 of 3
Market Package No. 9		
Utilities		
Power <ul style="list-style-type: none"> ▪ Electric Cooperative ▪ Municipality Energ'n Status ▪ Power Tariff (Basic Rates as of December 2000) <ul style="list-style-type: none"> ✓ Residential ✓ Commercial ✓ Industry <ul style="list-style-type: none"> - Demand Charge - Energy Charge 	<ul style="list-style-type: none"> ▪ MASELCO ▪ 22% ▪ PhP 22.83 for first 6 kWhr PhP 3.8054/kWhr (in excess of 6 kWhr) ▪ PhP 38.15 for first 10 kWhr PhP 3.8154/kWhr (in excess of 10 kWhr) ▪ No data ▪ PhP 3.8154/kWhr 	
Social Services		
Education (Schools)	<ul style="list-style-type: none"> ▪ at least 28 schools 	

CATAINGAN, MASBATE



1. Abaca
2. Aguada
3. Badiang
4. Bagumbayan
5. Cadulawan
6. Cagbatang
7. Chimenea
8. Concepcion
9. Curvada
10. Divisoria
11. Domorong
12. Estampar
13. Gahit
14. Libtong
15. Liong
16. Maanahao
17. Madamba
18. Malobago
19. Matayum
20. Matubinao
21. Mintac
22. Nadawisan
23. Osmena
24. Pawican
25. Pitogo
26. Poblacion
27. Quezon
28. San Isidro
29. San Jose

30. San Pedro
31. San Rafael
32. Santa Teresita
33. Santo Nino
34. Tagboan
35. Tuybo
36. Villa Pogado

LEGEND :



ENERGIZED



UNENERGIZED

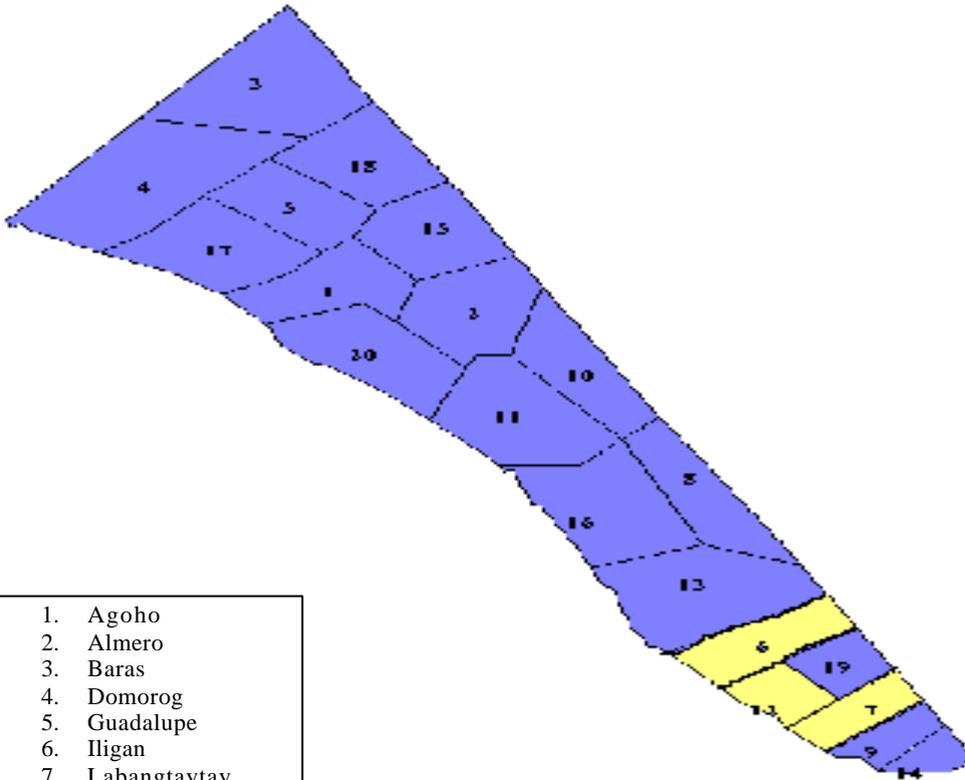
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

ESPERANZA, MASBATE		1 of 2		
Market Package No. 10				
General Information				
Political Subdivisions <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	Twenty (20) barangays Three (3) barangay Seventeen (17) barangays and these are: <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Agoho ✓ Almero ✓ Baras ✓ Domorog ✓ Guadalupe ✓ Labrador ✓ Libertad ✓ Magsaysay </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Masbaranon ✓ Putting Bato ✓ Rizal ✓ San Roque ✓ Santiago ✓ Serosimbajan ✓ Tawad ✓ Tunga ✓ Villa </td> </tr> </table>		<ul style="list-style-type: none"> ✓ Agoho ✓ Almero ✓ Baras ✓ Domorog ✓ Guadalupe ✓ Labrador ✓ Libertad ✓ Magsaysay 	<ul style="list-style-type: none"> ✓ Masbaranon ✓ Putting Bato ✓ Rizal ✓ San Roque ✓ Santiago ✓ Serosimbajan ✓ Tawad ✓ Tunga ✓ Villa
<ul style="list-style-type: none"> ✓ Agoho ✓ Almero ✓ Baras ✓ Domorog ✓ Guadalupe ✓ Labrador ✓ Libertad ✓ Magsaysay 	<ul style="list-style-type: none"> ✓ Masbaranon ✓ Putting Bato ✓ Rizal ✓ San Roque ✓ Santiago ✓ Serosimbajan ✓ Tawad ✓ Tunga ✓ Villa 			
Climate	<ul style="list-style-type: none"> ▪ No very pronounced maximum rain period, with a short dry season ▪ Climatological Data (1998) <ul style="list-style-type: none"> ✓ Total rainfall : 1462.7 mm ✓ No. of rainy days : 147 days ✓ Ave. Temperature : 29.6⁰C 			
Demographic Profile				
Household Population (1995)	▪ 3,085 HH			
Projected HH Population (2000)	▪ 3,542 HH			
Ave. Annual Pop'n Growth Rate	▪ 2.8 (1990 - 1995)			
Ave. HH Size	▪ 5.13 persons			
Population Density	▪ 38.23 HH/km ²			
Macro-economic Indicators				
Ave. Annual HH Income	▪ PhP 30,582.78			
Ave. Annual HH Expenditures	▪ PhP 26,066.27			
Ave. Annual HH Disp.Income	▪ PhP 4,516.51			
Ave. HH Energy Expenditures	▪ PhP 251.54/month			
Municipality Income Class	▪ 5th			

**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

ESPERANZA, MASBATE		2 of 2
Market Package No. 10		
Natural Resources		
Land Area	▪ 80.70 km ²	
Land Capability Slope Distribution	<ul style="list-style-type: none"> ▪ 0 - 3% : 45.76% (level to nearly level) ▪ 3 - 5% : 25.42% (very gently sloping) ▪ 5 - 8% : 10.17% (Gently sloping) ▪ 8 - 15% : 5.08% (Moderately sloping) ▪ 15 - 25% : 13.56% (Strongly sloping) 	
Land Use	▪ Coconut Plantations : 58 km ²	
Renewable Energy Resources		
Solar Energy	▪ 5kWhr/m ² /day	
Wind Energy		
✓ Wind power density	▪ 200-300 W/m ²	
✓ Wind Speed	▪ 5.6 - 6.4 m/s	
Economic Activities		
Predominant Economic Activities	▪ Farming	
Coconut		
▪ Total Number of trees	▪ 370,440	
▪ Ave. nut prod/tree/year	▪ 26	
▪ Number of coco farms	▪ 4943	
▪ Average farm size	▪ 1.65 hectares	
Trade	No. of establishments	
▪ Industry Sector	▪ 4	
▪ Services Sector	▪ 1	
Other Livelihood Activities	▪ Animal dispersal	
Utilities		
Power		
▪ Electric Cooperative	▪ MASELCO	
▪ Municipal Energ'n Status	▪ 15%	
▪ Power Tariff (Basic Rates as of December 2000)		
✓ Residential	▪ PhP 22.83 for first 6 kWhr PhP 3.8054/kWhr (in excess of 6 kWhr)	
✓ Commercial	▪ PhP 38.15 for first 10 kWhr PhP 3.8154/kWhr (in excess of 10 kWhr)	
✓ Industry		
- Demand Charge	▪ No data	
- Energy Charge	▪ PhP 3.8154/kWhr	
Social Services		
Education (Schools)	at least 16 schools	

ESPERANZA, MASBATE



1. Agoho
2. Almero
3. Baras
4. Domorog
5. Guadalupe
6. Iligan
7. Labangtaytay
8. Labrador
9. Libertad
10. Magsaysay
11. Masbaranon
12. Poblacion
13. Potingbato
14. Rizal
15. San Roque
16. Santiago
17. Sorosimbahan
18. Tawad
19. Tunga
20. Villa

LEGEND :

-  ENERGIZED
-  UNENERGIZED

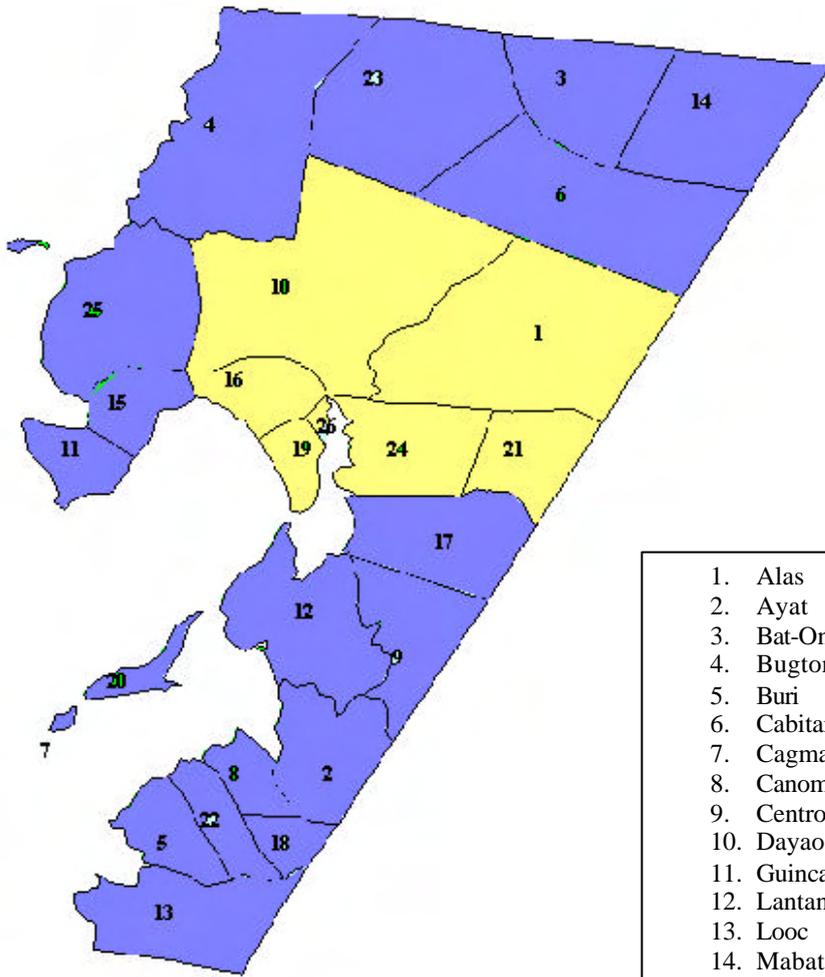
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

MANDAON, MASBATE																					
Market Package No. 11																					
1 of 2																					
General Information																					
Political Subdivisions <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	Twenty-six (26) barangays Seven (7) barangay Nineteen (19) barangays and these are <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">✓ Ayat</td> <td style="width: 50%;">✓ Lantangan</td> </tr> <tr> <td>✓ Bat-ungan</td> <td>✓ Looc</td> </tr> <tr> <td>✓ Bugtong</td> <td>✓ Mabatobato</td> </tr> <tr> <td>✓ Buri</td> <td>✓ Maolingon</td> </tr> <tr> <td>✓ Cabitan</td> <td>✓ Nanipsan</td> </tr> <tr> <td>✓ Cagmasoso Is.</td> <td>✓ Pinamangcaan</td> </tr> <tr> <td>✓ Canomoy</td> <td>✓ Polo Dacu</td> </tr> <tr> <td>✓ Centro</td> <td>✓ San Pablo</td> </tr> <tr> <td>✓ Guincaiptan</td> <td>✓ Sta. Fe</td> </tr> <tr> <td></td> <td>✓ Tumalaytay</td> </tr> </table>	✓ Ayat	✓ Lantangan	✓ Bat-ungan	✓ Looc	✓ Bugtong	✓ Mabatobato	✓ Buri	✓ Maolingon	✓ Cabitan	✓ Nanipsan	✓ Cagmasoso Is.	✓ Pinamangcaan	✓ Canomoy	✓ Polo Dacu	✓ Centro	✓ San Pablo	✓ Guincaiptan	✓ Sta. Fe		✓ Tumalaytay
✓ Ayat	✓ Lantangan																				
✓ Bat-ungan	✓ Looc																				
✓ Bugtong	✓ Mabatobato																				
✓ Buri	✓ Maolingon																				
✓ Cabitan	✓ Nanipsan																				
✓ Cagmasoso Is.	✓ Pinamangcaan																				
✓ Canomoy	✓ Polo Dacu																				
✓ Centro	✓ San Pablo																				
✓ Guincaiptan	✓ Sta. Fe																				
	✓ Tumalaytay																				
Climate	<ul style="list-style-type: none"> ▪ No very pronounced maximum rain period, with a short dry season ▪ Climatological Data (1998) <ul style="list-style-type: none"> ✓ Total rainfall : 1462.7 mm ✓ No. of rainy days : 147 days ✓ Ave. Temperature : 29.6⁰C 																				
Demographic Profile (1995)																					
Household Population (1995)	▪ 3,145 Households																				
Projected HH Population (2000)	▪ 3,489 Households																				
Ave. Annual Pop'n Growth Rate	▪ 2.1 (1990 - 1995)																				
Ave. HH Size	▪ 5.3 persons																				
Population Density (1995)	▪ 11.2 persons/km ²																				
Macro-economic Indicators																					
Ave. Annual HH Income	▪ PhP 39,613.64																				
Ave. Annual HH Expenditures	▪ PhP 35,802.65																				
Ave. Annual HH Disp.Income	▪ PhP 3,810.99																				
Ave. HH Energy Expenditures	▪ PhP 188.86/month																				
Municipality Income Class	▪ Fourth Class																				
Natural Resources																					
Land Area	▪ 280.90 km ²																				
Land Capability Slope Distribution	<ul style="list-style-type: none"> ▪ 0 - 3% : 1.55% (level to nearly level) ▪ 3 - 5% : 3.87% (very gently sloping) ▪ 5 - 8% : 46.57% (Gently sloping) ▪ 8 - 15% : 12.40% (Moderately sloping) ▪ 15 - 25% : 7.52% (Strongly sloping) 																				

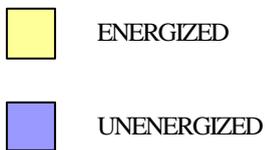
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

MANDAON, MASBATE Market Package No. 11		2 of 2
Land Use	<ul style="list-style-type: none"> ▪ Pasture lands : 161 km² ▪ Fishponds : 8km² 	
Renewable Energy Resources		
Solar Energy	<ul style="list-style-type: none"> ▪ 5kWhr/m²/day 	
Wind Energy	<ul style="list-style-type: none"> ▪ 200-300 W/m² ▪ 5.6 - 6.4 m/s 	
<ul style="list-style-type: none"> ✓ Wind power density ✓ Wind Speed 		
Hydro Power	<ul style="list-style-type: none"> ▪ 50 Watts 	
Economic Activities		
Predominant Economic Activities	<ul style="list-style-type: none"> ▪ Farming 	
Coconut	<ul style="list-style-type: none"> ▪ Total Number of trees : 443,900 ▪ Ave. nut prod/tree/year : 25 ▪ Number of coco farms : 2219 ▪ Average farm size : 2.00 hectares 	
Trade	No. of establishments	
<ul style="list-style-type: none"> ▪ Industry Sector : 10 ▪ Services Sector : 1 		
Utilities		
Power	<ul style="list-style-type: none"> ▪ Electric Cooperative : MASELCO ▪ Municipal Energ'n Status : 27 % ▪ Power Tariff (Basic Rates as of December 2000) <ul style="list-style-type: none"> ✓ Residential : PhP 22.83 for first 6 kWhr PhP 3.8054/kWhr (in excess of 6 kWhr) ✓ Commercial : PhP 38.15 for first 10 kWhr PhP 3.8154/kWhr (in excess of 10 kWhr) ✓ Industry <ul style="list-style-type: none"> - Demand Charge : No data - Energy Charge : PhP 3.8154/kWhr 	
Social Services		
Education (Schools)	<ul style="list-style-type: none"> ▪ at least 18 schools 	

MANDAON, MASBATE



LEGEND :



1. Alas
2. Ayat
3. Bat-Ongan
4. Bugtong
5. Buri
6. Cabitan
7. Cagmasoso
8. Canomoy (Canomay)
9. Centro
10. Dayao
11. Guincaiptan
12. Lantangan
13. Looc
14. Mabatobato
15. Maolingon
16. Nailaban
17. Nanipsan
18. Pinamangsaan
19. Poblacion
20. Pulo Dacu
21. San Juan
22. San Pablo
23. Santa Fe
24. Tagbu
25. Tumulaytay
26. Laguinbanwa

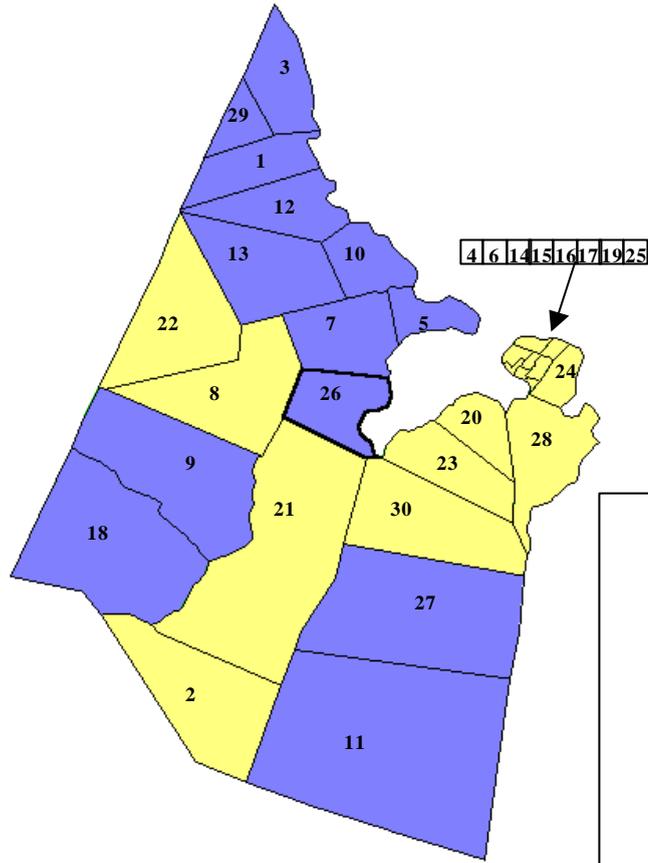
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

MASBATE, MASBATE Market Package No. 12		1 of 2		
General Information				
Political Subdivisions <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	Thirty (30) barangays Seventeen (17) barangay Thirteen (13) barangays and these are: <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Anas ✓ Bantigue ✓ Batuhan ✓ Biyong ✓ B. Titong ✓ Bolo ✓ Cagay </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Cawayan Exterior ✓ Cawayan Interior ✓ Igang ✓ Obongan Dacu ✓ Pawa ✓ Sinalongan </td> </tr> </table>		<ul style="list-style-type: none"> ✓ Anas ✓ Bantigue ✓ Batuhan ✓ Biyong ✓ B. Titong ✓ Bolo ✓ Cagay 	<ul style="list-style-type: none"> ✓ Cawayan Exterior ✓ Cawayan Interior ✓ Igang ✓ Obongan Dacu ✓ Pawa ✓ Sinalongan
<ul style="list-style-type: none"> ✓ Anas ✓ Bantigue ✓ Batuhan ✓ Biyong ✓ B. Titong ✓ Bolo ✓ Cagay 	<ul style="list-style-type: none"> ✓ Cawayan Exterior ✓ Cawayan Interior ✓ Igang ✓ Obongan Dacu ✓ Pawa ✓ Sinalongan 			
Climate	<ul style="list-style-type: none"> ▪ No very pronounced maximum rain period, with a short dry season ▪ Climatological Data (1998) <ul style="list-style-type: none"> ✓ Total rainfall : 1462.7 mm ✓ No. of rainy days : 147 days ✓ Ave. Temperature : 29.6⁰C 			
Demographic Profile (1995)				
Household Population (1995)	<ul style="list-style-type: none"> ▪ 2,711 Households 			
Projected HH Population (2000)	<ul style="list-style-type: none"> ▪ 3,023 Households 			
Ave. Annual Pop'n Growth Rate	<ul style="list-style-type: none"> ▪ 2.2 (1990 - 1995) 			
Ave. HH Size	<ul style="list-style-type: none"> ▪ 5.3 persons 			
Population Density (1995)	<ul style="list-style-type: none"> ▪ 15.09 HH/km² 			
Macro-economic Indicators				
Ave. Annual HH Income	<ul style="list-style-type: none"> ▪ PhP 40,280.62 			
Ave. Annual HH Expenditures	<ul style="list-style-type: none"> ▪ PhP 32,532.06 			
Ave. Annual HH Disp.Income	<ul style="list-style-type: none"> ▪ PhP 7,748.56 			
Ave. HH Energy Expenditures	<ul style="list-style-type: none"> ▪ PhP 90.77/month 			
Municipality Income Class	<ul style="list-style-type: none"> ▪ Second (2nd) Class 			
Natural Resources				
Land Area	<ul style="list-style-type: none"> ▪ 179.70 km² 			
Land Capability Slope Distribution	<ul style="list-style-type: none"> ▪ 0 - 3% : 2.56% (level to nearly level) ▪ 3 - 5% : 4.27% (very gently sloping) ▪ 5 - 8% : 6.847% (Gently sloping) ▪ 8 - 15% : 5.18% (Moderately sloping) ▪ 15 - 25% : 81.20% (Strongly sloping) 			
Land Use	<ul style="list-style-type: none"> ▪ Pasture lands : 83 km² 			

**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

MASBATE, MASBATE Market Package No. 12		2 of 2
Renewable Energy Resources		
Solar Energy	▪ 6 kWhr/m ² /day	
Wind Energy		
✓ Wind power density	▪ 200-300 W/m ²	
✓ Wind Speed	▪ 5.6 - 6.4 m/s	
Economic Activities		
Predominant Economic Activities	▪ Farming	
Coconut		
▪ Total Number of trees	▪ 986,647	
▪ Ave. nut prod/tree/year	▪ 25	
▪ Number of coco farms	▪ 2281	
▪ Average farm size	▪ 1.06 hectares	
Trade	No. of establishments	
▪ Industry Sector	▪ 281	
▪ Services Sector	▪ 253	
Other Livelihood Activities	▪ Marble industry	
	▪ Guano processing	
	▪ Weaving industry	
Utilities		
Power		
▪ Electric Cooperative	▪ MASELCO	
▪ Municipal Energ'n Status	▪ 57%	
▪ Power Tariff (Basic Rates as of December 2000)		
✓ Residential	▪ PhP 22.83 for first 6 kWhr	
	PhP 3.8054/kWhr (in excess of 6 kWhr)	
✓ Commercial	▪ PhP 38.15 for first 10 kWhr	
	PhP 3.8154/kWhr (in excess of 10 kWhr)	
✓ Industry		
- Demand Charge	▪ No data	
- Energy Charge	▪ PhP 3.8154/kWhr	
Social Services		
Education (Schools)	▪ at least 13 schools	

MASBATE, MASBATE



LEGEND :

- ENERGIZED
- UNENERGIZED

1. Anas
2. Asid
3. B. Titong
4. Bagumbayan
5. Bantique
6. Bapor
7. Batuhan
8. Bayombon
9. Biyong
10. Bolo
11. Cagay
12. Cawayan Exterior
13. Cawayan Interior
14. Centro
15. Espinosa
16. F. Magallanes
17. Ibingay
18. Igang
19. Kalipay
20. Kinamaligan
21. Malinta
22. Mapina
23. Mayngaran
24. Nursery
25. Pating
26. Pawa
27. Sinalongan
28. Tugbo
29. Ubongan Dacu
30. Usab

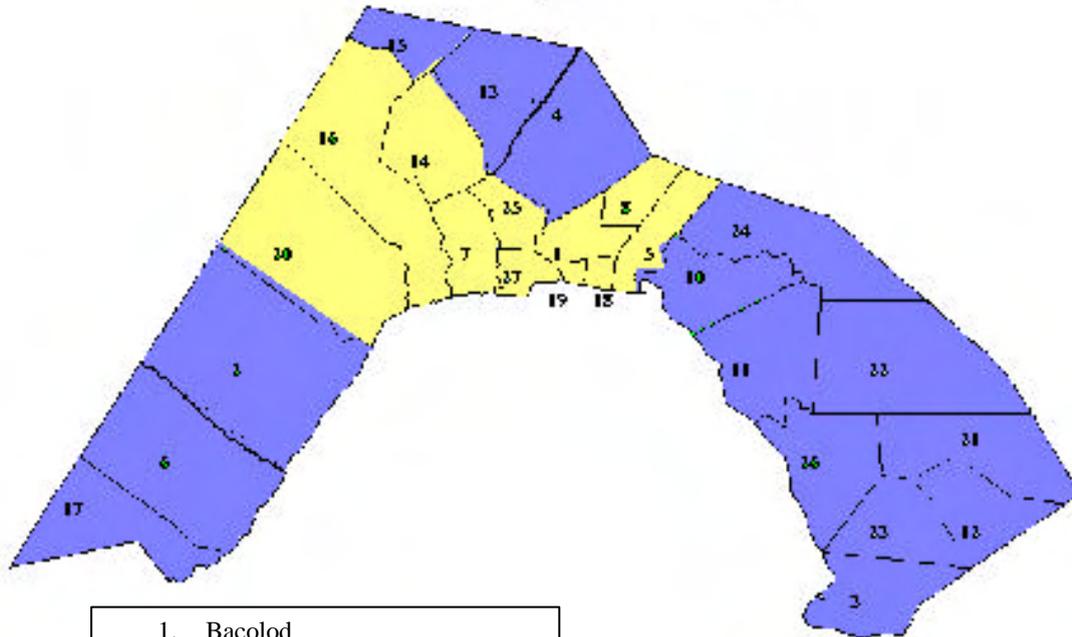
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

MILAGROS, MASBATE Market Package No. 13		1 of 2																
General Information																		
Political Subdivisions <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	Twenty-seven (27) barangays Eleven (11) barangay Sixteen (16) barangays and these are <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">✓ Bangad</td> <td style="width: 50%;">✓ Matanglad</td> </tr> <tr> <td>✓ Bara</td> <td>✓ Mr. Espinosa</td> </tr> <tr> <td>✓ Bonbon</td> <td>✓ Pamangpangon</td> </tr> <tr> <td>✓ Calumpang</td> <td>✓ San Antonio</td> </tr> <tr> <td>✓ Guinlothangan Is.</td> <td>✓ San Carlos</td> </tr> <tr> <td>✓ Jamorawon</td> <td>✓ Sawmill</td> </tr> <tr> <td>✓ Magsalangi</td> <td>✓ Tagbon</td> </tr> <tr> <td>✓ Matagbac</td> <td>✓ Tigbao</td> </tr> </table>		✓ Bangad	✓ Matanglad	✓ Bara	✓ Mr. Espinosa	✓ Bonbon	✓ Pamangpangon	✓ Calumpang	✓ San Antonio	✓ Guinlothangan Is.	✓ San Carlos	✓ Jamorawon	✓ Sawmill	✓ Magsalangi	✓ Tagbon	✓ Matagbac	✓ Tigbao
✓ Bangad	✓ Matanglad																	
✓ Bara	✓ Mr. Espinosa																	
✓ Bonbon	✓ Pamangpangon																	
✓ Calumpang	✓ San Antonio																	
✓ Guinlothangan Is.	✓ San Carlos																	
✓ Jamorawon	✓ Sawmill																	
✓ Magsalangi	✓ Tagbon																	
✓ Matagbac	✓ Tigbao																	
Climate	<ul style="list-style-type: none"> ▪ No very pronounced maximum rain period, with a short dry season ▪ Climatological Data (1998) <ul style="list-style-type: none"> ✓ Total rainfall : 1462.7 mm ✓ No. of rainy days : 147 days ✓ Ave. Temperature : 29.6⁰C 																	
Demographic Profile																		
Household Population (1995)	▪ 3,298 Households																	
Projected HH Population (2000)	▪ 3,823 Households																	
Ave. Annual Pop'n Growth Rate	▪ 3.0 (1990 - 1995)																	
Ave. HH Size	▪ 5.3 persons																	
Population Density (1995)	▪ 7.48 HH/km ²																	
Macro-economic Indicators																		
Ave. Annual HH Income	▪ PhP 46,835.97																	
Ave. Annual HH Expenditures	▪ PhP 33,682.81																	
Ave. Annual HH Disp.Income	▪ PhP 13,153.16																	
Ave. HH Energy Expenditures	▪ PhP 147.38/month																	
Municipality Income Class	▪ Third Class																	
Natural Resources																		
Land Area	▪ 565.40 km ²																	
Land Capability Slope Distribution (Topography)	<ul style="list-style-type: none"> ▪ 0 - 3% : 44.72% (level to nearly level) ▪ 3 - 5% : 17.07% (very gently sloping) ▪ 5 - 8% : 17.07% (Gently sloping) ▪ 8 - 15% : 17.11% (Moderately sloping) ▪ 15 - 25% : 11.07% (Strongly sloping) 																	

**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

MILAGROS, MASBATE Market Package No. 13		2 of 2
Land Use	<ul style="list-style-type: none"> ▪ Pasture lands : 402 km² ▪ Irrigated Lands : 15.3 km² 	
Renewable Energy Resources		
Solar Energy	<ul style="list-style-type: none"> ▪ 6 kWhr/m²/day 	
Wind Energy		
✓ Wind power density	<ul style="list-style-type: none"> ▪ 200-300 W/m² 	
✓ Wind Speed	<ul style="list-style-type: none"> ▪ 5.6 - 6.4 m/s 	
Hydro Power	<ul style="list-style-type: none"> ▪ 50 Watts 	
Economic Activities		
Predominant Economic Activities	<ul style="list-style-type: none"> ▪ Farming 	
Coconut		
<ul style="list-style-type: none"> ▪ Total Number of trees ▪ Ave. nut prod/tree/year ▪ Number of coco farms ▪ Average farm size 	<ul style="list-style-type: none"> ▪ 422,291 ▪ 20 ▪ 1127 ▪ 3.20 hectares 	
Trade	No. of establishments	
<ul style="list-style-type: none"> ▪ Industry Sector ▪ Services Sector 	<ul style="list-style-type: none"> ▪ 35 ▪ 7 	
Other Livelihood Activities	<ul style="list-style-type: none"> ▪ Copra processing ▪ Ginger production ▪ Fish processing (drying) 	
Utilities		
Power		
<ul style="list-style-type: none"> ▪ Electric Cooperative ▪ Municipal Energ'n Status ▪ Power Tariff (Basic Rates as of December 2000) <ul style="list-style-type: none"> ✓ Residential ✓ Commercial ✓ Industry <ul style="list-style-type: none"> - Demand Charge - Energy Charge 	<ul style="list-style-type: none"> ▪ MASELCO ▪ 41% ▪ PhP 22.83 for first 6 kWhr PhP 3.8054/kWhr (in excess of 6 kWhr) ▪ PhP 38.15 for first 10 kWhr PhP 3.8154/kWhr (in excess of 10 kWhr) ▪ No data ▪ PhP 3.8154/kWhr 	
Social Services		
Education (Schools)	at least 15 schools	

MILAGROS, MASBATE



1. Bacolod
2. Bangad
3. Bara
4. Bonbon
5. Calasuche
6. Calumpang
7. Capaculan
8. Cayabon
9. Guinluthangan
10. Jamorawon
11. Magsalangi
12. Matagbac
13. Matanglad
14. Matiporon
15. Moises R. Espinosa
16. Narangasan
17. Pamangpangon
18. Poblacion East
19. Poblacion West
20. Paraiso (Potot)
21. San Antonio
22. San Carlos
23. Sawmill
24. Tagbon
25. Tawad
26. Tigbao
27. Tinaclipan

LEGEND :

- ENERGIZED
- UNENERGIZED

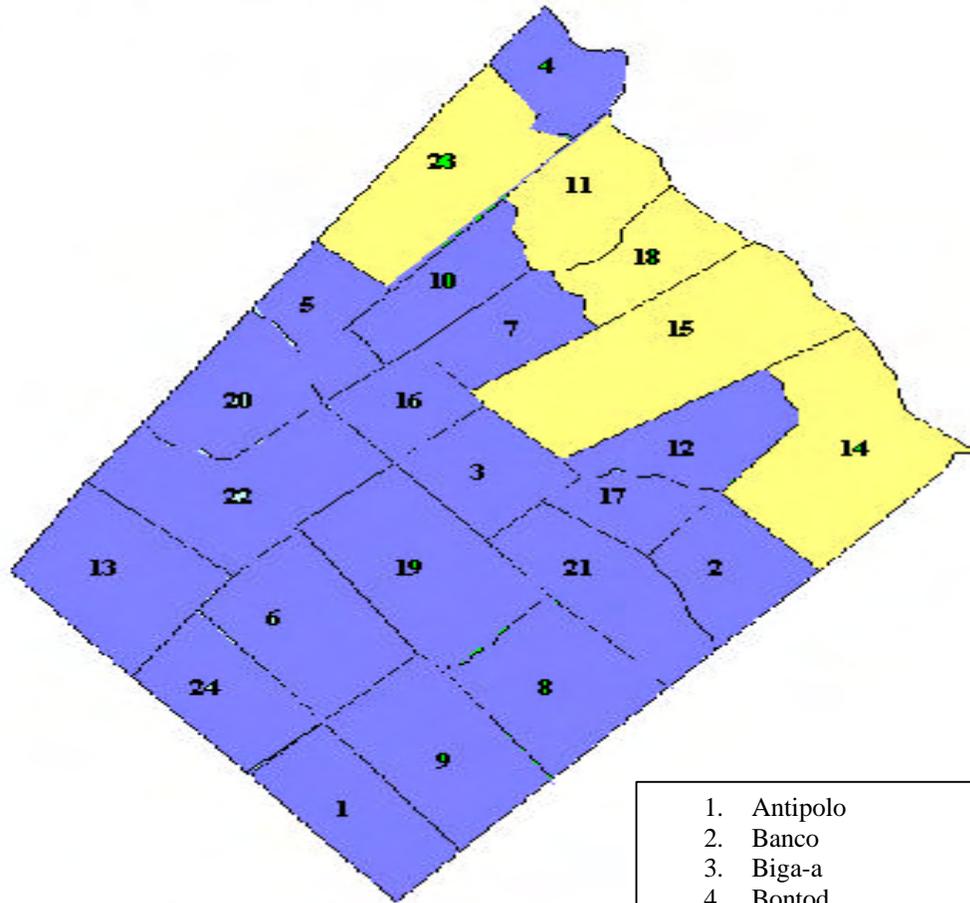
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

PALANAS, MASBATE Market Package No. 14		1 of 2																		
General Information																				
Political Subdivisions <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	Twenty-four (24) barangays Six (6) barangays Eighteen (18) barangays and these are <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">✓ Antipolo</td> <td style="width: 50%;">✓ Malatawan</td> </tr> <tr> <td>✓ Banco</td> <td>✓ Matugnao</td> </tr> <tr> <td>✓ Bigaa</td> <td>✓ Miyabas</td> </tr> <tr> <td>✓ Bontod</td> <td>✓ Parina</td> </tr> <tr> <td>✓ Buenasuerte</td> <td>✓ Pina</td> </tr> <tr> <td>✓ Intosan</td> <td>✓ Salvacion</td> </tr> <tr> <td>✓ Maanahao</td> <td>✓ San Antonio</td> </tr> <tr> <td>✓ Libtong</td> <td>✓ San Carlos</td> </tr> <tr> <td>✓ Mabini</td> <td>✓ San Isidro</td> </tr> </table>		✓ Antipolo	✓ Malatawan	✓ Banco	✓ Matugnao	✓ Bigaa	✓ Miyabas	✓ Bontod	✓ Parina	✓ Buenasuerte	✓ Pina	✓ Intosan	✓ Salvacion	✓ Maanahao	✓ San Antonio	✓ Libtong	✓ San Carlos	✓ Mabini	✓ San Isidro
✓ Antipolo	✓ Malatawan																			
✓ Banco	✓ Matugnao																			
✓ Bigaa	✓ Miyabas																			
✓ Bontod	✓ Parina																			
✓ Buenasuerte	✓ Pina																			
✓ Intosan	✓ Salvacion																			
✓ Maanahao	✓ San Antonio																			
✓ Libtong	✓ San Carlos																			
✓ Mabini	✓ San Isidro																			
Climate	<ul style="list-style-type: none"> ▪ No very pronounced maximum rain period, with a short dry season ▪ Climatological Data (1998) <ul style="list-style-type: none"> ✓ Total rainfall : 1462.7 mm ✓ No. of rainy days : 147 days ✓ Ave. Temperature : 29.6⁰C 																			
Demographic Profile																				
Household Population (1995)	▪ 2,630 Households																			
Projected HH Population (2000)	▪ 2,833 Households																			
Ave. Annual Pop'n Growth Rate	▪ 1.5 (1990 - 1995)																			
Ave. HH Size	▪ 4.8 persons																			
Population Density	▪ 15.37 HH/km ²																			
Macro-economic Indicators																				
Ave. Annual HH Income	▪ PhP 43,913.09																			
Ave. Annual HH Expenditures	▪ PhP 38,167.39																			
Ave. Annual HH Disp.Income	▪ PhP 5,745.70																			
Ave. HH Energy Expenditures	▪ PhP 157.59/month																			
Municipality Income Class	▪ Fifth Class																			
Natural Resources																				
Land Area	▪ 171.10 km ²																			
Land Capability Slope Distribution	<ul style="list-style-type: none"> ▪ 0 - 3% : --- ▪ 3 - 5% : 49.00% (very gently sloping) ▪ 5 - 8% : 29.00% (Gently sloping) ▪ 8 - 15% : 18.00% (Moderately sloping) ▪ 15 - 25% : 4.00% (Strongly sloping) 																			

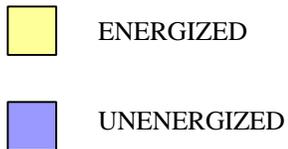
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

PALANAS, MASBATE Market Package No. 14		2 of 2
Renewable Energy Resources		
Solar Energy	<ul style="list-style-type: none"> ▪ 6 kWhr/m²/day 	
Wind Energy	<ul style="list-style-type: none"> ▪ 200-400 W/m² 	
<ul style="list-style-type: none"> ✓ Wind power density ✓ Wind Speed 	<ul style="list-style-type: none"> ▪ 5.6 - 7.0 m/s 	
Hydro Power	<ul style="list-style-type: none"> ▪ 50 - 100 Watts 	
Economic Activities		
Predominant Economic Activities	<ul style="list-style-type: none"> ▪ Farming 	
Coconut	<ul style="list-style-type: none"> ▪ Total Number of trees ▪ Ave. nut prod/tree/year ▪ Number of coco farms ▪ Average farm size 	
	<ul style="list-style-type: none"> ▪ 1,201,750 ▪ 20 ▪ 5,205 ▪ 2.00 hectares 	
Trade	No. of establishments	
<ul style="list-style-type: none"> ▪ Industry Sector ▪ Services Sector 	<ul style="list-style-type: none"> ▪ 15 ▪ 4 	
Other Livelihood Activities	<ul style="list-style-type: none"> ▪ Mat weaving ▪ Bamboo furniture making ▪ Livestock 	
Utilities		
Power	<ul style="list-style-type: none"> ▪ MASELCO ▪ 25 % 	
<ul style="list-style-type: none"> ▪ Electric Cooperative ▪ Municipal Energ'n Status ▪ Power Tariff (Basic Rates as of December 2000) <ul style="list-style-type: none"> ✓ Residential ✓ Commercial ✓ Industry <ul style="list-style-type: none"> - Demand Charge - Energy Charge 	<ul style="list-style-type: none"> ▪ PhP 22.83 for first 6 kWhr ▪ PhP 3.8054/kWhr (in excess of 6 kWhr) ▪ PhP 38.15 for first 10 kWhr ▪ PhP 3.8154/kWhr (in excess of 10 kWhr) ▪ No data ▪ PhP 3.8154/kWhr 	
Social Services		
Education (Schools)	<ul style="list-style-type: none"> ▪ at least 31 schools 	

PALANAS, MASBATE

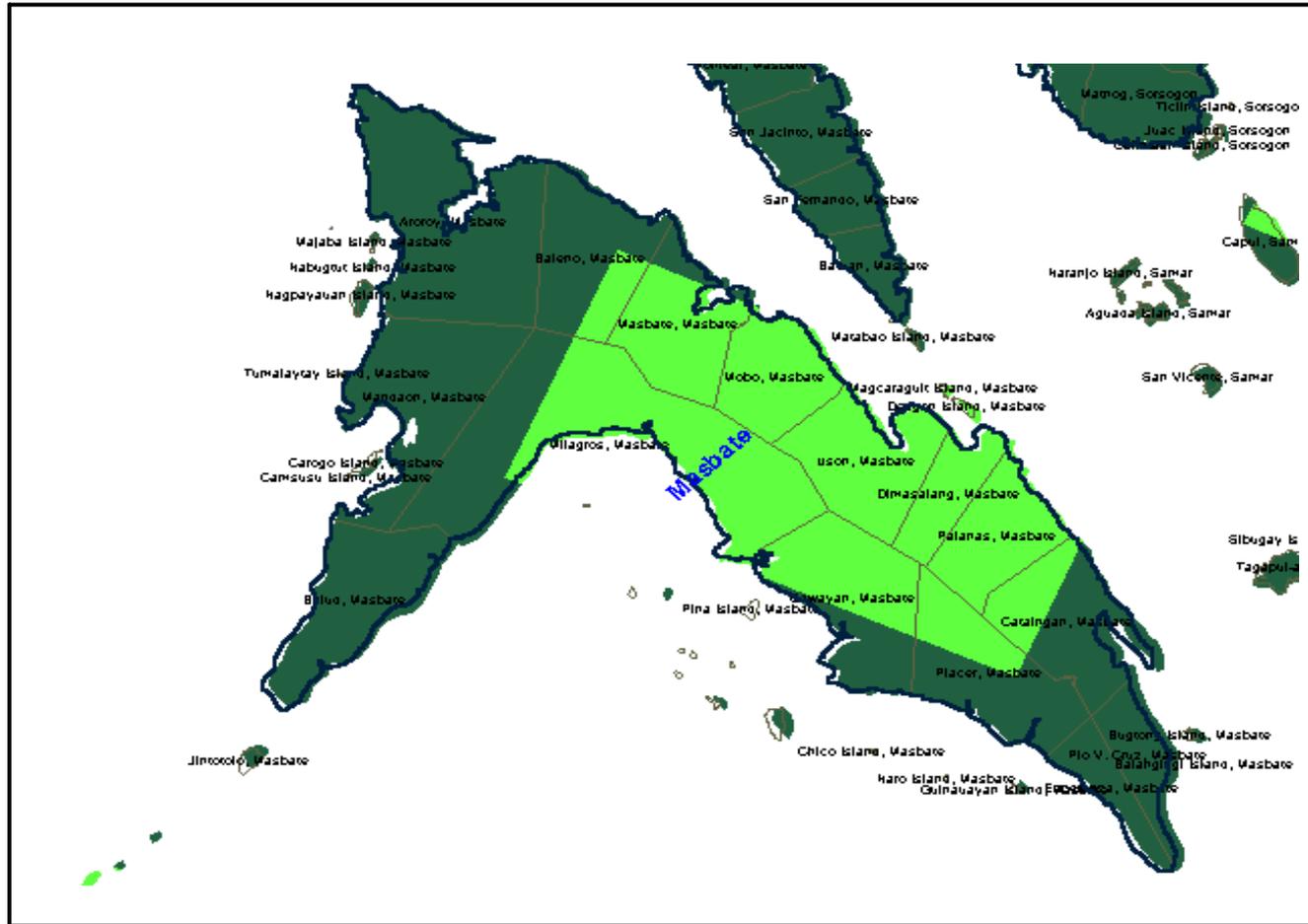


LEGEND



1. Antipolo
2. Banco
3. Biga-a
4. Bontod
5. Buenasuerte
6. Intusan
7. Jose A. Abenir Sr. (Libtong)
8. Maanahao
9. Mabini
10. Malibas
11. Marvilla
12. Matugnao
13. Miabas
14. Nabangig
15. Nipa
16. Parina
17. Pina
18. Poblacion
19. Salvacion
20. San Antonio
21. San Carlos
22. San Isidro
23. Santa Cruz
24. Malatawan

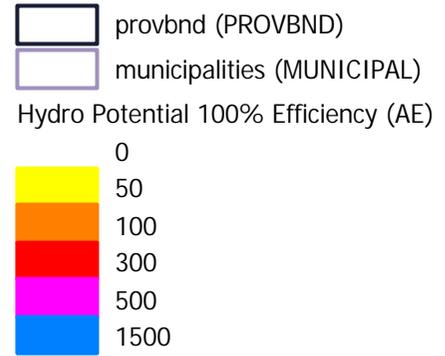
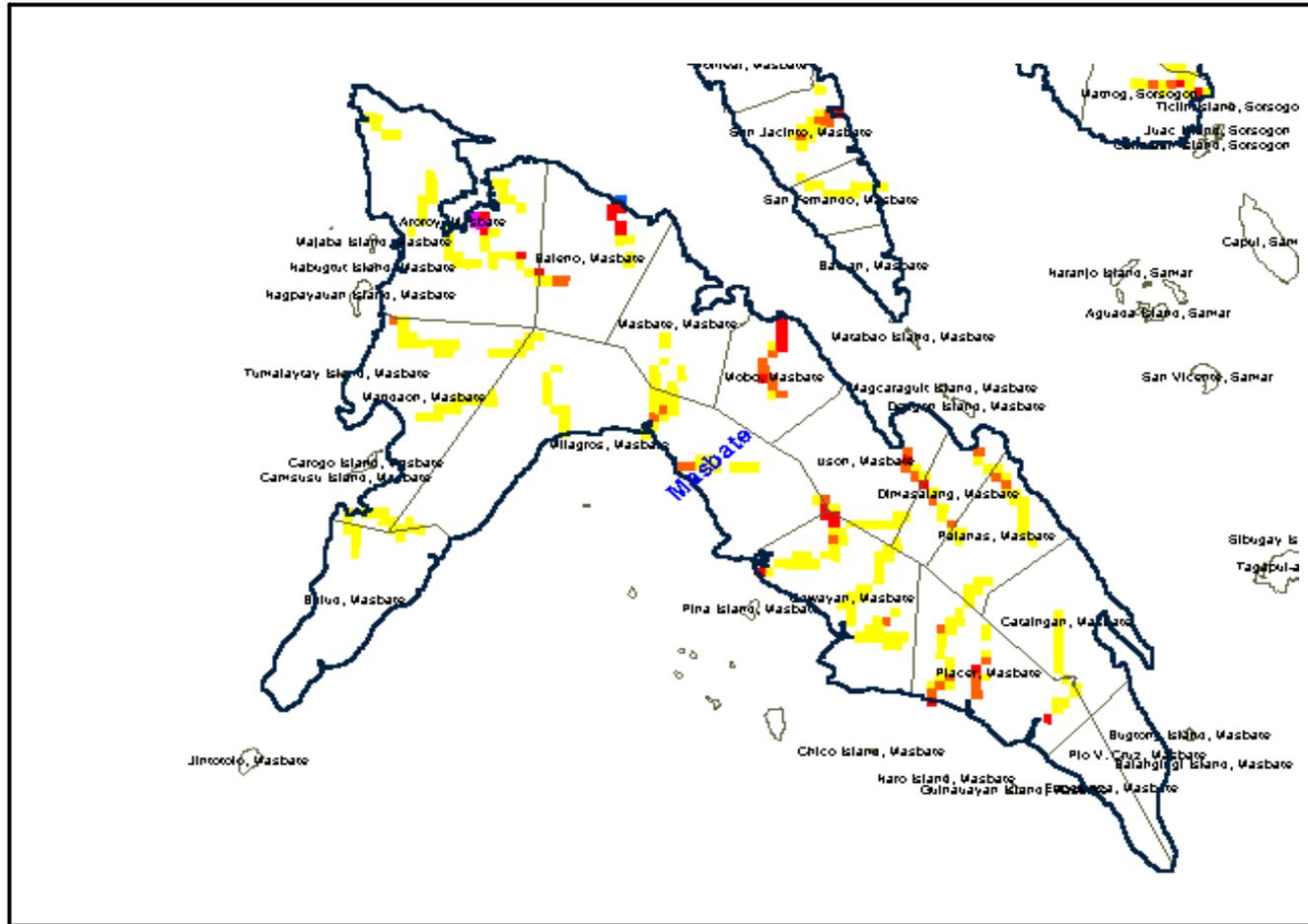
Solar Energy Potential (Masbate)



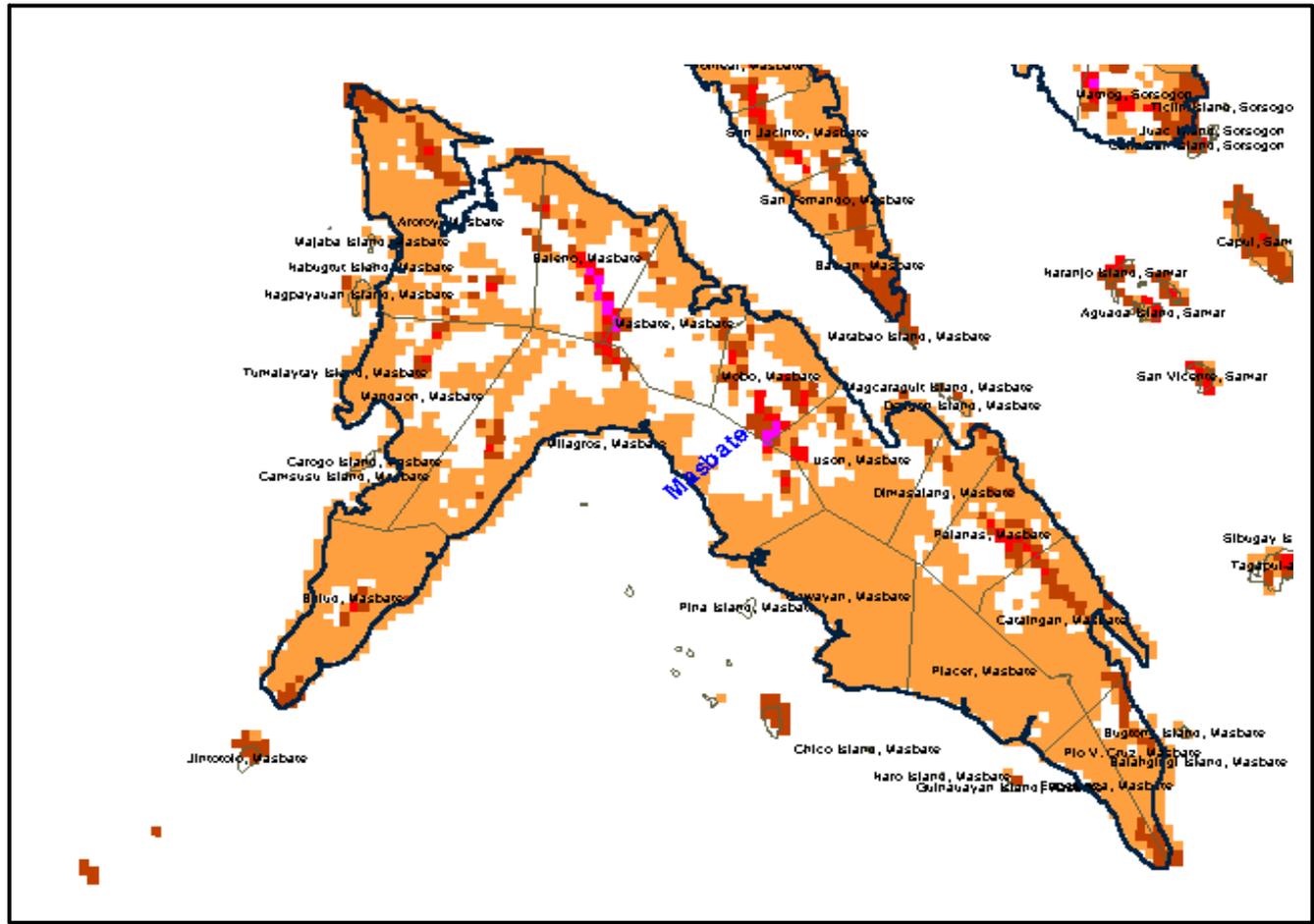
provbnd (PROVBND)
municipalities (MUNICIPAL)
Annual (kWhr/m2/day) Global Horizontal (AEANN)
5
6



Hydro Potential (Masbate)



Wind energy Potential (Masbate)



provbnd (PROVBND)
municipalities (MUNICIPAL)

Wind Power (W/m2) (AEPOW)

0
100
200
300
400
600
1200

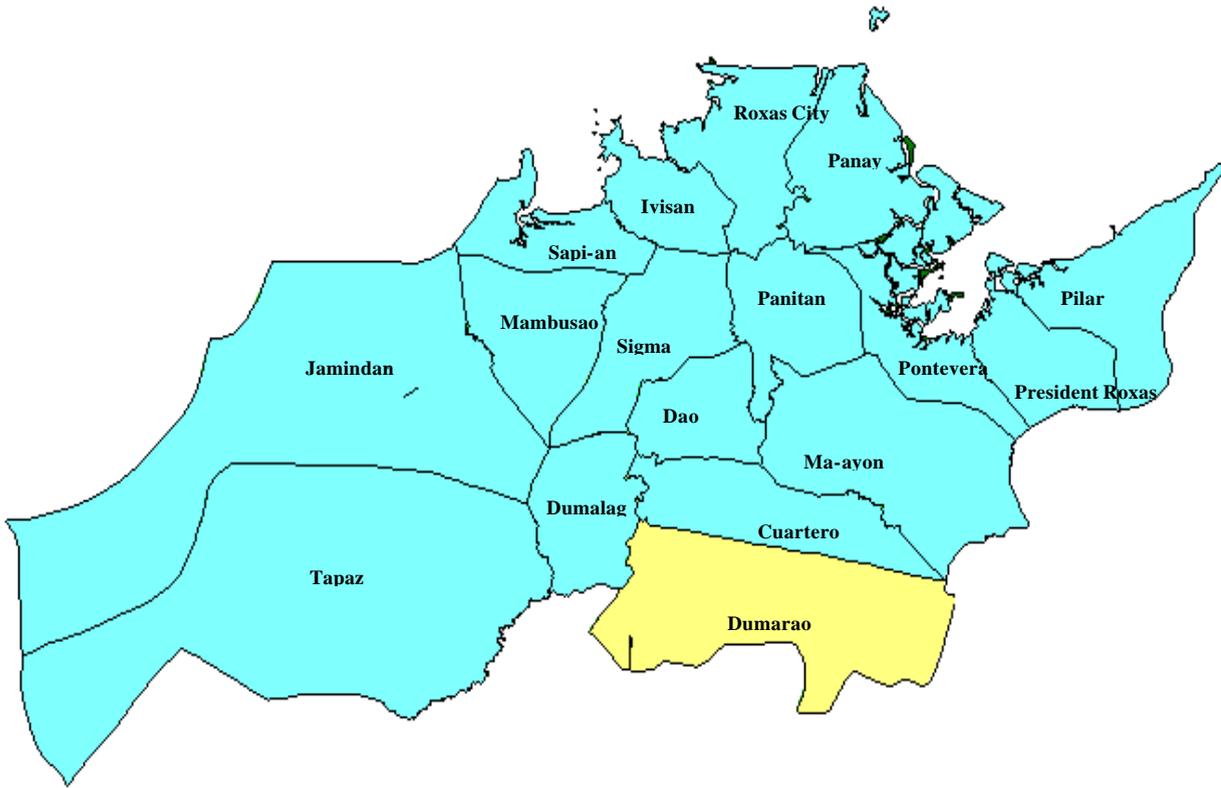


MARKET PACKAGES

Capiz

M.P. # 15 : Dumarao

Capiz



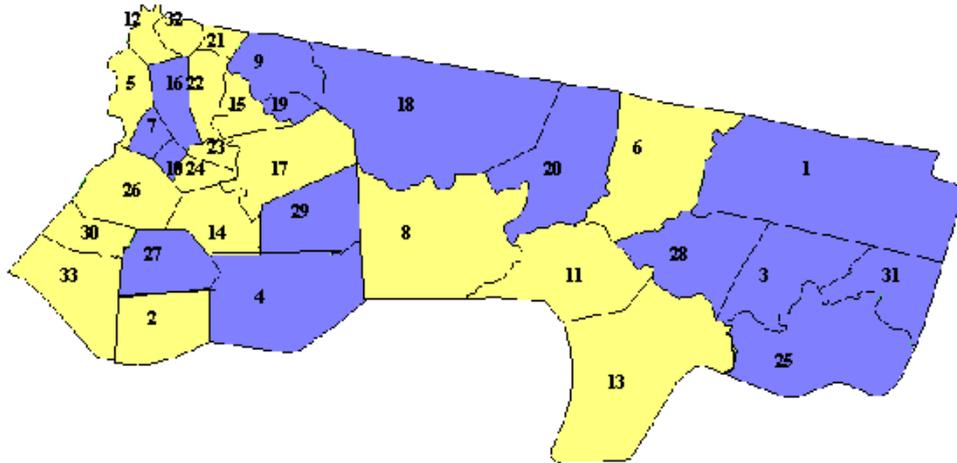
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

DUMARAO, CAPIZ Market Package No. 15		1 of 2		
General Information				
Political Subdivisions <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	Thrity-three (33) barangays Eighteen (18) barangays Fifteen (15) barangays and these are <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Agbatuan ✓ Aglanot ✓ Agsirab ✓ Bayog ✓ Calapawan ✓ Cubi ✓ Jambad ✓ Lawaan </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Maloloy ✓ Nagsulang ✓ Sagrada Familia ✓ San Juan ✓ Sibariwan ✓ Tina ✓ Tumalalud </td> </tr> </table>		<ul style="list-style-type: none"> ✓ Agbatuan ✓ Aglanot ✓ Agsirab ✓ Bayog ✓ Calapawan ✓ Cubi ✓ Jambad ✓ Lawaan 	<ul style="list-style-type: none"> ✓ Maloloy ✓ Nagsulang ✓ Sagrada Familia ✓ San Juan ✓ Sibariwan ✓ Tina ✓ Tumalalud
<ul style="list-style-type: none"> ✓ Agbatuan ✓ Aglanot ✓ Agsirab ✓ Bayog ✓ Calapawan ✓ Cubi ✓ Jambad ✓ Lawaan 	<ul style="list-style-type: none"> ✓ Maloloy ✓ Nagsulang ✓ Sagrada Familia ✓ San Juan ✓ Sibariwan ✓ Tina ✓ Tumalalud 			
Demographic Profile				
Household Population (1995)	▪ 2,547 Households			
Projected HH Population (2000)	▪ 2,633 Households			
Ave. Annual Pop'n Growth Rate	▪ 0.67%			
Population Density (1995)	▪ 10.88 HH/km ²			
Ave. HH Size	▪ 5.00 persons			
Macro-economic Indicators				
Ave. Annual HH Income	▪ PhP 42,811.50			
Ave. Annual HH Expenditures	▪ PhP 25,424.10			
Ave. Annual HH Disp. Income	▪ PhP17,387.40			
Ave. HH Energy Expenditures	▪ PhP 115.46/month			
Municipality Income Class	▪ Fourth (4 th) Class			
Natural Resources				
Land Area (DILG)	▪ 234.2 km ²			
Land Capability Slope Distribution (Topography)	▪ Upland			
Renewable Energy Resources				
Solar Energy	▪ 6 kWhr/m ² /day			
Wind Energy <ul style="list-style-type: none"> ✓ Wind power density 	▪ 200 - 300 W/m ²			
Hydro Power Potential	50 - 100 Watts			

**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

DUMARAO, CAPIZ Market Package No. 15		2 of 2
Economic Activities		
Predominant Economic Activities	<ul style="list-style-type: none"> ▪ Farming 	
Utilities		
Power <ul style="list-style-type: none"> ▪ Electric Cooperative ▪ Municipal Energ'n Status ▪ Power Tariff (Basic Rates as of December 2000) <ul style="list-style-type: none"> ✓ Residential ✓ Commercial ✓ Industry <ul style="list-style-type: none"> - Demand Charge - Energy Charge ▪ Estimated Cost of Grid Extension 	<ul style="list-style-type: none"> ▪ CAPELCO ▪ 55 % ▪ PhP 45.96 for first 13 kWhr PhP 3.5354/kWhr (in excess of 13 kWhr) ▪ PhP 107.56 for first 30 kWhr PhP 3.5854/kWhr (in excess of 30 kWhr) ▪ PhP 14.00/kW ▪ PhP 3.4854/kWhr ▪ PhP 16,461,929.00 (excluding Sagrada Familia) 	
Social Services		
Education (Schools)	<ul style="list-style-type: none"> ▪ At least 15 schools 	

DUMARAO, CAPIZ



1. Agbatuan
2. Aglalana
3. Aglanot
4. Agsirat
5. Alipasiawan
6. Astorga
7. Bayog
8. Bungsuan
9. Calapawan
10. Cubi
11. Dacuton
12. Dangula
13. Gibato
14. Codingle
15. Guinotos
16. Jambad
17. Janguslob
18. Lawaan
19. Malonoy
20. Nagsulang
21. Ongol Ilawod
22. Ongol Ilaya
23. Poblacion Ilawod
24. Poblacion Ilaya
25. Sagrada Familia
26. Salcedo
27. San Juan
28. Sibariwan
29. Tamulalud
30. Taslan
31. Tina
32. Tinaytayan
33. Traciano

LEGEND :

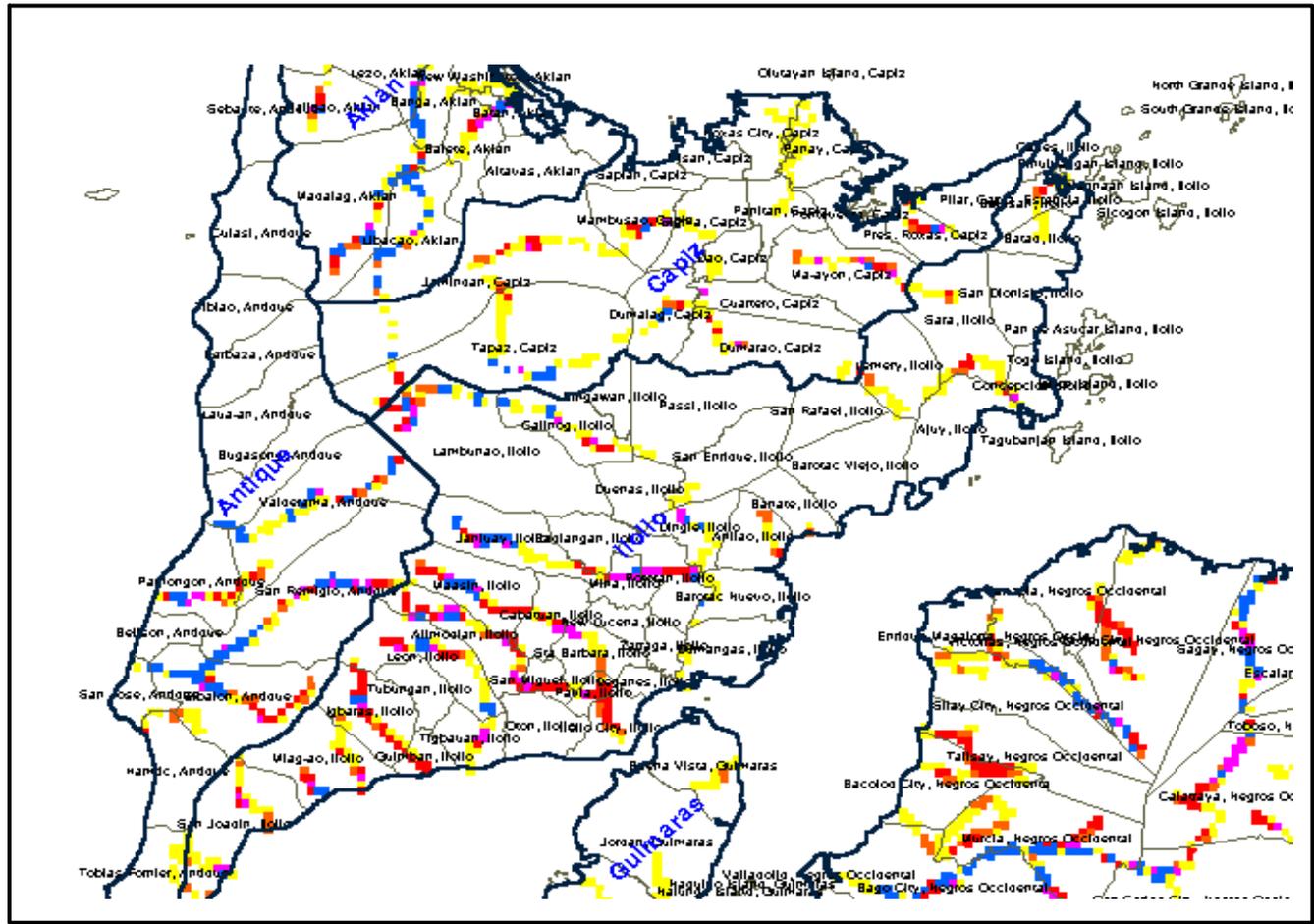


ENERGIZED



UNENERGIZED

Hydro Potential (Capiz, Iloilo)



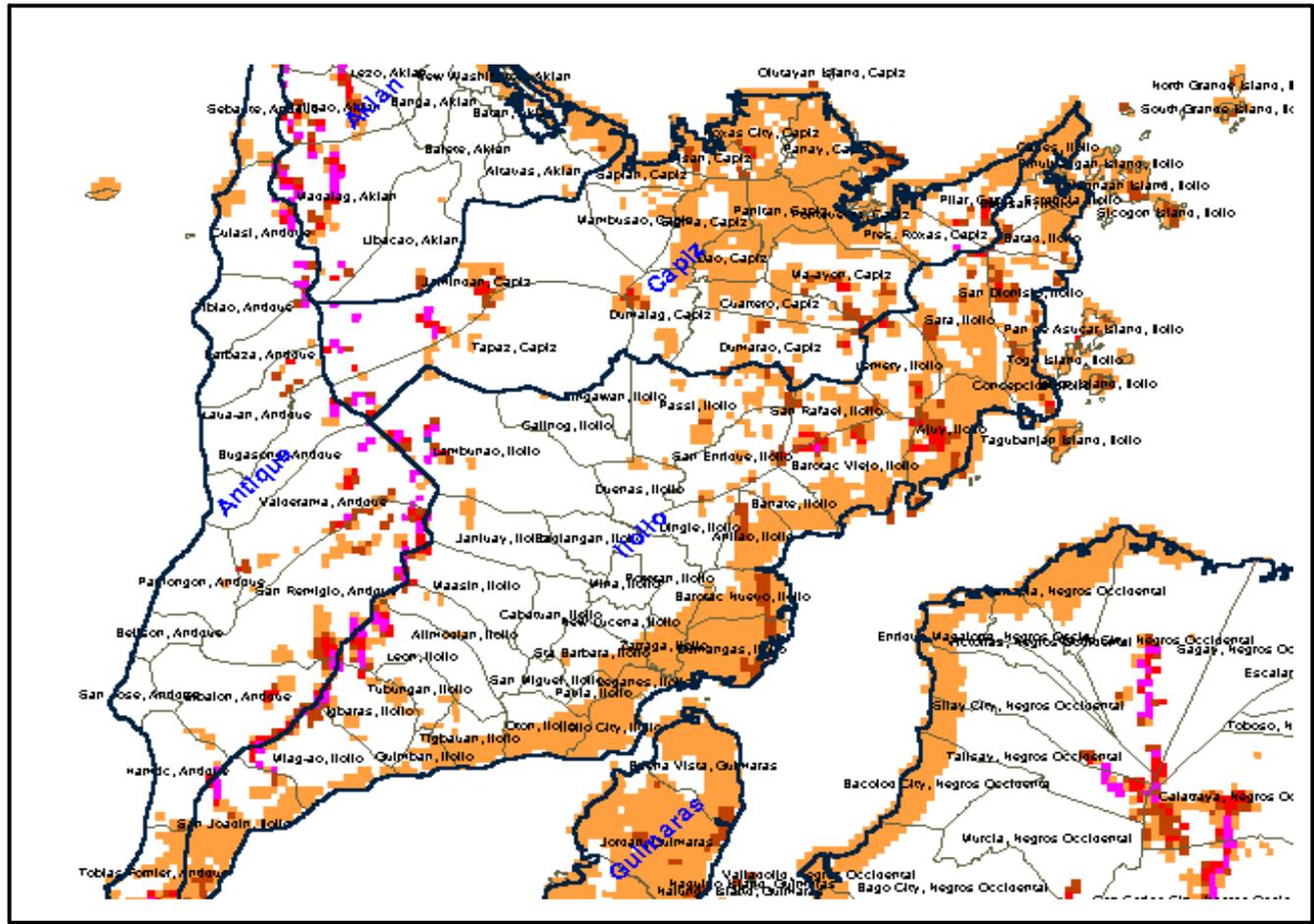
provbnd (PROVBND)
municipalities (MUNICIPAL)

Hydro Potential 100% Efficiency (AE)

0
50
100
300
500
1500



Wind Potential (Capiz, Iloilo)



provbnd (PROVBND)
municipalities (MUNICIPAL)

Wind Power (W/m²) (AEPOW)

0
100
200
300
400
600
1200



MARKET PACKAGES

Iloilo

M.P. # 16 : Dueñas

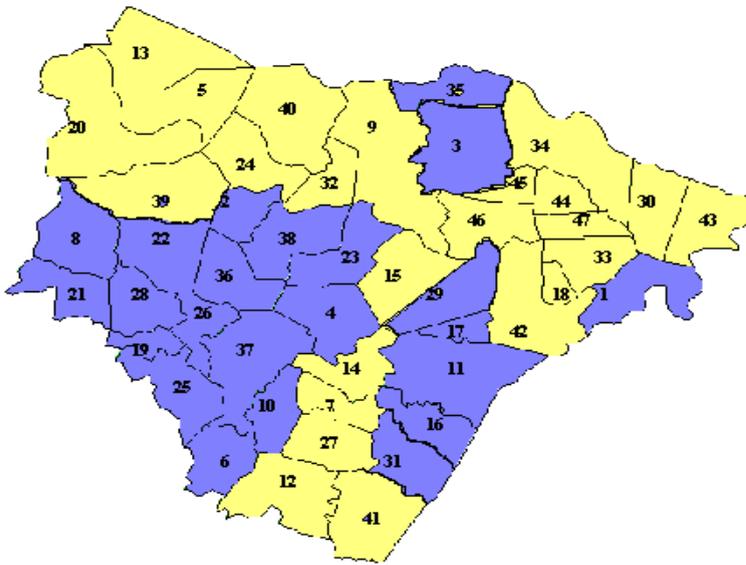
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

DUEÑAS, ILOILO Market Package No. 16		1 of 2		
General Information				
Political Subdivisions <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	Forty-seven (47) barangays Twenty-four (24) barangays Twenty-three (23) barangays and these are <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Agutayan ✓ Angare ✓ Anjawan ✓ Baac ✓ Balangigan ✓ Banugan ✓ Bita ✓ Buenavista ✓ Calawinan ✓ Capay-capay ✓ Catig ✓ Fundacion </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Inadlawan ✓ Jagdon ✓ Lacadon ✓ Luag ✓ Maribuyong ✓ Minanga ✓ Navalas ✓ Punung P. ✓ Purog ✓ Romblon ✓ San Isidro </td> </tr> </table>		<ul style="list-style-type: none"> ✓ Agutayan ✓ Angare ✓ Anjawan ✓ Baac ✓ Balangigan ✓ Banugan ✓ Bita ✓ Buenavista ✓ Calawinan ✓ Capay-capay ✓ Catig ✓ Fundacion 	<ul style="list-style-type: none"> ✓ Inadlawan ✓ Jagdon ✓ Lacadon ✓ Luag ✓ Maribuyong ✓ Minanga ✓ Navalas ✓ Punung P. ✓ Purog ✓ Romblon ✓ San Isidro
<ul style="list-style-type: none"> ✓ Agutayan ✓ Angare ✓ Anjawan ✓ Baac ✓ Balangigan ✓ Banugan ✓ Bita ✓ Buenavista ✓ Calawinan ✓ Capay-capay ✓ Catig ✓ Fundacion 	<ul style="list-style-type: none"> ✓ Inadlawan ✓ Jagdon ✓ Lacadon ✓ Luag ✓ Maribuyong ✓ Minanga ✓ Navalas ✓ Punung P. ✓ Purog ✓ Romblon ✓ San Isidro 			
Demographic Profile				
Household Population (1995)	▪ 2,110 Households			
Projected HH Population (2000)	▪ 2,151 Households			
Ave. Annual Pop'n Growth Rate	▪ 0.34 %			
Population Density (1995)	▪ 23.31HH/km ²			
Ave. HH Size	▪ 5.29 persons			
Macro-economic Indicators				
Ave. Annual HH Income	▪ PhP 39,839.05			
Ave. Annual HH Expenditures	▪ PhP 29,349.95			
Ave. Annual HH Disp. Income	▪ PhP 10,489.10			
Ave. HH Energy Expenditures	▪ PhP 80.88/month			
Municipality Income Class	▪ Fourth(4 th) Class			
Natural Resources				
Land Area (DILG)	▪ 90.5 km ²			
Land Capability Slope Distribution (Topography)	▪ Inland			
Renewable Energy Resources				
Solar Energy	▪ 6 kWhr/m ² /day			
Wind Energy ✓ Wind power density	▪ 200 W/m ²			
Hydro Power	no data			

**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

DUEÑAS, ILOILO Market Package No. 16		2 of 2
Economic Activities		
<ul style="list-style-type: none"> ▪ Predominant Economic Activities 	<ul style="list-style-type: none"> ▪ Farming 	
<ul style="list-style-type: none"> ▪ Other Livelihood Activities 	<ul style="list-style-type: none"> ▪ Bamboo furniture making 	
Utilities		
Power <ul style="list-style-type: none"> ▪ Electric Cooperative ▪ Municipal Energ'n Status ▪ Power Tariff (Basic Rates as of December 2000) <ul style="list-style-type: none"> ✓ Residential ✓ Commercial ✓ Industry <ul style="list-style-type: none"> - Demand Charge - Energy Charge <ul style="list-style-type: none"> ▪ Estimated Cost of Grid Extension 	<ul style="list-style-type: none"> ▪ ILECO II ▪ 51 % ▪ PhP 58.87 for first 15 kWhr PhP 3.9249/kWhr (in excess of 15 kWhr) ▪ PhP 59.62 for first 15 kWhr PhP 3.9749/kWhr (in excess of 15 kWhr) ▪ PhP 10.00/kW ▪ PhP 3.9409/kWhr ▪ PhP 20,671,549.00 	
Social Services		
Education (Schools)	<ul style="list-style-type: none"> ▪ At least 23 schools 	

DUENAS, ILOILO



LEGEND :



ENERGIZED

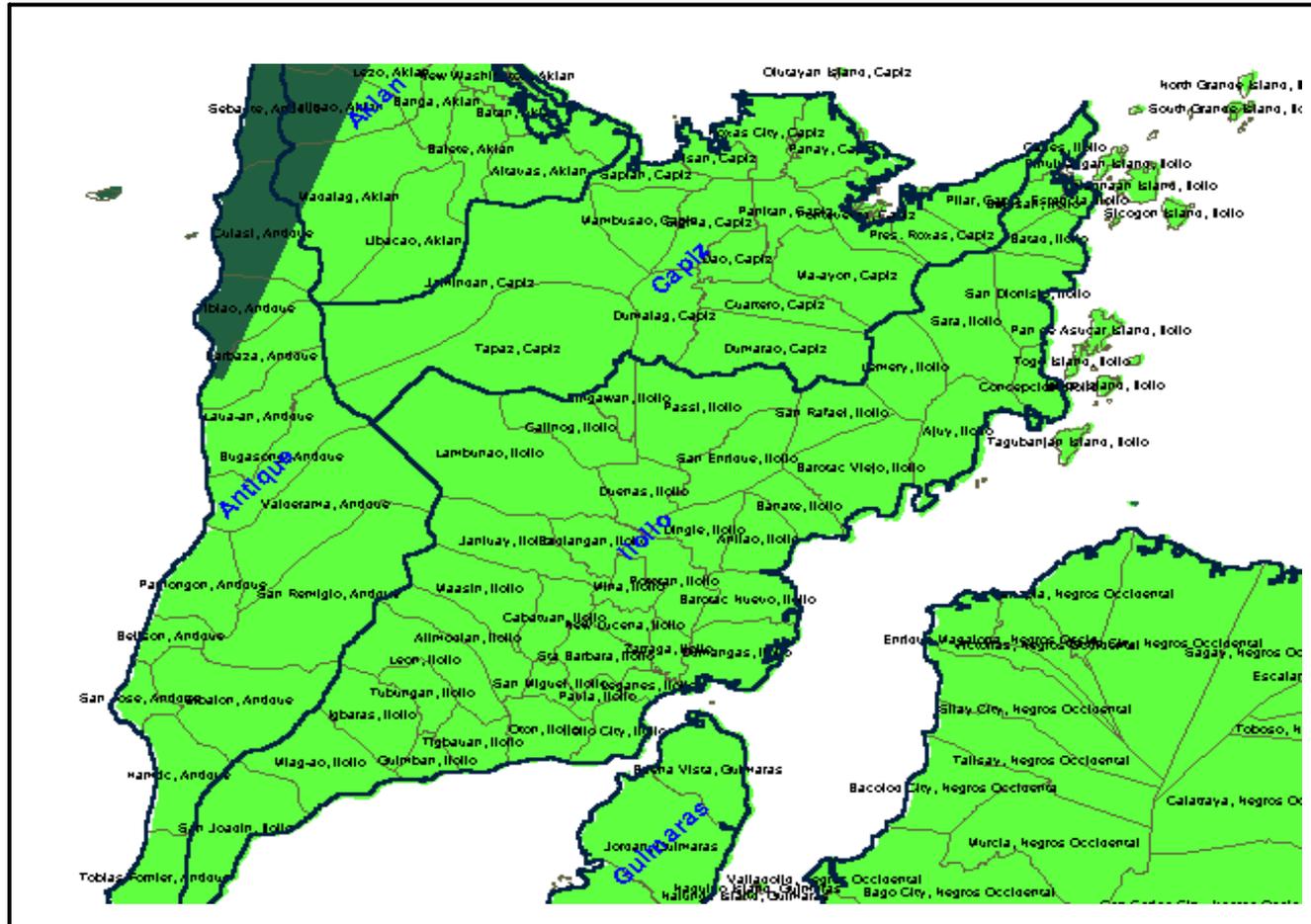


UNENERGIZED

- 1. Agutayan
- 2. Angare
- 3. Anjawan
- 4. Baac
- 5. Bagonbong
- 6. Balangigan
- 7. Balingasag
- 8. Banugan
- 9. Batuan
- 10. Bita
- 11. Buenavista
- 12. Bugtungan
- 13. Cabudian
- 14. Calaca-an
- 15. Calang
- 16. Calawinan
- 17. Capaycapay
- 18. Capuling
- 19. Catig
- 20. Dilaan
- 21. Fundacion
- 22. Inadlawan
- 23. Jagdong
- 24. Jaguimit
- 25. Lacadon
- 26. Lu-ag
- 27. Malusgod
- 28. Maribuyong
- 29. Minanga
- 30. Monpon

- 31. Navalas
- 32. Pader
- 33. Pandan
- 34. Punong Grande
- 35. Punong Pequeno
- 36. Purog
- 37. Romblon
- 38. San Isidro
- 39. Santo Nino
- 40. Sawe
- 41. Taminla
- 42. Tinocuan
- 43. Tipolo
- 44. Poblacion A
- 45. Poblacion B
- 46. Poblacion C
- 47. Poblacion D

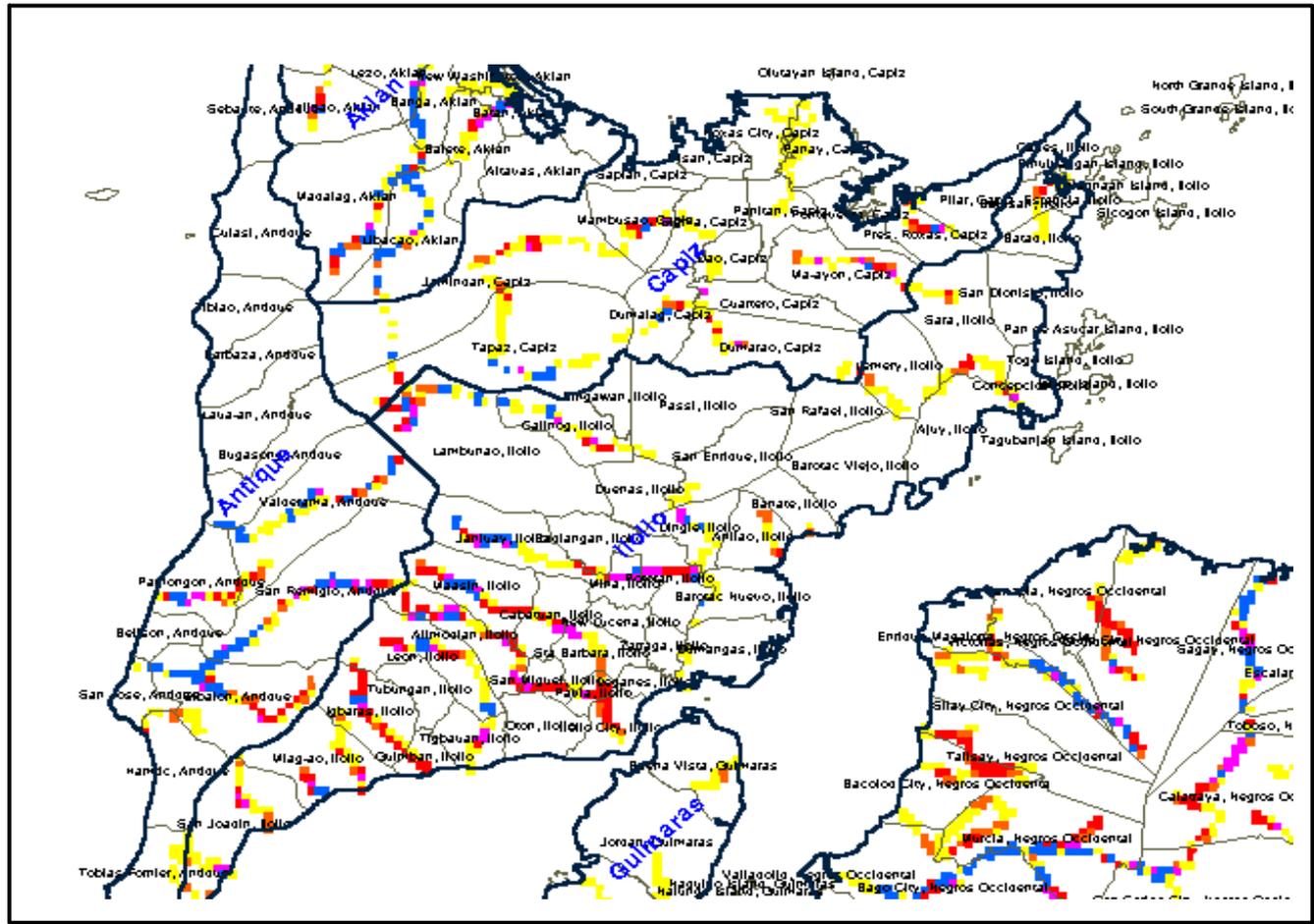
Solar Energy Potential (Capiz, Iloilo)



provbnd (PROVBND)
municipalities (MUNICIPAL)
Annual (kWhr/m2/day) Global Horizontal (AEANN)
5
6



Hydro Potential (Capiz, Iloilo)



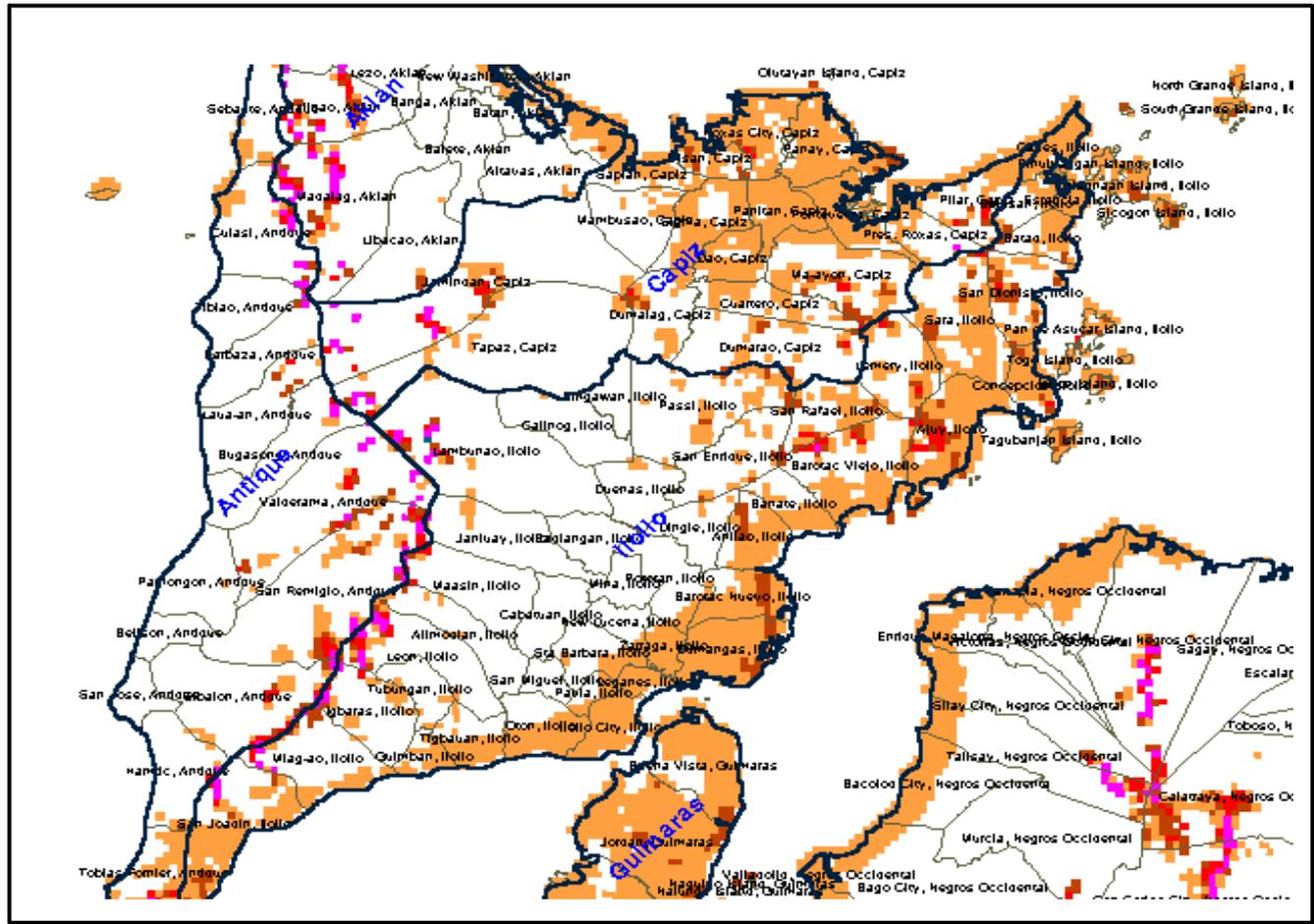
provbnd (PROVBND)
municipalities (MUNICIPAL)

Hydro Potential 100% Efficiency (AE)

0
50
100
300
500
1500



Wind Potential (Capiz, Iloilo)



provbnd (PROVBND)
municipalities (MUNICIPAL)

Wind Power (W/m2) (AEPOW)

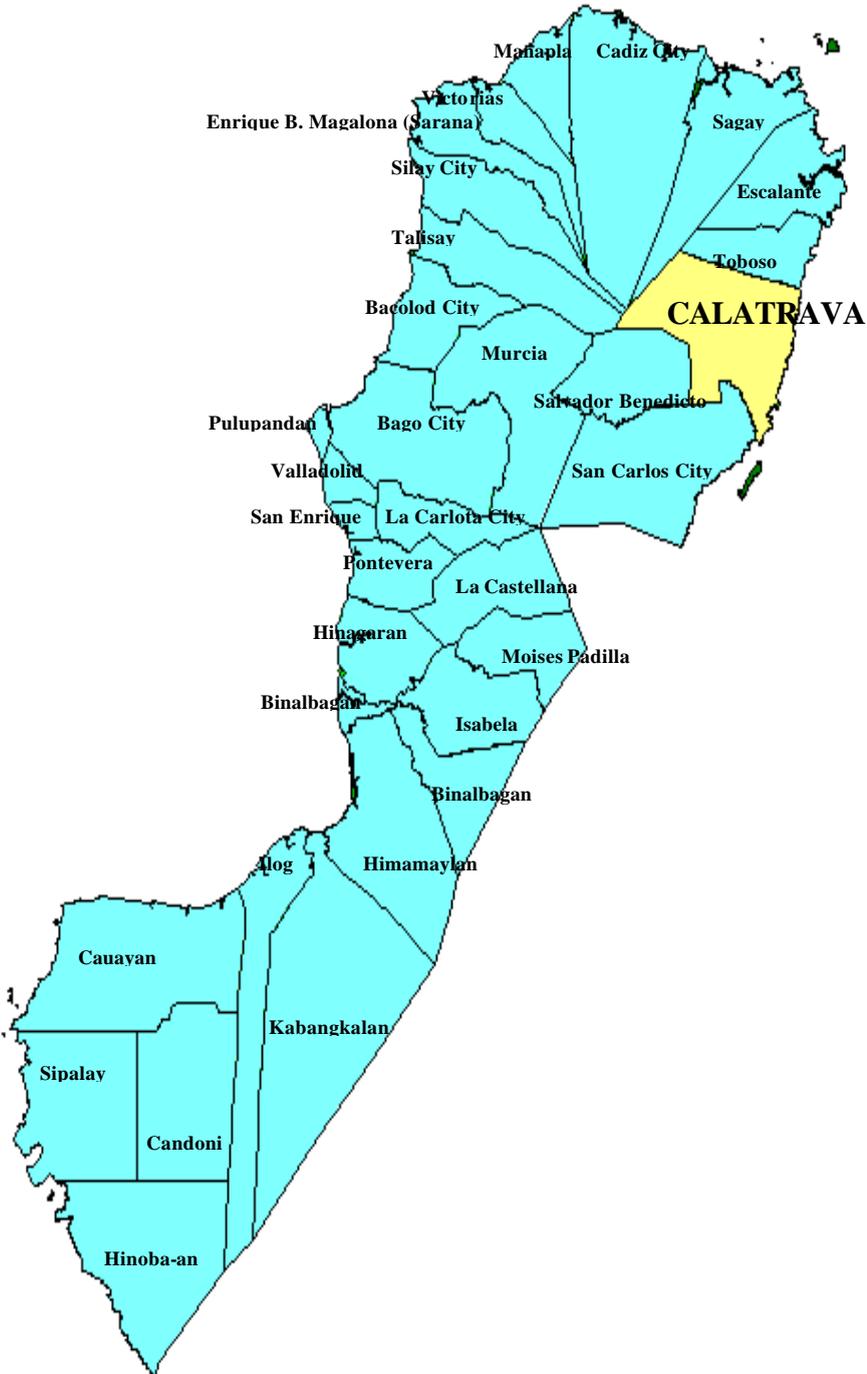
0
100
200
300
400
600
1200



MARKET PACKAGES
Negros Occidental

M.P. # 17 : Calatrava

Negros Occidental



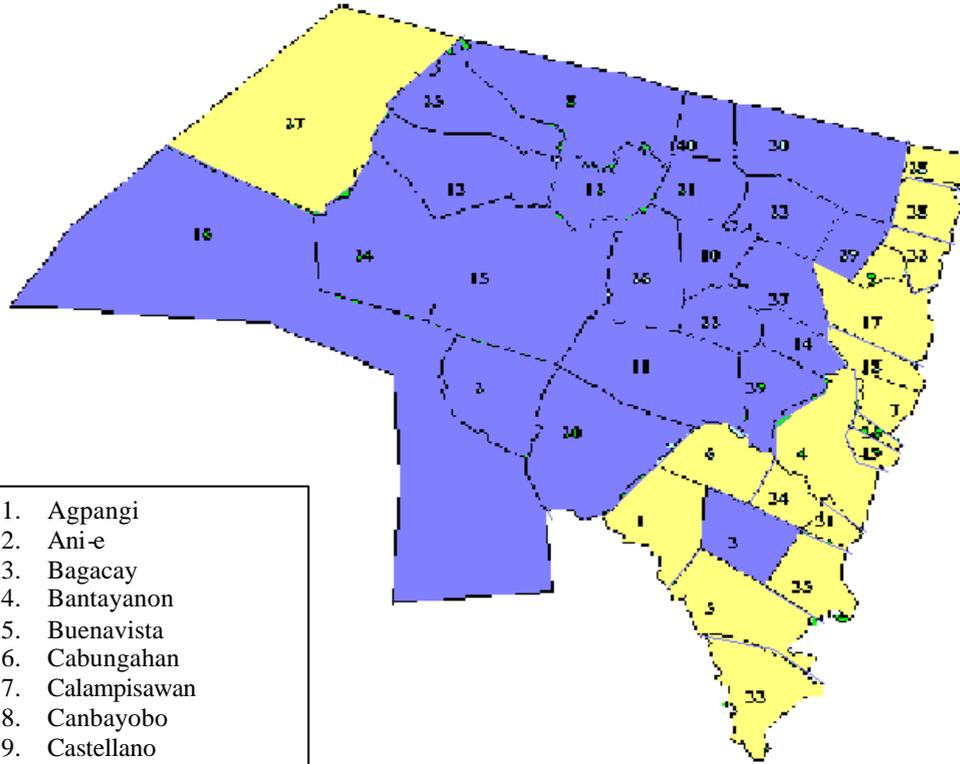
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

CALATRAVA, NEGROS OCCIDENTAL		1 of 2																		
Market Package No. 17																				
General Information																				
Political Subdivisions <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	Forty (40) barangays Twenty-two (22) barangays Eighteen (18) barangays and these are <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">✓ Ani-e</td> <td style="width: 50%;">✓ Lalong</td> </tr> <tr> <td>✓ Bagacay</td> <td>✓ Maaslob</td> </tr> <tr> <td>✓ Cambayobo</td> <td>✓ Malanog</td> </tr> <tr> <td>✓ Cruz</td> <td>✓ Mechaca</td> </tr> <tr> <td>✓ Dolis</td> <td>✓ Mina-utok</td> </tr> <tr> <td>✓ Hilub-ang</td> <td>✓ Pantao</td> </tr> <tr> <td>✓ Hinab-ungan</td> <td>✓ Telim</td> </tr> <tr> <td>✓ Ilaya</td> <td>✓ Tigbon</td> </tr> <tr> <td>✓ Lagaan</td> <td>✓ Winaswasan</td> </tr> </table>		✓ Ani-e	✓ Lalong	✓ Bagacay	✓ Maaslob	✓ Cambayobo	✓ Malanog	✓ Cruz	✓ Mechaca	✓ Dolis	✓ Mina-utok	✓ Hilub-ang	✓ Pantao	✓ Hinab-ungan	✓ Telim	✓ Ilaya	✓ Tigbon	✓ Lagaan	✓ Winaswasan
✓ Ani-e	✓ Lalong																			
✓ Bagacay	✓ Maaslob																			
✓ Cambayobo	✓ Malanog																			
✓ Cruz	✓ Mechaca																			
✓ Dolis	✓ Mina-utok																			
✓ Hilub-ang	✓ Pantao																			
✓ Hinab-ungan	✓ Telim																			
✓ Ilaya	✓ Tigbon																			
✓ Lagaan	✓ Winaswasan																			
Demographic Profile																				
Household Population (1995)	▪ 5,810 Households																			
Projected HH Population (2000)	▪ 6,804 Households																			
Ave. Annual Pop'n Growth Rate	▪ 3.21 %																			
Population Density (1995)	▪ 11.52 HH/km ²																			
Ave. HH Size	▪ 4.93 persons																			
Macro-economic Indicators																				
Ave. Annual HH Income	▪ PhP 28,892.82																			
Ave. Annual HH Expenditures	▪ PhP 18,672.50																			
Ave. Annual HH Disp. Income	▪ PhP 10,220.32																			
Ave. HH Energy Expenditures	▪ PhP 107.51/month																			
Municipality Income Class	▪ Second (2 nd) Class																			
Natural Resources																				
Land Area (DILG)	▪ 504.5 km ²																			
Land Capability Slope Distribution (Topography)	▪ Mixed terrain - lowlands and uplands																			
Renewable Energy Resources																				
Solar Energy	▪ 6 kWhr/m ² /day																			
Wind Energy ✓ Wind power density	▪ 100 - 600 W/m ²																			
Hydro Power	▪ 50 - 500 Watts																			

**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

CALATRAVA, NEGROS OCCIDENTAL		2 of 2
Market Package No. 17		
Economic Activities		
Predominant Economic Activities	<ul style="list-style-type: none"> ▪ Farming and fishing 	
Utilities		
Power <ul style="list-style-type: none"> ▪ Electric Cooperative ▪ Municipal Energ'n Status ▪ Power Tariff (Basic Rates as of December 2000) <ul style="list-style-type: none"> ✓ Residential ✓ Commercial ✓ Industry <ul style="list-style-type: none"> - Demand Charge - Energy Charge ▪ Estimated Cost of Grid Extension 	<ul style="list-style-type: none"> ▪ VRESCO ▪ 55 % ▪ PhP 37.36 for first 10 kWhr PhP 3.7356/kWhr (in excess of 10 kWhr) ▪ PhP 37.66 for first 10 kWhr PhP 3.7656/kWhr (in excess of 10 kWhr) ▪ PhP 15.00/kW ▪ PhP 3.7156/kWhr ▪ PhP 22,166,701.00 	
Social Services		
Education (Schools)	<ul style="list-style-type: none"> ▪ At least 18 schools 	

CALATRAVA, NEGROS OCCIDENTAL



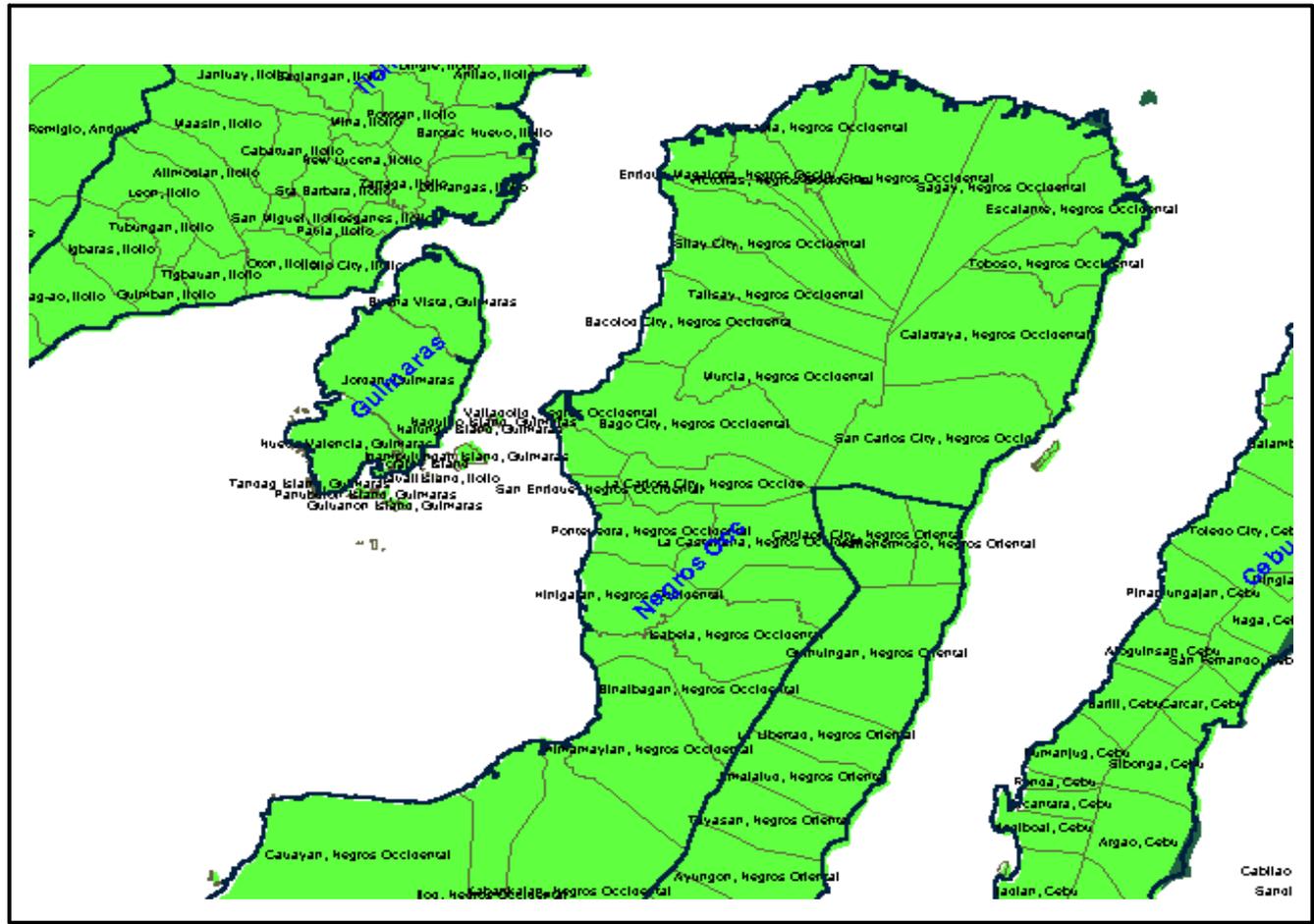
1. Agpangi
2. Ani-e
3. Bagacay
4. Bantayanon
5. Buenavista
6. Cabungahan
7. Calampisawan
8. Canbayobo
9. Castellano
10. Cruz
11. Dolis
12. Hilub-ang
13. Hinab-ongan
14. Ilaya
15. Laga-an
16. Lalong
17. Lemery
18. Lipat-on
19. Lo-ok
20. Ma-aslob
21. Macasilao
22. Malanog
23. Malatas
24. Marcelo
25. Mina-utok
26. Menchaca
27. Minapasok
28. Mahilum
29. Paghumayan
30. Pantao
31. Patun-an
32. Pinocutan
33. Refugio
34. San Benito
35. San Isidro
36. Suba (Poblacion)

37. Telim
38. Tigbao
39. Tigbon
40. Winaswasan

LEGEND :

- ENERGIZED
- UNENERGIZED

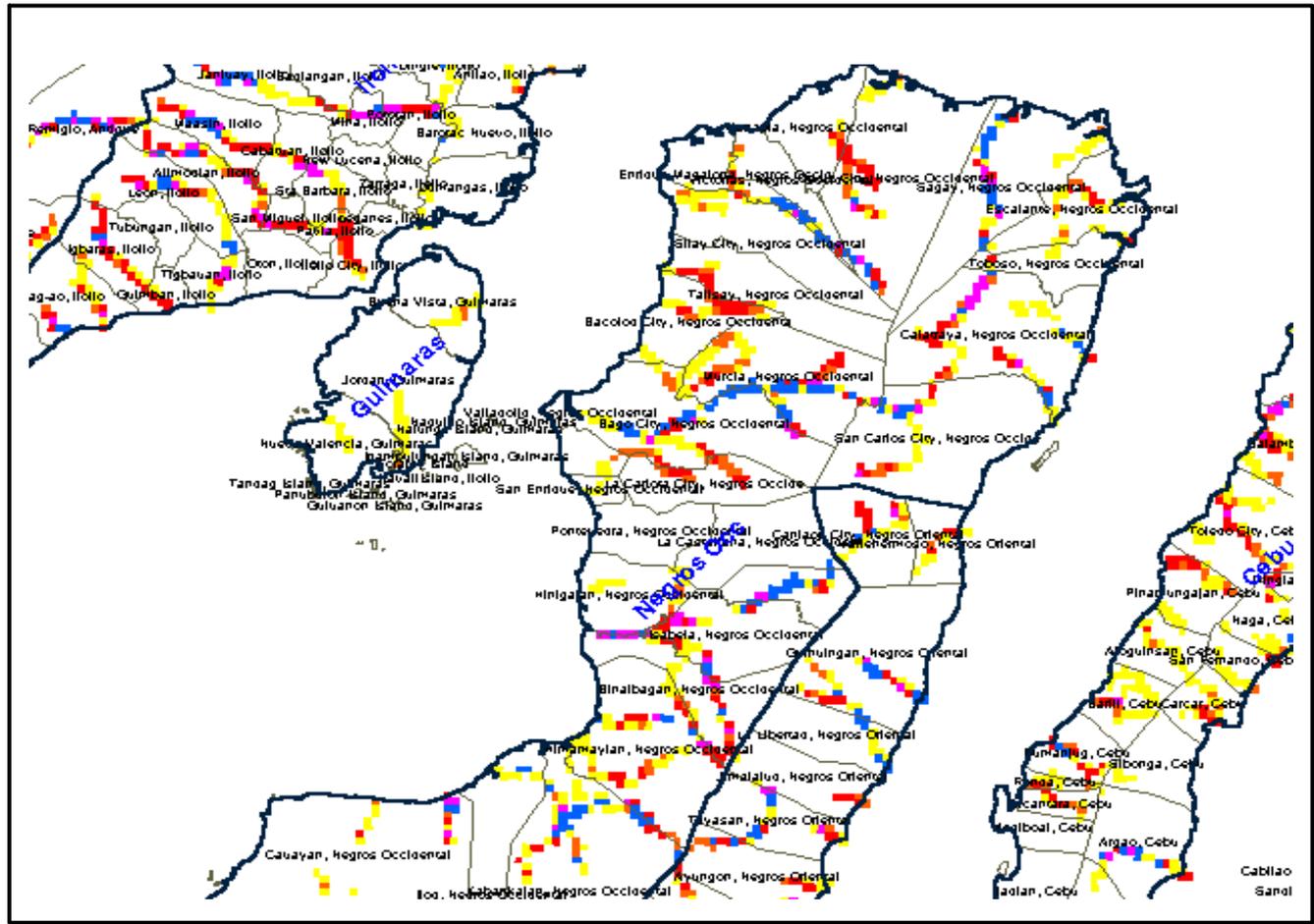
Solar Energy Potential (Negros Occidental)



provbnd (PROVBND)
municipalities (MUNICIPAL)
Annual (kWhr/m2/day) Global Horizontal (AEANN)
5
6



Hydro Potential (Negros Occidental)



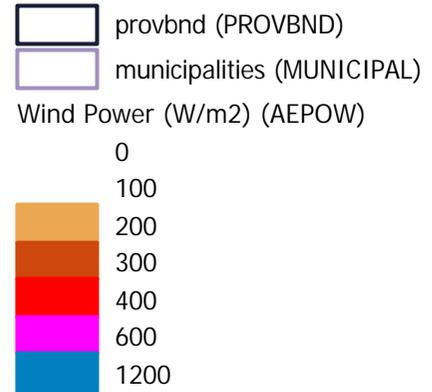
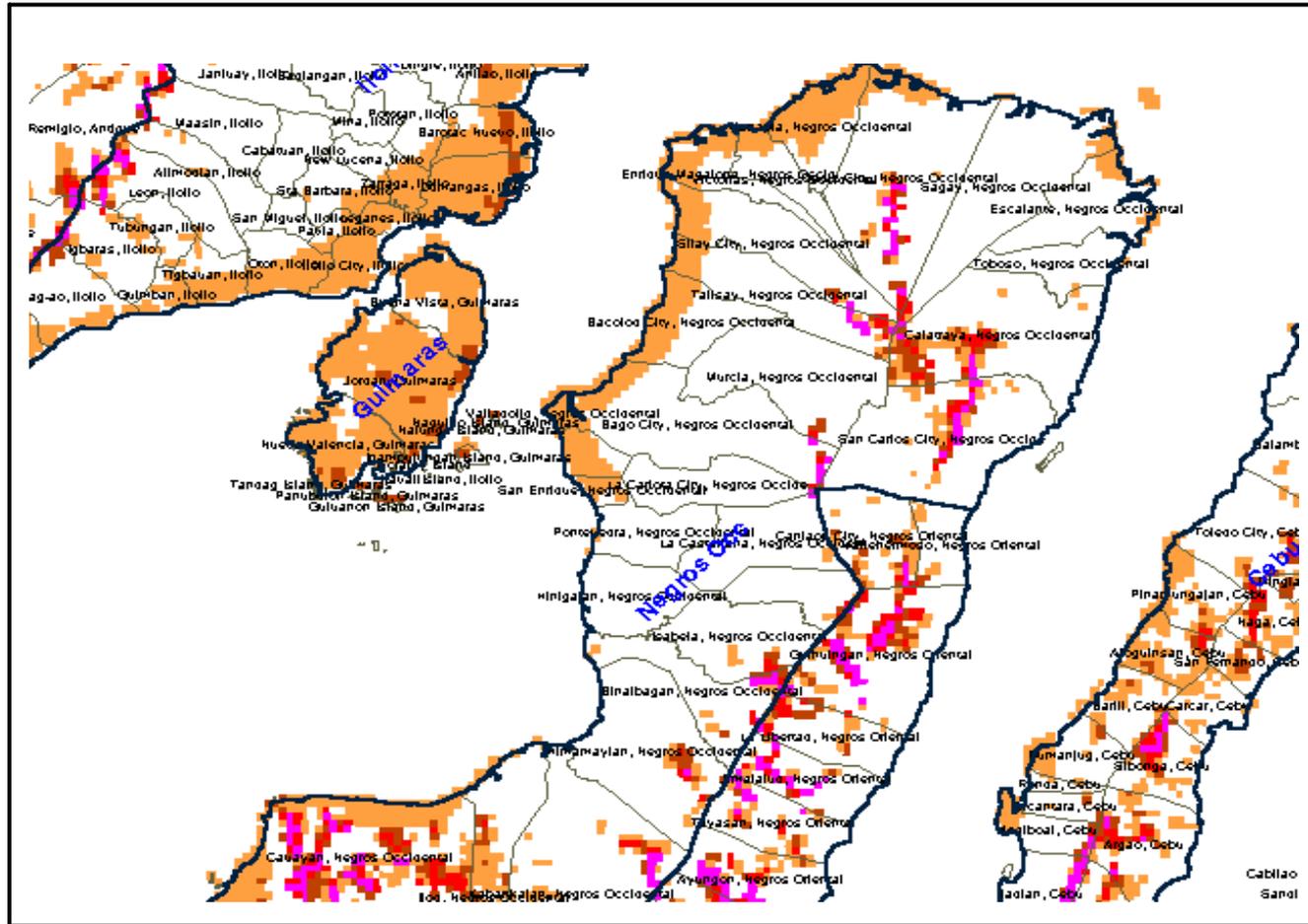
provbnd (PROVBND)
municipalities (MUNICIPAL)

Hydro Potential 100% Efficiency (AE)

0
50
100
300
500
1500



Wind Potential (Negros Occidental)



MARKET PACKAGES

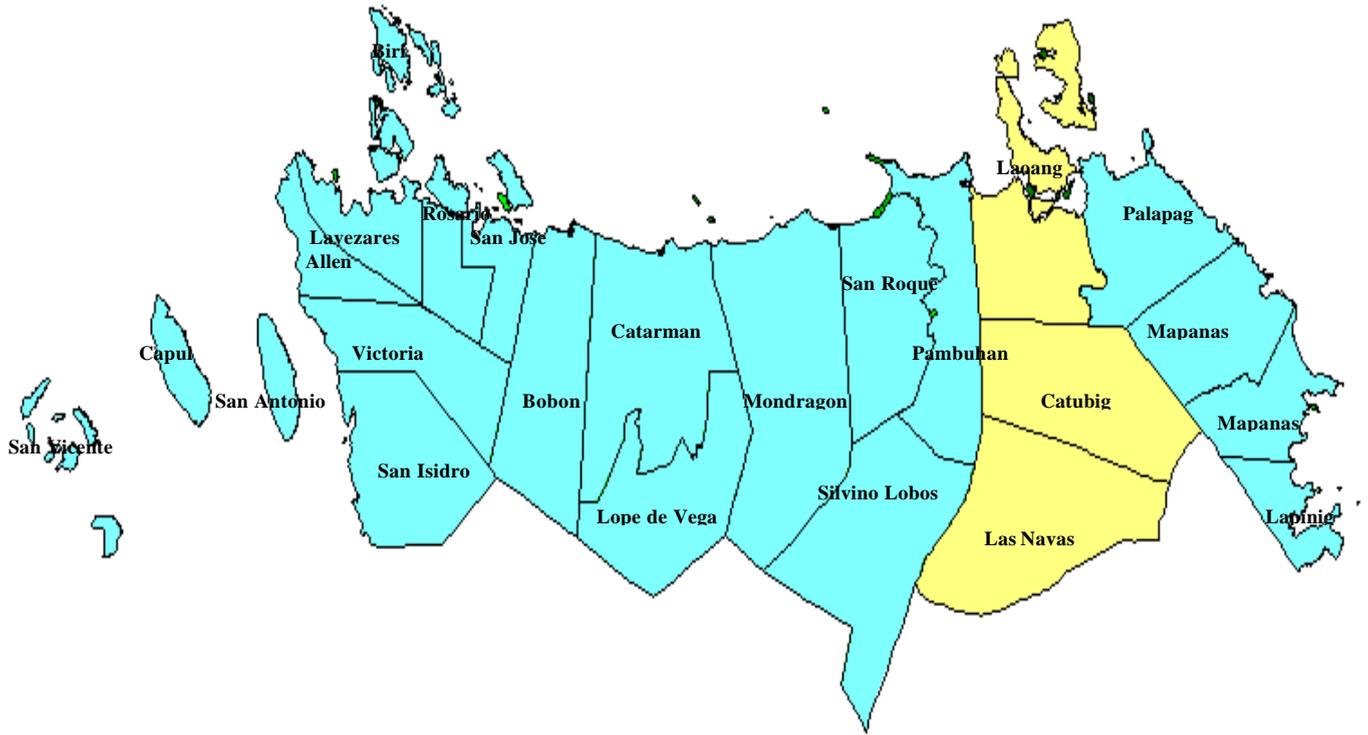
Northern Samar

M.P. # 18 : Catubig

M.P. # 19 : Las Navas

M.P. # 20 : Laoang

Northern Samar



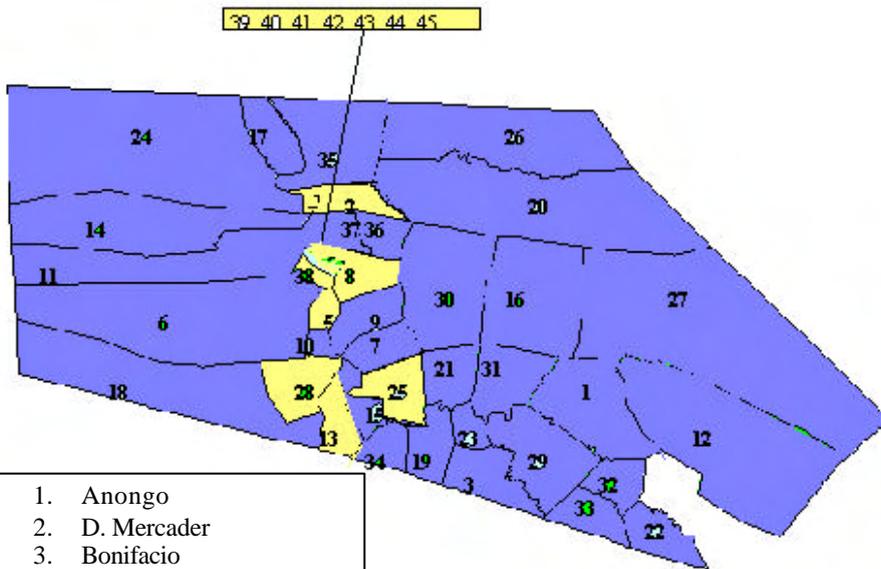
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

CATUBIG, NORTHERN SAMAR		1 of 2		
Market Package No. 18				
General Information				
Political Subdivisions <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	Forty-seven (47) barangays Sixteen (16) barangays Thirty-one (31) barangays and these are <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Anongo ✓ Bonifacio ✓ Boring ✓ Cagobngan ✓ Canuctan ✓ C.M. Recto ✓ Guibuangan ✓ Hinagonoyan ✓ Hiparayan ✓ Hitapi-an ✓ Irawahan ✓ Libon ✓ Lenoy-ahan ✓ Magongon ✓ Magtuad ✓ Manering </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Nabulo ✓ Nagoocan ✓ Nahulid ✓ Osang ✓ P. Rebadulla ✓ Roxas ✓ San Antonio ✓ San Francisco ✓ San Jose ✓ San Vicente ✓ Santa Fe ✓ Sulitan ✓ Tangbo ✓ Tungodnon ✓ Vienna Maria </td> </tr> </table>		<ul style="list-style-type: none"> ✓ Anongo ✓ Bonifacio ✓ Boring ✓ Cagobngan ✓ Canuctan ✓ C.M. Recto ✓ Guibuangan ✓ Hinagonoyan ✓ Hiparayan ✓ Hitapi-an ✓ Irawahan ✓ Libon ✓ Lenoy-ahan ✓ Magongon ✓ Magtuad ✓ Manering 	<ul style="list-style-type: none"> ✓ Nabulo ✓ Nagoocan ✓ Nahulid ✓ Osang ✓ P. Rebadulla ✓ Roxas ✓ San Antonio ✓ San Francisco ✓ San Jose ✓ San Vicente ✓ Santa Fe ✓ Sulitan ✓ Tangbo ✓ Tungodnon ✓ Vienna Maria
<ul style="list-style-type: none"> ✓ Anongo ✓ Bonifacio ✓ Boring ✓ Cagobngan ✓ Canuctan ✓ C.M. Recto ✓ Guibuangan ✓ Hinagonoyan ✓ Hiparayan ✓ Hitapi-an ✓ Irawahan ✓ Libon ✓ Lenoy-ahan ✓ Magongon ✓ Magtuad ✓ Manering 	<ul style="list-style-type: none"> ✓ Nabulo ✓ Nagoocan ✓ Nahulid ✓ Osang ✓ P. Rebadulla ✓ Roxas ✓ San Antonio ✓ San Francisco ✓ San Jose ✓ San Vicente ✓ Santa Fe ✓ Sulitan ✓ Tangbo ✓ Tungodnon ✓ Vienna Maria 			
Demographic Profile				
Household Population (1995)	▪ 3,407 Households			
Projected HH Population (2000)	▪ 3,911 Households			
Ave. Annual Pop'n Growth Rate	▪ 2.8 (1990 - 1995)			
Population Density (1995)	▪ 12.33 HH/km ²			
Ave. HH Size	▪ 5.2 persons			
Macro-economic Indicators				
Ave. Annual HH Income	▪ PhP 38,635.00			
Ave. Annual HH Expenditures	▪ PhP 29,574.90			
Ave. Annual HH Disp. Income	▪ PhP 9,060.10			
Ave. HH Energy Expenditures	▪ PhP 150.18/month			
Municipality Income Class	▪ Fourth Class			
Natural Resources				
Land Area (DILG)	▪ 276.3 km ²			
Land Capability Slope Distribution (Topography)	▪ mixed terrain - lowlands and uplands			
Renewable Energy Resources				
Solar Energy	▪ 6 kWhr/m ² /day			
Wind Energy	▪ 200 -300 W/m ²			

**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

CATUBIG, NORTHERN SAMAR Market Package No. 18		2 of 2
Hydro Power	<ul style="list-style-type: none"> ▪ 50 Watts 	
Economic Activities		
Predominant Economic Activities	<ul style="list-style-type: none"> ▪ Farming and fishing 	
Utilities		
Power	<ul style="list-style-type: none"> ▪ Electric Cooperative ▪ Municipal Energ'n Status ▪ Power Tariff (Basic Rates as of December 2000) <ul style="list-style-type: none"> ✓ Residential ✓ Commercial ✓ Industry <ul style="list-style-type: none"> - Demand Charge - Energy Charge <ul style="list-style-type: none"> ▪ Estimated Cost of Grid Extension 	
	<ul style="list-style-type: none"> ▪ NORSAMELCO ▪ 34 % ▪ PhP 43.62 for first 10 kWhr PhP 4.362/kWhr (in excess of 10 kWhr) ▪ PhP 43.62 for first 10 kWhr PhP 4.362/kWhr (in excess of 10 kWhr) ▪ No data ▪ No data ▪ PhP 18,926,308.00 	
Social Services		
Education (Schools)	<ul style="list-style-type: none"> ▪ At least 31 schools 	

CATUBIG, NORTHERN SAMAR



1. Anongo
2. D. Mercader
3. Bonifacio
4. Boring
5. Cagbugna
6. Cagmanaba
7. Cagogobngan
8. Calingnan
9. Canuctan
10. Guibwangan
11. Hiparayan
12. Hitapi-an
13. Inoburan
14. Irawahan
15. Libon
16. Claro M. Recto
17. Lenoy-ahan
18. Mag-ongon
19. Magtuad
20. Manering
21. Nabulo
22. Nago-oacan
23. Nahulid
24. Opong
25. Osmena
26. P. Rebadulla
27. Roxas
28. Sagudsuron

29. San Antonio
30. San Francisco
31. San Jose
32. San Vicente
33. Santa Fe
34. Sulitan
35. Tangbo
36. Tungodnon
37. Vienna Maria
38. Barangay 1
39. Barangay 2
40. Barangay 3
41. Barangay 4
42. Barangay 5
43. Barangay 6
44. Barangay 7
45. Barangay 8

LEGEND :

 ENERGIZED

 UNENERGIZED

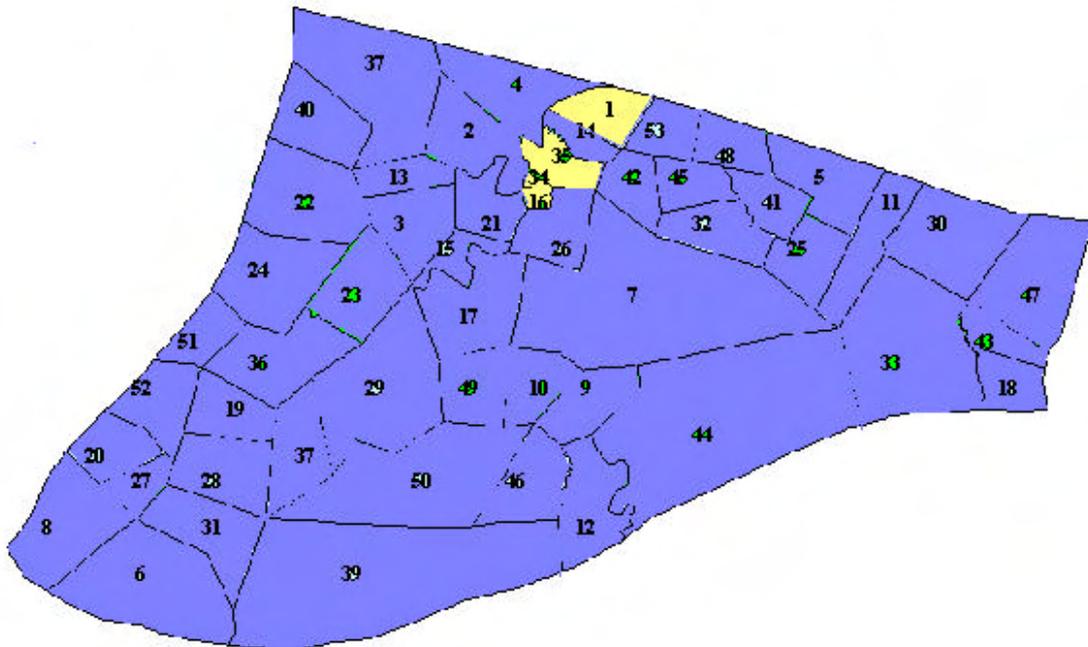
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

LAS NAVAS, NORTHERN SAMAR		1 of 2		
Market Package No. 19				
General Information				
<p>Political Subdivisions</p> <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	<p>Fifty-three (53) barangays Nine (9) barangays</p> <p>Forty-four (44) barangays and these are</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Bag-od ✓ Bugay ✓ Bugtusan ✓ Bukid ✓ Bulao ✓ Caputoan ✓ Catoto-ogan ✓ Cuenco ✓ Dapdap ✓ Dolores ✓ Hangi ✓ Geguinta ✓ Gerardo ✓ Imelda ✓ Epaw ✓ Jole-jole ✓ Lakandula ✓ Lourdes ✓ Mabini ✓ Magsaysay ✓ Matiralag ✓ Mc Arthur </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Osmeña ✓ Paco ✓ Palanas ✓ Perez ✓ Pio del Pilar ✓ Poponton ✓ Quezon ✓ Quirino ✓ Rizal ✓ Roxas ✓ Rufino ✓ San Antonio ✓ San Andres ✓ San Fernando ✓ San Francisco ✓ San Jose ✓ San Isidro ✓ Santo Tomas ✓ Tagan-ayan ✓ Tagab-iran ✓ Taylor ✓ Victory </td> </tr> </table>		<ul style="list-style-type: none"> ✓ Bag-od ✓ Bugay ✓ Bugtusan ✓ Bukid ✓ Bulao ✓ Caputoan ✓ Catoto-ogan ✓ Cuenco ✓ Dapdap ✓ Dolores ✓ Hangi ✓ Geguinta ✓ Gerardo ✓ Imelda ✓ Epaw ✓ Jole-jole ✓ Lakandula ✓ Lourdes ✓ Mabini ✓ Magsaysay ✓ Matiralag ✓ Mc Arthur 	<ul style="list-style-type: none"> ✓ Osmeña ✓ Paco ✓ Palanas ✓ Perez ✓ Pio del Pilar ✓ Poponton ✓ Quezon ✓ Quirino ✓ Rizal ✓ Roxas ✓ Rufino ✓ San Antonio ✓ San Andres ✓ San Fernando ✓ San Francisco ✓ San Jose ✓ San Isidro ✓ Santo Tomas ✓ Tagan-ayan ✓ Tagab-iran ✓ Taylor ✓ Victory
<ul style="list-style-type: none"> ✓ Bag-od ✓ Bugay ✓ Bugtusan ✓ Bukid ✓ Bulao ✓ Caputoan ✓ Catoto-ogan ✓ Cuenco ✓ Dapdap ✓ Dolores ✓ Hangi ✓ Geguinta ✓ Gerardo ✓ Imelda ✓ Epaw ✓ Jole-jole ✓ Lakandula ✓ Lourdes ✓ Mabini ✓ Magsaysay ✓ Matiralag ✓ Mc Arthur 	<ul style="list-style-type: none"> ✓ Osmeña ✓ Paco ✓ Palanas ✓ Perez ✓ Pio del Pilar ✓ Poponton ✓ Quezon ✓ Quirino ✓ Rizal ✓ Roxas ✓ Rufino ✓ San Antonio ✓ San Andres ✓ San Fernando ✓ San Francisco ✓ San Jose ✓ San Isidro ✓ Santo Tomas ✓ Tagan-ayan ✓ Tagab-iran ✓ Taylor ✓ Victory 			
Demographic Profile				
Household Population (1995)	▪ 4,357 Households			
Projected HH Population (2000)	▪ 4,978 Households			
Ave. Annual Pop'n Growth Rate	▪ 2.7 (1990 - 1995)			
Population Density (1995)	▪ 20.67 HH/km ²			
Ave. HH Size	▪ 5.0 persons			
Macro-economic Indicators				
Ave. Annual HH Income	▪ PhP 37,764.84			
Ave. Annual HH Expenditures	▪ PhP 28,206.16			
Ave. Annual HH Disp. Income	▪ PhP 9,558.68			
Ave. HH Energy Expenditures	▪ PhP 213.15/month			
Municipality Income Class	▪ Fifth Class			

**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

LAS NAVAS, NORTHERN SAMAR		2 of 2
Market Package No. 19		
Natural Resources		
Land Area (DILG)	<ul style="list-style-type: none"> ▪ 210.8 km² 	
Land Capability Slope Distribution (Topography)	<ul style="list-style-type: none"> ▪ mixed terrain - lowlands and uplands 	
Renewable Energy Resources		
Solar Energy	<ul style="list-style-type: none"> ▪ 6 kWhr/m²/day 	
Wind Energy ✓ Wind power density	<ul style="list-style-type: none"> ▪ 200 W/m² 	
Hydro Power	<ul style="list-style-type: none"> ▪ 50 Watts 	
Economic Activities		
Predominant Economic Activities	<ul style="list-style-type: none"> ▪ Farming and fishing 	
Other Livelihood Activities	<ul style="list-style-type: none"> ▪ Abaca weaving ▪ Bamboo and wood furniture ▪ Mushroom production ▪ Soap making 	
Utilities		
Power	<ul style="list-style-type: none"> ▪ Electric Cooperative ▪ Municipal Energ'n Status ▪ Power Tariff (Basic Rates as of December 2000) <ul style="list-style-type: none"> ✓ Residential ✓ Commercial ✓ Industry <ul style="list-style-type: none"> - Demand Charge - Energy Charge ▪ Estimated Cost of Grid Extension 	
	<ul style="list-style-type: none"> ▪ NORSAMELCO ▪ 17 % ▪ PhP 43.62 for first 10 kWhr PhP 4.362/kWhr (in excess of 10 kWhr) ▪ PhP 43.62 for first 10 kWhr PhP 4.362/kWhr (in excess of 10 kWhr) ▪ No data ▪ No data ▪ PhP 29,990,441.00 	
Social Services		
Education (Schools)	<ul style="list-style-type: none"> ▪ At least 44 schools 	

LAS NAVAS, NORTHERN SAMAR



1. Balugo
2. Bugay
3. Bugtosan
4. Bukid
5. Bulao
6. Caputoan
7. Catoto-ogan
8. Cuenco
9. Dapdap
10. Del Pilar
11. Dolores
12. Epaw
13. Geguinta
14. Geracdo
15. Guyo
16. H. Jolejole District
17. Hangi
18. Imelda
19. L. Empon
20. Lakandula
21. Lumala-og
22. Lourdes
23. Mabini
24. Macarthur
25. Magsaysay
26. Matelarag
27. Osmena
28. Paco
29. Palanas
30. Perez
31. Poponton

32. Quezon
33. Quirino
34. Quirino District
35. Rebong
36. Rizal
37. Roxas
38. Rufino
39. Sag-od
40. San Andres
41. San Antonio
42. San Fernando
43. San Francisco
44. San Isidro
45. San Jorge
46. San Jose
47. San Miguel
48. Santo Tomas
49. Tagab-iran
50. Tagan-ayan
51. Taylor
52. Victory
53. H. Jolejole

LEGEND :

- ENERGIZED
- UNENERGIZED

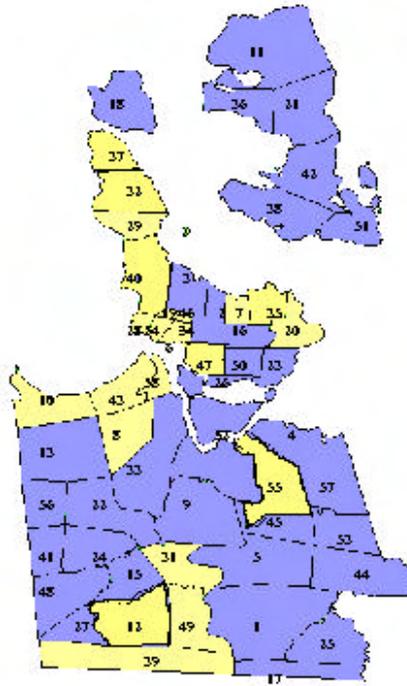
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

LAOANG, NORTHERN SAMAR		1 of 2																																		
Market Package No. 20																																				
General Information																																				
Political Subdivisions <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	<p>Fifty-six (56) barangays Twenty-two (22) barangays</p> <p>Thirty-four (34) barangays and these are</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">✓ Abaton</td> <td style="width: 50%;">✓ E.J. Dulay</td> </tr> <tr> <td>✓ Aguadahan</td> <td>✓ G.B. Tan</td> </tr> <tr> <td>✓ Antipolo</td> <td>✓ Gibatangan</td> </tr> <tr> <td>✓ Arongaga</td> <td>✓ Lawaan</td> </tr> <tr> <td>✓ Bawang</td> <td>✓ Marubay</td> </tr> <tr> <td>✓ Bongliw</td> <td>✓ Napiotocan</td> </tr> <tr> <td>✓ Cabadyangan</td> <td>✓ Palmera</td> </tr> <tr> <td>✓ Cabago-an</td> <td>✓ Pangdan</td> </tr> <tr> <td>✓ Cabagngan</td> <td>✓ Rombang</td> </tr> <tr> <td>✓ Cabulaloan</td> <td>✓ San Antonio</td> </tr> <tr> <td>✓ Caga-asan</td> <td>✓ Sibunot</td> </tr> <tr> <td>✓ Cagdarao</td> <td>✓ Suba</td> </tr> <tr> <td>✓ Cahayagan</td> <td>✓ Tanawan</td> </tr> <tr> <td>✓ Candawid</td> <td>✓ Tarusan</td> </tr> <tr> <td>✓ Cangcahipos</td> <td>✓ Tinoblan</td> </tr> <tr> <td>✓ Canyonanao</td> <td>✓ Yabas</td> </tr> <tr> <td>✓ Catigbian</td> <td>✓ Yabyaban</td> </tr> </table>		✓ Abaton	✓ E.J. Dulay	✓ Aguadahan	✓ G.B. Tan	✓ Antipolo	✓ Gibatangan	✓ Arongaga	✓ Lawaan	✓ Bawang	✓ Marubay	✓ Bongliw	✓ Napiotocan	✓ Cabadyangan	✓ Palmera	✓ Cabago-an	✓ Pangdan	✓ Cabagngan	✓ Rombang	✓ Cabulaloan	✓ San Antonio	✓ Caga-asan	✓ Sibunot	✓ Cagdarao	✓ Suba	✓ Cahayagan	✓ Tanawan	✓ Candawid	✓ Tarusan	✓ Cangcahipos	✓ Tinoblan	✓ Canyonanao	✓ Yabas	✓ Catigbian	✓ Yabyaban
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✓ Cahayagan	✓ Tanawan																																			
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✓ Cangcahipos	✓ Tinoblan																																			
✓ Canyonanao	✓ Yabas																																			
✓ Catigbian	✓ Yabyaban																																			
Demographic Profile																																				
Household Population (1995)	▪ 3,466 Households																																			
Projected HH Population (2000)	▪ 3,921 Households																																			
Ave. Annual Pop'n Growth Rate	▪ 2.5 (1990 - 1995)																																			
Population Density (1995)	▪ 16.14 HH/km ²																																			
Ave. HH Size	▪ 5.3 persons																																			
Macro-economic Indicators																																				
Ave. Annual HH Income	▪ PhP 39,577.64																																			
Ave. Annual HH Expenditures	▪ PhP 28,478.72																																			
Ave. Annual HH Disp. Income	▪ PhP 11,098.92																																			
Ave. HH Energy Expenditures	▪ PhP 171.47/month																																			
Municipality Annual Income	<ul style="list-style-type: none"> ▪ PhP 24,145,516.55 (1998) ▪ PhP 29,693,316.54 (1999) ▪ PhP 35,596,523.36 (2000) 																																			
Municipality Income Class	▪ Fourth Class																																			

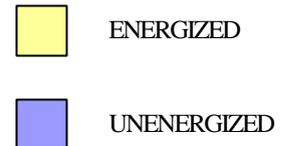
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

LAOANG, NORTHERN SAMAR Market Package No. 20		2 of 2
Natural Resources		
Land Area (DILG)	<ul style="list-style-type: none"> ▪ 214.7 km² 	
Land Capability Slope Distribution (Topography)	<ul style="list-style-type: none"> ▪ Mixed terrain - lowlands and uplands 	
Renewable Energy Resources		
Solar Energy	<ul style="list-style-type: none"> ▪ 6 kWhr/m²/day 	
Wind Energy ✓ Wind power density	<ul style="list-style-type: none"> ▪ 200 W/m² 	
Hydro Power	<ul style="list-style-type: none"> ▪ 50 - 300 Watts 	
Economic Activities		
Predominant Economic Activities	<ul style="list-style-type: none"> ▪ Farming and fishing 	
Other Livelihood Activities	<ul style="list-style-type: none"> ▪ Coconut processing ▪ Fish processing ▪ Bamboo furniture 	
Utilities		
Power	<ul style="list-style-type: none"> ▪ Electric Cooperative ▪ Municipal Energ'n Status ▪ Power Tariff (Basic Rates as of December 2000) <ul style="list-style-type: none"> ✓ Residential ✓ Commercial ✓ Industry <ul style="list-style-type: none"> - Demand Charge - Energy Charge ▪ Estimated Cost of Grid Extension 	
	<ul style="list-style-type: none"> ▪ NORSAMELCO ▪ 39 % ▪ PhP 43.62 for first 10 kWhr PhP 4.362/kWhr (in excess of 10 kWhr) ▪ PhP 43.62 for first 10 kWhr PhP 4.362/kWhr (in excess of 10 kWhr) ▪ No data ▪ No data ▪ PhP 20,458,024.00 	
Social Services		
Education (Schools)	<ul style="list-style-type: none"> ▪ At least 34 schools 	

LAOANG, NORTHERN SAMAR



LEGEND :

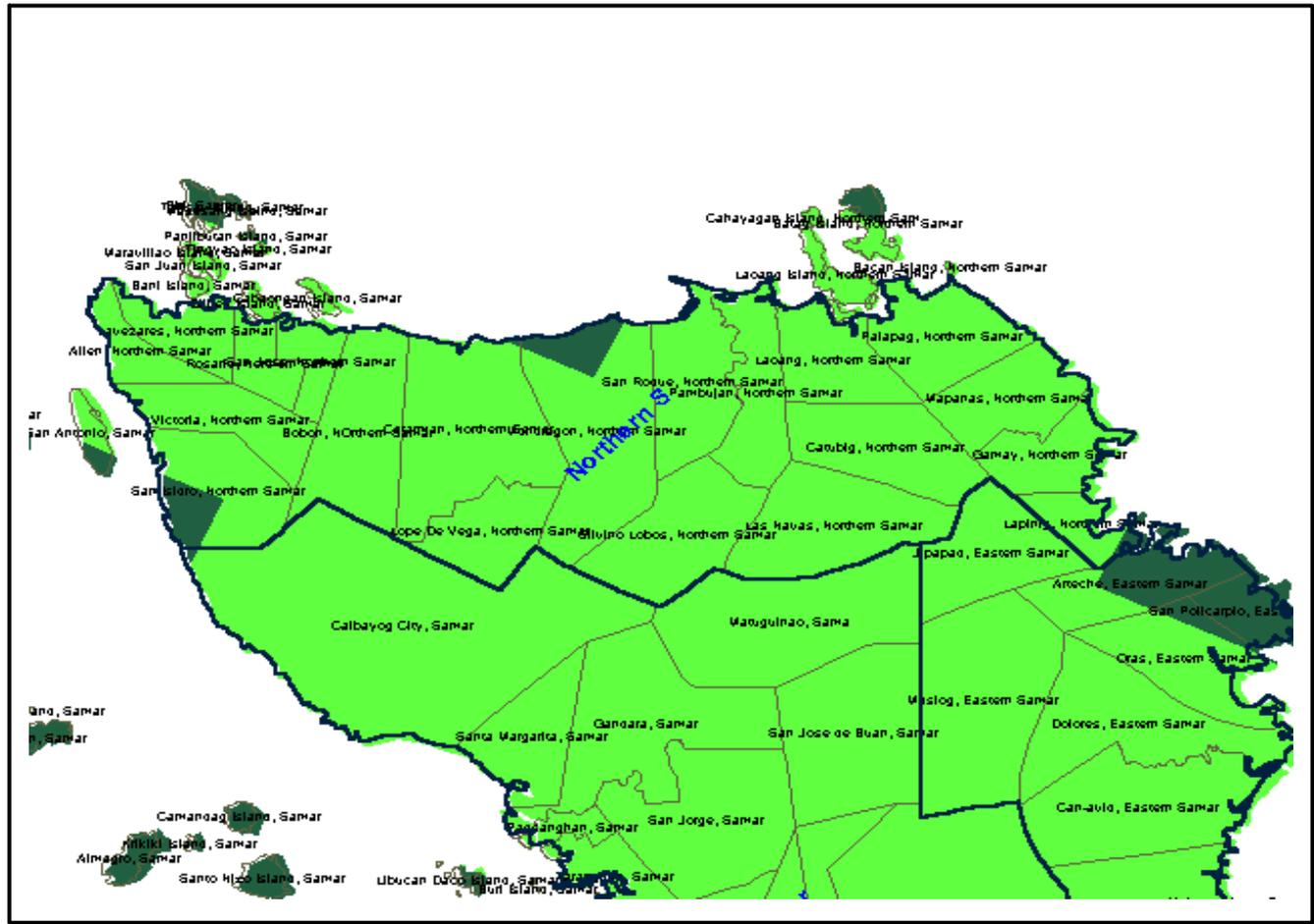


1. Abaton
2. Aguadahan
3. Aroganga
4. Atipolo
5. Bawang
6. Baybay
7. Binatiklan
8. Bobolosan
9. Bongliw
10. Burabud
11. Cabadiangan
12. Cabagnan
13. Cabago-an
14. Hinagonoyan(not in the Map)
15. Cabulaloan
16. Cagaasan
17. Cagdara-o
18. Cahayagan
19. Calintaan
20. Calomotan
21. Candawid
22. Cangchapos

23. Canyomanao
24. Catigbian
25. E.J. Dulay
26. G.B. Tan
27. Gibatangan
28. Guilaoagi
29. Inamlan
30. Osang(not in the Map)
31. La Perla
32. Langob
33. Lawaan
34. Little Vanice
35. Magsaysay
36. Marubay
37. Mualbual
38. Napotiocan
39. Oleras
40. Onay (Dona Luisa)
41. Palmera
42. Pangdan
43. Rawis
44. Rombang

45. San Antonio
46. San Miguel Heights
47. Sangcol
48. Sibunot
49. Simora
50. Suba
51. Tan-awan
52. Tarusan
53. Tinoblan
54. Tumaguinting
55. Vigo
56. Yabyaban
57. Yapas
58. Talisay

Solar Energy Potential (Northern Samar)



provbnd (PROVBND)
municipalities (MUNICIPAL)
Annual (kWhr/m2/day) Global Horizontal (AEANN)
5
6

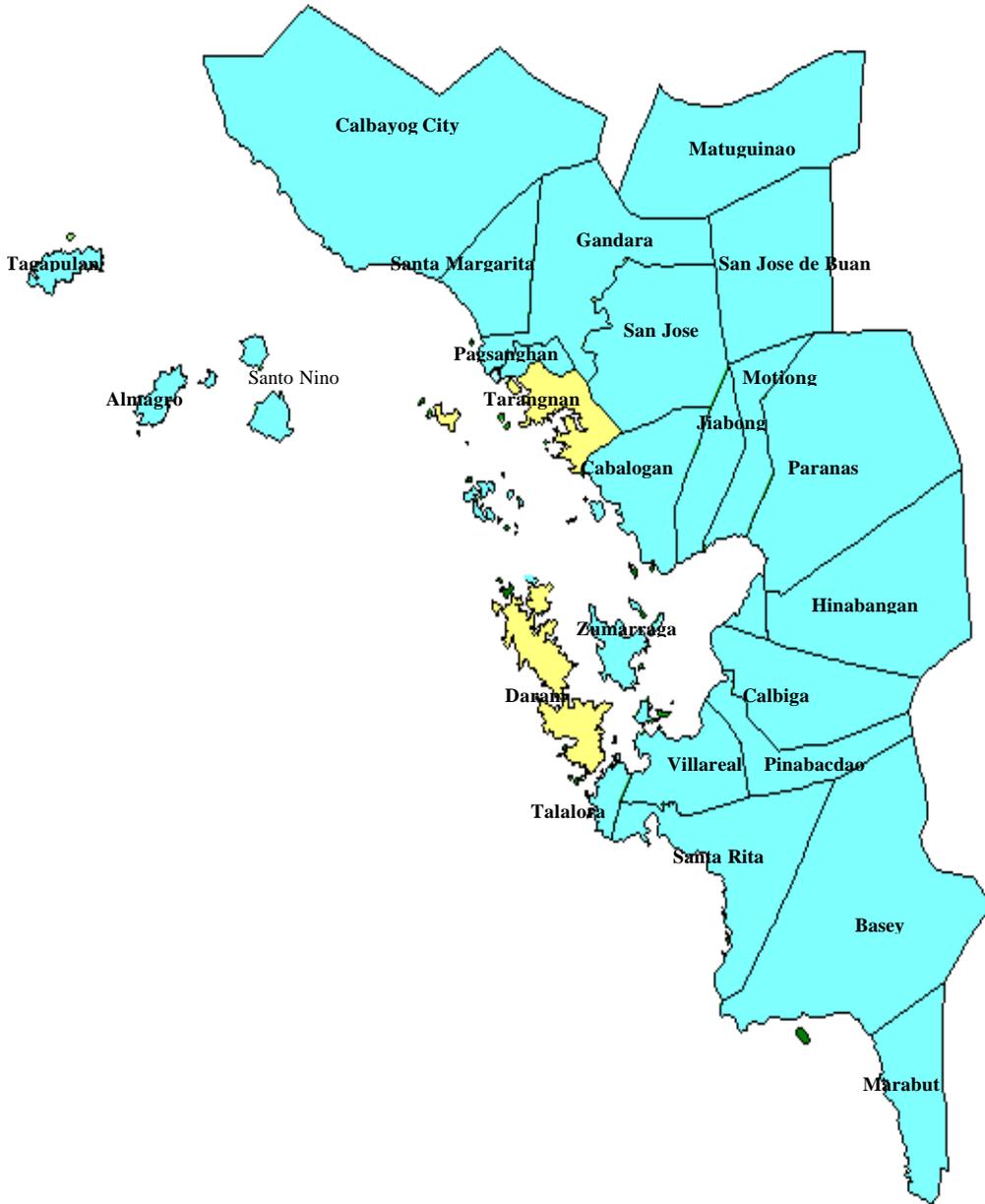
MARKET PACKAGES

Western Samar

M.P. # 21 : Tarangnan

M.P. # 22 : Daram

Western Samar



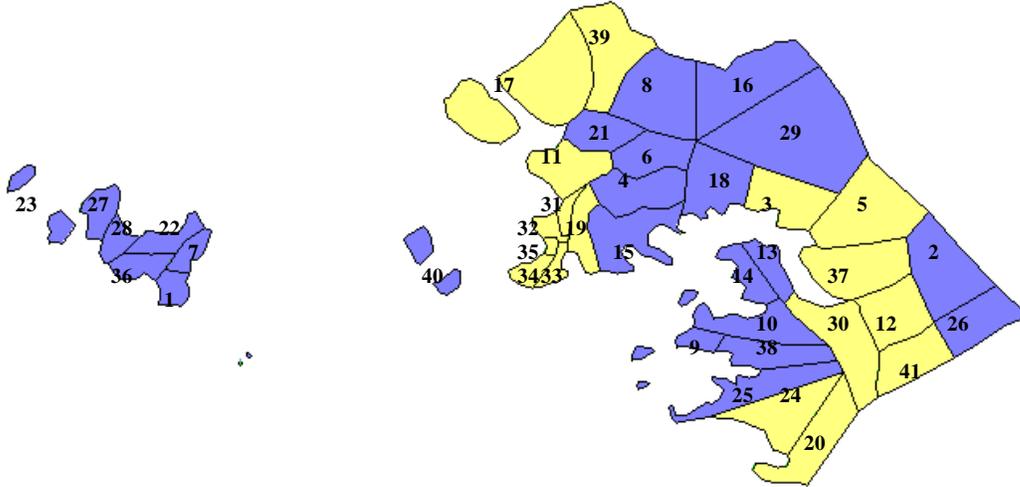
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

TARANGNAN, WESTERN SAMAR		1 of 2																				
Market Package No. 21																						
General Information																						
Political Subdivisions <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	Forty-one (41) barangays Twenty-one (21) barangays Twenty (20) barangays and these are <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">✓ Alcazar</td> <td style="width: 50%;">✓ Gallego</td> </tr> <tr> <td>✓ Awang</td> <td>✓ Lahong</td> </tr> <tr> <td>✓ Balonga-as</td> <td>✓ Libucan Daco</td> </tr> <tr> <td>✓ Bangon Gote</td> <td>✓ Libucan Gote</td> </tr> <tr> <td>✓ Baras</td> <td>✓ Mancares</td> </tr> <tr> <td>✓ Bunga</td> <td>✓ Marabut</td> </tr> <tr> <td>✓ Cambatutay Nuevo</td> <td>✓ Oeste B</td> </tr> <tr> <td>✓ Cambatutay Viejo</td> <td>✓ Pajo</td> </tr> <tr> <td>✓ Canunghan</td> <td>✓ San Vicente</td> </tr> <tr> <td>✓ Catan-agan</td> <td>✓ Sugod</td> </tr> </table>		✓ Alcazar	✓ Gallego	✓ Awang	✓ Lahong	✓ Balonga-as	✓ Libucan Daco	✓ Bangon Gote	✓ Libucan Gote	✓ Baras	✓ Mancares	✓ Bunga	✓ Marabut	✓ Cambatutay Nuevo	✓ Oeste B	✓ Cambatutay Viejo	✓ Pajo	✓ Canunghan	✓ San Vicente	✓ Catan-agan	✓ Sugod
✓ Alcazar	✓ Gallego																					
✓ Awang	✓ Lahong																					
✓ Balonga-as	✓ Libucan Daco																					
✓ Bangon Gote	✓ Libucan Gote																					
✓ Baras	✓ Mancares																					
✓ Bunga	✓ Marabut																					
✓ Cambatutay Nuevo	✓ Oeste B																					
✓ Cambatutay Viejo	✓ Pajo																					
✓ Canunghan	✓ San Vicente																					
✓ Catan-agan	✓ Sugod																					
Demographic Profile																						
Household Population (1995)	▪ 2,165 Households																					
Projected HH Population (2000)	▪ 2,589 Households																					
Ave. Annual Pop'n Growth Rate	▪ 3.64 %																					
Population Density (1995)	▪ 16.78 HH/km ²																					
Ave. HH Size	▪ 5.09 persons																					
Macro-economic Indicators																						
Ave. Annual HH Income	▪ PhP 33,449.63																					
Ave. Annual HH Expenditures	▪ PhP 23,428.35																					
Ave. Annual HH Disp. Income	▪ PhP 10,021.28																					
Ave. HH Energy Expenditures	▪ PhP 151.40/month																					
Municipality Income Class	▪ Fifth (5 th) Class																					
Natural Resources																						
Land Area (DILG)	▪ 129 km ²																					
Land Capability Slope Distribution (Topography)	▪ relatively flat lands and coastal																					
Renewable Energy Resources																						
Solar Energy	▪ 6 kWhr/m ² /day																					
Wind Energy <ul style="list-style-type: none"> ✓ Wind power density 	▪ 200 W/m ²																					

**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

TARANGNAN, WESTERN SAMAR		2 of 2
Market Package No. 21		
Economic Activities		
Predominant Economic Activities	<ul style="list-style-type: none"> ▪ Farming and fishing 	
Other Livelihood activities	<ul style="list-style-type: none"> ▪ Fish processing (drying) 	
Utilities		
Power	<ul style="list-style-type: none"> ▪ Electric Cooperative ▪ Municipal Energ'n Status ▪ Power Tariff (Basic Rates as of December 2000) <ul style="list-style-type: none"> ✓ Residential ✓ Commercial ✓ Industry <ul style="list-style-type: none"> - Demand Charge - Energy Charge ▪ Estimated Cost of Grid Extension 	
	<ul style="list-style-type: none"> ▪ SAMELCO I ▪ % ▪ PhP 43.65 for first 10 kWhr PhP 4.3654/kWhr (in excess of 10 kWhr) ▪ PhP 88.10 for first 20 kWhr PhP 4.4054/kWhr (in excess of 20 kWhr) ▪ PhP 20.00/kW ▪ PhP 4.4074/kWhr ▪ PhP 11,664,087.00 	
Social Services		
Education (Schools)	<ul style="list-style-type: none"> ▪ At least 20 schools 	

TARANGNAN, WESTERN SAMAR



1. Alcazar
2. Awang
3. Bahay
4. Balonga-as
5. Balugo
6. Bangon Gote
7. Baras
8. Binalayan
9. Bisitahan
10. Bonga
11. Cabunga-an
12. Cagtutulo
13. Cambatutay Nuevo
14. Cambatutay Viejo
15. Canunghan
16. Catan-agan
17. Dapdap
18. Gallego
19. Imelda
20. Lucerdoni
21. Lahong
22. Libucan Dacu
23. Libucan Gote
24. Majacob
25. Mancares
26. Marabut
27. Oeste-A
28. Oeste-B
29. Pajo
30. Palencia
31. Poblacion A
32. Poblacion B
33. Poblacion C
34. Poblacion D
35. Poblacion E
36. San Vicente

37. Sta. Cruz
38. Sugod
39. Talinga
40. Tigdaranao
41. Tizon

LEGEND :



ENERGIZED



UNENERGIZED

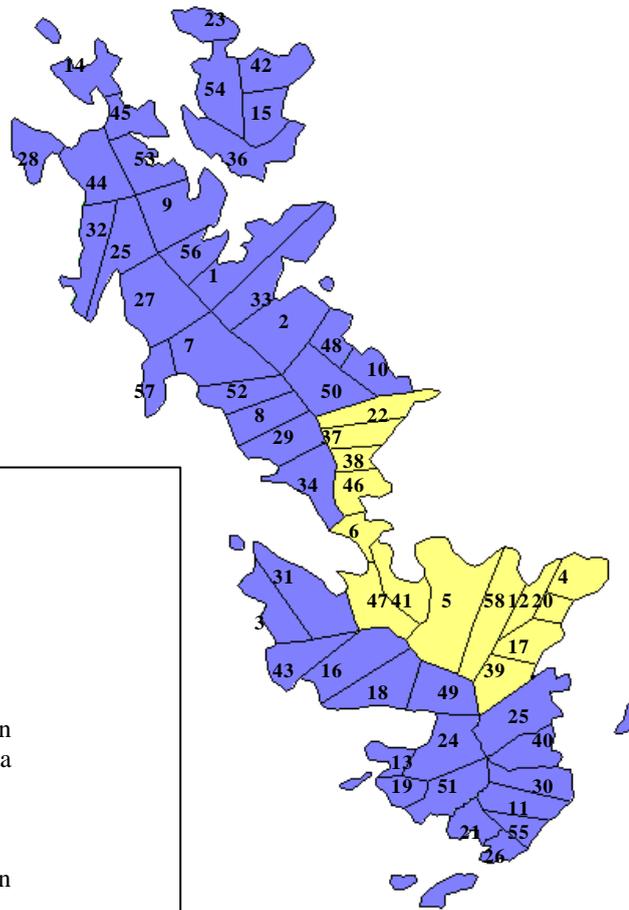
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

DARAM, WESTERN SAMAR Market Package No. 22		1 of 2		
General Information				
Political Subdivisions <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	Fifty-eight (58) barangays Sixteen (16) barangays Forty-two (42) barangays and these are <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Arawane ✓ Astorga ✓ Bachao ✓ Betang ✓ Birawan ✓ Bono-anon ✓ Burgos ✓ Cabil-isan ✓ Cabiton-an ✓ Cabugao ✓ Cagboboto ✓ Calawan-an ✓ Canduque ✓ Canloloy ✓ Cansaganay ✓ Casab-ahan ✓ Guindaponan ✓ Guintampilan ✓ Iquiran ✓ Jacopon ✓ Locoblocob </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Losa ✓ Macalpe ✓ Mandoyucan ✓ Marupangdan ✓ Mayabay ✓ Mongolbongol ✓ Nipa ✓ Parasan ✓ Poso ✓ Rizal ✓ San Antonio ✓ San Jose ✓ San Miguel ✓ San Vicente ✓ So-ong ✓ Sua ✓ Sugod ✓ Talisay ✓ Tugas ✓ Ubo ✓ Valles-vello </td> </tr> </table>		<ul style="list-style-type: none"> ✓ Arawane ✓ Astorga ✓ Bachao ✓ Betang ✓ Birawan ✓ Bono-anon ✓ Burgos ✓ Cabil-isan ✓ Cabiton-an ✓ Cabugao ✓ Cagboboto ✓ Calawan-an ✓ Canduque ✓ Canloloy ✓ Cansaganay ✓ Casab-ahan ✓ Guindaponan ✓ Guintampilan ✓ Iquiran ✓ Jacopon ✓ Locoblocob 	<ul style="list-style-type: none"> ✓ Losa ✓ Macalpe ✓ Mandoyucan ✓ Marupangdan ✓ Mayabay ✓ Mongolbongol ✓ Nipa ✓ Parasan ✓ Poso ✓ Rizal ✓ San Antonio ✓ San Jose ✓ San Miguel ✓ San Vicente ✓ So-ong ✓ Sua ✓ Sugod ✓ Talisay ✓ Tugas ✓ Ubo ✓ Valles-vello
<ul style="list-style-type: none"> ✓ Arawane ✓ Astorga ✓ Bachao ✓ Betang ✓ Birawan ✓ Bono-anon ✓ Burgos ✓ Cabil-isan ✓ Cabiton-an ✓ Cabugao ✓ Cagboboto ✓ Calawan-an ✓ Canduque ✓ Canloloy ✓ Cansaganay ✓ Casab-ahan ✓ Guindaponan ✓ Guintampilan ✓ Iquiran ✓ Jacopon ✓ Locoblocob 	<ul style="list-style-type: none"> ✓ Losa ✓ Macalpe ✓ Mandoyucan ✓ Marupangdan ✓ Mayabay ✓ Mongolbongol ✓ Nipa ✓ Parasan ✓ Poso ✓ Rizal ✓ San Antonio ✓ San Jose ✓ San Miguel ✓ San Vicente ✓ So-ong ✓ Sua ✓ Sugod ✓ Talisay ✓ Tugas ✓ Ubo ✓ Valles-vello 			
Demographic Profile				
Household Population (1995)	▪ 4,637 Households			
Projected HH Population (2000)	▪ 5,005 Households			
Ave. Annual Pop'n Growth Rate	▪ 1.54 %			
Population Density (1995)	▪ 44.85 HH/km ²			
Ave. HH Size	▪ 5.36 persons			
Macro-economic Indicators				
Ave. Annual HH Income	▪ PhP 39,938.37			
Ave. Annual HH Expenditures	▪ PhP 34,935.84			
Ave. Annual HH Disp. Income	▪ PhP 5,002.53			
Ave. HH Energy Expenditures	▪ PhP 148.11/month			
Municipality Income Class	▪ Second (2 nd) Class			
Natural Resources				
Land Area (DENR, 1998)	▪ 103.4 km ²			
Topography	▪ Lowlands and coastal			

**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

DARAM, WESTERN SAMAR Market Package No. 22		2 of 2
Renewable Energy Resources		
Solar Energy	<ul style="list-style-type: none"> ▪ 6 kWhr/m²/day 	
Wind Energy ✓ Wind power density	<ul style="list-style-type: none"> ▪ 200 - 300 W/m² 	
Economic Activities		
Predominant Economic Activities	<ul style="list-style-type: none"> ▪ Fishing 	
Other Livelihood Activities	<ul style="list-style-type: none"> ▪ Fish culture processing ▪ Vegetable gardening ▪ Shellcraft 	
Utilities		
Power <ul style="list-style-type: none"> ▪ Electric Cooperative ▪ Municipal Energ'n Status ▪ Power Tariff (Basic Rates as of December 2000) <ul style="list-style-type: none"> ✓ Residential ✓ Commercial ✓ Industry <ul style="list-style-type: none"> - Demand Charge - Energy Charge - Estimated Cost of Grid Extension 	<ul style="list-style-type: none"> ▪ SAMELCO II ▪ 28 % ▪ PhP 66.01 for first 15 kWhr PhP 4.4009/kWhr (in excess of 15 kWhr) ▪ PhP 88.62 for first 20 kWhr PhP 4.4309/kWhr (in excess of 20 kWhr) ▪ PhP 15.00/kW ▪ PhP 4.4609/kWhr ▪ PhP 44,143,292.00 	
Social Services		
Education (Schools)	<ul style="list-style-type: none"> ▪ At least 42 schools 	

DARAM, WESTERN SAMAR



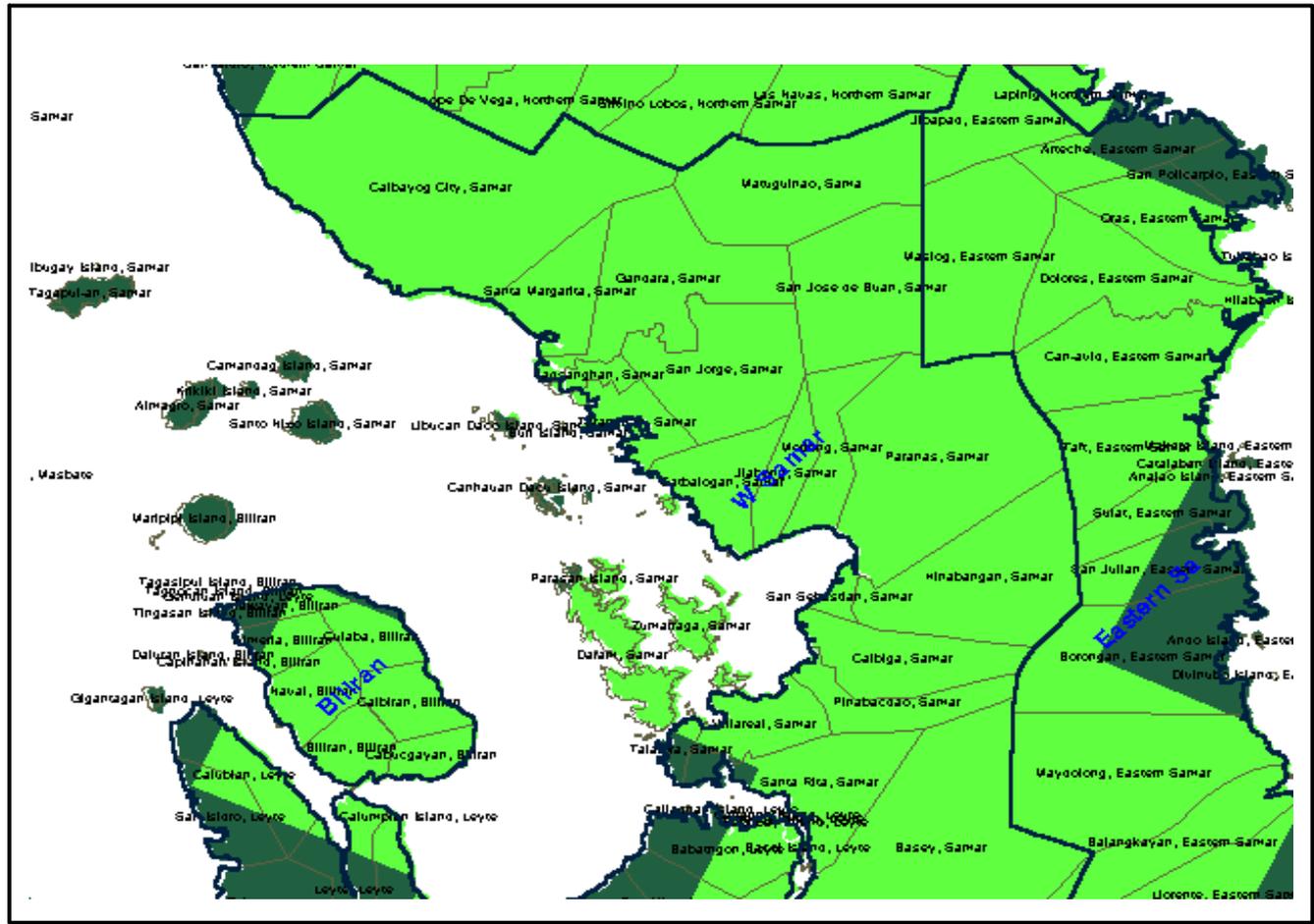
1. Arawane
2. Astorga
3. Bachao
4. Baclayan
5. Bagacay
6. Bayog
7. Birawan
8. Betaug
9. Bono-anon
10. Buenavista
11. Burgos
12. Cabac
13. Cabil-isan
14. Cabiton-an
15. Cabugao
16. Calawanan
17. Cambuhay
18. Candugue
19. Canloloy
20. Campelipa
21. Cansaganay
22. Poblacion 3
23. Casab-ahan
24. Guindapunan
25. Guintampilan
26. Iquiran
27. Jacopon
28. Losa
29. Mabini
30. Macalpe
31. Mandoyucan
32. Mongolbongol
33. Marupangdan
34. Mayabay
35. Nipa
36. Parasan
37. Poblacion 1

38. Poblacion 2
39. Pondang
40. Poso
41. Real
42. Rizal
43. San Antonio
44. San Jose
45. San Miguel
46. San Roque
47. Saugan
48. So-ong
49. Sua
50. Talisay
51. Tugas
52. Ubo
53. Valles-Bello
54. Cagboboto
55. Lucob-lucob
56. San Vicente
57. Sugod
58. Yangta

LEGEND :

- ENERGIZED
- UNENERGIZED

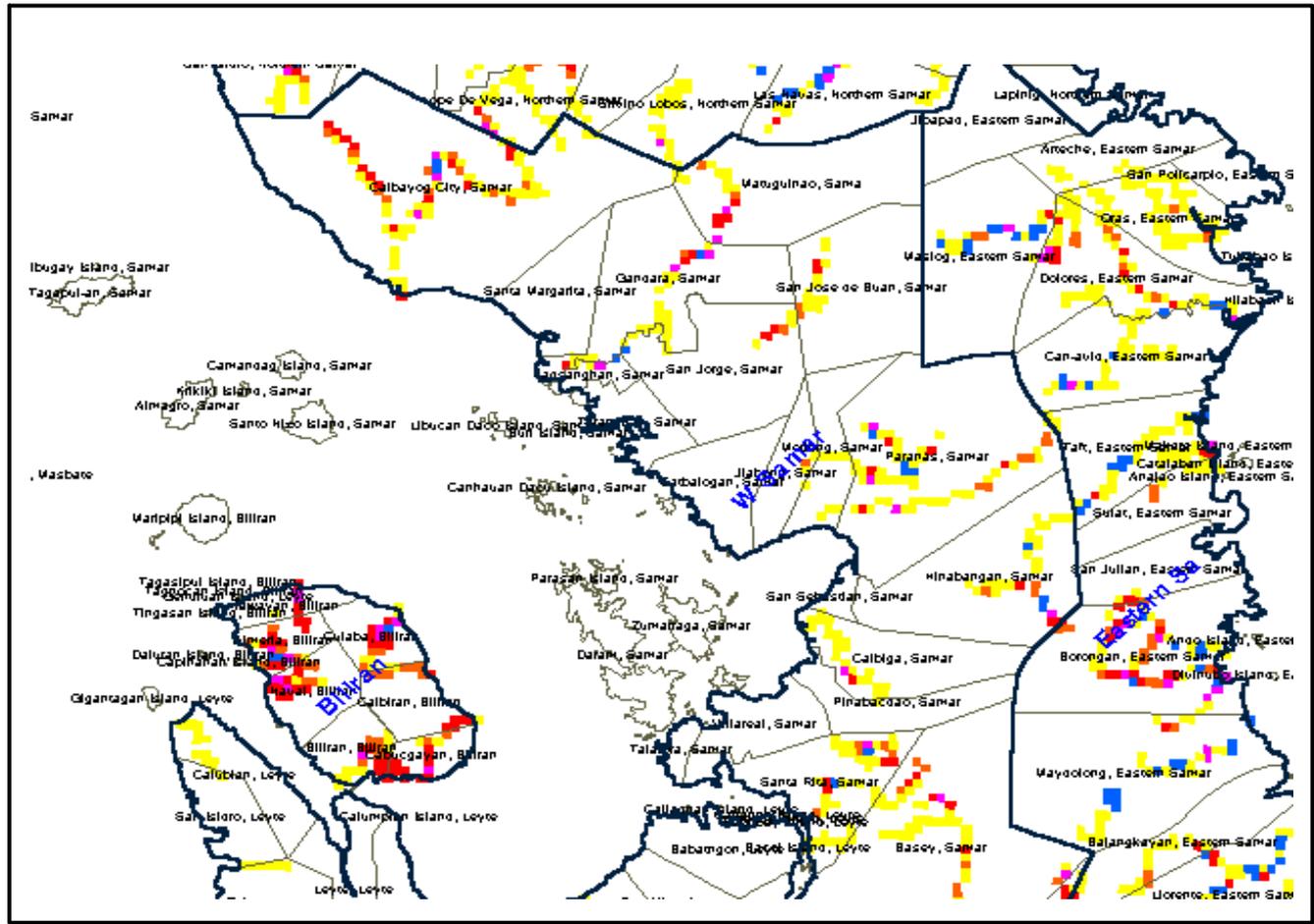
Solar Energy Potential (Western Samar)



provbnd (PROVBND)
municipalities (MUNICIPAL)
Annual (kWhr/m²/day) Global Horizontal (AEANN)
5
6



Hydro Potential (Western Samar)



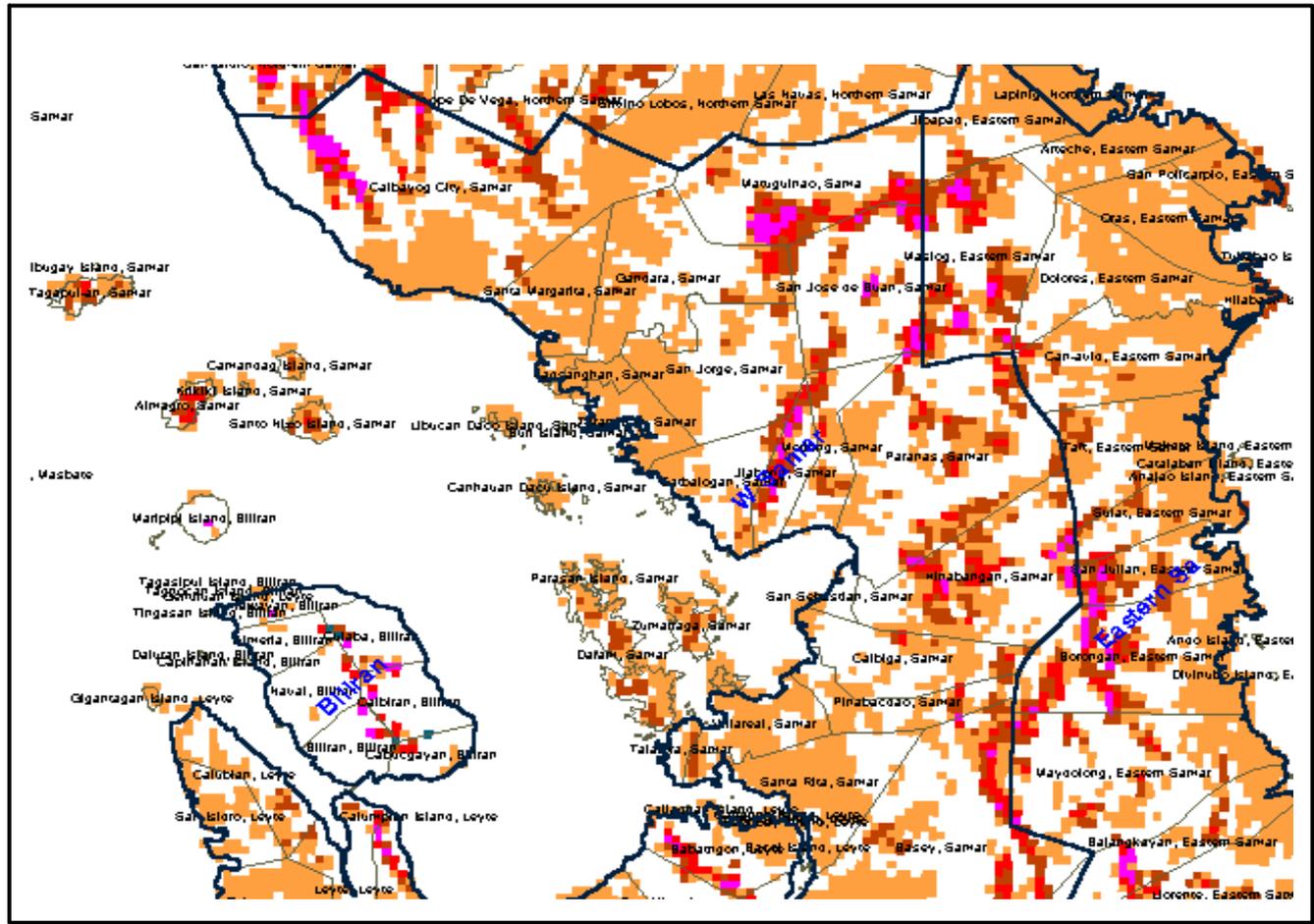
provbd (PROVBND)
municipalities (MUNICIPAL)

Hydro Potential 100% Efficiency (AE)

0
50
100
300
500
1500



Wind Potential (Western Samar)



provbd (PROVBND)
municipalities (MUNICIPAL)

Wind Power (W/m²) (AEPOW)

- 0
- 100
- 200
- 300
- 400
- 600
- 1200

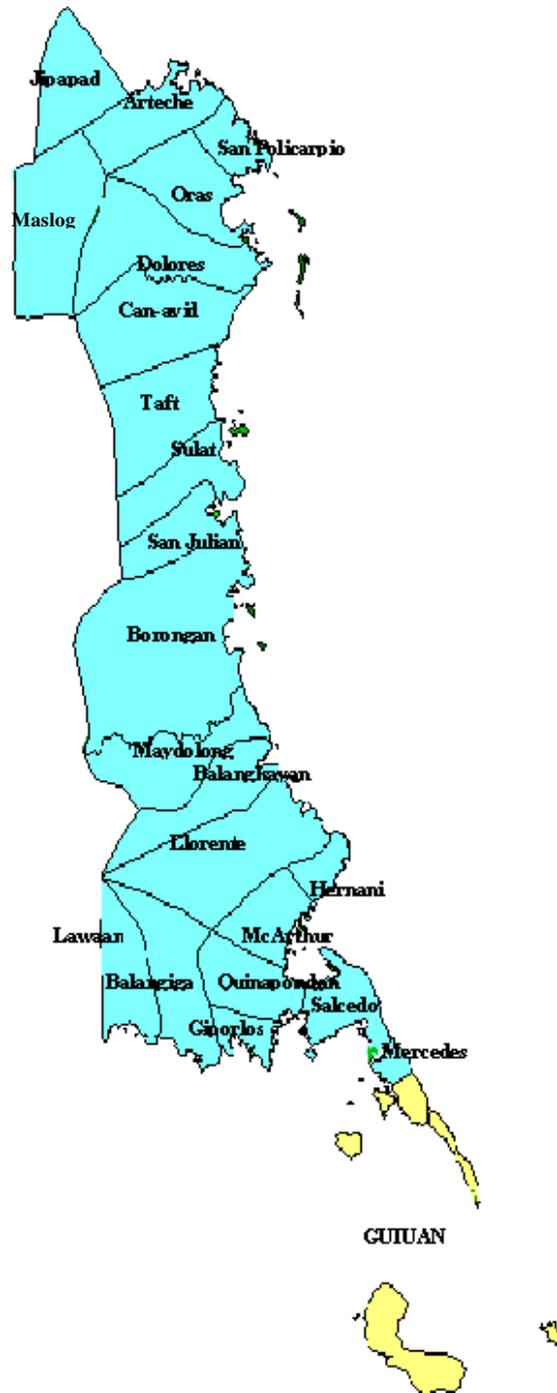


MARKET PACKAGES

Eastern Samar

M.P. # 23 : Guiuan

Eastern Samar



**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

GUIUAN, EASTERN SAMAR Market Package No. 23		1of 3		
General Information				
Political Subdivisions <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	Sixty (60) barangays Thirty-four (34) barangays Twenty-six (26) barangays and these are <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Alingarog ✓ Bagua ✓ Bana-ag ✓ Bituagan ✓ Bucao ✓ Buenavista ✓ Cagdarao ✓ Cagusu-an ✓ Camparang ✓ Canawayon ✓ Cogon ✓ Culasi ✓ Dalaragan </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Gahoy ✓ Habag ✓ Hagna ✓ Mayana ✓ San Antonio ✓ San Pedro ✓ Sapao ✓ Sto. Niño ✓ Suluan ✓ Tagporo ✓ Timala ✓ Trinidad ✓ Victory (Tubabao) </td> </tr> </table>		<ul style="list-style-type: none"> ✓ Alingarog ✓ Bagua ✓ Bana-ag ✓ Bituagan ✓ Bucao ✓ Buenavista ✓ Cagdarao ✓ Cagusu-an ✓ Camparang ✓ Canawayon ✓ Cogon ✓ Culasi ✓ Dalaragan 	<ul style="list-style-type: none"> ✓ Gahoy ✓ Habag ✓ Hagna ✓ Mayana ✓ San Antonio ✓ San Pedro ✓ Sapao ✓ Sto. Niño ✓ Suluan ✓ Tagporo ✓ Timala ✓ Trinidad ✓ Victory (Tubabao)
<ul style="list-style-type: none"> ✓ Alingarog ✓ Bagua ✓ Bana-ag ✓ Bituagan ✓ Bucao ✓ Buenavista ✓ Cagdarao ✓ Cagusu-an ✓ Camparang ✓ Canawayon ✓ Cogon ✓ Culasi ✓ Dalaragan 	<ul style="list-style-type: none"> ✓ Gahoy ✓ Habag ✓ Hagna ✓ Mayana ✓ San Antonio ✓ San Pedro ✓ Sapao ✓ Sto. Niño ✓ Suluan ✓ Tagporo ✓ Timala ✓ Trinidad ✓ Victory (Tubabao) 			
Climate	<ul style="list-style-type: none"> ▪ Marked seasonal period of heavy precipitation at all months of the year ▪ Rainy season: November to January Dry season : July to September ▪ Climatological Data (1998) <ul style="list-style-type: none"> ✓ Total rainfall : 3146.6 mm (whole prov) ✓ No. of rainy days : 192 days ✓ Ave. Temperature : 26.8⁰C 			
Demographic Profile				
Household Population (1995)	▪ 2,755 HH			
Projected HH Population (2000)	▪ 2,867 HH			
Ave. Annual Pop'n Growth Rate	▪ 0.8 (1990 - 1995)			
Average Household Size	▪ 5.02 persons			
Population Density (1995)	▪ 7.9 HH/km ²			
Macro-economic Indicators				
Ave. Annual HH Income (FIES)	▪ PhP 60,634.00 (whole province)			
Ave. HH Expenditures (FIES)	▪ PhP 39,433.00 (whole province)			
Ave. Annual HH Income (MA)	▪ PhP 49,365.85			
Ave. HH Expenditures (MA)	▪ PhP 36,200.37			
Ave. HH Energy Expenditures	▪ PhP 174.42/month			

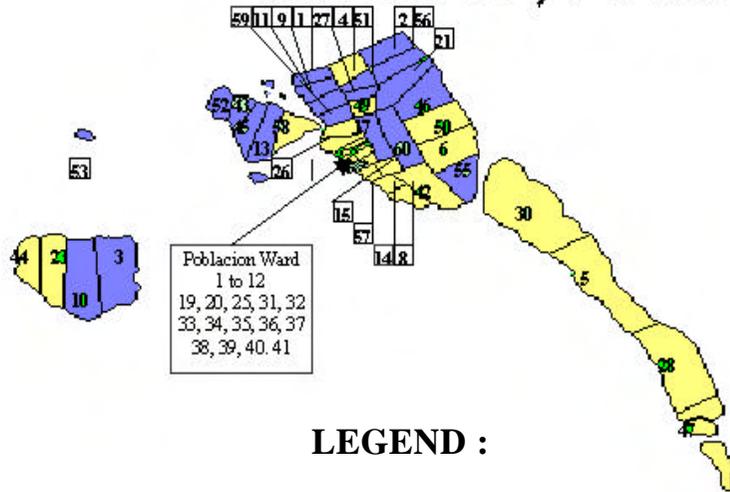
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

GUIUAN, EASTERN SAMAR Market Package No. 23		2 of 3
Municipality Internal Allotment (in Philippine pesos)	<ul style="list-style-type: none"> ▪ 11,971,501.00 (1995) ▪ 12,959,467.00 (1996) ▪ 15,955,527.00 (1997) 	
Municipality Income Class	<ul style="list-style-type: none"> ▪ Fourth 	
Natural Resources		
Land Area (DILG)	<ul style="list-style-type: none"> ▪ 160.00 km² 	
Land Capability Slope Distribution (Topography)	<ul style="list-style-type: none"> ▪ 0 - 3% : 14.35% (level to nearly level) ▪ 3 - 8% : 5.46% (very gently sloping) ▪ 8 - 18% : 18.84% (Gently sloping) ▪ 18 - 30% : 24.32% (Moderately sloping) ▪ above 30% : 37.03% (Strongly sloping) 	
Land Use (DENR, 1997)	<ul style="list-style-type: none"> ▪ Forest lands : 130.05km² ▪ A&D lands : 43.40km² 	
Renewable Energy Resources		
Solar Energy	<ul style="list-style-type: none"> ▪ 5 kWhr/m²/day 	
Wind Energy ✓ Wind power density	<ul style="list-style-type: none"> ▪ 200 - 300 W/m² 	
Economic Activities		
Predominant economic activity	<ul style="list-style-type: none"> ▪ Farming 	
Coconut <ul style="list-style-type: none"> ▪ Total Area Planted to Coconut ▪ Total Number of trees ▪ Number of coco farmers 	<ul style="list-style-type: none"> ▪ 5,610 hectares ▪ 841,500 ▪ 4,780 	
Trade and Industry <ul style="list-style-type: none"> ▪ Trading ▪ Manufacturing ▪ Services ▪ Others 	No. of establishments <ul style="list-style-type: none"> ▪ 173 ▪ 19 ▪ 40 ▪ 7 	

**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

GUIUAN, EASTERN SAMAR Market Package No. 23		3 of 3
Infrastructure and Utilities		
Road Network	The main road network of the province of Eastern Samar runs through the major settlements and along the coastal areas from Arteche to barangay Buenavista in Quinapondan where it branches west to Lawaan and south to Guiuan.	
Air Transportation	Guiuan Airport, built by the US Navy during the WW II period (no commercial flights)	
Port Facilities	Guiuan Port, Brgy. Tulay (causeway/pier)	
Infrastructure and Utilities (continuation)		
Power	<ul style="list-style-type: none"> ▪ Electric Cooperative ▪ Municipal Energ'n Status ▪ Power Tariff (Basic Rates as of December 2000) <ul style="list-style-type: none"> ✓ Residential ✓ Commercial ✓ Industry <ul style="list-style-type: none"> - Demand Charge - Energy Charge ▪ Estimated Cost of Grid Extension 	
	<ul style="list-style-type: none"> ▪ ESAMELCO ▪ 57% ▪ PhP 44.01 for first 10 kWhr PhP 4.4009/kWhr (in excess of 10 kWhr) ▪ PhP 54.01 for first 12 kWhr PhP 4.5009/kWhr (in excess of 12 kWhr) ▪ PhP 15.00/kW ▪ PhP 4.4009/kWhr ▪ PhP 15,852,716.00 	
Social Services		
Health	<ul style="list-style-type: none"> ▪ Southern Samar General Hospital, Guiuan ▪ Josue S. Agpalo Hospital, Guiuan ▪ Immaculate Concepcion Clinic, Guiuan 	
Education (Schools)	<ul style="list-style-type: none"> ▪ Elementary ▪ Secondary 	
	<ul style="list-style-type: none"> ▪ 40 ▪ 5 	

GUIUAN, EASTERN SAMAR



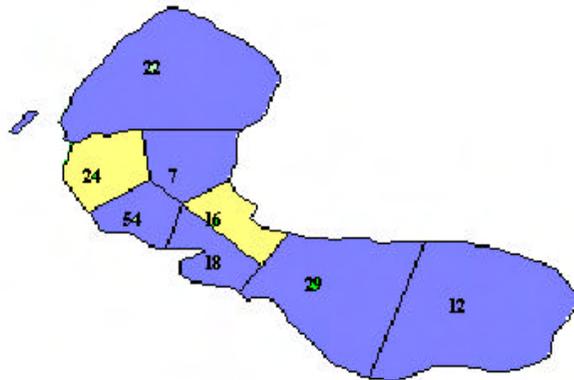
LEGEND :



ENERGIZED



UNENERGIZED

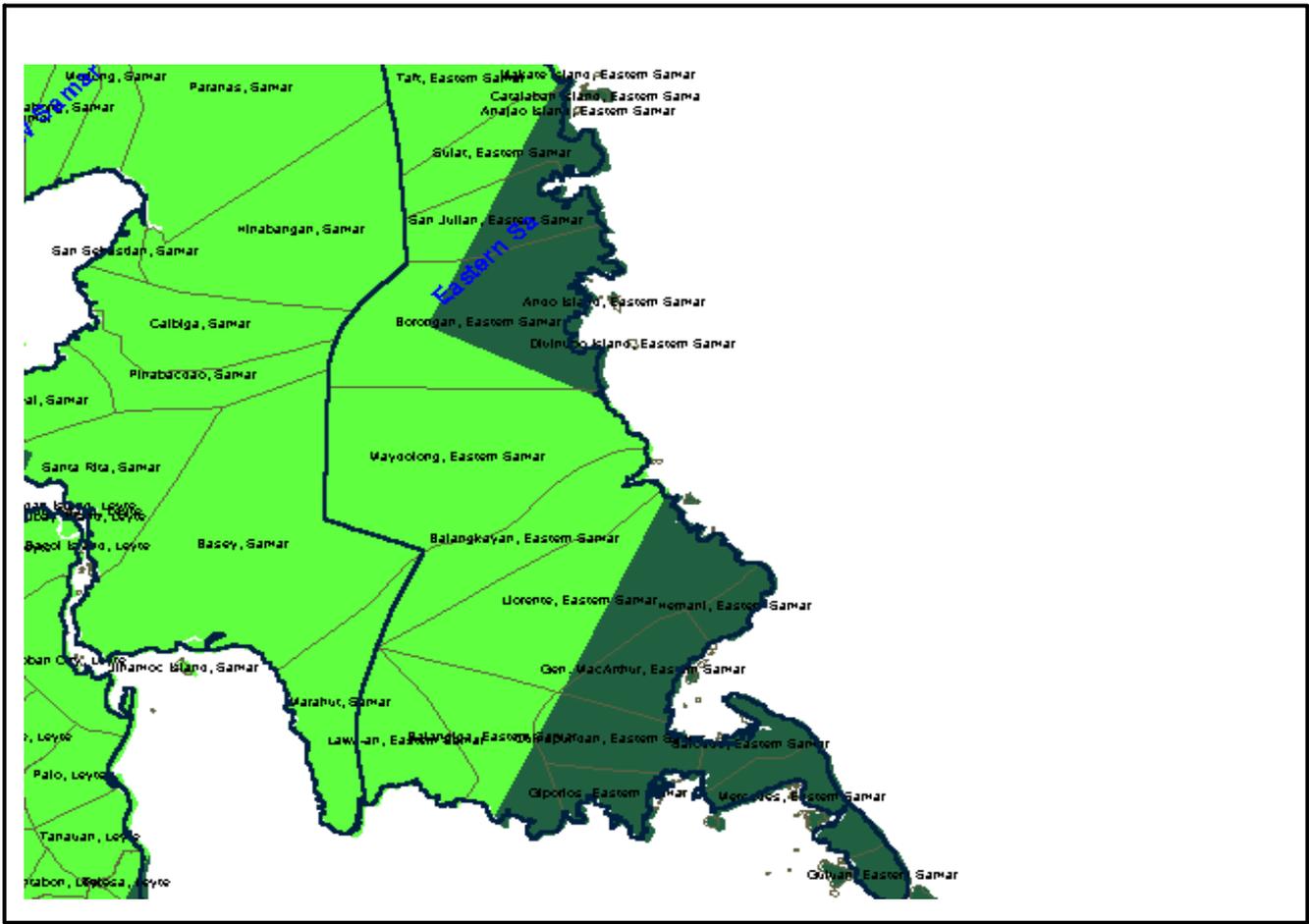


1. Alingarog
2. Bagua
3. Banaag
4. Banahao
5. Baras
6. Barbo
7. Bitaugan
8. Bungtod
9. Bucao
10. Buenavista
11. Cagdara-o
12. Cagusuan
13. Camparang
14. Campoyong
15. Cantahay
16. Casuguran
17. Cogon
18. Culasi
19. Pob Ward 10
20. Pob Ward 9-A
21. Gahoy
22. Habag
23. Hamorawon
24. Inapulangan
25. Pob Ward 4-A
26. Lupok
27. Mayana
28. Ngolos
29. Pagbabangnan
30. Pagnamitan
31. Pob Ward 1
32. Pob Ward 2
33. Pob Ward 11
34. Pob Ward 12
35. Pob Ward 3

36. Pob Ward 4
37. Pob Ward 5
38. Pob Ward 6
39. Pob Ward 7
40. Pob Ward 8
41. Pob Ward 9
42. Salug
43. San Antonio
44. San Jose
45. San Pedro
46. Sapao
47. Sulangan
48. Suluan
49. Surok
50. Taytay
51. Timala
52. Trinidad
53. Victory Island
54. Canawayon
55. Dalarangan
56. Hagna
57. Hollywood
58. San Juan
59. Sto. Nino
60. Tagporo



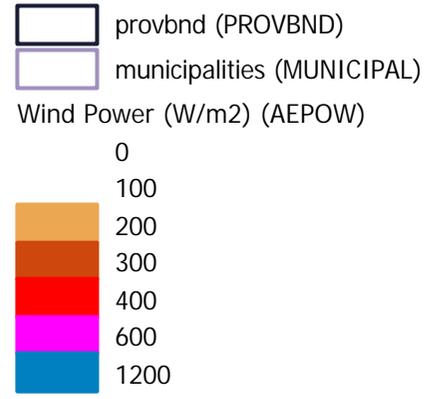
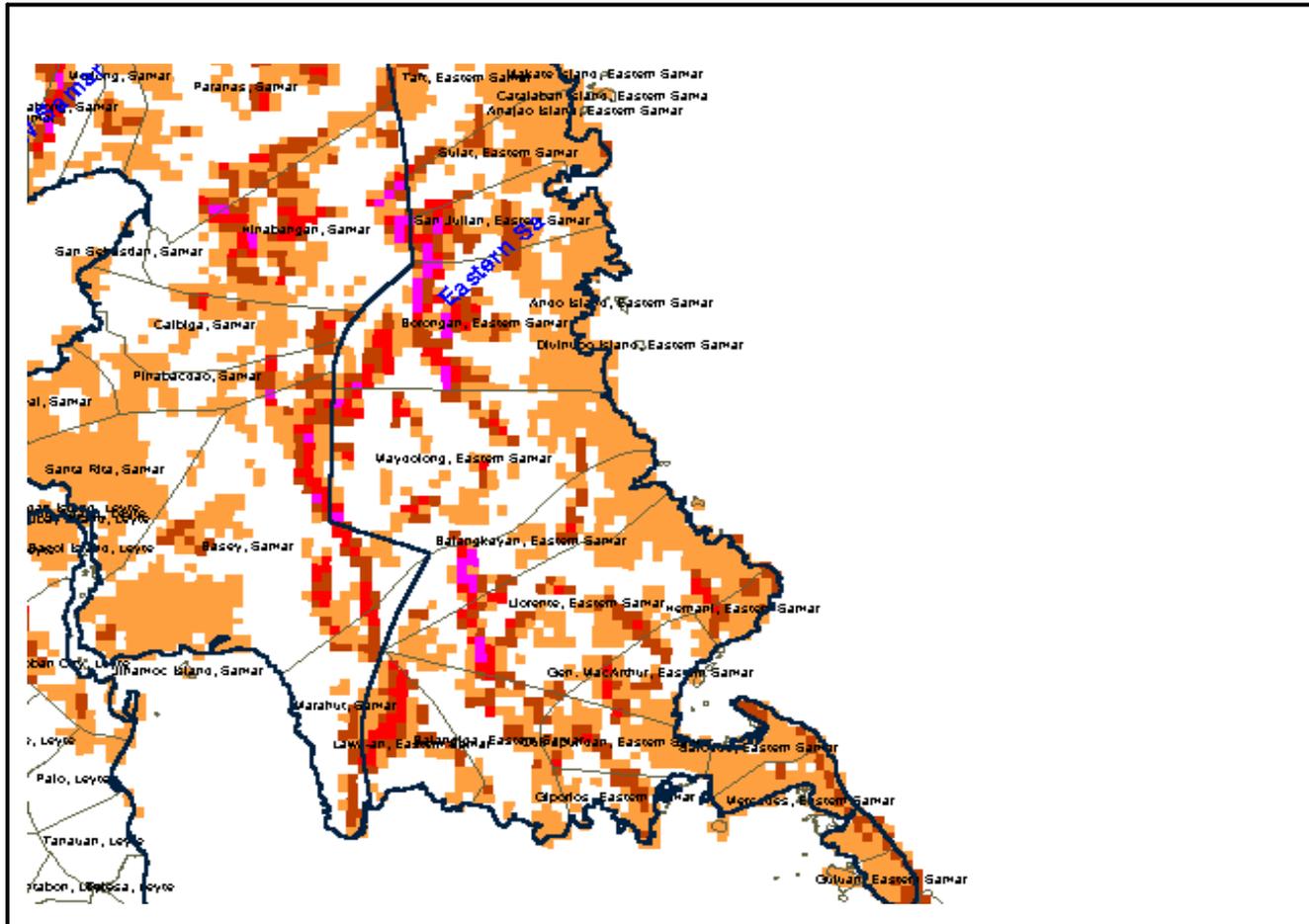
Solar Energy Potential (Eastern Samar)



provbnd (PROVBND)
municipalities (MUNICIPAL)
Annual (kWhr/m2/day) Global Horizontal (AEANN)
5
6



Wind Potential (Eastern Samar)



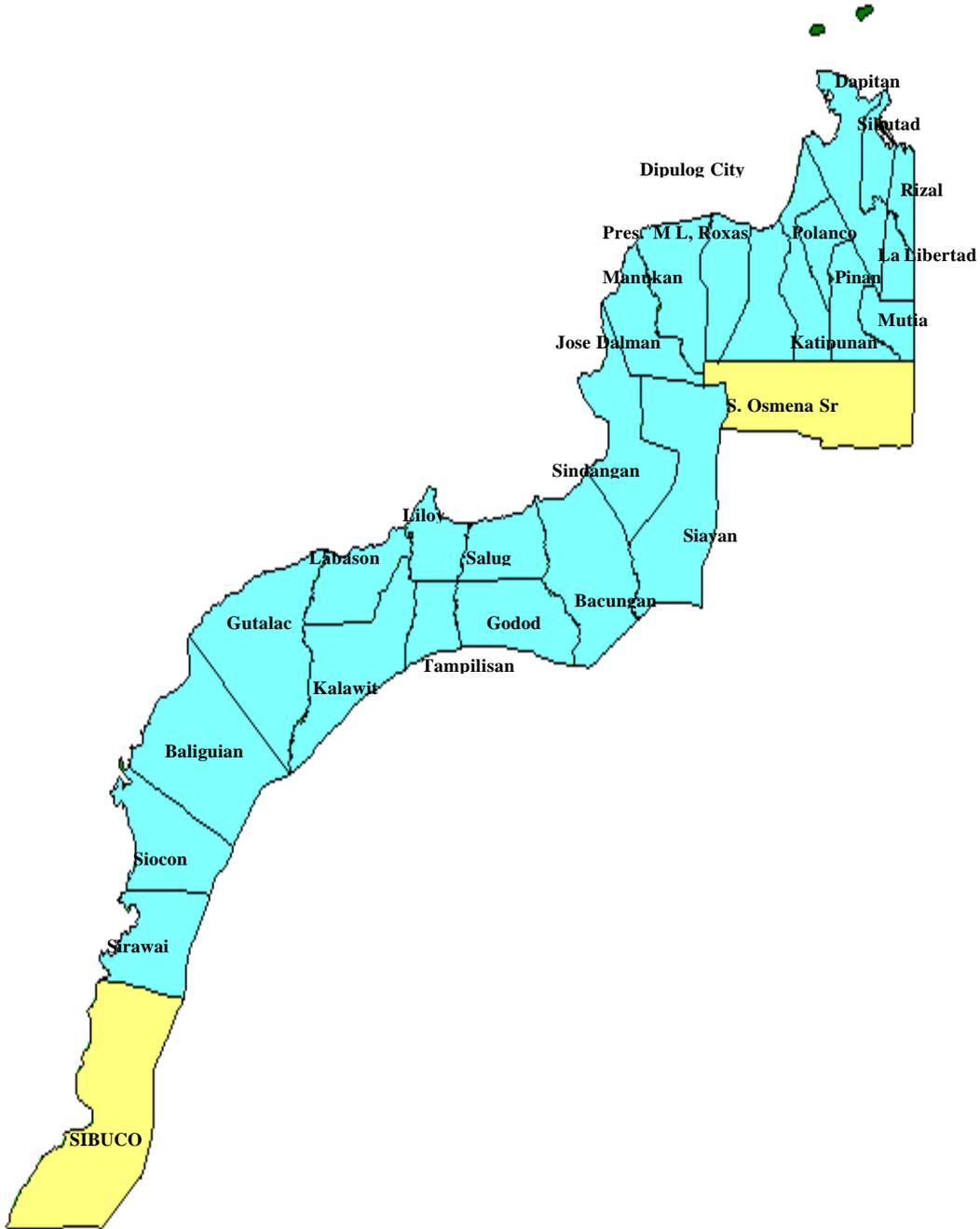
MARKET PACKAGES

Zamboanga Norte

M.P. # 24 : Sergio Osmeña

M.P. # 25 : Sibuco

Zamboanga Norte



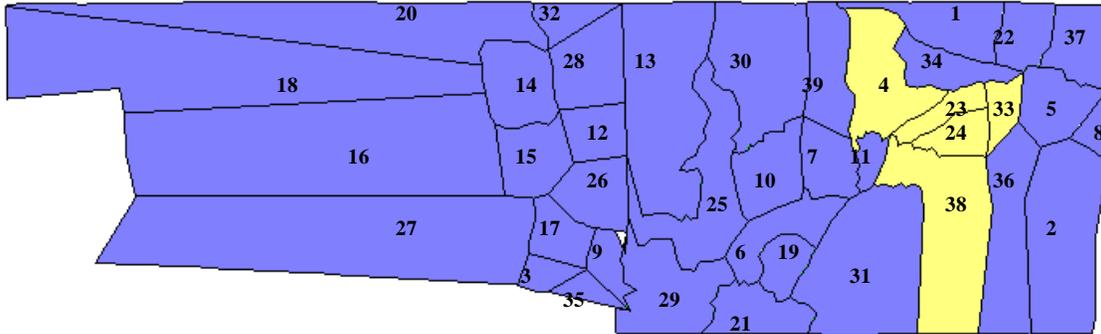
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

SERGIO OSMEÑA, ZAMBOANGA NORTE		1 of 2		
Market Package No. 24				
General Information				
Political Subdivisions <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	Thirty-nine (39) barangays Five (5) barangays Thirty-four (34) barangays and these are <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Antonino ✓ Bagumbayan ✓ Bagong Baguio ✓ Buenavista ✓ Dampalan ✓ Danao ✓ Don Eleno ✓ Kauswagan ✓ Labiray ✓ Liwanag ✓ Mabuhay ✓ Macalibre ✓ Mahayahay ✓ Marapong ✓ Nazareth ✓ Nebo ✓ New Rizal </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ New Tangub ✓ Nueva Vista ✓ Pedangan ✓ Penacio ✓ Princesa Freshia ✓ Princesa Lamaya ✓ San Antonio ✓ San Francisco ✓ San Isidro ✓ San Jose ✓ San Juan ✓ Sinaad ✓ Situbo ✓ Tinago ✓ Tinidungan ✓ Tuburan ✓ Wilben </td> </tr> </table>		<ul style="list-style-type: none"> ✓ Antonino ✓ Bagumbayan ✓ Bagong Baguio ✓ Buenavista ✓ Dampalan ✓ Danao ✓ Don Eleno ✓ Kauswagan ✓ Labiray ✓ Liwanag ✓ Mabuhay ✓ Macalibre ✓ Mahayahay ✓ Marapong ✓ Nazareth ✓ Nebo ✓ New Rizal 	<ul style="list-style-type: none"> ✓ New Tangub ✓ Nueva Vista ✓ Pedangan ✓ Penacio ✓ Princesa Freshia ✓ Princesa Lamaya ✓ San Antonio ✓ San Francisco ✓ San Isidro ✓ San Jose ✓ San Juan ✓ Sinaad ✓ Situbo ✓ Tinago ✓ Tinidungan ✓ Tuburan ✓ Wilben
<ul style="list-style-type: none"> ✓ Antonino ✓ Bagumbayan ✓ Bagong Baguio ✓ Buenavista ✓ Dampalan ✓ Danao ✓ Don Eleno ✓ Kauswagan ✓ Labiray ✓ Liwanag ✓ Mabuhay ✓ Macalibre ✓ Mahayahay ✓ Marapong ✓ Nazareth ✓ Nebo ✓ New Rizal 	<ul style="list-style-type: none"> ✓ New Tangub ✓ Nueva Vista ✓ Pedangan ✓ Penacio ✓ Princesa Freshia ✓ Princesa Lamaya ✓ San Antonio ✓ San Francisco ✓ San Isidro ✓ San Jose ✓ San Juan ✓ Sinaad ✓ Situbo ✓ Tinago ✓ Tinidungan ✓ Tuburan ✓ Wilben 			
Demographic Profile				
Household Population (1995)	▪ 4,020 Households			
Projected HH Population (2000)	▪ 4,699 Households			
Ave. Annual Pop'n Growth Rate	▪ 3.17 %			
Population Density (1995)	▪ 7.41 HH/km ²			
Ave. HH Size	▪ 5.07 persons			
Macro-economic Indicators				
Ave. Annual HH Income	▪ PhP 22,529.00			
Ave. Annual HH Expenditures	▪ PhP 9,005.80			
Ave. Annual HH Disp. Income	▪ PhP 13,523.20			
Ave. HH Energy Expenditures	▪ PhP 53.64/month			
Municipality Income Class	▪ Fourth (4 th) Class			
Natural Resources				
Land Area (DENR, 1998)	▪ 542.9 km ²			
Land Capability Slope Distribution (Topography)	▪ Upland			

**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

SERGIO OSMENA, ZAMBOANGA NORTE		2 of 2
Market Package No. 24		
Renewable Energy Resources		
Solar Energy	▪	6 kWhr/m ² /day
Wind Energy	▪	200 - 300 W/m ²
✓ Wind power density	▪	50 - 500 watts
Hydro Power	▪	
Economic Activities		
Predominant Economic Activities	▪	Farming
Other Livelihood Activities	▪	Bamboo furniture making
	▪	Mat weaving
Utilities		
Power	▪	ZANECO
▪ Electric Cooperative	▪	13 %
▪ Municipal Energ'n Status		
▪ Power Tariff (Basic Rates as of December 2000)	▪	PhP 42.67 for first 15 kWhr
✓ Residential		PhP 2.8446/kWhr (in excess of 15 kWhr)
✓ Commercial	▪	PhP 57.89 for first 20 kWhr
		PhP 2.8946/kWhr (in excess of 20 kWhr)
✓ Industry	▪	PhP 18.00/kW
- Demand Charge	▪	PhP 2.8446/kWhr
- Energy Charge		
▪ Estimated Cost of Grid Extension	▪	PhP 52,563,810.00
Social Services		
Education (Schools)	▪	At least 34 schools

S. OSMENA SR., ZAMBOANGA DEL NORTE



1. Antonino
2. Bagong-Baguio
3. Bagumbayan
4. Biayon
5. Buenavista
6. Dampalan
7. Danao
8. Don Eleno
9. Kauswagan
10. Labiray
11. Liwanag
12. Mabuhay
13. Macalibre
14. Mahayahay
15. Marapong
16. Nazareth
17. Nebo
18. New Rizal
19. New Tangub
20. Nuevavista
21. Pedagan
22. Penacio
23. Poblacion Alto
24. Poblacion Bajo
25. Princesa Lamaya
26. Princesa Freshia
27. San Antonio
28. San Francisco
29. San Isidro
30. San Jose
31. San Juan
32. Sinaad
33. Sinai
34. Situbo
35. Tinago
36. Tinindugan
37. Tuburan
38. Venus
39. Wilben

LEGEND :

-  ENERGIZED
-  UNENERGIZED

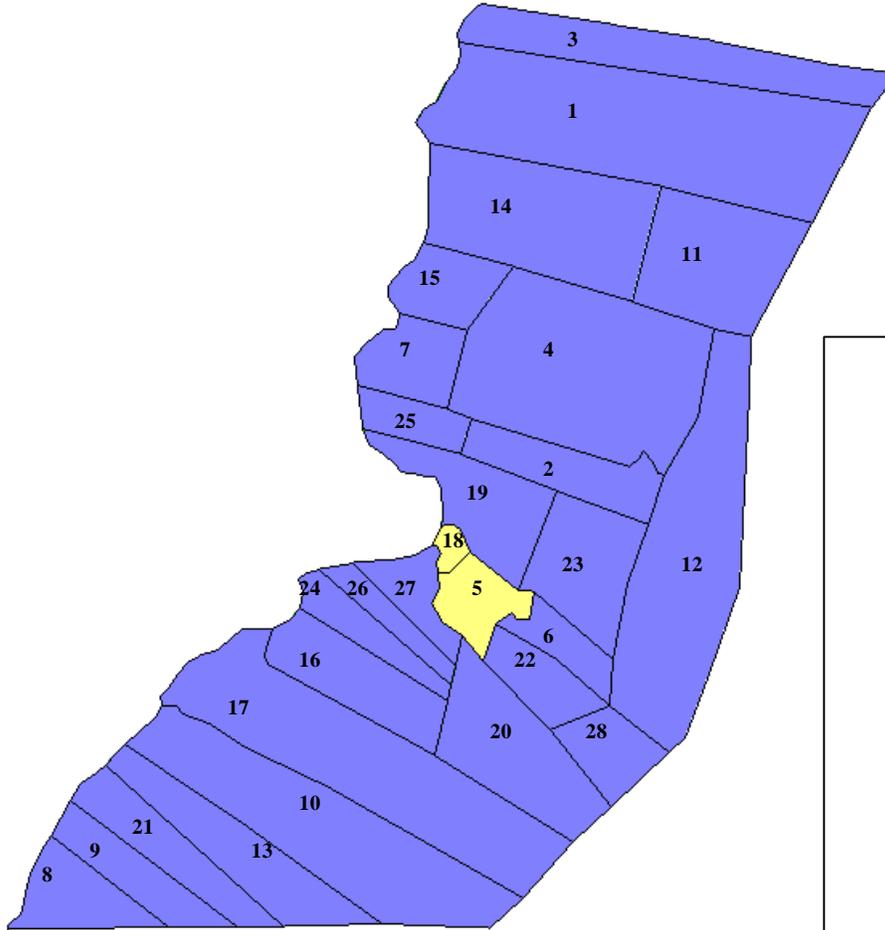
**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

SIBUCO, ZAMBOANGA NORTE		1 of 2		
Market Package No. 25				
General Information				
Political Subdivisions <ul style="list-style-type: none"> ▪ Number of barangays ▪ Number of energized barangays ▪ Number of unenergized barangays 	Twenty-eight (28) barangays Two (2) barangays Twenty-six (26) barangays and these are <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Anongan ✓ Basak ✓ Bungalao ✓ Cabbunan ✓ Cawit-cawit ✓ Culagoan ✓ Cusipan ✓ Dinulan ✓ Kamarangan ✓ Lakiki ✓ Lambagoan ✓ Limpapa ✓ Lingayon </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> ✓ Lintangan ✓ Litawan ✓ Lunday ✓ Malayal ✓ Mantivo ✓ Nala ✓ Panganuran ✓ Pangian ✓ Paniran ✓ Pasilnabut ✓ Puliran ✓ Santo Niño ✓ Tangarak </td> </tr> </table>		<ul style="list-style-type: none"> ✓ Anongan ✓ Basak ✓ Bungalao ✓ Cabbunan ✓ Cawit-cawit ✓ Culagoan ✓ Cusipan ✓ Dinulan ✓ Kamarangan ✓ Lakiki ✓ Lambagoan ✓ Limpapa ✓ Lingayon 	<ul style="list-style-type: none"> ✓ Lintangan ✓ Litawan ✓ Lunday ✓ Malayal ✓ Mantivo ✓ Nala ✓ Panganuran ✓ Pangian ✓ Paniran ✓ Pasilnabut ✓ Puliran ✓ Santo Niño ✓ Tangarak
<ul style="list-style-type: none"> ✓ Anongan ✓ Basak ✓ Bungalao ✓ Cabbunan ✓ Cawit-cawit ✓ Culagoan ✓ Cusipan ✓ Dinulan ✓ Kamarangan ✓ Lakiki ✓ Lambagoan ✓ Limpapa ✓ Lingayon 	<ul style="list-style-type: none"> ✓ Lintangan ✓ Litawan ✓ Lunday ✓ Malayal ✓ Mantivo ✓ Nala ✓ Panganuran ✓ Pangian ✓ Paniran ✓ Pasilnabut ✓ Puliran ✓ Santo Niño ✓ Tangarak 			
Demographic Profile				
Household Population (1995)	▪ 3,905 Households			
Projected HH Population (2000)	▪ 4,375 Households			
Ave. Annual Pop'n Growth Rate	▪ 2.3 %			
Population Density (1995)	▪ 5.1 HH/km ²			
Ave. HH Size	▪ 5.12 persons			
Macro-economic Indicators				
Ave. Annual HH Income	▪ PhP 61,617.05			
Ave. Annual HH Expenditures	▪ PhP 33,222.41			
Ave. Annual HH Disp. Income	▪ PhP 28,394.64			
Ave. HH Energy Expenditures	▪ PhP 116.26/month			
Municipality Income Class	▪ Second (2 nd) Class			
Natural Resources				
Land Area (DENR, 1998)	▪ 766.4 km ²			
Land Capability Slope Distribution (Topography)	▪ Lowlands - coastal			
Renewable Energy Resources				
Solar Energy	▪ 6 kWhr/m ² /day			
Wind Energy ✓ Wind power density	▪ 200 W/m ²			

**USAID/PA-DOE TA on Enhancing Private Sector Participation
in Renewable Energy Investments for Off-Grid Rural Electrification**

SIBUCO, ZAMBOANGA NORTE Market Package No. 25		2 of 2
Hydro Power	<ul style="list-style-type: none"> ▪ 50 Watts 	
Economic Activities		
Predominant Economic Activities	<ul style="list-style-type: none"> ▪ Fishing 	
Other Livelihood Activities	<ul style="list-style-type: none"> ▪ Furniture making 	
Utilities		
Power	<ul style="list-style-type: none"> ▪ Electric Cooperative ▪ Municipal Energy Status ▪ Power Tariff (Basic Rates as of December 2000) <ul style="list-style-type: none"> ✓ Residential ✓ Commercial ✓ Industry <ul style="list-style-type: none"> - Demand Charge - Energy Charge ▪ Estimated Cost of Grid Extension 	
	<ul style="list-style-type: none"> ▪ ZAMSURECO II ▪ 7 % ▪ PhP 40.57 for first 15 kWhr PhP 2.7046/kWhr (in excess of 15 kWhr) ▪ PhP 55.09 for first 20 kWhr PhP 2.7546/kWhr (in excess of 20 kWhr) ▪ PhP 15.00/kW ▪ PhP 2.7146/kWhr ▪ PhP 30,091,429.00 	
Social Services		
Education (Schools)	<ul style="list-style-type: none"> ▪ At least 26 schools 	

SIBUCO, ZAMBOANGA DEL NORTE



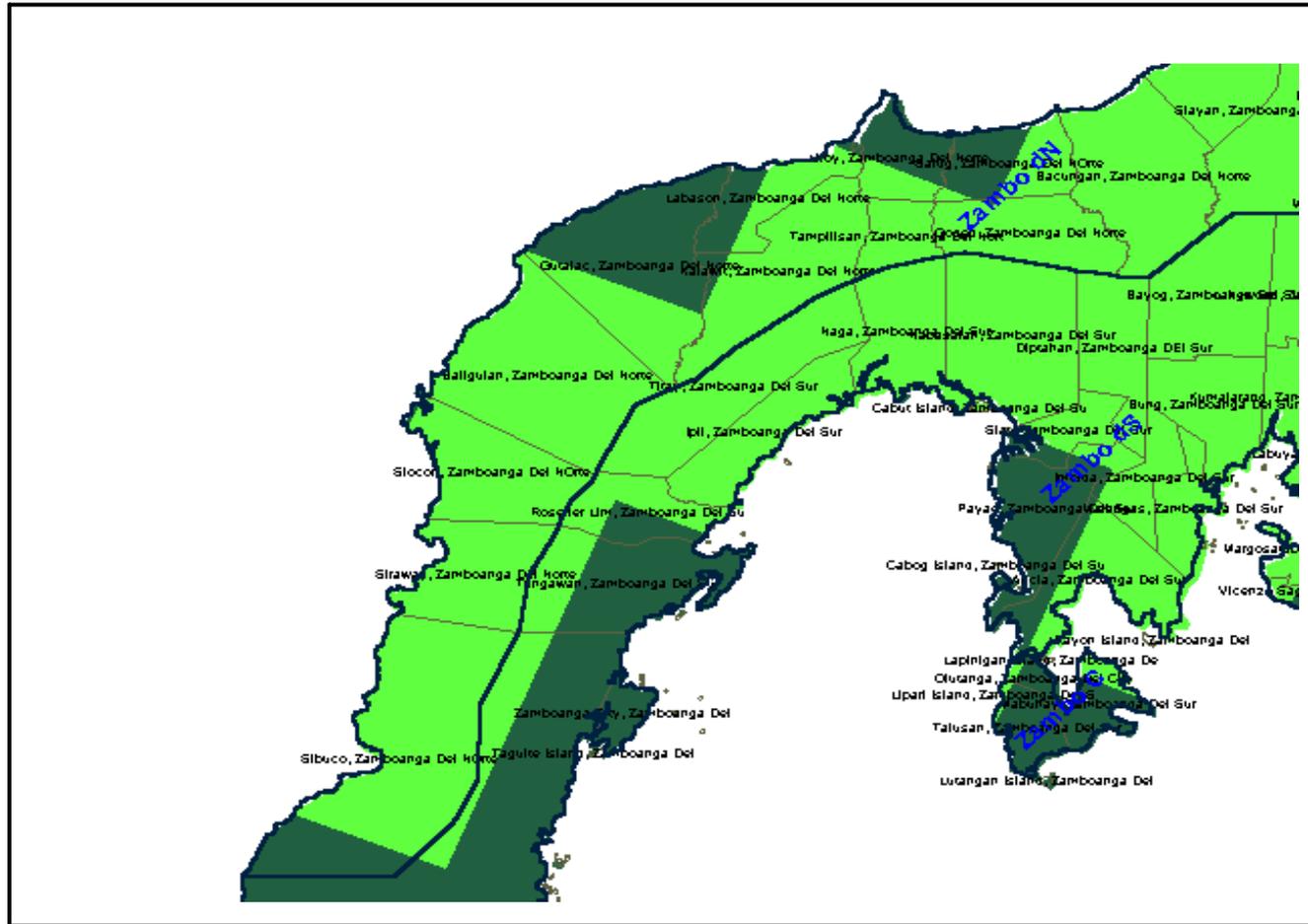
LEGEND :

 ENERGIZED

 UNENERGIZED

1. Anongan
2. Basak
3. Cawit-cawit
4. Dinulan
5. Jatian
6. Lakiki
7. Lambagoan
8. Limpapa
9. Lingayon
10. Lintangan
11. Litawan
12. Lunday
13. Malayal
14. Mantivo
15. Panganuran
16. Pangian
17. Paniran
18. Poblacion
19. Puliran
20. Santo Nino
21. Bongalao
22. Cabbunan
23. Culaguan
24. Cusipan
25. Kamarangan
26. Nala
27. Pasilnahut
28. Tangarak

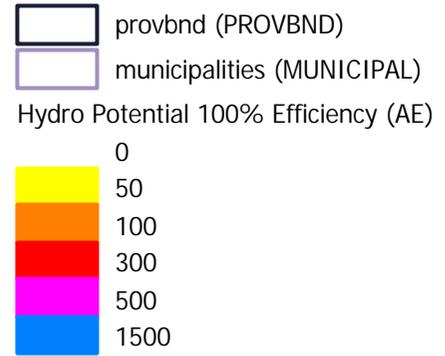
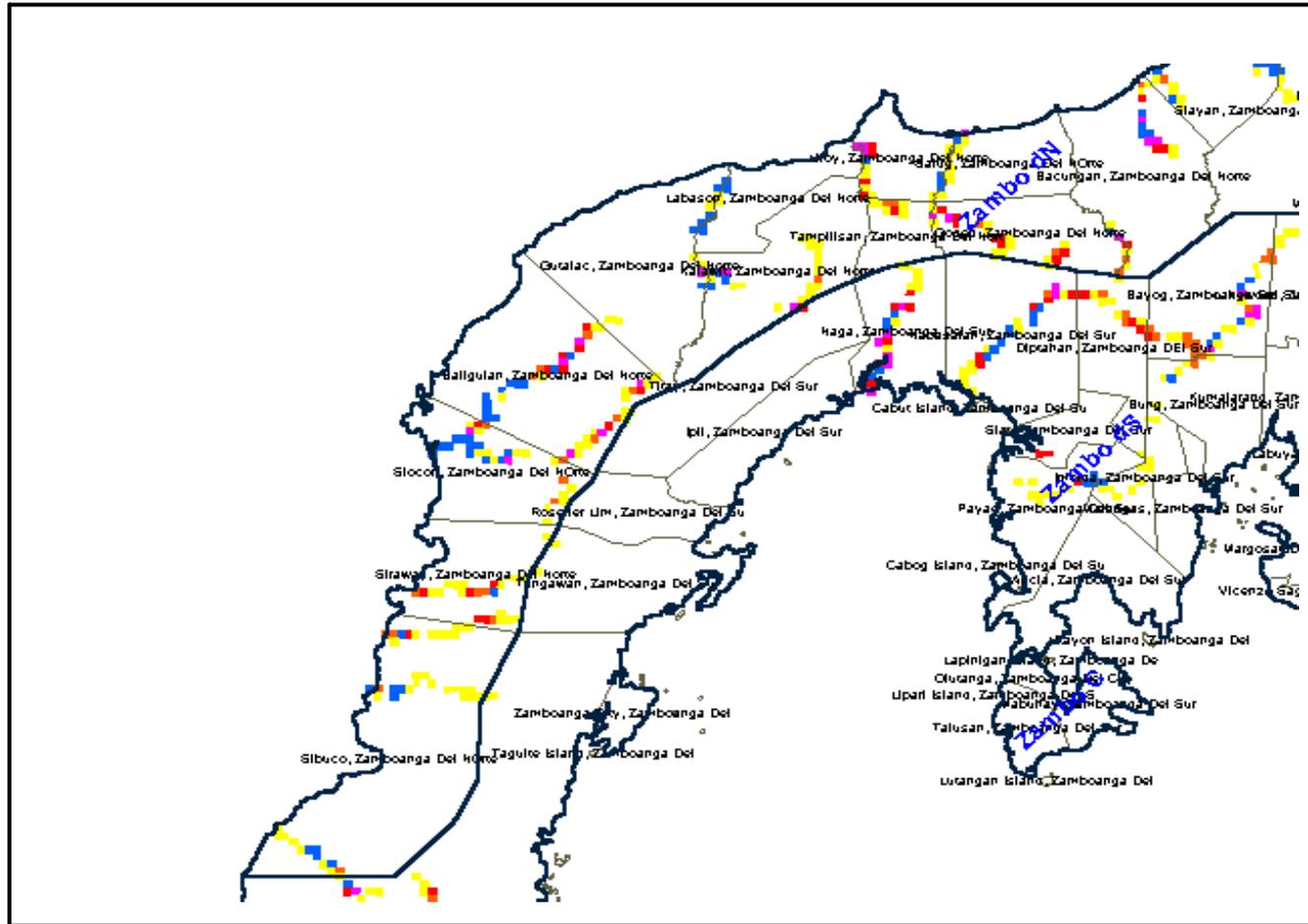
Solar Energy Potential (Zaboanga del Norte)



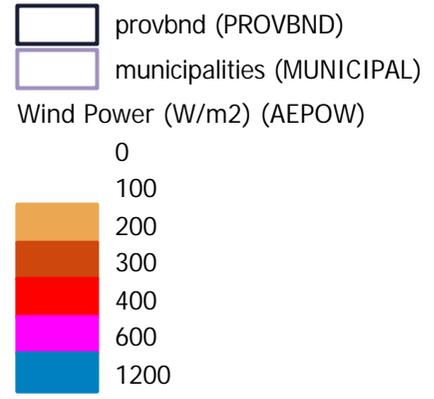
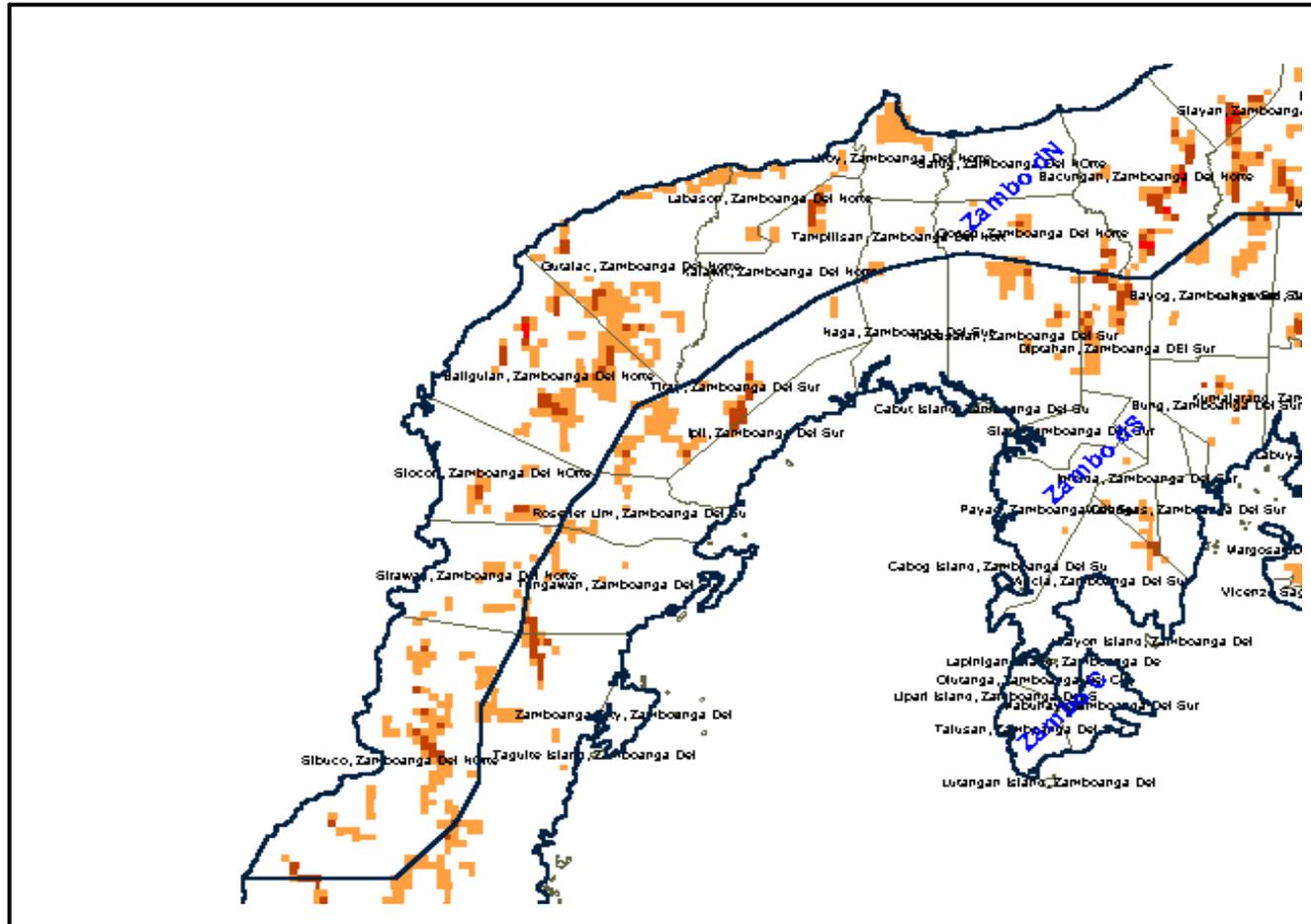
provbnd (PROVBND)
municipalities (MUNICIPAL)
Annual (kWhr/m2/day) Global Horizontal (AEANN)
5
6



Hydro Potential (Zamboanga del Norte)



Wind Potential (Zaboanga del Norte)



CHAPTER 5

Rural Electrification Market Packaging: Skills Transfer (Mentoring of DOE Staff)

80. One of the deliverables of Task 3 is the mentoring of a DOE-EUMB/NCED staff in identifying rural electrification market packages.
81. Specifically, Task 3 focuses on five regions and there are still a large number of non-electrified barangays that need to be clustered together to be attractive to the private sector. Thus, the intent of this deliverable is to provide a DOE staff adequate appreciation and skills in handling/processing vast information to continue with the rural electrification market packaging.
82. Rodel Padrique was assigned to work with the consultant. He participated in most of the meetings and consultations and particularly in processing the information.
83. To facilitate systematic use of the information gathered, a database program was developed. Mr. Padrique provided vital inputs in developing the program.

The Database Development for the Market Packages

84. A special database system for the conduct of the market package identification and prioritization was developed. The computer database program based on Microsoft ACCESS 97 contained all the secondary data used in the identification and analysis of the market packages. Aptly called "Market Package (MKTPACK) for Off-grid Electrification", the program was used to conduct the prioritization of the 25 market packages.
85. Below is a brief description of the database:

- **Structure of the Database**

The database consists of three (3) major tables, namely, Barangay Table, the Municipality Table, and the EC (Electric Cooperative) Table. Considering that the system is only intended for preliminary database development, there are other data fields which have been included in the system but was not actually used. Likewise, important information on each of the market packages but not directly needed in the screening and ranking of the market packages have also been included in the said tables. Future activities may involve the completion of some blank data fields in the three tables as well as the addition of additional fields to store other information.

- a. **The Barangay Table**

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The Barangay Table contains the records of all unelectrified barangays in the country reported by NEA as of May 2000. Fields for each barangay include the municipality, the covering EC, the number of households based on 1995 census conducted by the National Survey Office, the default NEA schedule and option for electrification and the NEA's estimated cost of electrification. There are 8,000 barangays recorded in this table. Listing of datafields for the barangay table is given in Table 5.

Table 5. The Data Entries for the Barangay Table

Data Field	Description	Data Type/ Units	Data Source	Remarks
Barangay ID	Entry Number	Auto No.	N/A	N/A
Barangay	Name of Barangay	Text	NEA (2000)	
Municipality	Name of Municipality	Text	NEA (2000)	
EC	Name of Covering EC	Text	NEA (2000)	
HHs '95	Number of Households Per Barangay	Number	NSO (1995)	Census 2000 not available at the time of study
Schedule	Energization Schedule by NEA	Year	NEA (2000)	
Option	Default Electrification Option by NEA	Text	NEA (2000)	
NEA Cost	Cost of Electrification	Pesos	NEA (2000)	
Area	Total Land Area	Hectares	DILG (2000)	
Grid Distance	Ave. Distance from Nearest Post	Kilometers	NEA (2000)	
WTP	Willingness to Pay by Households	Pesos per month	WB MA Study (2000)	Data only for 300 bgys.
CTP	Capacity to Pay by Households	Pesos per month	WB MA Study (2000)	Data only for 300 bgys.

b. Municipality Table

The Municipality Tables contains records of all municipalities with unelectrified barangays. Important fields used to characterize the municipalities include the covering EC, land area, number of barangays, total households, number of unenergized barangays scheduled for electrification by 2001-2004, income classification, among others. A separate field was also included to indicate whether the municipality was covered or not by the Market Assessment Study by the World Bank. Such information were used in the 3-stage screening of municipalities and in the identification of the 25 priority market packages as required by USAID Technical Assistance. More than 400 municipalities have been stored in the table. Table 6 shows the listing of data fields for this table.

Table 6. The Data Entries for the Municipality Table. Raw Data.

Data Field	Description	Data Type/ Units	Data Source
Municipality ID	Entry Number	Autonumber	N/A

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Municipality Name	Name of the Municipality	Text	NEA (2000)
Province	Name of Province	Text	NEA (2000)
EC ID	Name of Franchising EC	Text	NEA (2000)
Region	Region of Location	Text	NEA (2000)
DOF Classification	Classification of municipality as per 6-tier system provided by DOF Circular No. ___	Number (1-6)	DOF
Total Bgys	Total No. of Barangays in the municipality	Count of bgys/ Integer	NEA (2000)
Energized Bgys	No. of energized bgys in the municipality	Count of bgys/ Integer	NEA (2000)
Unenergized Bgys	No. of unenergized bgys in the municipality	Count of bgys/Integer	NEA (2000)
Tot Hhs	Sum of households of the barangays in the municipality	Count of hhs/ Integer	NSO (1995)
Total Unenergized Hhs	Sum of unenergized households of the bgys in the municipality	Count of hhs/ Integer	NEA (2000)
WTP	Average Willingness to Pay by the households in the municipality	Pesos per month	WB MA Study (2000)
Total Land Area	Total land area of the municipality	Hectares	DILG (2000)
PercentElecEC	Percentage of electrification by the EC covering the area	Percent	NEA (2000)
PercentElecMun	Percentage of electrification in the municipality	Percent	NEA (2000)

Meanwhile, several data fields have also been provided for those important values that will be derived from the raw data. Said derived or calculated values are summarized in Table 7.

Table 7. The Data Entries for the Municipality Table. Calculated Values

Data Field	Description	Data Type/ Units	Remarks
Pop Density	Density of unelectrified hhs per municipality	Unenergized hhs per ha.,	Obtained by dividing unelectrified hhs in the municipality by its land area.
Ave HH Income	Ave. Household Income	Pesos/year	Ave values for the households in the municipality surveyed by WB MA Study.
Ave HH Tot Expenditure	Ave. Household Total Expenditure	Pesos/year	Ave values for the households in the municipality surveyed by WB MA Study.
Ave Disp Income	Ave. disposable income per Household	Pesos/year	Ave values for the households in the municipality surveyed by WB MA Study.
AveHHEgyExpenditure	Ave. Household energy expenditure	Pesos/year	Ave values for the households in the municipality surveyed by WB MA Study.

To store the values of the results of the four screenings conducted for the study, a set of special data fields have also been provided in the

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in Renewable Energy Investments for Off-Grid Rural Electrification**

Municipality Table. Table 8 lists all the special fields used in storing the results of the analysis in this study.

Table 8. The Data Entries for the Municipality Table. Data for Screening Results

Data Field	Description
PassScreening1	Indicator if the municipality passed Screening level 1 (Yes/No)
PassScreening2	Indicator if the municipality passed Screening level 2 (Yes/No)
PassScreening3	Indicator if the municipality passed Screening level 3 (Yes/No)
Pass123	Indicator if the municipality passed all screenings 1, 2 and 3(Yes/No)
PointsHHs	Score received for household criterion during Screening4
PointsDOFClass	Score received the criterion "DOF Classification" on screening level 4
PointsDispIncome	Score garnered for the criterion "Disposable Household Income" during Screening level 4
PointsEEExpen	Score garnered for the criterion "Household Energy Expenditure" during Screening level 4
PointsPopDensity	Score garnered for the criterion "Density of Unelectrified Households" during Screening 4
Sum	Total scores received during Screening level 4
RankScreening4	Ranking of market packages based on the "sum" of scores in Screening 4

The Municipality Table is the largest table in the database system. Future enhancement of the database systems may separate these tables according to the three groupings made in these sections.

c. EC Table

The EC Table, on the other hand, contains the records of the electric cooperatives covering the unelectrified barangays in the Barangay Table. Important information such as EC's franchise coverage in terms of number of barangays, the number of barangays reported energized, the percent energization, among others, have been used to characterize each EC. Said information were used during the preliminary screening of the municipality. Table 9 lists the data fields included in the EC table.

There are indeed other relevant information regarding the electric cooperatives covering the municipalities which can be included in the future work. These include, among others, the prevailing electricity consumption of the average EC customers (residential, commercial, industrial) as well as the performance indicators of the operation of the ECs in the rural areas which may be useful when the processes for screening the market packages will become more complicated later.

Table 9. The Data Entries for the EC Table.

Data Field	Description	Data Type/ Units	Data Source
EC ID	EC Entry Number	Autonumber	
EC Name	Name of the electric cooperative	Text	NEA
EC Bgys	No. of barangays covered by the franchise of the EC	Count of bgys/ Integer	NEA (2000)

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in Renewable Energy Investments for Off-Grid Rural Electrification**

EC Bgys Energized	No of barangays energized by EC within its franchise area	Count of bgys/Integers	NEA (2000)
EC Pot Hhs	No. of households covered by the franchise of the EC	Count of hhs/Integer	NSO (1995)
EC HH Conn	No. of households already served by the EC in its franchise area	Count of hhs/Integer	NEA (2000)
Percent HH Elec EC	Percent electrification at household level by the EC in its franchise area	Percent	Derived
Percent Bgy Elec EC	Percent electrification at barangay level by the EC in its franchise area	Percent	Derived

d. The Database Organization

A switchboard manager has also been created to guide the potential users of the database program. A start-up form was also included to introduce the purpose of the database. Indeed, the said database is by no means complete. Other information included in the three tables which are not yet filled up due to lack of time by the consultants. Nevertheless, these information, though necessary to fully complete the characterizations of the market packages, are not necessary in the conduct of the screening and the final selection of the market package. It is expected that the Department of Energy, which is target user of the said database, may complete the said database or may reduce the data requirements of the system according to its own needs in the future.

▪ **Data Manipulation and other Related Calculations**

Various data entry/editing forms have also been prepared for easy inputting and editing of the necessary data. Furthermore, several queries have also been prepared to extract relevant information from the tables. Some of these queries have been utilized to calculate additional data entries to the said tables.

The most important part of the database program is the form named as “**Screening 4**” which was used to calculate the rating of the various market packages identified after the conduct of the 3-tier screening process. A special routine written in Visual Basic programming language was prepared to automatically calculate the rating points for each municipality-market package. The calculations used in the said routine have been based on the criteria previously made for the ranking of the market packages. The “Screening 4” Form has also the capability to store the calculation results done by the Visual Basic routine. Further, a separate query has been made to rank the 87 market packages according to the total rating points received based on the criteria. The table generated by the query can easily be extracted to MS Excel spreadsheet file.

In general, the rating system for the prioritization 87 market packages uses the a linearized ranking criteria, which means that the score given for each package in each criterion is based on the linear proportions among the attribute values of all the packages being rated. Thus, the

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following procedures have been adopted in the preparation of the Visual Basic routine for said rating system. First, the maximum and the minimum rating points are defined for each criterion. This serves as the rating limit for each criterion. Said points can be represented as P1 (X1, Y1) and P2 (X2, Y2), respectively. The abscissa (x axis) is the measure or the attribute value of a particular criterion while the ordinate (y axis) represents the rating points or scores which will be calculated in the process. If there is no maximum and minimum rating points that can easily be identified with sense, the median of the available data were used to identify them. Based on the two said points, the rating equation is constructed mathematically by the simple linear equation in the form of:

$$Y_i = m * X_i + b$$

Where:

$$m = (Y_2 - Y_1) / (X_2 - X_1); \text{ and,}$$

$$b = Y_1 - M * X_1 = Y_2 - M * X_2.$$

i = index number for each market package.

The program routine is based on the above equation. The assignment of values uses the rules shown in Table 10. Thus, each of the six criteria in the ranking of the market packages has its own set of equation consistent with the said rules.

Table 10. General Rule for the Rating Equation

Interval	Point
Below Range	Y = Minimum point
Within the range (Between or equal to X1 and X2)	$Y_i = m * X_i + b$
Above the range	Y = Maximum point

CHAPTER 6

Conclusions

86. Preliminary review and assessment of relevant statistics show that non-electrified barangays can be clustered and grouped into market packages that may be potentially attractive to private investors.
87. Due to the very large service area coverage of certain electric cooperatives, there are municipalities with very high economic growth potentials that have remained poorly energized. Examples of these municipalities are Baggao, Cagayan and San Mariano, Isabela.
88. Targeted and coordinated efforts to address rural off-grid electrification may lead to the expeditious provision of electricity services to the non-electrified barangays. A consultation with officials of concerned electric cooperatives revealed their willingness to waive or better yet, to collaborate with a third party to facilitate the energization of the remaining non-electrified barangays in their area coverage.

Recommendations:

89. A market package is redefined in this paper as a municipality-based grouping of all non-electrified barangays in that municipality. If a waiver can be successfully secured from the concerned EC, the municipality will then be under two service providers, the EC and the new private investor.

Hypothetically, it will be more efficient to put a service area (a municipality) under one management. Municipalities which have been electrified by the ECs (one barangay electrified) simply to comply with the thrust of 100% energization at the municipal level may see the prospects of service expansion as dim.

It is viewed, therefore, that there is merit in certain municipalities for the EC to waive its rights over the whole municipality. Asset disposal/turn over, among other concerns, may be a barrier.

It is recommended that a policy study be done to look into the legal and operational aspect of turning over the whole municipality to the new energy delivery partner.

90. There are 163 short-listed municipal market packages that may be potentially attractive to private sector investors. However, due to time limitations and the availability of salient information, only 87 (out of the 163 market packages) were further characterized.

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It is recommended that a characterization of the remaining 76 municipal market packages be done. This can be done two ways:

- *Using the NSO FIES data sets but data extracted to the barangay and municipal levels;*
- *Conduct of a mini- survey that can be done by the Affiliated Noncon Energy Centers.*

91. *It is recommended that methodology of identifying market packages be also applied to the other regions that have not been covered by this Task.*

Annex A
STATISTICS

Annex A-2. Basic Statistics on the 87 Municipal Market Packages

Market Package Number	Region	Province	Electric Cooperative	Level of Energization	Municipality	Coverage Barangays	Barangays Energized	Barangays Unenergized	% Energized
1	2	Cagayan	CAGELCO I	74%	Baggao	48	23	25	48%
2					Sto. Niño (Faire)	29	13	16	45%
3		Isabela	ISELCO II	75%	Benito Soliven	29	8	21	28%
4					Divilican	12	1	11	8%
5					Naguilian	25	14	11	56%
6					Palanan	17	5	12	29%
7					San Mariano	36	12	24	33%
8		Nueva Vizcaya	NUVELCO	70%	Kasibu	30	12	18	40%
9					Kayapa	30	10	20	33%
10	5	Camarines Sur	CASURECO I	79%	Ragay	38	27	11	71%
11			CASURECO IV	83%	Caramoan	49	33	16	67%
12		Albay	ALECO	73%	Bacacay	56	35	21	63%
13					Guinobatan	44	32	12	73%
14					Jovellar	23	10	13	43%
15					Libon	47	29	18	62%
16					Oas	53	29	24	55%
17					Rapu-Rapu	34	4	30	12%
18		Sosogon	SORECO II	88%	Donsol	51	34	17	67%
19		Masbate	MASELCO	32%	Baleno	24	10	14	42%
20					Balud	32	1	31	3%
21					Cataingan	36	8	28	22%
22					Dimasalang	20	7	13	35%
23					Esperanza	20	4	16	20%
24					Mandaon	26	8	18	31%
25					Masbate	30	17	13	57%
26					Milagros	27	12	15	44%
27					Mobo	29	16	13	55%
28					Palanas	24	8	16	33%
29	Pio V. Corpuz				18	7	11	39%	
30	Uson	35	16	19	46%				

Annex A-2. Basic Statistics on the 87 Municipal Market Packages

Market Package Number	Region	Province	Electric Cooperative	Level of Energization	Municipality	Coverage Barangays	Barangays Energized	Barangays Unenergized	% Energized		
31	6	Aklan	AKELCO	76%	Madalag	25	3	22	12%		
32		Antique	ANTECO	64%	Barbaza	39	17	22	44%		
33					Culasi	44	31	13	70%		
34					Patnongon	36	17	19	47%		
35					San Remigio	45	18	27	40%		
36					Sibalom	76	54	22	71%		
37					T. Fornier	50	28	22	56%		
38					Valderrama	22	8	14	36%		
39					Capiz	CAPELCO	82%	Dumarao	33	18	15
40		Tapaz	58	26				32	45%		
41		Iloilo	ILECO I	80%	Leon	85	62	23	73%		
42					Maasin	50	34	16	68%		
43					San Joaquin	85	39	46	46%		
44					Tubungan	48	31	17	65%		
45			ILECO II	77%	Dueñas	47	25	22	53%		
46					Passi	51	38	13	75%		
47			ILECO III	80%	Lemery	31	21	10	68%		
48			Negros Occ	VRESCO	85%	Calatrava	40	22	18	55%	
49			8	Leyte	LEYECO I	78%	Abuyog	63	32	31	51%
50							Burauen	76	38	38	50%
51	La Paz	35					25	10	71%		
52	Southern Leyte	SOLECO					76%	Bontoc	40	27	13
53				Tomas Oppus	29	18		11	62%		
54	Northern Samar	NORSAMELCO		44%	Catarman	55	31	24	56%		
55					Catubig	47	15	32	32%		
56					Gamay	26	11	15	42%		
57					Laoang	56	21	35	38%		
58					Las navas	53	4	49	8%		
59					Lavezares	26	14	12	54%		
60					Lope de Vega	22	2	20	9%		
61					Mondragon	24	13	11	54%		
62					Palapag	32	14	18	44%		
63					Pambujan	26	12	14	46%		

Annex A-2. Basic Statistics on the 87 Municipal Market Packages

Market Package Number	Region	Province	Electric Cooperative	Level of Energization	Municipality	Coverage Barangays	Barangays Energized	Barangays Unelectrified	% Energized			
64	8	Samar	SAMELCO I	51%	Calbayog City	87	45	42	52%			
65					Gandara	69	32	37	46%			
66					San Jorge	41	18	23	44%			
67					Tarangnan	41	21	20	51%			
68			SAMELCO II	63%	Calbiga	41	27	14	66%			
69					Daram	58	16	42	28%			
70					Hinabangan	21	10	11	48%			
71					Zumarraga	25	14	11	56%			
72					Eastern Samar	ESAMELCO	58%	Arteche	20	7	13	35%
73								Borongnan	61	42	19	69%
74		Can-Avid	28	17				11	61%			
75		Guiuan	60	34				26	57%			
76					Salcedo	41	20	21	49%			
77		9	Zamboanga Norte	ZANECO	60%	Katipunan	30	16	14	53%		
78	Sergio Osmeña					39	5	34	13%			
79	Zamboanga Sur		ZAMSURECO I	56%	Aurora	42	28	14	67%			
80					Midsalip	33	13	20	39%			
81					Sominot (D.M. Marcos)	18	7	11	39%			
82					Tambulig	31	20	11	65%			
83					Tigbao	18	8	10	44%			
84					ZAMSURECO II	49%	Bayog	28	9	19	32%	
85	Tungawan		25	12			13	48%				
86	Titay		29	15			14	52%				
87	Sibuco, Zamb. Norte	28	2	26			7%					

Annex A-3. Prioritization of 87 Municipal Market Packages

M.P. #	Municipality	No. of HH in unenergized Barangays	Points	HH Income	Points	HH Energy Expenditures	Points	HH Disposable Income	Points	Population Density	Points	Municipality Class	Points	Total Points	Ranking
1	Baggao	3750	23.10	76,270.00	10.00	128.84	9.63	27,058.89	15.00	4.07	2.90	1st	20	80.63	5
2	Sto. Niño (Faire)	1630	8.17	37,862.50	7.83	87.74	4.23	11,468.25	12.26	3.18	2.25	4th	12	46.74	48
3	Benito Soliven	2267	12.65	58,991.31	10.00	119.05	8.34	31,976.36	15.00	13.59	9.85	5th	9	64.85	18
4	Divilican	426	2.50	32,130.78	5.77	144.52	11.69	10,067.55	10.40	2.15	1.50	5th	9	40.85	59
5	Naguilian	961	3.46	26,347.50	3.69	120.72	8.56	6,618.25	5.80	5.66	4.06	5th	9	34.57	73
6	Palanan	1607	8.01	31,943.50	5.70	131.04	9.92	10,486.75	10.95	1.83	1.50	3rd	15	51.08	40
7	San Mariano	3133	18.75	63,622.67	10.00	155.46	13.12	30,404.83	15.00	2.13	1.50	1st	20	78.38	7
8	Kasibu	2083	11.36	25,437.24	3.36	127.05	9.39	4,951.45	3.58	5.81	4.17	4th	12	43.87	55
9	Kayapa	2243	12.49	43,260.25	9.77	92.40	4.85	9,406.25	9.51	4.66	3.33	4th	12	51.94	38
10	Ragay	1056	4.13	38,816.79	8.17	119.25	8.37	7,505.89	6.98	3.86	2.75	3rd	15	45.40	51
11	Caramoan	0	0.00	43,480.40	9.84	114.35	7.73	12,802.96	14.04	0.00	0.00	4th	12	43.61	56
12	Bacacay	3537	21.60	40,320.18	8.71	193.00	15.00	5,004.31	3.65	31.52	15.00	4th	12	75.96	9
13	Guinobatan	2272	12.69	41,545.73	9.15	135.76	10.54	7,184.43	6.55	11.19	8.10	2nd	18	65.03	---
14	Jovellar	1988	10.69	32,585.00	5.93	124.03	9.00	5,361.58	4.12	18.86	13.70	5th	5	48.44	45
15	Libon	3230	19.44	32,850.41	6.03	108.30	6.93	5,705.14	4.58	17.42	12.65	3rd	15	64.63	19
16	Oas	4226	25.00	34,743.15	6.71	114.35	7.73	9,570.83	9.73	15.58	11.30	3rd	15	75.47	11
17	Rapu-Rapu	4181	25.00	37,846.15	7.82	151.54	12.61	4,366.69	2.80	25.84	15.00	4th	12	75.23	12
18	Donsol	1160	4.86	32,556.65	5.92	106.03	6.64	6,568.05	5.73	3.22	2.28	4th	12	37.43	70
19	Baleno	1160	4.86	29,946.76	4.98	126.57	9.33	7,481.74	6.95	6.86	4.94	5th	9	40.06	61
20	Balud	4622	25.00	40,974.30	8.94	186.08	15.00	11,915.58	12.86	22.76	15.00	4th	12	88.80	1
21	Cataingan	5170	25.00	29,504.50	4.83	102.25	6.14	1,122.84	1.50	25.29	15.00	4th	12	64.46	20
22	Dimasalang	1771	9.16	42,313.03	9.43	122.50	8.80	8,998.63	8.97	14.76	10.70	5th	9	56.06	30
23	Esperanza	3085	18.42	30,582.78	5.21	251.54	15.00	4,516.51	3.00	38.23	15.00	5th	9	65.63	16
24	Mandaon	3145	18.84	39,613.64	8.46	188.86	15.00	3,810.99	2.06	11.20	8.11	4th	12	64.46	21
25	Masbate	2711	15.78	40,280.62	8.70	90.77	4.63	7,748.56	7.31	15.09	10.95	2nd	18	65.36	17
26	Milagros	3298	19.92	46,835.97	10.00	147.38	12.06	13,153.16	14.51	5.83	4.19	3rd	15	75.67	10
27	Mobo	1110	4.51	33,339.20	6.20	100.77	5.94	3,824.58	2.08	7.48	5.39	5th	9	33.12	75
28	Palanas	2630	15.21	43,913.09	10.00	157.59	13.40	5,745.70	4.64	15.37	11.15	5th	9	63.40	23
29	Pio V. Corpuz	2015	10.88	33,066.27	6.10	149.00	12.27	1,022.88	1.50	19.10	13.87	5th	9	53.63	35
30	Uson	3292	19.87	23,448.87	2.65	79.38	3.14	6,042.31	5.03	20.17	14.65	4th	12	57.35	28

Annex A-3. Prioritization of 87 Municipal Market Packages

M.P. #	Municipality	No. of HH in unenergized Barangays	Points	HH Income	Points	HH Energy Expenditures	Points	HH Disposable Income	Points	Population Density	Points	Municipality Class	Points	Total Points	Ranking
31	Madalag	2161	11.91	30,940.85	5.34	90.20	4.56	7,668.10	7.20	9.22	6.66	5th	9	44.67	53
32	Barbaza	710	2.50	9,972.17	1.00	71.48	2.10	799.37	1.50	5.95	4.27	5th	9	20.37	84
33	Culasi	1149	4.78	15,401.60	1.00	77.22	2.85	3,790.50	2.03	5.98	4.30	4th	12	26.96	80
34	Patnongon	1670	8.45	18,980.33	1.05	71.95	2.16	5,780.45	4.68	13.24	9.59	4th	12	37.94	65
35	San Remigio	2202	12.20	14,190.20	1.00	43.43	1.50	7,202.35	6.58	7.56	5.45	4th	12	38.72	64
36	Sibalom	1451	6.91	25,167.15	3.27	91.79	4.77	7,876.38	7.48	5.88	4.22	3rd	15	41.64	57
37	T. Fornier	1515	7.36	19,649.96	1.29	94.93	5.18	4,635.01	3.16	13.56	9.83	5th	9	35.81	72
38	Valderrama	1482	7.13	7,678.75	1.00	75.14	2.58	552.00	1.50	5.05	3.62	5th	9	24.82	81
39	Dumarao	2547	14.63	42,811.50	9.60	115.46	7.87	17,387.40	15.00	10.88	7.87	4th	12	66.98	15
40	Tapaz	4298	25.00	16,792.65	1.00	53.52	1.50	2,911.40	1.50	12.81	9.28	3rd	15	53.28	36
41	Leon	1102	4.45	28,207.60	4.36	147.70	12.10	8,634.50	8.49	7.86	5.67	4th	12	47.07	46
42	Maasin	1939	10.35	27,267.25	4.02	80.64	3.30	911.05	1.50	12.38	8.97	4th	12	40.14	60
43	San Joaquin	2061	11.20	16,278.99	1.00	98.72	5.68	3,360.82	1.50	8.91	6.43	4th	12	37.81	67
44	Tubungan	516	2.50	15,603.25	1.00	68.67	1.73	4,495.90	2.97	15.04	10.91	5th	9	28.11	79
45	Dueñas	2110	11.55	39,839.05	8.54	80.88	3.33	10,489.10	10.96	23.31	15.00	4th	12	61.38	25
46	Passi	4350	25.00	51,137.90	10.00	215.90	15.00	18,558.06	15.00	17.35	12.59	2nd	18	95.59	---
47	Lemery	915	3.13	35,574.36	7.01	96.95	5.44	15,049.10	15.00	7.63	5.50	5th	9	45.08	52
48	Calatrava	5810	25.00	28,892.82	4.61	107.51	6.83	10,220.32	10.60	11.52	8.34	2nd	18	73.37	13
49	Abuyog	1936	10.32	27,969.18	4.27	95.06	5.20	3,482.23	1.62	6.57	4.73	2nd	18	44.14	54
50	Burauen	2915	17.22	27,615.76	4.15	74.19	2.46	3,971.98	2.27	16.38	11.89	3rd	15	52.98	37
51	La Paz	77	2.50	26,177.30	3.63	146.89	12.00	11,696.63	12.57	0.45	1.50	5th	9	41.19	58
52	Bontoc	545	2.50	18,852.65	1.00	78.74	3.05	4,541.55	3.03	5.34	3.83	5th	9	22.41	82
53	Tomas Oppus	918	3.15	31,374.04	5.50	43.41	1.50	10,247.68	10.64	10.80	7.81	5th	9	37.60	69
54	Catarman	2615	15.11	28,747.75	4.55	103.50	6.30	3,405.69	1.52	4.63	3.31	2nd	18	48.79	44
55	Catubig	3407	20.68	38,635.00	8.10	150.18	12.43	9,060.10	9.05	12.33	8.93	4th	12	71.20	14
56	Gamay	1755	9.05	37,003.70	7.52	153.56	12.87	8,117.70	7.80	15.25	11.06	5th	9	57.30	29
57	Laoang	3466	21.10	39,577.64	8.44	171.47	15.00	11,098.92	11.77	16.14	11.71	3rd	15	83.02	2
58	Las Navas	4357	25.00	37,764.84	7.79	213.15	15.00	9,558.68	9.72	20.67	15.00	5th	9	81.51	4
59	Lavezares	1114	4.54	37,412.70	7.67	91.87	4.78	6,039.35	5.03	9.32	6.73	5th	9	37.74	68
60	Lope de Vega	1386	6.45	28,624.87	4.51	110.97	7.28	5,162.52	3.86	7.93	5.72	6th	5	32.82	76
61	Mondragon	961	3.46	40,033.95	8.61	169.72	14.99	12,366.67	13.46	3.33	2.36	4th	12	54.88	32
62	Palapag	1693	8.61	33,357.61	6.21	135.10	10.45	10,043.78	10.36	9.43	6.81	5th	9	51.45	39
63	Pambujan	1561	7.68	43,004.32	9.67	128.07	9.53	10,115.16	10.46	10.08	7.29	5th	9	53.63	34

Annex A-3. Prioritization of 87 Municipal Market Packages

M.P. #	Municipality	No. of HH in unenergized Barangays	Points	HH Income	Points	HH Energy Expenditures	Points	HH Disposable Income	Points	Population Density	Points	Municipality Class	Points	Total Points	Ranking
64	Calbayog City	2481	14.16	20,703.25	1.66	76.57	2.77	4,813.15	3.39	2.75	1.94	3rd	15	38.93	62
65	Gandara	2218	12.31	21,910.40	2.10	84.24	3.78	4,769.75	3.34	5.12	3.67	4th	12	37.19	71
66	San Jorge	973	3.54	18,556.90	1.00	79.68	3.18	2,256.81	1.50	4.03	2.87	5th	9	21.09	83
67	Tarangnan	2165	11.94	33,449.63	6.24	151.40	12.59	10,021.28	10.33	16.78	12.18	5th	9	62.28	24
68	Calbiga	825	2.50	32,292.35	5.83	86.45	4.07	5,049.10	3.71	2.91	2.05	4th	12	30.16	77
69	Daram	4637	25.00	39,938.37	8.57	148.11	12.16	5,002.53	3.65	44.85	15.00	4th	12	76.38	8
70	Hinabangan	726	2.50	20,081.65	1.44	66.57	1.50	3,391.55	1.50	1.95	1.35	4th	12	20.30	85
71	Zumarraga	1385	6.44	34,164.42	6.50	163.54	14.18	4,422.24	2.87	36.84	15.00	5th	9	54.00	32
72	Arteche	1232	5.37	41,675.44	9.20	150.47	12.47	15,085.78	15.00	6.76	4.86	5th	9	55.89	31
73	Borongnan	1523	7.42	28,102.05	4.32	124.21	9.02	5,626.00	4.48	3.37	2.39	2nd	18	45.63	50
74	Can-Avid	1271	5.64	43,170.56	9.73	181.45	15.00	5,364.72	4.13	4.64	3.32	5th	9	46.82	47
75	Guiuan	2755	16.09	49,365.85	10.00	174.42	15.00	13,165.48	14.52	65.13	15.00	4th	12	82.61	3
76	Salcedo	1842	9.66	28,136.70	4.33	130.00	9.78	3,846.58	2.11	15.80	11.46	5th	9	46.35	49
77	Katipunan	3002	17.83	25,792.35	3.49	73.05	2.31	12,210.63	13.25	15.29	11.09	4th	12	59.97	26
78	Sergio Osmeña	4020	25.00	22,529.00	2.32	53.64	1.50	13,523.20	15.00	7.40	5.33	3rd	15	64.15	22
79	Aurora	0	0.00	20,614.68	1.63	58.02	1.50	10,621.80	11.13	0.00	0.00	3rd	15	29.27	78
80	Midsalip	2250	12.54	26,998.43	3.93	74.09	2.44	13,025.33	14.34	12.13	8.78	5th	9	51.03	41
81	Sominot (D.M. Marcos)	1203	5.16	26,961.36	3.91	62.83	1.50	13,328.89	14.74	0.00	0.00	5th	9	34.32	74
82	Tambulig	1260	5.56	29,200.30	4.72	99.22	5.74	12,786.68	14.02	9.40	6.79	4th	12	48.83	43
83	Tigbao	1093	4.39	38,281.63	7.98	66.90	1.50	19,351.39	15.00	0.00	0.00	5th	9	37.86	66
84	Bayog	1830	9.58	21,595.95	1.99	42.90	1.50	8,656.55	8.52	7.14	5.14	4th	12	38.72	63
85	Tungawan	2238	12.45	25,584.55	3.42	99.79	5.82	11,258.95	11.98	10.29	7.44	5th	9	50.11	42
86	Titay	2395	13.56	35,915.38	7.13	97.50	5.52	12,315.03	13.39	9.25	6.68	4th	12	58.27	27
87	Sibuco, Zamb. Norte	3905	24.19	61,617.05	16.36	116.26	7.98	28,394.64	15.00	5.10	3.65	4th	12	79.18	6

Annex A-4. The 25 Prioritized NRE Municipal Market Packages

M.P. #	Province	Municipality	% Energized	No. of HH	HH Income	HH Energy Exp'ditures	HH Disposable Income	Population Density	Municipality Class
1	Cagayan	Baggao	48%	3750	76,270.00	128.84	27,058.89	4.07	1st
2	Isabela	Benito Soliven	28%	2267	58,991.31	119.05	31,976.36	13.59	5th
3		San Mariano	33%	3133	63,622.67	155.46	30,404.83	2.13	1st
4	Albay	Bacacay	63%	3537	40,320.18	193.00	5,004.31	31.52	4th
5		Libon	62%	3230	32,850.41	108.30	5,705.14	17.42	3rd
6		Oas	55%	4226	34,743.15	114.35	9,570.83	15.58	3rd
7		Rapu-Rapu	12%	4181	37,846.15	151.54	4,366.69	25.84	4th
8	Masbate	Balud	3%	4622	40,974.30	186.08	11,915.58	22.76	4th
9		Cataingan	22%	5170	29,504.50	102.25	1,122.84	25.29	4th
10		Esperanza	20%	3085	30,582.78	251.54	4,516.51	38.23	5th
11		Mandaon	31%	3145	39,613.64	188.86	3,810.99	11.20	4th
12		Masbate	57%	2711	40,280.62	90.77	7,748.56	15.09	2nd
13		Milagros	44%	3298	46,835.97	147.38	13,153.16	5.83	3rd
14		Palanas	33%	2630	43,913.09	157.59	5,745.70	15.37	5th
15	Capiz	Dumarao	55%	2547	42,811.50	115.46	17,387.40	10.88	4th
16	Iloilo	Dueñas	53%	2110	39,839.05	80.88	10,489.10	23.31	4th
17	Negros Occ	Calatrava	55%	5810	28,892.82	107.51	10,220.32	11.52	2nd
18	N. Samar	Catubig	32%	3407	38,635.00	150.18	9,060.10	12.33	4th
19		Laoang	38%	3466	39,577.64	171.47	11,098.92	16.14	3rd
20		Las navas	8%	4357	37,764.84	213.15	9,558.68	20.67	5th
21	Samar	Tarangnan	51%	2165	33,449.63	151.40	10,021.28	16.78	5th
22		Daram	28%	4637	39,938.37	148.11	5,002.53	44.85	4th
23	E. Samar	Guiuan	57%	2755	49,365.85	174.42	13,165.48	65.13	4th
24	Zamb. Norte	Sergio Osmeña	13%	4020	22,529.00	53.64	13,523.20	7.40	3rd
25		Sibuco	7%	3905	61,617.05	116.26	28,394.64	5.10	4th

Annex B

CHRONICLE OF CONSULTATIONS AND MEETINGS

CHRONICLE OF CONSULTATIONS AND MEETINGS HELD

Date		Attendees	Subject	Discussions/Agreements
1	March 7, 2001	R. T. Quejas	Criteria and Methodology	▪ Brainstorming on relevant considerations/criteria
		F. V. Arriola		▪ Identification of data requirements and sources of information
		R. T. Padrique		▪ General approach/methodology
		G. C. Zamudio		
2	March 9, 2001	R. Abergas	SPUG Activities	▪ On-going and planned electrification activities
		R. Barruela	Criteria	▪ Criteria used in PV projects
				▪ Other related matters
3	March 13, 2001	N. Irorita	NEA Data and Plans	▪ Level of data available at NEA
		M. Soriano		▪ O-Ilaw Program (Status and Plans)
				▪ General information on the ECs
4	March 13, 2001	DILG	Provincial , municipal information	▪ Basic statistics
				▪ Projects and plans
5	March 16, 2001	M. Soriano	Preliminary methodology	▪ Special considerations to be given to barangays scheduled for electrification on 2003 - 2004
		NEA-Planning Staff		▪ Recognition of presence of informal electricity Providers in declared non-electrified barangays
6	March 23, 2001	R. T. Quejas	DPEM Consultation in Northern Samar	▪ Methodology on identifying market packages
		F. V. Arriola		▪ Preliminary results on market packages
		R. T. Padrique	Market Packages	▪ DPEM presentation materials
		A. Pamintuan		▪ Arrangements on the LGU consultations
		DPEM Team		
7	March 26 - 30	DPEM Team	LGU Consultation in Northern Samar (Provincial) Laoang, N. Samar (Municipal)	▪ Rural Electrification Program and Activities
		R. T. Padrique		▪ Market Packages
		M. Celi		▪ Technical and Financial Assistance
				▪ Feedback from the LGU officials
		▪ Level of acceptance of LGU officials		

CHRONICLE OF CONSULTATIONS AND MEETINGS HELD

Date		Attendees	Subject	Discussions/Agreements
8	April 18, 2001	G. Yeneza (Task 1)	Standard Franchise Waiver Agreement	<ul style="list-style-type: none"> ▪ SFWA presented by G. Yeneza
		W. Ballesteros (PHILRECA)		<ul style="list-style-type: none"> ▪ General sentiment by ECs that agreement will be interim in nature
		L. Natividad (MASELCO)	Methodology in identifying Market Packages	<ul style="list-style-type: none"> ▪ Clarifications made on obligations of private sector to the EC while SFWA is effective
		L. Lim (ANTECO)		<ul style="list-style-type: none"> ▪ The methodology/criteria used in identifying the market packages is generally acceptable
		D. Davila (VRESKO)		<ul style="list-style-type: none"> ▪ For most of the preliminary municipal market packages identified, the concerned ECs present during the consultation are willing to waive the their rights over the areaa
		F. Savellano (ISELCO II)	Market packages identified	<ul style="list-style-type: none"> ▪ Specific to Baggao, Cagayan, the EC Manager expressed refusal to waive their franchise over the area. Baggao is a growth area.
		P. Rosales (SAMELCO II)		<ul style="list-style-type: none"> ▪ ECs cited additional areas recommended for private sector operations
		O. Pueblos (SAMELCO I)		<ul style="list-style-type: none"> ▪ General acceptance and concurrence on the Methodology and the criteria used
		R. Merro (DORELCO)		
		P. Flores (NUVELCO)		
		E. Bassig (CAGELCO I)		
		W. Billena (ILECO I)		
		G. Altamira (ILECO III)		
		G. Tordesillas (CAGELCO II)		
E. Castor (ZANECO)				
9	May 4, 2001	A. Mercado	Methodology	<ul style="list-style-type: none"> ▪ General acceptance and concurrence on the Methodology and the criteria used
		M. Soriano	Market Packages identified	
10	June 14, 2001	D. A. E. Bueno (NEA)	Evaluation Meeting for all the TA tasks	<ul style="list-style-type: none"> ▪ Clarification on the use of the Municipal Energization Index
		C. Calderon (USAID)		<ul style="list-style-type: none"> ▪ Redefinition of market packages from cluster of barangays to municipal-based grouping
		C. Tatlonghari (USAID)		<ul style="list-style-type: none"> ▪ Intent of the regional prioritization
		F. A. Benito (DOE)		<ul style="list-style-type: none"> ▪ Clarification on the non-inclusion of ARMM as a prioritized region in the identification of market packages
		A. Pamintuan (PA)		
		M. Celi (PA)		
		R. T. Padrique (DOE-NCED)		
		TA Consultants		

Annex C

WEEKLY STATUS REPOTS

Project Title	TA for Enhancing Private Sector Participation in RE Investments for Off-Grid Rural Electrification		
Task No	#3 - Identifying The Market Packages		
Donor Agency	USAID	Contractor	Renato T. Goco Chief of Party PA Government Services, Inc.
Weekly Status Report No.	1	Date of Submission	12 March 2001
Subcontractor / Consultant	Arlene S.M. Lafrades		
A. Programmed Activity/ies			
<p>Establishing criteria and methodology for determining a market package</p> <ul style="list-style-type: none"> ➤ Draft report End of week 2 ➤ Final Report End of week 3 			
B. Activities Undertaken			
<ul style="list-style-type: none"> ➤ Recruitment and mobilization of research assistant/s ➤ Meetings and initial discussions with DOE-EUMB-NCED and NPC <p>Meetings and discussions with various officials of DOE-EUMB-NCED were done. The salient discussions points during the meetings are: (1) status of the O-Ilaw Program, (2) relevant insights of the Market Assessment and the Barangay Profiling and (3) clarifications on the task. A database on the status of the barangay electrification was gathered from NCED.</p> <p>A meeting with R. Abergas and R. Barruela of NPC was also held during the week. Current and planned undertakings of NPC on the barangay electrification and small island power development are the main items discussed. Likewise, some basic information on wind energy potential sites were gathered.</p> <ul style="list-style-type: none"> ➤ Data/Information research and review <p>The major documents and information being reviewed are (1) O-Ilaw Program Database, (2) Market Assessment for Rural Electrification, (3) Identification of Appropriate NRE Systems in Unelectrified Off-grid Barangays, (4) NEA Chronicle, (5) RE Market Assessment (UNDP-GEF DOE-ICEE PDF-B Project document), (6) Market Analysis for Off-Grid renewable Energy: An Approach to Better Analysis by Ron D. White</p> <p>Preliminary data processing and analyses</p>			
C. Next Activity/ies			
<ul style="list-style-type: none"> ➤ Meetings and consultations with NEA, NGO (Sibat), FIs (LBP), others ➤ Continue data processing and analyses ➤ Draft report on Criteria and Methodology for determining market packages 			

Project Title	TA for Enhancing Private Sector Participation in RE Investments for Off-Grid Rural Electrification		
Task No	#3 - Identifying The Market Packages		
Donor Agency	USAID	Contractor	Renato T. Goco Chief of Party PA Government Services, Inc.
Weekly Status Report No.	2	Date of Submission	18 March 2001
Subcontractor/Consultant	Arlene S.M. Lafrades		
A. Programmed Activity/ies			
Establishing criteria and methodology for determining a market package			
<ul style="list-style-type: none"> ➢ Draft report End of week 2 (March 17, 2001) ➢ Final Report End of week 3 (March 23, 2001) 			
B. Activities Undertaken			
<ul style="list-style-type: none"> ➢ Review of Literatures <p>The major literatures reviewed are: (1) NEA Red Book, (2) REC Investment Analysis, (3) Market Assessment for Rural Electrification, (4) Identification of Appropriate NRE Systems in Un electrified Off-grid Barangays, (5) the O-Ilaw Program, (6) MSIP activities and accomplishments, (7) SPOTS Project, and (8) ER 1-94 Benefits to Energy Projects Host Communities.</p> <p>The NEA Proposed Barangay Energization Schedule (2000-2004), commonly referred to as the Red Book (as of May 2000)¹ is a vital documents. Some of the salient information and insights gathered are:</p> <ul style="list-style-type: none"> ▪ The original rural electrification plan covering 8 years to completely electrify the country has been revised and compressed to year 2004. ▪ The task of rural electrification is now shared by NEA with the other members of the energy family (DOE, NPC, and PNOC). The private sector, specifically the IPPs and some private individuals and entities extend financial support to the program. ▪ Only about 16% of unenergized barangays are candidates for NRE-based electrification systems per EC assessment ▪ High NRE-based electrification potential seen in Regions 2, 4, 6, 8, 12, 11 ARMM, and CAR 			

¹ A revised/updated version of the NEA Red Book is forthcoming.

- As validated by discussions with NEA officials, barangays that are candidate for NRE-based electrification are those barangays that have not been surveyed by the concerned ECs primarily due to remoteness and the rough terrain. In the Red Book, no Kilometers of Transmission/Distribution Line (1-Phase, Open secondary and Under-Built) is indicated.
- For barangays programmed to be connected to the grid, the ranges of kilometers of line to the nearest tapping point are as follows:
 - ✓ 1-Phase : 0.72kms - 19.00kms
 - ✓ Open Secondary Line : 0.09kms - 9.00kms
 - ✓ Under-built Line : 0.00kms - 15.00kms

Likewise, the REC Investment Analysis for each of the ECs provide very relevant information such as, grid expansion and rehabilitation plan, cost requirement and sources, energy sales and demand forecast by customer type, financial and economic evaluation, willingness to pay, among others.

The DOE/NCED-MEMSI Market Assessment for Rural Electrification and Barangay Profiling (Identification of Appropriate NRES in Unelectrified Off-Grid Barangays present wealth of information at the barangay level that are critical and useful to the activity.

Program/project documents of O-Ilaw, MSIP, SPOTS and ER 1-94 give good inputs on various NRE related activities in the country which are also vital to the identification of market packages.

- The activity covered 302 barangays systematically selected and surveyed 6,000 households

➤ Meetings and consultations with DOE-EUMB-NCED, NEA, DILG

Meetings and consultations with various officials of DOE-EUMB-NCED and MAD were done. The salient discussions points during the meetings are: (1) status of the O-Ilaw Program, (2) overview of MSIP and SPOTS projects and (3) status of the ER 1-94. Continuous interfacing with NCED staff is ensured to achieve step - by - step transfer of skills.

Several visits and meetings with NEA Planning Department were done to gather information and validate insights and observations relevant to the task. On-site field practical information critical to the identification of criteria and methodology for developing market packages were shared.

Initial visit to DILG office was also made.

➤ Formulation of conceptual framework for identifying market packages

Initial processing of information gathered led to the formulation of the conceptual framework. A draft report is submitted for discussion and consultation.

- Preliminary simulation run of the criteria and methodology

The regions prioritized are Regions 2, 4, 5, 6, 8, and 9. Likewise, there are about 63 municipalities shortlisted and will be subjected to further screening.

- Processing and generation of maps of 63 shortlisted municipalities
- To aid analysis, maps of the 63 municipalities are being prepared. This is particularly critical with regards to the criteria of contiguousness of barangays in a market package.

C. Next Activity/ies

- Consultations re: Draft Criteria and Methodology for Identifying Off-Grid Rural Electrification Market Packages
- Secondary data research and analysis
- Data processing and analyses
- Preparation of Final Report on Criteria and Methodology for Determining Market Packages

Project Title	TA for Enhancing Private Sector Participation in RE Investments for Off-Grid Rural Electrification		
Task No	#3 - Identifying The Market Packages		
Donor Agency	USAID	Contractor	Renato T. Goco Chief of Party PA Government Services, Inc.
Weekly Status Report No.	3	Date of Submission	31 March 2001
Subcontractor/Consultant	Arlene S.M. Lafrades		
A. Programmed Activity/ies			
<p>Establishing criteria and methodology for determining a market package</p> <ul style="list-style-type: none"> ➤ Draft report End of week 2 (March 18, 2001) ➤ Final Report End of week 3 (March 24, 2001) 			
B. Activities Undertaken			
<ul style="list-style-type: none"> ➤ Consultation with key offices <p>The draft framework on "Criteria and Methodology for Identifying Market Packages for Off-Grid Rural Electrification" was presented with the DOE, NEA and TA project team (i.e., USAID, PA, TA consultants).</p> <p>The major comments gathered during the consultations are:</p> <ul style="list-style-type: none"> ▪ Inclusion of unenergized barangays that are scheduled for electrification by year 2002 in the screening process; ▪ The final shortlisted regions are Regions 2, 5, 6, 8, and 9. Region 4 is classified among the least priority regions recognizing the many on-going efforts in the area. ▪ Further review of shortlisted municipalities in Region 2. Initially, Isabela is the lone province cited where potential market packages are located. Based on past experiences, candidate packages can be found in Cagayan and Nueva Ecija. ▪ Inclusion of the least-cost/benefit cost item in the criteria for ranking market packages identified. Recognizing the inadequacy of salient information to undertake a good least-cost/benefit cost analysis and through the representation of Mr. Quejas, the least-cost/benefit cost analysis is a bonus exercise. If at all possible, the result of the analysis may be used among other criteria for ranking the identified market packages. ▪ Inclusion of barangays reported by ECs as unenergized though field visits showed that they are energized through privately owned diesel gensets. These are observations shared by NEA and DOE-EUMB-NCED. 			

- Data Gathering
 - Continuation of gathering of secondary data relevant to the next step, i.e. identification of candidate market packages from Regions 2, 5, 6, 8, and 9.
 - Offices visited are DILG, NEA, DOF and NPC.
- Development of Computer-Aided Program for the Identification of Market Packages
 - A Microsoft Access Program is being developed which will be used in identifying the market packages. Salient parameters/criteria relevant to the screening and prioritization process are being inputted in the program.
 - Data entry in the program has been initiated and continuing as the data are gathered.
- Processing and generation of maps of 63 shortlisted municipalities
 - Processing and generation of maps of 63 shortlisted municipalities were continued. As a result of simulation runs, new municipalities are being identified and maps are likewise being generated.

C. Next Activities

- Secondary data research
- Data processing and analyses
- Participation in the LGU Consultations at Northern Samar, March 26 - 30, 2001

D. Concerns

- **Revision of Schedule of Deliverables.** The following changes on the schedule of deliverables are requested:
 - Long list of Market Packages : End of Wk 6 (vis-à-vis Mid Week 5)
 - Priority list of Market Packages : End of Wk 6 (vis-à-vis End of Wk 5)
 - Draft Document Market Brief : End of Wk 8 (vis-à-vis End of Wk 6)
 - Final Document Market Brief : End of Wk 9 (vis-à-vis End of Wk 7)
 - Terminal Report : End of Wk 10 (vis-à-vis End of Wk 8)

The slide of one week on the original schedule for submission of output/s for Long list and priority list is due to the participation in the LGU Consultation in Northern Samar, March 26 - 30, 2001. The participation of the consultant was requested by DPEM and DOE.

Likewise, during the field visit at Northern Samar, it was realized that gathering secondary socio-economic profiles of candidate municipalities is not an easy task. Thus, ample time is being requested to prepare the market brief of the 25 prioritized market packages.

Project Title	TA for Enhancing Private Sector Participation in RE Investments for Off-Grid Rural Electrification		
Task No	#3 - Identifying The Market Packages		
Donor Agency	USAID	Contractor	Renato T. Goco Chief of Party PA Government Services, Inc.
Weekly Status Report No.	4	Date of Submission	2 April 2001
Subcontractor/Consultant	Arlene S.M. Lafrades		
A. Programmed Activity/ies			
<p>Establishing criteria and methodology for determining a market package</p> <ul style="list-style-type: none"> ➤ Final Report End of week 4 (March 31, 2001) <p>Processing of data for Long List of Market Packages</p>			
B. Activities Undertaken			
<ul style="list-style-type: none"> ➤ Participation to the LGU Consultation at Northern Samar, March 26 - 30, 2001 <p>During the LGU consultation, the undersigned acted as resource person for the "market packages" and other pertinent matters during the consultation. Administrative support was likewise provided.</p> <ul style="list-style-type: none"> ➤ Data Gathering <p>Socio-economic profiles and other pertinent information were gathered at the provincial and municipal levels. Visits to the provincial capitol, the municipal offices of Laoang and the provincial office of the DILG were made.</p> <ul style="list-style-type: none"> ➤ Data Processing and Analyses <p>Based on insights gathered during the consultation and the field visits to several offices, data processing and analyses were done to further fine-tune the criteria and methodology.</p>			
C. Next Activities			
<ul style="list-style-type: none"> ➤ Secondary data research ➤ Data processing and analyses ➤ Preparation of final report on Criteria and Methodology 			

D. Concerns

Refinements on the draft report on Criteria and Methodology will be done to take into consideration results of various consultations done including that of the LGU consultation in Northern Samar. These refinements will be discussed with DOE-EUMB-NCED.

The final report of the Criteria and Methodology will be submitted towards the end of week 5.

Project Title	TA for Enhancing Private Sector Participation in RE Investments for Off-Grid Rural Electrification		
Task No	#3 - Identifying The Market Packages		
Donor Agency	USAID	Contractor	Renato T. Goco Chief of Party PA Government Services, Inc.
Weekly Status Report No.	5 & 6	Date of Submission	18 April 2001
Subcontractor/Consultant	Arlene S.M. Lafrades		
A. Programmed Activity/ies			
<p>Establishing criteria and methodology for determining a market package</p> <ul style="list-style-type: none"> ➤ Final Report End of week 5 (April 7, 2001) ➤ Long List of Market Packages (MPs) End of week 6 (April 12, 2001) ➤ Prioritized 25 NRE-based MPs End of week 6 (April 12, 2001) 			
B. Activities Undertaken			
<ul style="list-style-type: none"> ➤ Continuing consultations/discussions with NEA and DOE on criteria and methodology <p>Several consultations/discussions were held during the period and relevant insights and agreements were reached. These will be further elaborated in the final report of the "Criteria and Methodology for Identifying Market Packages".</p> <ul style="list-style-type: none"> ➤ Data Processing and Analyses <p>Updated reports on electrification status from NEA are now available and appropriate works were done on the databases. These information provided clearer picture on identification of candidate market packages that will be recommended for further investigation.</p> <ul style="list-style-type: none"> ➤ Report Preparation <p>The final write-up of the report on "Criteria and Methodology for Identifying Market Packages" was started during the period. Some items were not finished because in the course of data analysis, it was observed that certain agreements on criteria were not possible. Meeting with NEA and DOE will have to be done.</p> <p>(Note: Very few activities were undertaken during week 6 due to 3 holidays)</p>			
C. Next Activities			
<ul style="list-style-type: none"> ➤ Secondary data research for market briefs ➤ Data processing and analyses for prioritization of market packages ➤ Consultative Meeting with ECs 			

Project Title	TA for Enhancing Private Sector Participation in RE Investments for Off-Grid Rural Electrification		
Task No	#3 - Identifying The Market Packages		
Donor Agency	USAID	Contractor	Renato T. Goco Chief of Party PA Government Services, Inc.
Weekly Status Report No.	8	Date of Submission	30 April 2001
Subcontractor/Consultant	Arlene S.M. Lafrades		
A. Programmed Activity/ies			
➤ Prioritization of Market Packages		End of Week 8 (April 29, 2001)	
➤ Preparation of Draft Market Briefs		End of Week 9 (May 5, 2001)	
➤ Final Draft of Market Briefs		End of Week 10 (May 12, 2001)	
➤ Terminal Report		May 15, 2001	
B. Activities Undertaken			
➤ Data Processing and Analyses Various simulation runs were done to come up with the prioritized 25 NRE-Based Market Packages. This activity further fine tune the methodology developed in identifying/prioritizing the market packages.			
➤ Data Gathering for the Market Briefs Based on other criteria that are already available, such as aggregate number of household, municipality classification (based on average annual income) and the household population density, a tentative prioritization can be done. The initial list of prioritized market packages will be the basis for secondary data gathering. A template on the market brief/info kits will be prepared together with DOE to serve as the general format for the documents to be prepared.			
C. Next Activities			
➤ Data processing and analyses for prioritization of market packages ➤ Continuation of secondary data research for market briefs ➤ Preparation of market brief template ➤ Initial draft on the market packages			

Project Title	TA for Enhancing Private Sector Participation in RE Investments for Off-Grid Rural Electrification		
Task No	#3 - Identifying The Market Packages		
Donor Agency	USAID	Contractor	Renato T. Goco Chief of Party PA Government Services, Inc.
Weekly Status Report No.	9	Date of Submission	7 May 2001
Subcontractor/Consultant	Arlene S.M. Lafrades		
A. Programmed Activity/ies			
<ul style="list-style-type: none"> ➤ Preparation of Draft Market Briefs End of Week 9 (May 5, 2001) ➤ Final Draft of Market Briefs End of Week 10 (May 12, 2001) ➤ Terminal Report May 15, 2001 			
B. Activities Undertaken			
<ul style="list-style-type: none"> ➤ Data Gathering and Processing for the Market Briefs Materials and information gathered from DILG were reviewed. A visit to DPEM was also made to get relevant information on areas where consultations were done. Initial coordination with Dr. Capareda, project leader of MA, was also made to borrow municipal profiles gathered during the conduct of the survey. Selected ANECs are also involved in gathering information relevant to the market briefs. ➤ Preparation of the Draft Market Briefs A template has been prepared and about ten market briefs have been prepared. Provincial and municipal maps will be included in the market briefs. 			
C. Next Activities			
<ul style="list-style-type: none"> ➤ Continuation of secondary data research for market briefs ➤ Preparation of 25 market briefs/info kits 			

Annex D

PRESENTATION MATERIALS



Philippines Climate Change Mitigation Program
A Joint Program of the

Philippines Department of Energy



US Agency for International Development

Technical Assistance to DOE

*Enhancing Private Sector Participation in
Renewable Energy Investments for
Off-Grid Rural Electrification*

TASK 3

IDENTIFYING MARKET PACKAGES

DOE - USAID/PA Technical Assistance "Enhancing
Private Sector Participation in renewable Energy
Investments for Off-grid Rural Electrification"

Arlene S.M. Lafrades

TASK 3 DELIVERABLES

- ☐ **Methodology for determining a market package**
- ☐ **Classification of market packages**
 - **Long-list of market packages (50 market packages)**
 - **25 Prioritized RE-Based Off-grid Market Packages**
- ☐ **Market Briefs for 25 Prioritized Off-grid Market Packages**
- ☐ **Mentoring of DOE-EUMB staff on market packaging methodology**

DOE - USAID/PA Technical Assistance "Enhancing
Private Sector Participation in renewable Energy
Investments for Off-grid Rural Electrification"

Task 3 - Identifying Market Packages

GUIDING PRINCIPLES IN DETERMINING A MARKET PACKAGE

- ☞ **Social equity to access to electricity services**
- ☞ **Maximization of opportunities for private sector entry**
- ☞ **Efficiency in rural electrification**

DOE - USAID/PA Technical Assistance "Enhancing Private Sector Participation in renewable Energy Investments for Off-grid Rural Electrification"

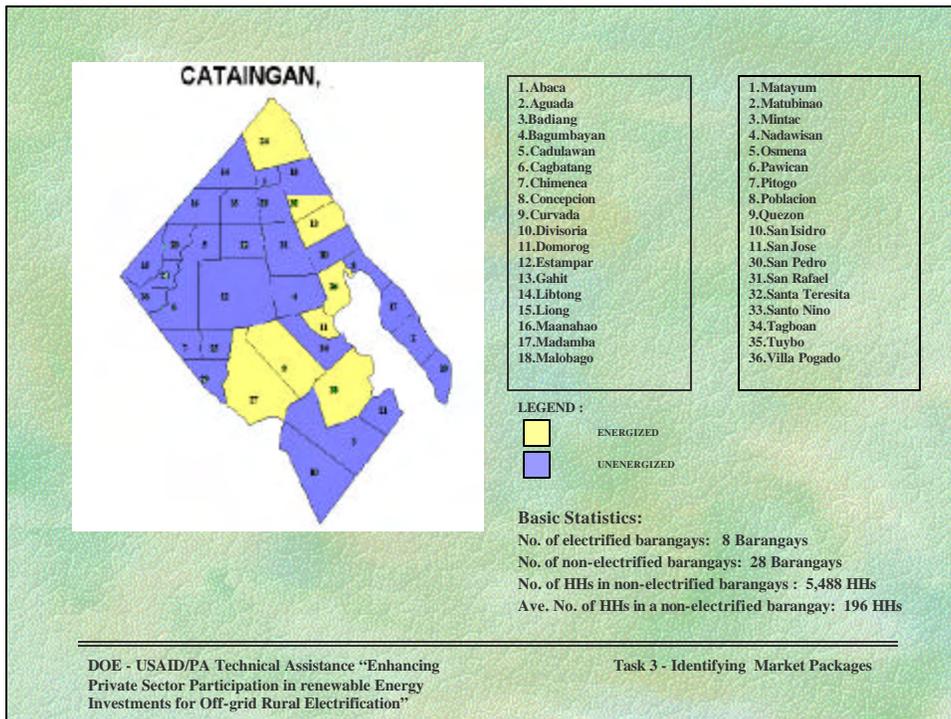
Task 3 - Identifying Market Packages

MARKET PACKAGES REDEFINED

- ☞ **Initial Definition : "Cluster of ten or more non-electrified barangays with adequate number of base customers"**
- ☞ **Proposed Definition : "All non-electrified barangays in selected municipalities with adequate number of base customers"**

DOE - USAID/PA Technical Assistance "Enhancing Private Sector Participation in renewable Energy Investments for Off-grid Rural Electrification"

Task 3 - Identifying Market Packages



REDEFINED MARKET PACKAGES Merits

- ⇒ **Greater chances of achieving electrification targets**
- ⇒ **Economy of scale of operation for private sector/ civil society cum LGU partnership**
- ⇒ **Assist EC in achieving greater efficiency in providing electricity services to its customers**

DOE - USAID/PA Technical Assistance "Enhancing Private Sector Participation in renewable Energy Investments for Off-grid Rural Electrification" Task 3 - Identifying Market Packages

METHODOLOGY FOR IDENTIFYING MARKET PACKAGES

- ☐ Screening of non-electrified barangays
- ☐ Prioritization of shortlisted market packages

DOE - USAID/PA Technical Assistance "Enhancing Private Sector Participation in renewable Energy Investments for Off-grid Rural Electrification"

Task 3 - Identifying Market Packages

SCREENING OF NON-ELECTRIFIED BARANGAYS

Stages	Population/Sample	Criteria	Result/s
1 : Regional Shortlisting	Whole Philippines	Reg'l Energization Status; Security	Regions 2, 5, 6, 8 and 9
2 : Municipal Shortlisting			
- 1st Level	565 Municipalities/ Cities	MEI	259 Municipalities
- 2nd Level	259 Municipalities	10 or more non-electrified barangays	163 Municipalities
- 3rd Level	163 Municipalities	MA sample municipality	87 Municipalities

LONG LIST OF MP : 87 MUNICIPALITIES

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Task 3 - Identifying Market Packages

MUNICIPAL ENERGIZATION INDEX (MEI)

☞ ratio of the municipal energization status to that of the national energization status measured at the barangay level

☞ indicator used to identify candidate off-grid municipalities

☞ Eg. Cataingan, Masbate

Municipal Energization Status : 22%
National Energization Status : 77%
MEI : 0.29

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Task 3 - Identifying Market Packages

PROFILE OF 163 CANDIDATE OFF-GRID MUNICIPALITIES

☞ Geographical Distribution

- Region 2 : 15 municipalities
- Region 5 : 32 municipalities
- Region 6 : 25 municipalities
- Region 8 : 50 municipalities
- Region 9 : 41 municipalities

☞ Electric Cooperatives

- Region 2 : Five ECs (CAGELCO I/II, ISELCO I/II, NUVELCO)
- Region 5 : Eight ECs (CANORECO, CASURECO I/III/IV, ALECO, MASELCO, SORECO II, TISELCO)
- Region 6 : Seven ECs (AKELCO, ANTECO, CAPELCO, ILECO I/II/III and VRESCO)
- Region 8 : Seven ECs (LEYECO I, NORSAMELCO, ESAMELCO, SAMELCO I/II, SOLECO)
- Region 9 : Four ECs (ZANECO, ZAMSURECO I/II, BASELCO)

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Task 3 - Identifying Market Packages

PROFILE OF 163 CANDIDATE OFF-GRID MUNICIPALITIES

☰ Level of Energization

- < 20 % : 19 municipalities
- 21 % - 40 % : 46 municipalities
- 41 % - 60 % : 61 municipalities
- 61 % - 76% : 37 municipalities

☰ Number of Non-Electrified Barangays

- 10 - 15 non-electrified barangays : 77 municipalities
- 16 - 20 non-electrified barangays : 39 municipalities
- 21 - 25 non-electrified barangays : 22 municipalities
- 26 - 30 non-electrified barangays : 10 municipalities
- > 30 non-electrified barangays : 15 municipalities

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PRIORITIZATION OF MARKET PACKAGES

Parameters

Weights/Points

☰ No. of HHs in non-electrified barangays	25 points
☰ HH energy expenditures	15 points
☰ HH disposable income	15 points
☰ HH total income	10 points
☰ HH population density	15 points
☰ Municipal financial capacity	20 points

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25 PRIORITIZED MARKET PACKAGES

Region 2: Baggao, Cagayan
Benito Soliven, Isabela
San Mariano, Isabela

Region 5: Bacacay, Albay
Libon, Albay
Oas, Albay
Rapu-Rapu, Albay
Balud, Masbate
Cataingan, Masbate
Esperanza, Masbate
Masbate, Masbate
Mandaon, Masbate
Milagros, Masbate
Palanas, Masbate

Region 6: Dumarao, Capiz
Dueñas, Iloilo
Calatrava, Negros Occ.

Region 8: Catubig, N. Samar
Las Navas, N. Samar
Laoang, N. Samar
Tarangnan, W. Samar
Daram, W. Samar
Guiuan, E. Samar

Region 9: S.Osmeña Sr., Zamb. Norte
Sibuco, Zamb. Norte

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Task 3 - Identifying Market Packages

PROFILE OF 25 PRIORITIZED MARKET PACKAGES

Geographical Distribution

- Region 2 : Three (3) municipalities
- Region 5 : Eleven (11) municipalities
- Region 6 : Three (3) municipalities
- Region 8 : Six (6) municipalities
- Region 9 : Two (2) municipalities

Electric Cooperatives

- Region 2 : Two (2) ECs (CAGELCO I, ISELCO II)
- Region 5 : Two (2) ECs (ALECO, MASELCO)
- Region 6 : Three (3) ECs (CAPELCO, ILECO II and VRESCO)
- Region 8 : Four (4) ECs (NORSAMELCO, ESAMELCO, SAMELCO I/II)
- Region 9 : Two (2) ECs (ZANECO, ZAMSURECO II)

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Task 3 - Identifying Market Packages

PROFILE OF 25 PRIORITIZED MARKET PACKAGES

☰ Level of Energization

- < 20 % : Six (6) municipalities
- 21 % - 40 % : Eight (8) municipalities
- 41 % - 60 % : Nine (9) municipalities
- 61 % - 76% : Two (2) municipalities

☰ Number of Non-Electrified Barangays

- 10 - 15 non-electrified barangays : Three (3) municipalities
- 16 - 20 non-electrified barangays : Six (6) municipalities
- 21 - 25 non-electrified barangays : Six (6) municipalities
- 26 - 30 non-electrified barangays : Four (4) municipalities
- > 30 non-electrified barangays : Six (6) municipalities

PROFILE OF 25 PRIORITIZED MARKET PACKAGES

☰ Aggregate Number of HHs in Non-Electrified Barangays

- 2,000 - 2,500 HHs : Three (3) municipalities
- 2,501 - 3,000 HHs : Four (4) municipalities
- 3,001 - 3,500 HHs : Seven (7) municipalities
- > 3,500 HHs : Eleven (11) municipalities

☰ Classification of Municipality by DOF

- 1st Class Municipality : Two (2) municipalities
- 2nd Class Municipality : Two (2) municipalities
- 3rd Class Municipality : Five (5) municipalities
- 4th Class Municipality : Eleven (11) municipalities
- 5th Class Municipality : Five (5) municipalities

PROFILE OF 25 PRIORITIZED MARKET PACKAGES

≡ Average Annual Household Income

- PhP 20,000 - PhP 30,000 : Three (3) municipalities
- PhP 30,001 - PhP 40,000 : Eleven (11) municipalities
- PhP 40,001 - PhP 50,000 : Seven (7) municipalities
- PhP 50,001 - PhP 60,000 : One (1) municipalities
- > PhP 60,000 : Three (3) municipalities

≡ Average Monthly Household Energy Expenditures

- <PhP 100.00 : Three (3) municipalities
- PhP 100.00 - PhP 150.00 : Ten (10) municipalities
- PhP 150.01 - PhP 200.00 : Ten (10) municipalities
- PhP 200.01 - PhP 250.00 : One (1) municipalities
- > PhP 250.00 : One (1) municipalities

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Task 3 - Identifying Market Packages

PROFILE OF 25 PRIORITIZED MARKET PACKAGES

≡ Average Annual Household Disposable Income

- < PhP 5,000 : Four (4) municipalities
- PhP 5,000 - PhP 10,000 : Eight (8) municipalities
- PhP 10,001 - PhP 15,000 : Eight (8) municipalities
- PhP 15,001 - PhP 20,000 : One (1) municipalities
- PhP 20,001 - PhP 25,000 : None (0) municipalities
- > PhP 25,000 : Four (4) municipalities

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Task 3 - Identifying Market Packages

25 PRIORITIZED MARKET PACKAGES World Bank Criteria

Municipalities to Qualify

- **Baggao, Cagayan**
 - 1st Class Municipality
 - 3,750 HHs
- **San Mariano, Isabela**
 - 1st Class Municipality
 - 3,133 HHs
- **Masbate, Masbate**
 - 2nd Class Municipality
 - 2,711 HHs
- **Calatrava, Negros Occidental**
 - 2nd Class Municipality
 - 5,810 HHs

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Task 3 - Identifying Market Packages

SAMPLE MARKET BRIEF OF MARKET PACKAGES (MP)

- ⇒ **Provincial map showing the municipal market packages**
- ⇒ **Individual market brief template per MP**
- ⇒ **Municipal map showing the electrified and non-electrified barangays**
- ⇒ **RE resource maps (solar, wind, hydro)**

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Task 3 - Identifying Market Packages

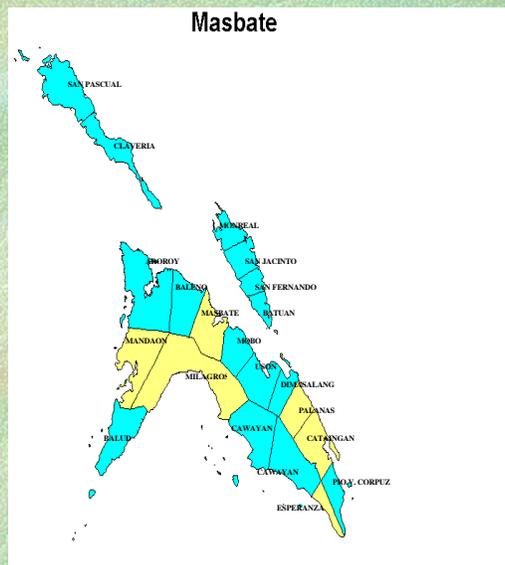
MARKET PACKAGES

Masbate

- M.P. # 8 : Balud
- M.P. # 9 : Cataingan
- M.P. # 10 : Esperanza
- M.P. # 11 : Mandaon
- M.P. # 12 : Masbate
- M.P. # 13 : Milagros
- M.P. # 14 : Palanas

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Task 3 - Identifying Market Packages



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Task 3 - Identifying Market Packages

CATAINGAN, MASBATE
Market Package No. 9

1 of 3

General Information

Political Subdivisions	Thirty - six (36) barangays																												
• Number of barangays	Eight (8) barangay																												
• Number of energized barangays																													
• Number of unenergized barangays	Twenty-eight (28) barangays and these are																												
	<table border="0"> <tr> <td>✓ Abaca</td> <td>✓ Malobago</td> </tr> <tr> <td>✓ Aguda</td> <td>✓ Marayum</td> </tr> <tr> <td>✓ Badiang</td> <td>✓ Matubinao</td> </tr> <tr> <td>✓ Bagumbayan</td> <td>✓ Mintac</td> </tr> <tr> <td>✓ Chimnea</td> <td>✓ Nadawisan</td> </tr> <tr> <td>✓ Cadulawan</td> <td>✓ Osmena</td> </tr> <tr> <td>✓ Cagbatang</td> <td>✓ Pitogo</td> </tr> <tr> <td>✓ Concepcion</td> <td>✓ San Isidro</td> </tr> <tr> <td>✓ Divisoria</td> <td>✓ San Jose</td> </tr> <tr> <td>✓ Estampar</td> <td>✓ San Pedro</td> </tr> <tr> <td>✓ Leong</td> <td>✓ San Rafael</td> </tr> <tr> <td>✓ Librong</td> <td>✓ Tagboan</td> </tr> <tr> <td>✓ Maanahao</td> <td>✓ Toybo</td> </tr> <tr> <td>✓ Madamba</td> <td>✓ Villa Pogado</td> </tr> </table>	✓ Abaca	✓ Malobago	✓ Aguda	✓ Marayum	✓ Badiang	✓ Matubinao	✓ Bagumbayan	✓ Mintac	✓ Chimnea	✓ Nadawisan	✓ Cadulawan	✓ Osmena	✓ Cagbatang	✓ Pitogo	✓ Concepcion	✓ San Isidro	✓ Divisoria	✓ San Jose	✓ Estampar	✓ San Pedro	✓ Leong	✓ San Rafael	✓ Librong	✓ Tagboan	✓ Maanahao	✓ Toybo	✓ Madamba	✓ Villa Pogado
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✓ Maanahao	✓ Toybo																												
✓ Madamba	✓ Villa Pogado																												

Climate	<ul style="list-style-type: none"> • No very pronounced maximum rain period, with a short dry season • Climatological Data (1998) <ul style="list-style-type: none"> ✓ Total rainfall : 1462.7 mm ✓ No. of rainy days : 147 days ✓ Ave. Temperature : 29.6°C
---------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Demographic Profile

Household Population (1995)	• 5,170 Households
Projected HH Population (2000)	• 5,488 HH
Ave. Annual Pop'n Growth Rate	• 1.2 (1990 - 1995)
Ave. HH Size	• 4.8 persons
HH Population Density	• 25.29 HH/km ²

Macro-economic Indicators

Ave. Annual HH Income	• PhP 29,504.50
Ave. Annual HH Expenditures	• PhP 28,381.66
Ave. Annual HH Disp. Income	• PhP 1,122.84
Ave. HH Energy Expenditures	• PhP 102.85/month
Municipality Income Class	• Fourth

CATAINGAN, MASBATE
Market Package No. 9

2 of 3

Natural Resources

Land Area	• 204.40 km ²
Land Capability Slope Distribution	<ul style="list-style-type: none"> • 0 - 2% : 10.00% (level to nearly level) • 3 - 5% : 20.67% (very gently sloping) • 5 - 8% : 30.67% (Gently sloping) • 8 - 15% : 8.67% (Moderately sloping) • 15 - 25% : 30.00% (Strongly sloping)

Land Use	<ul style="list-style-type: none"> • Cultivated Croplands : 121 km² • Irrigated land : 1.45km² • Fishponds : 1km²
----------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Renewable Energy Resources

Solar Energy	• 5kWhr/m ² /day
Wind Energy	<ul style="list-style-type: none"> ✓ Wind power density : 200-400 W/m² ✓ Wind Speed : 5.6 - 7.0 m/s
Hydro Power	• 50 watts

Economic Activities

Predominant Economic Activities	• Farming
Livestock	<ul style="list-style-type: none"> • Cattle Population <ul style="list-style-type: none"> ✓ 2,001 (backyard) ✓ 200 (semi-commercial)
Coconut	<ul style="list-style-type: none"> • Total Number of trees : 886,426 • Ave. nut prod./tree/year : 24 • Number of coco farms : 264 • Average farm size : 3.00 hectares
Trade	No. of establishments
• Industry Sector	• 33
• Services Sector	• 12
Other Livelihood Activities	<ul style="list-style-type: none"> • Mat weaving • Fish culture/drying • Coconut processing

CATAINGAN, MASBATE

Market Package No. 9

3 of 3

Utilities

Power

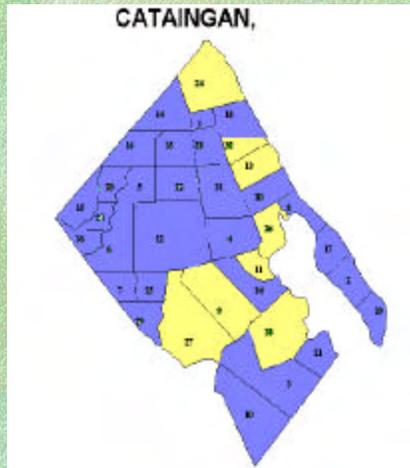
- Electric Cooperative ▪ MASELCO
- Municipality Energy Status ▪ 22%
- Power Tariff (Basic Rates as of December 2000)
 - ✓ Residential ▪ PhP 22.83 for first 6kWhr
PhP 3.8054kWhr (in excess of 6 kWhr)
 - ✓ Commercial ▪ PhP 38.15 for first 10kWhr
PhP 3.8154kWhr (in excess of 10 kWhr)
 - ✓ Industry
 - Demand Charge ▪ No data
 - Energy Charge ▪ PhP 3.8154kWhr

Social Services

- Education (Schools)* ▪ at least 28 schools

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Task 3 - Identifying Market Packages



- 1. Abaca
- 2. Aguada
- 3. Badiang
- 4. Bagumbayan
- 5. Cadulawan
- 6. Cagbatang
- 7. Chimenea
- 8. Concepcion
- 9. Curvada
- 10. Divisoria
- 11. Domorong
- 12. Estampar
- 13. Gabit
- 14. Libtong
- 15. Liong
- 16. Maanahao
- 17. Madamba
- 18. Malobago

- 1. Matayum
- 2. Matubinao
- 3. Mintac
- 4. Nadawisan
- 5. Osmena
- 6. Pawican
- 7. Pitogo
- 8. Poblacion
- 9. Quezon
- 10. San Isidro
- 11. San Jose
- 30. San Pedro
- 31. San Rafael
- 32. Santa Teresita
- 33. Santo Nino
- 34. Tagboan
- 35. Tuybo
- 36. Villa Pogado

LEGEND :
 ENERGIZED
 UNENERGIZED

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Task 3 - Identifying Market Packages



MARKET PACKAGES FOR OFF - GRID RURAL ELECTRIFICATION

a presentation by:

Arlene S.M. Lafrades

Private Sector Consultation
Workshop

Horizon Edsa Hotel

June 28, 2001



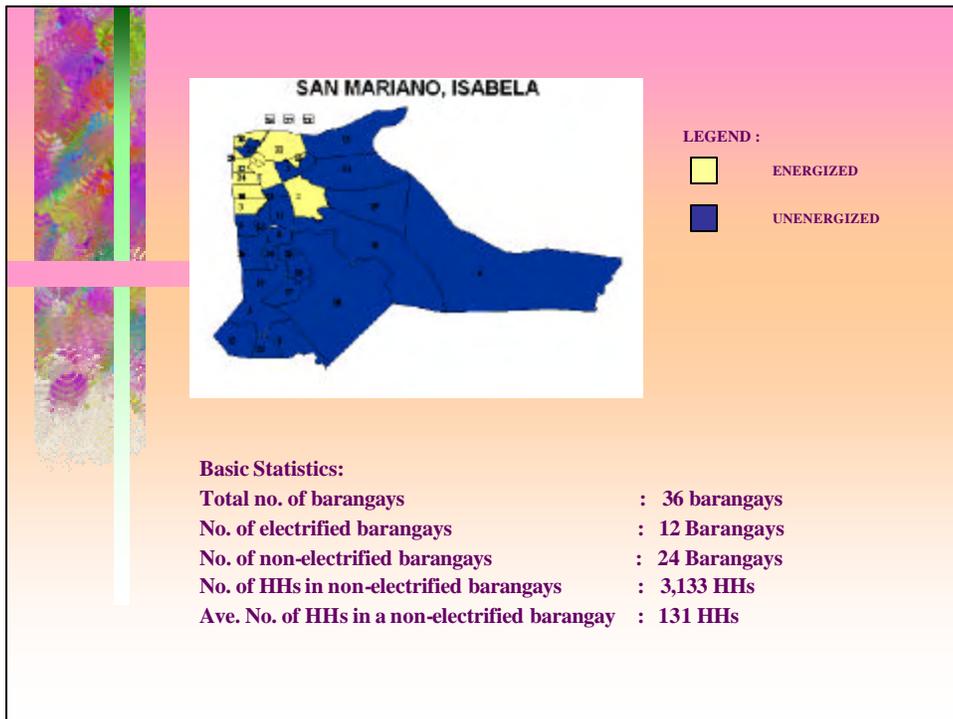
MARKET PACKAGES REDEFINED

Initial Definition :

"Cluster of ten or more non-electrified barangays
with adequate number of base customers"

Proposed Definition :

"All non-electrified barangays in selected
municipalities with adequate number of base
customers"



- ## REDEFINED MARKET PACKAGES
- ### Merits
- Greater chances of achieving electrification targets
 - Economy of scale of operation for private sector/ civil society cum LGU partnership
 - Assist EC in achieving greater efficiency in providing electricity services to its customers

25 PRIORITIZED MARKET PACKAGES

Region 2: Baggao, Cagayan
Benito Soliven, Isabela
San Mariano, Isabela

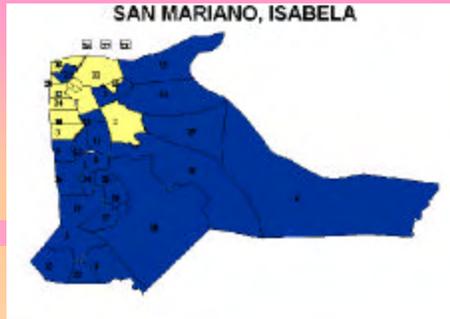
Region 6: Dumarao, Capiz
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Calatrava, Negros Occ.

Region 5: Bacacay, Albay
Libon, Albay
Oas, Albay
Rapu-Rapu, Albay
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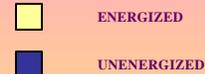
Region 8: Catubig, N. Samar
Las Navas, N. Samar
Laoang, N. Samar
Tarangnan, W. Samar
Daram, W. Samar
Guiuan, E. Samar

Region 9: S.Osmeña Sr., Zamb. Norte
Sibuco, Zamb. Norte

SAN MARIANO, ISABELA



LEGEND :



Basic Statistics:

Total No. of Barangays	: 36 barangays
No. of Electrified Barangays	: 12 Barangays
No. of Non-electrified Barangays	: 24 Barangays
No. of HHs in Non-electrified Barangays	: 3,133 HHs (1995)
	: 3,273 HHs (2000)
Municipality Land Area	: 1,469 km ²
Topography	: Upland
Municipality Classification	: First Class
Average Annual HH Income	: PhP 63,622.67
Average Monthly HH Energy Expenditures	: PhP 155.46
Average Annual HH Disposable Income	: PhP 30,404.83
Electric Cooperative	: ISELCO II

