Case study 1

Capacity Building for financing institutions – Establishing energy loan program

Case study 1 is based on the Republic of Palau National Development Bank experience of establishing an energy loan program. This is the first of three case studies to be prepared under the project agreement between the International Renewable Energy Agency (IRENA) and the Secretariat of the Pacific Regional Environment Programme (SPREP), further supported by the International Union of Conservation Nature (IUCN Oceania). This case study emphasizes the situation that gave rise to the development of the program and actions taken to develop a program replicable to other pacific small island states.

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Table of contents

Acronyms used

EESP Energy Efficiency Subsidy Program

ELP Energy Loan Program

NDBP National Development Bank of Palau

REFW Renewable Energy Financing Program

SPREP Secretariat of the Pacific Regional Environment Programme

Introduction

This case study is provided to illustrate a modality for the sustainable implementation of energy efficiency and renewable energy projects through innovating financing delivered by development banks which operate throughout the Pacific. It is one of three case studies prepared for this purpose. This first case study reviews the overall strategy and implementation of an energy loan program. The next two cases will focus on, i) the development of an energy efficiency housing loan program and, ii) the development of a renewable energy loan program – funding both grid connected and off-grid photovoltaic systems.

The cases in this study are based on the experience of the National Development Bank of Palau (NDBP) which launched its Energy Efficiency Housing Program in 2008 and expanded into financing renewable energy projects in 2010. The program is considered a success based on its longevity and the regional and international recognition the Bank has received.

It is believed that the situation and opportunities which allowed the NDBP to develop its program are applicable and replicable throughout the Pacific provided nation-specific environmental considerations are addressed; i.e., national energy policy and mandate of the bank concerned are reflected in program design. The aim of the three case studies are to highlight the most important features of the programme to allow for replicability in other Islands.

The Pacific and Republic of Palau in context

The Pacific Islands are spread throughout a vast ocean between Asia and the Americas and above Australia and New Zealand. There are three main groups – Micronesia to the northwest, Melanesia to the south, and Polynesia to the east. The weather is warm year round and the abundance of sunlight provides a great resource opportunity for all island countries. A few larger countries have hydro resources whilst some have thermal resources. Wind is not a usual opportunity as there is either too little or too much of it in the Pacific.

Palau is located in the northwest Pacific, 500 miles (800 km) east of the Philippines. The country has abundant solar potential and also calm wind throughout the year due to its location near the equator. Geographic coordinates are latitude 3°N–9°N and longitude 131°E–135°E. Locations close to the equator have infrequent typhoons – which also reduces wind and wave energy technology opportunities. Calm winds and infrequent storms work to these islands' advantage for photovoltaic systems which are prone to wind related damage.

As typical amongst Pacific Islands, there is an estimated 300 islands in Palau, most of which are small, uninhabited, rocky islands that are hard to reach. Dispersed and sparsely populated islands have diseconomies of scale and logistical challenges for energy project implementation. Palau is

one of the smaller pacific islands with total land area of 488 km^2 with a large exclusive economic zone estimated at 3,120,000 km^2. Pacific island ocean boundaries are important for the tuna resources they contain as well as for strategic importance to larger nations.

Due to dispersion and remoteness of small land masses over a large ocean, the Pacific comprises a small population group compared to the rest of the world. Palau is no exception with population estimated in 2011 at 20,643 with an average growth rate of 0.6%. Population density is 41 people per km^2 reflecting low growth rates and emigration common with many of its neighbors. Urbanization is also an issue. In Palau, about 80% of the population lives in the economic, political, and business center of Koror State. Though land is available in rural areas of the larger island of Babeldaob, the high costs of adding new infrastructure creates challenges for attracting the population from the urban center. Independent power generation such as off-grid PV is considered one of the few options available for these areas as well as remote islands accessible by boat or small plane.

Economies in the Pacific vary widely in size. The resource and land rich Melanesian countries have mining and forestry industries (and oil/natural gas). The mid-size countries of Polynesia are agriculture and fishery based. Many of the smaller countries are tourism based – like Palau. Palau's visitor arrivals are about five times its population. The industry relies on primarily Taiwanese and Japanese tourists which represent the bulk of visitors to Palau each year. Tourists are important drivers of development for the Islands. Energy efficiency and renewable energy projects are considered clean technology suitable for the island image.

The different types of energy technologies suitable for the Pacific have different price points as well as returns on investment. Average incomes, household income, and GDP per capita are relevant factors for consideration of affordability in energy loan programs design. It is believed that an increase in national income results in increased energy demand. This held true for Palauan households which have decreased in number to four (4) persons on average per household while size of houses built (in the bank's experience) grew larger and built of concrete. As houses grew, so did electricity demand. The largest use of electricity was for air conditioning, followed by appliances and lighting.

Palau was the ideal test case for energy loan program development due to higher incomes and high electricity usage per household. Palau's GDP in 2008 was estimated at US$180 million for about 20,000 people or about US$8,812.3 per capita. Economic growth of 2.5% was minimal – negated by inflation around the same at 2.3%. Unemployment was minimal at 4.2% based on the last estimate in 2005. So affordability was not a major issue. Additional economic information is provided in the appendix.

The electric utility (Palau Public Utilities Corporation) was also suffering from low tariffs charged and were deferring maintenance which eventually resulted in a fire which destroyed its main power plant. This situation is considered common amongst pacific island countries which struggle with the political difficulty of raising tariffs in a high energy price environment and with a weak global economy. These factors were evident to the National Development Bank of Palau and to the Palau Energy Office which began to collaborate to discuss financing a national housing energy efficiency program. It was also determined that there was a large number of households using over 200 kWh per month at subsidized electric tariff rates. Palau is fortunate to have a knowledgeable energy office with many years of experience with photovoltaic systems in the remote locations of Palau.

The National Development Bank of Palau

History - The bank is a 100% government owned corporation. Its corporate objective is to actively promote economic development in all sectors of the nation, and housing. The Palau National Code Annotated 26 PNCA § 102 established the National Development Bank of Palau in 1982. The bank is not regulated by the central government or bank supervisor and does not take deposits and rarely receives appropriations from congress. The last time the bank received government support was in 2000 when it received US$3 million for its first time home owner loan program. The bank's main source of funding is borrowing from international and bilateral sources and the Palau Social Security Administration.

Management - There are seven directors of the bank, six of which are appointed by the President of the Republic, with advice and consent of the Senate. The seventh, the president of the bank who also serves as CEO is an ex-officio member of the board by virtue of his position. Two of the bank's board of directors had experience in the Energy Sector having worked as part of the electric utility's management.

Finances - In 1982 the bank assumed loans originating from Palau from the regional economic development loan fund that operated in the region. Many of these loans were non-performing (not paying as agreed) and the bank struggled to fulfill its mandate of economic development with this stigma attached. After several outside consultations the bank began to modernize its operations and hire professional management. It began to grow but under the shadow of its former failures – high pressure on its turnaround. The bank's efforts were recognized and resulted in the $3 million government appropriation, $6 million from Social Security Administration, Euro 5 million from the European Investment Bank and another $5 million from a Taiwan bank. Bank financial statements are provided in the appendix.

Loan Programs - Housing is featured prominently in the NDBP portfolio in 2008. This is partly due to the government appropriation in 2000 for housing but also based on a need for housing in and around the urban center of Koror State. In fact, housing loans were about one half of the portfolio as shown in the table below.

National Development Bank of Palau - Loans in 2008

Sector	Number	Amount (000's)	%Value
Agriculture	9	$113.4	1%
Fisheries	4	14.9	0%
Commerce	103	10,300.7	50%
Housing	293	9,969.8	49%
Total		**$20,398,8**	**100%**

Source: NDBP 2008 Audit of Financial Statements

NDBP is the housing lender in the Republic because commercial banks perceive too much risk in mortgage lending for several reasons. These reasons include lack of title insurance, problems with underlying title to lands, and small market for resale. Over the course of 8 years, the bank had perfected its system of lending for housing. The quality of housing constructed was improving and so was the market demand for quality housing.

Need and development of the Energy Loan Program

The bank was flush with resources when the global economic crisis occurred and oil prices spiked. Management noticed pressure on its borrowers to make their repayments and new loan requests were few and far between by this time. The investment in the energy sector was a logical intervention.

In or around 2006, unrelated to its own energy research and development efforts, bank management began discussions with the Energy Office regarding supporting energy efficiency in housing. The discussion included possible subsidy for including energy measures. This funding was made possible through Italian and Austrian funds managed by the International Union for the Conservation of Nature – Oceania office.

While these discussions were occurring, the Bank conducted its own research by hiring its own consultants and travelling to Hawaii, considered related market, to speak to experts there. The bank then began to develop its proposal concurrently with other consultant project proposal development for both energy efficiency and photovoltaic systems. It is clear that the bank would have proceeded with its own program regardless of whether or not it received assistance. In this way, the bank had full ownership of the Energy Loan Program and maintained that ownership throughout the process.

During its research phase, the bank began to study the issues involved in the energy sector. It also began to collect relevant data for its program on household energy usage. The bank already

had a close relationship with the private sector and contractors but it was during this time that the bank began to cultivate its relationship with the Energy Office and the Electric Utility. This is significant to program development as these partners are critical to the success of the Energy Loan Program.

The bank also took the opportunity to include its partners in discussion sessions with its consultant to increase basic knowledge and solicit commitment and feedback on the bank's program to be launched. Many of these meetings were hosted at restaurants or meeting rooms and included refreshments at some cost to the bank. In retrospect, partners are critical to the success of the bank's energy loan program. All parts are necessary and must work together for an energy loan program to work. Without formal structure, this network was cultivated and organized as discussed next.

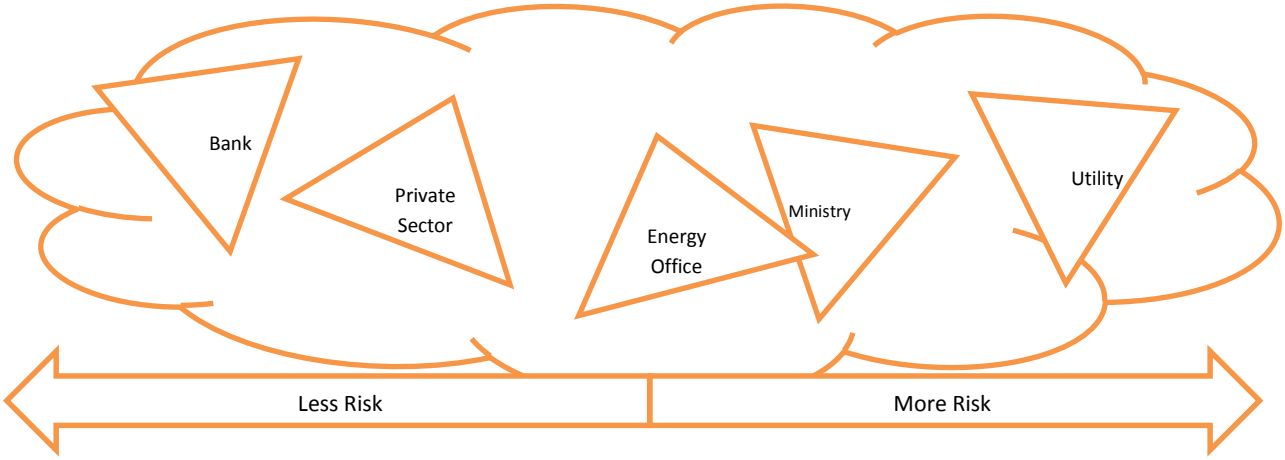
Current status of NDBP program

- Both energy efficiency and PV systems programs have been consolidated into one program called the 'Energy Loan Program'
- As per Operations Manager, latest calculation of savings from recent survey in 2014 savings average for EESP homes is 38%. For example, bills from $150 per month to $75 per month. Compare to target of 15%.
- Number of energy efficient homes constructed is close to 60 homes.
- The bank has been highly successful in selling its inventory of on-grid photovoltaic systems but less so with the off-grid kits. The bank is about to make its next inventory purchase. One contractor has already sourced his own equipment and the bank can end its inventory support once its stock is completed.
- The bank has continued to receive additional subsidy support to extend the efficiency program several more years.
- Bank now relies on new local consultant to provide support for PV installations. Consultant also works with businesses to install larger grid systems not funded by bank. This may be missed opportunity for bank.
- Issue arose with inventory where prices dropped for equipment leaving the bank with more expensive equipment in stock. Accounting decision of how to value inventory has to be made.
- It appears that the contractors for the bank's efficiency program routinely build houses with efficiency measures.
- A commercial bank has agreed to provide housing loans under the same specifications as the Development Bank's efficiency housing program. Planned amount of loans is US$5 million.

Organogram – Energy sector institutional relations

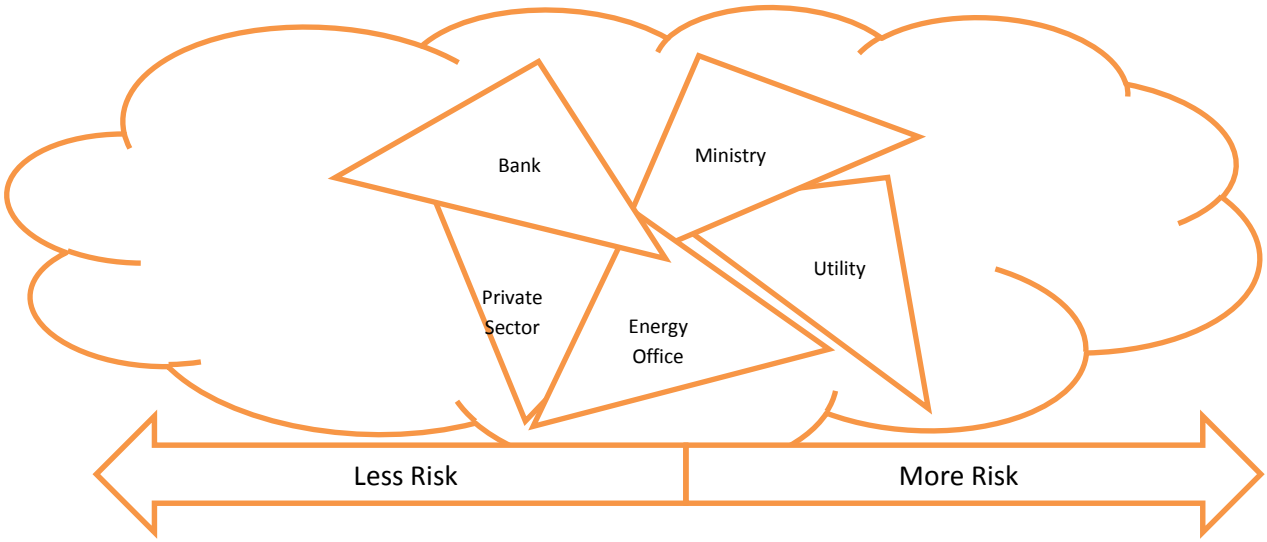
The energy sector in Palau could be considered typical for the Pacific as illustrated below. The cloud represents the ambiguity in the sector. Notice that despite the existence of formal plans and national policy, the connections between the various players is missing. The diagram also illustrates degree of risk taking. The banks and private sector are more conservative than governmental agencies. This may also be a result of a grant funded underdeveloped energy sector such as what was the case in Palau.

Figure 1 Energy Sector before Energy Loan Program



Following the implementation of an energy loan program, coordination and synergies were realized as represented by the overlap of the different partner triangles. Because of the Energy Loan Program, the bank developed to be the link between the various partners. The cloud around the triangles (ambiguity) also shrank in relation to the Energy Loan Program.

Figure 2 Energy Sector after Energy Loan Program



Partner roles

The roles of the different partners are reviewed next. There is logically an overlap in certain areas such as marketing for the loan program but the importance is the consistency in the message and its delivery to encourage uptake of the program.

- **Bank** – Provides overall guidance for the program and financing under its rules. Actively coordinates the project development and dissemination of information and new opportunities; and wherever needed fill in the gaps between its partners.
- **Energy office** – Provides technological support and serves as interface with donors as the official government representative for the energy sector. Also provides general and specific marketing for the program. Through Energy Office, worked with donors like UNDP and IUCN for project follow up and also to secure assistance for procurement of PV Systems. Energy Office staff also provided feedback on procurement selection.
- **Ministry** – Provides support for Energy Office and supports policy development for energy sector including Utility. During the project, the Energy Office was moved several times between the Ministry and Office of the President.
- **Utility** – Provided marketing support and guidance for net metering and grid connected guidelines. Utility provided data to determine system sizing and market size. Also signed Memorandum of Understanding to allow initial PV pilot projects to be connected to the grid.
- **Private sector** – *Retailers* provided support for carrying inventory of energy efficiency products at favorable pricing and participated in the consideration of PV equipment sourcing. Retailers support contractors and have in-store displays of energy products. *Contractors* participated in the training for installation and signed contracts to perform installations for pilot projects. Contractors also sell programs and one stored inventory and has begun to order its own equipment for installation that meets bank's specifications.

Communication and training

It is important to note the importance of constant communication with partners and their participation in the marketing and feedback from implementation provided. Continued training is required for contractors, for instance, because of the change in staffing within the industry. Training programs are also opportunities to address any issues that may not have been covered previously. For instance, alternative installation materials when the market runs out of the original material is important to address. Contractors are also responsible for follow up maintenance and that information is needed for updating the program. There are also changes in the bank's staffing that also need to be addressed.

Administration

It was clear early on that there would need to be a senior loan officer with skills in procurement and management to assist the CEO in program development and supervision of partners and bank Staff for the Energy Loan Program. A lending officer was chosen for the efficiency program and was coached through the launch. A second officer was then chosen for the PV program. One of these officers was later chosen

to be the focal point while the other continued duties with the program they had implemented. Separate meetings were held with this team and the CEO to address issues. These meetings were also scheduled when different consultants would be visiting Palau and the bank. The additional project and supervisory duties (which included training and reporting) were important in the review of these staff who were among the candidates for higher positions. No additional compensation was offered but the prestige and additional travel opportunities provided appeared to be reward enough.

Funding arrangements

Subsidies are treated two different ways for the efficiency program and the PV program. Subsidies under the efficiency program are in the form of cash that do not belong to the customer until the measures are installed and certified. The bank estimates the number of installations that will be completed in the quarter and makes a draw from the donor to a separate trust fund. Once the project is completed the bank obtains a certificate and requests approval for disbursement. This request is handled by the loan officer and is handled by accounting through the regular channels on the standard forms.

The funds are then released via check to the Bank in the name of the borrower. Funds are applied directly to the loan. This is an immediate paydown of the loan and the client has the option to re-amortize the loan or modify his payment to amortize the loan over the original loan period. Often nothing is done in favor of these actions taken later down the road. This essentially accelerates the loan repayment and the customer's loan is paid faster than scheduled. When a re-amortization is requested, usually by the third year of loan, the reduction in term or loan payment is significant and customer is better off and happier.

Marketing efforts

Marketing is considered critical for the success of the Energy Loan Program. Marketing programs are designed around the existing programs of the Bank but additional effort was made to focus on awareness and promotion. The different marketing channels used were radio, television, interviews, brochures, booklets, school visits, community meetings, and cross selling at the bank and with partners to name a few initiatives. Professional grade material was sought and the budgets of both the bank and the Energy Officer were used to fund the program. Marketing was also accomplished by the contractors and retailers when building homes, selling efficiency products and encouraging the installation of PV systems (usually for on-grid PV systems). Raffles were used as a tool to build awareness but the bank also installed features at its building to show clients and visitors actual efficiency measures that could be felt and experienced. It also showed the bank to use what it recommended. The bank invested in its own on-grid and off-grid systems which were installed as part of the training program for contractors.

Monitoring

Program supervisors were responsible for reporting on the projects as identified in the project documents. Information was collected on number of projects supported but also on the projects themselves. For instance, data from solar panels were collected by the bank and provided to consultants and the Energy

Office for review. This information was also important for the new applications for subsidy that were requested.

Sustainability

The original plan for sustainability for the programs differed between the efficiency and PV programs. The efficiency program is now considered to be sustainable as all houses built under the First Time Homeowner Program are required to be energy efficient. The bank needs to now make the non-first time homeowner program include efficiency measures. Retailers carry the required measures as a matter of course and are beginning to carry additional brands and types of measures as well.

The sustainability of the PV program was planned as a recapture of benefits from the key beneficiaries – namely the bank, utility, and government. A reduction in the subsidy amounts offered (initially 50%) was planned. An unexpected but welcome development that supports sustainability is the continued decrease in equipment prices and the increase in electricity tariffs. Both combined increase the affordability of equipment separate from the need for subsidies.

Best practice review – Program design

A summary of best practice in program design is provided for consideration.

1. The Energy Loan Program should be developed within the framework of national policy to attract available funding and avoid duplication of effort or conflicting activities with national agencies.
2. The National Utility is a key player for photovoltaic systems implementation and should be kept closely involved in the development initiative.
3. Institutional arrangements that are insufficient, such as the absence of net metering framework and building codes, can be addressed through procedure and regulation specific to their application to the Energy Loan Program.
4. Size of market is relevant for sustainability – The common opportunities across the Pacific are energy efficiency for new homes or retrofit projects and residential and small business photovoltaic systems.
5. Efficiency projects are the lowest cost investment in comparison to returns but also more challenging to evaluate and monitor.
6. The Energy Loan Program is a financing program first and foremost, therefore it is ideal that the bank leads this development initiative.
7. There is a direct correlation between benefits (in this case energy loan) with costs (subsidies) and projects funded should always be evaluated for their economic and financial merit.
8. An energy loan program can be quickly implemented if made part of the bank's existing loan program most associated with the benefit – Often housing loan programs.
9. Partner and stakeholder involvement in the design, implementation, and development of the Energy Loan Program are critical to its success.
10. The common element between all partners is usually the bank which can coordinate program development for all stakeholders. The importance of training and promotion cannot be overstated.

APPENDIX

Palau Gross Revenue Tax
for Calendar Years 2006, 2007 & 2008

Industry	CY2006	CY2007	CY2008
Agriculture, Hunting & Forestry	$43,953	$46,394	$39,595
Construction	$829,996	$1,085,735	$946,411
Financial Intermediation	$109,956	$62,531	$86,740
Fishing	$220,001	$87,053	$63,186
Hotels & Restaurants	$1,253,541	$1,459,713	$1,419,004
Manufacturing	$173,222	$29,396	$34,827
Mining & Quarrying	$62,394	$71,580	$88,464
Other Community, Social & Personal Activity	$233,361	$322,407	$376,342
Real Estate, Rent & Business Activity	$1,283,011	$1,546,504	$1,575,153
Transport, Storage & Communications	$1,071,631	$109,559	$96,337
Wholesale & Retail Trade	$4,563,513	$5,397,482	$5,742,437
TOTAL	**$9,844,579**	**$10,218,354**	**$10,468,496**

Source: Bureau of Revenue, Customs & Taxation

Palau - Total Wages Paid (in USD)

Industry	2006 Total	2007 Total	2008 Total
Agriculture, Hunting and Forestry	439	352	405
Fishing	700	688	622
Mining and Quarrying	154	152	143
Manufacturing	1,536	1,708	1,586
Electricity, Gas and Water Supply	1,547	1,560	1,482
Construction	9,742	7,480	5,841
Wholesale and Retail Trade; Repair Of Motor Vehicles, Motorcycles and Personal and Household Goods	11,241	11,594	11,830
Hotels and Restaurants	10,050	10,209	10,324
Transport, Storage and Communications	7,936	8,474	8,373
Financial Intermediation	2,474	2,617	2,550
Real Estate, Renting and Business Activities	5,429	6,536	6,664
Public Administration and Defense; Compulsory Social Security	35,786	37,077	38,928
Education	5,121	5,166	5,174
Health and Social Work	411	548	627
Other Community, Social and Personal Service Activities	1,343	1,322	1,279
Private Households With Employed Persons	1,582	1,582	1,466
Extra-Territorial Organizations and Bodies	134	156	160
TOTAL	**$95,624**	**$97,219**	**$97,453**

Source: Social Security Administration

Republic of Palau
Total Persons Employed 2006-2008

Industry	2006 Avg	2007 Avg	2008 Avg
Agriculture, Hunting and Forestry	188	145	131
Fishing	147	146	161
Mining and Quarrying	26	22	16
Manufacturing	258	272	261
Electricity, Gas and Water Supply	147	144	127
Construction	1,494	1,223	1,032
Wholesale and Retail Trade; Repair Of Motor Vehicles, Motorcycles and Personal and Household Goods	1,841	1,853	1,808
Hotels and Restaurants	1,694	1,675	1,630
Transport, Storage and Communications	789	851	865
Financial Intermediation	144	151	145
Real Estate, Renting and Businesss Activities	628	717	677
Public Administration and Defence; Compulsory Social Security	2,937	3,011	3,003
Education	592	572	560
Health and Social Work	47	75	96
Other Community, Social and Personal Service Activities	285	283	271
Private Households With Employed Persons	952	932	847
Extra-Territorial Organizations and Bodies	11	13	14
TOTAL	12,179	12,084	11,639

Source: Social Security Administration

National Development Bank of Palau
2008 Statement of Net Assets

	2008	2007	$ Change	% Change	2006
Current and other assets	$23,134,270	$22,263,833	$870,437	4%	$20,690,145
Capital assets	528,830	64,548	464,282	719%	34,813
Total assets	**$23,663,100**	**$22,328,381**	**$1,334,719**	**6%**	**$20,724,958**
Loans and interest payable	$8,461,687	$7,965,829	$495,858	6%	$6,875,725
Other liabilities	102,540	15,881	86,659	546%	16,612
Total liabilities	**$8,564,227**	**$7,981,710**	**$582,517**	**7%**	**$6,892,337**
Net Assets:					
Invested in capital assets, net of related debt	$528,830	$64,548	$464,282	719%	$34,813
Restricted	14,570,043	14,282,123	287,920	2%	13,797,808
Total Net Assets	**$15,098,873**	**$14,346,671**	**$752,202**	**5%**	**$13,832,621**

Source: NDBP 2008 Audit of Financial Statements

National Development Bank of Palau

2008 Statement of Revenues, Expenses and Change in Net Assets

	2008	2007	$ Change	% Change	2006
Revenues:					
Interest income on loans	$1,719,225	$1,620,604	$98,621	6%	$1,046,208
Loan fees and late charges	30,872	106,265	(75,393)	-71%	100,908
Other	6,724	10,858	(4,134)	-38%	16,515
Total operating revenues	**$1,756,821**	**$1,737,727**	**$19,094**	**1%**	**$1,163,631**
Provision for loan loss	(118,474)	(448,008)	329,534	-74%	(439,029)
Operating expenses:					
Salaries/wages/fringe benefits	$358,498	$295,329	$63,169	21%	$273,044
Rent	41,624	41,535	89	0%	41,565
Depreciation	42,115	35,638	6,477	18%	36,134
Training	26,280	28,825	(2,545)	-9%	10,457
Other expenses	215,242	172,330	42,912	25%	117,073
Total operating expenses	**$683,759**	**$573,657**	**$110,102**	**19%**	**$478,273**
Operating income	$954,588	$716,062	$238,526	33%	$246,329
Nonoperating revenues (exp), net	(324,948)	(357,794)	32,846	-9%	(253,624)
Interest income on interest Bearing accounts	122,562	155,782	(33,220)	-21%	180,924
Change in net assets	**$752,202**	**$514,050**	**$238,152**	**46%**	**$173,629**
Net assets at beginning of year	**14,346,671**	**13,832,621**	**514,050**	**4%**	**13,658,992**
Net assets at end of year	**$15,098,873**	**$14,346,671**	**$752,202**	**5%**	**$13,832,621**

Source: NDBP 2008 Audit of Financial Statements

National Development Bank of Palau

2008 Components of Loans Receivable

	2008	2007
Loans receivable	$20,439,433	$18,296,073
Less:		
Allowance for loan losses	(1,546,992)	(1,281,248)
Deferred loan origination fees	(58,305)	
	$18,834,136	**$17,014,825**
Current portion of economic development loans receivable	(2,655,041)	(1,626,540)
Net Loans	**$16,179,095**	**$15,388,285**

Source: NDBP 2008 Audit of Financial Statements