Case study 2

Capacity Building for financing institutions – Establishing energy loan program

Case Study based on Republic of Palau National Development Bank experience of establishing its Energy Loan Program. This is the second of three case studies to be prepared under a training contract with SPREP. This Case Study emphasizes the development of the energy efficiency loan program for housing.

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Foreward

This case study is provided to illustrate a modality for the sustainable implementation of energy efficiency and renewable energy projects through innovating financing programs delivered by development banks which operate throughout the Pacific. This is the second of three case studies prepared for this purpose.

The first case study reviewed the overall strategy and implementation of an energy loan program. This case is focused on the implementation of an energy efficiency housing loan program. The third case will address the implementation 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.

Palau in the Context of the Pacific

Palau's market is similar to the rest of the Pacific being a small island in the close to the equator with abundant sunshine and limited resources other than large ocean area and tuna resources. Palau is located in the western pacific close to Asia which provides the majority of its visitors – equal to about five (5) times the 20,000 or so population. As with most electric utilities in the region, costs are high per user and tariffs do not always recover full costs.

Palau differs from the rest of the regions because it is a former ward of the United States and is influenced politically and economically by this past relationship. For instance, housing standards are based on the USA standards, English is an official language, and the court system is also based on the United States. Palau also differs from the rest of the region due to its high income levels and corresponding high consumption of energy in the households.

Relevant demographic information used in the design of the program by the Energy Office Consultant was a population of 20,643 (2011 estimate) forecasted to grow by 2015 to 21,168 representing an annual population growth rate of 0.6%. This meant a continuing need for housing. Population density at the time was 41 people per km^2 which was a bit misleading as about 80% of the

population lived in Koror State. The larger island next to Koror State was where more construction was occurring due to the availability of ample space to build.

Best Practice Review

The following list represents the strategies considered essential to the success of the Palau Program that can be replicated in other institutions.

1. Use of Architect to design appropriate energy efficiency measures – reduces complexity and targets program for maximum effectiveness
2. Associating benefits of efficiency measures with its related costs – financing the marginal increase in cost of measures above non efficient design and using fixed value amounts to simplify program
3. Allowing optional measures in addition to mandatory efficiency measures and standard house design plans that already incorporate measures – improves convenience factor for customers
4. Emphasis on working with partners and stakeholders from beginning of project to implement program – fosters awareness and reduces disruptions
5. Emphasis on training and marketing with all stakeholders – promotes continuity of program and avoids interruptions due to changes in stakeholder operations or staffing
6. Launch of new construction before housing retrofit program – minimizes complexity of dealing with buildings that may not be structurally or financially suitable within program parameters
7. Use of key bank staff to manage project – provides necessary attention to program, demonstrates organizational commitment, and creates contact point for all stakeholders
8. Donor support and monitoring – reduces risk to stakeholders and keeps momentum of program development on track

NDBP housing program

The National Development Bank of Palau (NDBP) is the primary financier of home financing in Palau. There is a National Agency financing low income housing but Commercial Banks did not have housing finance programs. The average home constructed in the mid 2000's cost about USD 50,000 and took between 3-6 months to construct. The Bank financed about 30 homes on average each year to Palauan citizens. Typical repayment source was income allotted by employers directly to the Bank. The collateral was the home constructed and the underlying property – whether fee simple or leasehold. Typical interest rates were 8% for loans from 15-20 years. There were two types of home loan programs directly financed by the Bank (aside from the loan guarantees provided by the Bank to a US Department of Agriculture home loans). These programs were the legislated First Time Home Owner (FTHO) program which requires energy efficiency in homes, an 8% interest rate, and required the Bank to offer free house plans for customers; and the standard housing program at 10%. The Bank initially limited the size of loan allowable under its housing program but as funding was secured removed this limitation. Housing is the largest loan program for the Bank representing about 50% of its portfolio.

Conditions leading up to EE program

NDBP recognized and began working on its energy program in 2006. The rise in electricity tariffs due to higher price of fuel threatened the Bank's ability to collect on their loans from their housing customers. Directors also recognized that Palau's self-sufficiency would also require solutions in the energy sector – i.e., reliance on imported fossil fuels. Reduction in imports is part of the Bank's legislated mandate and a strong justification to entertain the development of an energy loan program.

Around this time, Bank management was also in discussions with the Energy Office to support financing initiatives for energy efficiency projects in the household sector. Initially, the Bank's thinking was to finance an energy company startup that would install on-grid photovoltaic systems. This thinking arose from the Country's many years of experience with off-grid photovoltaic systems on community village buildings funded by donors.

After the Bank conducted its initial research, it realized that financing an energy company was an overly simplistic solution. The problem was more complex than first thought. Issues such as suitability and specification of equipment and ability to connect to the grid were not considered and would be outside of the control of an individual business to address. Attention was then diverted to promoting energy efficiency in households while work continued on addressing issues for photovoltaic system development. In hindsight, starting the energy program for energy efficiency in housing first was the best strategy in terms of both cost minimization and result maximization.

By 2007, the Bank's Board of Directors committed to the development of an Energy Loan Program internationally recognized energy consultant, Dr. Herbert Wade, was retained to assist the Bank to develop its program. This assistance resulted in Board Paper No. 01, Meeting No. 05/2008 and Mr. Wade's June 20, 2008 Board Paper on the "Outline for the Development and Provision of Energy Efficient Home Loan Packages." Several other consultancies later and the Bank launched the Energy Efficiency Subsidy Program or EESP in January 2009 followed by the Energy Loan Program (ELP) in 2010 which implemented photovoltaic system financing. Note that the EESP was incorporated into the ELP at that time and the Energy Loan Program for the Bank is now considered one program financing both energy efficiency and renewable energy.

A key consideration of the housing program was more than sufficient funds to construct new homes. The initial USD 3 million appropriation from the government was almost all lent out. Available funds were borrowed and needed to be repaid so housing loans, being the less risky types of loans offered by the Bank were prioritized. In fact, a condition of the funds obtained from the Social Security Administration was fund allocation to housing loans.

Energy Efficiency Subsidy Program (EESP)

This efficiency loan program was launched in January 2009 but applications were accepted earlier in 2008 to avoid any delays in receiving applications. The first applications also received additional subsidy (USD 4,000) to entice them to use their house as model homes for other clients and the Bank – under contract for three years. The EESP launch was supported by grant monies from the Italian Government

of USD500,000 over a period of three years. Under the program homeowners received up to USD6,000 in grant subsidy against their loan for incorporating energy efficient measures into their homes.

The EESP was first applicable for new residential housing construction. Later it was opened to existing house renovations/expansion (referred to as "retrofits"). Both types of construction have been successful. The program was designed to support houses constructed with NDBP financing – which are most houses in the Country. The program was subsequently opened to houses constructed by the Palau Housing Authority which were for low income families at the same subsidy level. This support was accomplished with a separate Memorandum of Understanding (MOU) between the two agencies. As a result of this MOU, almost all houses built in Palau are energy efficient. Solar Water Heaters (SWH) is the only allowable solar energy appliance allowed under this program.

Funding for the EESP was provided by the Government of Italy which made USD 10 million available to Pacific Island Countries for renewable energy and energy efficiency projects through its Sustainable Energy Programme for the Pacific Small Island States (SEPPSIS) in 2007. These funds were supplemented by about €1 million from Austria. About €4 million was managed by the IUCN. The remaining funds were to be accessed directly through Italy's UN embassy in New York.

It was believed that efficiency measures would be adopted by homeowners if the marginal cost of selecting those materials or designs would be offset by subsidies. The primary objective of homeowners in Palau was to build the largest home possible for the loan they could afford. The measures that were identified early included tinted windows, radiant barriers under roofs, and proper door jamb and threshold sealing. The extra money saved by using energy efficient measures would be used to repay their loan faster. Instead, the Bank agreed to allow efficient homes to exceed its maximum repayment ratio and applied the subsidy directly to the customer's loan immediately reducing amount owed. Customers then had the option to re-amortize their loan and lower their repayment amount. Clients usually do not opt for this re-amortization until about three years after their homes are completed whereby the reduction in repayment amount becomes substantial.

The goal of the program that was established in the concept paper was a 15% drop in electricity consumption for new homes and the development of a local market for energy efficient products and services which were not readily available at the time of inception. The key to the EESP was its design of efficiency measures. Several discussions were held with the Bank, Consultant and bank's Architect to discuss appropriate measures and cost versus benefit for these measures. Discussions were also held with retailers and contractors to identify and select measures that were acceptable and would be used in the program. The design of measures to be used was separated such that there was a choice of what measures would be included in a house after the basic requirements were met. In this way, choice was offered to the homeowner reducing any resistance that may have been created if an all-or-nothing approach was used. Using a selection system also was location friendly as certain measures would be better suited to one house at a specific location than another.

The initial design for measures to be funded was a percentage subsidy for each measure taking into account the initial cost of the measure and its payback period. Consideration was made on whether or not to give higher subsidy percentages to lower-income homebuilder. A maximum dollar value was to be set for each measure to avoid wealthier homebuilders to get more subsidy than lower income groups.

Funding as percentages was believed to be superior than fixed amount for several reasons including greater flexibility for homes of varying size and discouraging redundant subsidies such as roof overhangs over tinted windows. The other advantage was support for more homes.

At implementation this plan changed to financing fixed amounts and addressing these concerns in the following ways: 1) A basic set of measures was established and amount attributed to those measures, 2) A set of optional measures were identified and an amount attributed for each measure eliminating redundancy issues, and 3) **A** maximum amount of subsidy was identified. These changes worked because most homes were similar in cost and design. It also worked because NDBP offered standard two and three bedroom house plans to clients for free. The clients were also free to make changes to the plan (with consideration of efficiency measures of course). A copy of the form used to select measures at the NDBP is provided in the appendix. The Bank also allowed the loan limits for home construction to be exceeded for efficiency homes by recognizing the subsidy.

Risks and mitigation

As a Bank program, consideration of risk, type of risk, likelihood of occurrence and degree of impact were considered for the Energy Efficiency Subsidy Program. Aside from the specific bank related risk not to be evaluated here, the Bank and its Consultant identified the following risks associated with the establishment of its EESP.

SNo	Key issues and associated risks	Solutions
1	**Difficulty of finding energy efficient products in Palau -**Absent building codes and appliance standards at the time, customers would not have access to efficiency measures and appliances. Likelihood of risk occurring was high and degree of impact was high. If this persisted, the program could not continue, costs would remain high, and program would be unsuccessful.	To address this risk, the Bank planned to work with retailers to carry the necessary inventory including energy efficient appliances and would seek external assistance to source the necessary products. Result of this effort was successful and energy efficient building products, house designs, and appliances are easily found in hardware establishments supported by contractors throughout Palau.
2	**Borrowers renege on efficient home commitment** - Bank allowed higher loan limits to accommodate incorporation of efficiency measures into home designs and may undertake additional risk without program success. Likelihood was moderate. Impact will be additional risk taken and grant funds will not be spent as quickly which was evaluated as moderate.	One solution proposed was higher mortgage rate if customer reneged. Solution was to incorporate measures into design and construction contract to be verified through normal inspection process. Result was 100% success as any change to design needs prior bank approval through “change order” process.

3	**Chance of no customers** - This may result from too low subsidy rate, poor information, or fear of new program or technology. Likelihood was moderate. Impact was considered low.	To address this risk, the Bank set subsidy rates at about 10% of the average home loan amount, adopted the first set of clients as model homes who would receive higher subsidy rate, and paying attention to marketing efforts. Result of effort was positive. Bank later required all first time homeowner loans to be energy efficient.

Program Implementation

The implementation of the EESP follows the routine process of a housing loan application with the addition of a few steps that incorporate efficiency into the process. With regards to documentation, a separate project document and several energy specific forms are needed to be accompanied by procedural memorandums from management to incorporate measures into housing program.

The steps are outlined in the chart in the appendix but restated here with corresponding procedural document established:

Step 1	**Pre-qualifying stage**	Requires identification of measures, marketing plan, and eligibility criteria for loan program. Also can utilize any standard house plans that are developed for the purpose. Marketing is assumed to have been conducted to bring customers to the Bank for this stage.
Step 2	**Educating clients**	Visit to model homes are useful in this part. Also brochures and personal sell of program.
Step 3	**Working with Parties**	Discussions begin with contractor and owner at this phase. Any checklist and plans that are prepared should include some form of commitment from borrower to avoid losing funding opportunity.
Step 4	**Confirmation of Measures**	Plans are reviewed here and confirmation of project details is made. Identification of measures is necessary here for inclusion into credit memo in next step.
Step 5	**Credit Memo/Approval**	Bank Loan Officer prepares and submits request to authority for approval. Loan account is established and client signs contract for building followed by phase funding as already established by Bank procedure. Construction begins and measures are monitored during phase inspections.
Step 6	**Final Inspection**	Bank inspector for energy needs to visit and provide inspection with certificate to Bank at completion of energy efficiency measures.
Step 7	**Subsidy**	Upon final inspection the Bank receives a certification from the Inspector and releases the funding against the loan. Funds are

		applied against loan balance from accounting fund established for the purpose.

The Bank learned that partner development, coordination, and participation are critical for the implementation and sustainability of the EESP. The partners are the contractors and retailers.

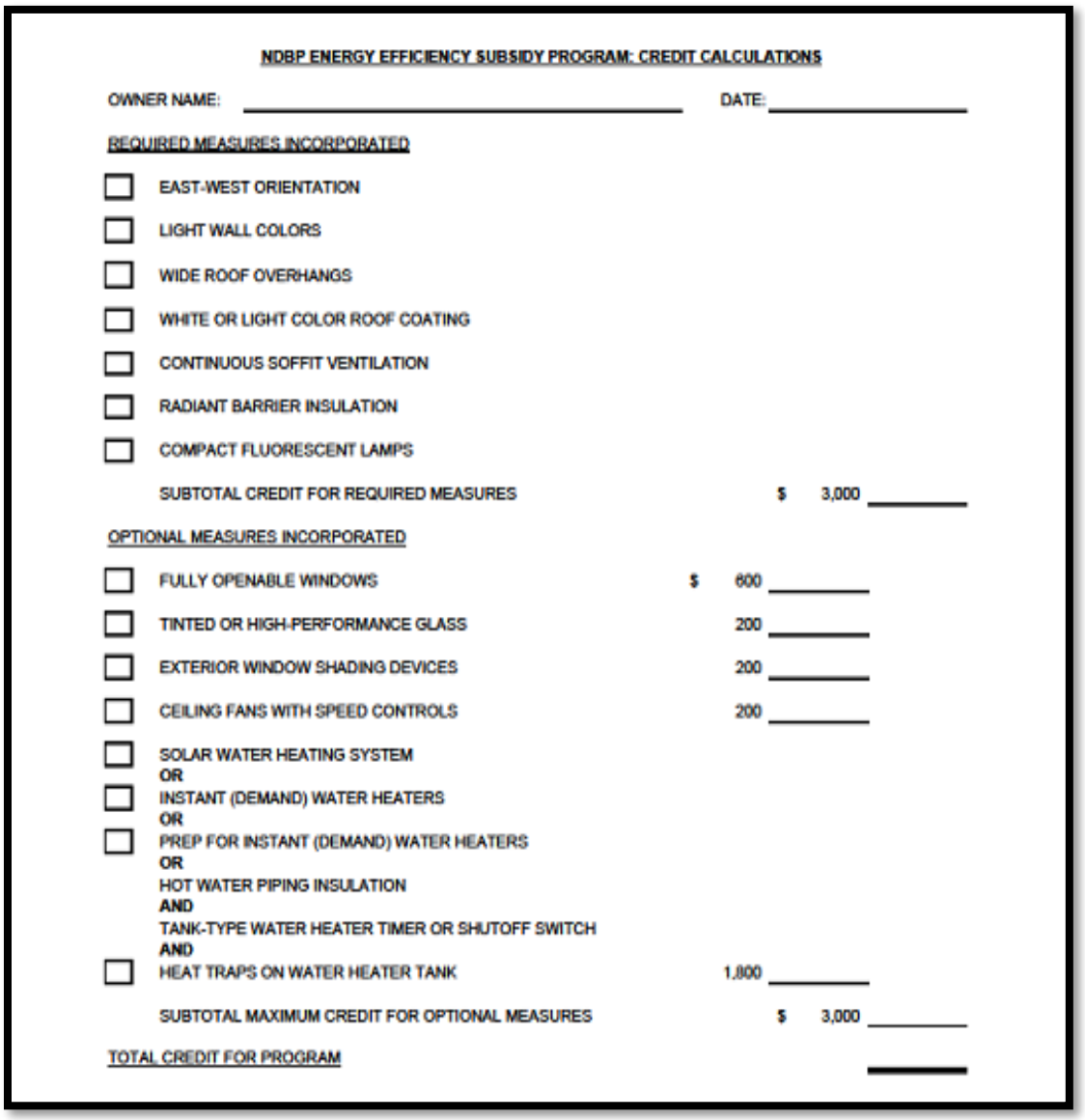
- Retailers need to know what materials to stock and in stock those in sufficient quantity. They need to be trained on how the products work and how to guide contractors on the proper installation of the materials. Bank sponsored training can be used to supplement or establish the proper methods and materials but in the long run it must be the retailers, preferably more than one, that correctly supply the industry.
- Contractors need to be convinced that the measures are necessary and that both clients and contractors benefit from the program the Bank is sponsoring. It is important to provide training to contractors so they understand the importance of the measures, difference with products, why select measures are chosen, and how the measures improve their business. Contractors also need to be monitored so that they do not charge any extra cost for the efficiency house they are building. This was a surprising development for the Bank. Contractors artificially raise their construction prices justifying the house as a better product. This was discovered by the Architect in plan review stage. While most houses were higher priced as expected because of the measures, the amounts corresponded to the increased price of materials.

Current Status of Program

IUCN reports close to 60 homes built under this program on their regional website. The actual number of homes impacted is likely at or over 100 homes. Per Operations Manager at the Bank, the latest calculation of savings from recent survey in 2014 is savings average for EESP of 38%. However, one homeowner reported a 50% reduction in electricity bill from USD150 per month to USD75 per month. Compare this result to planned target of 15% reduction in energy usage by using efficiency measures and appliances. Following launch of program, the Bank determined that all first time homeowner programs would be energy efficient homes. The Government also agreed to support the Bank granting subsidies to a commercial bank in Palau to offer housing loans. A MOU was signed between all parties. Homes under this program are to follow NDBP guidelines for energy efficiency homes. Lastly, it is believed that the contractors that are associated with the program have adopted the measures as part of their standard design criteria. It is believed that the subsidy will soon no longer be needed to encourage buyers to adopt measures for their new homes or renovations.

APPENDIX

Checklist for Efficiency Measures for Homes



NDBP ENERGY EFFICIENCY SUBSIDY PROGRAM: CREDIT CALCULATIONS

OWNER NAME: _____ DATE: _____

REQUIRED MEASURES INCORPORATED

- ☐ EAST-WEST ORIENTATION
- ☐ LIGHT WALL COLORS
- ☐ WIDE ROOF OVERHANGS
- ☐ WHITE OR LIGHT COLOR ROOF COATING
- ☐ CONTINUOUS SOFFIT VENTILATION
- ☐ RADIANT BARRIER INSULATION
- ☐ COMPACT FLUORESCENT LAMPS

SUBTOTAL CREDIT FOR REQUIRED MEASURES $ 3,000 _____

OPTIONAL MEASURES INCORPORATED

☐ FULLY OPENABLE WINDOWS	$ 600	_____
☐ TINTED OR HIGH-PERFORMANCE GLASS	200	_____
☐ EXTERIOR WINDOW SHADING DEVICES	200	_____
☐ CEILING FANS WITH SPEED CONTROLS	200	_____
☐ SOLAR WATER HEATING SYSTEM **OR** ☐ INSTANT (DEMAND) WATER HEATERS **OR** ☐ PREP FOR INSTANT (DEMAND) WATER HEATERS **OR** HOT WATER PIPING INSULATION **AND** TANK-TYPE WATER HEATER TIMER OR SHUTOFF SWITCH **AND** ☐ HEAT TRAPS ON WATER HEATER TANK	1,000	_____

SUBTOTAL MAXIMUM CREDIT FOR OPTIONAL MEASURES $ 3,000 _____

TOTAL CREDIT FOR PROGRAM _____

APPENDIX

Photos of Actual Palau Installed Efficiency Measures

Radiant Barrier

Roof and Soffit Vents

Efficient Appliances

White Roofs

Fully openable windows

Ceiling Fans

Instant Water Heaters

Compact Flourescent Lights

APPENDIX


Step 1
• Pre-Qualifying Stage
Step 2
• Educating Clients
Step 3
• Working with Involved Parties
Step 4
• Checking & Confirming Measures
Step 5
• Credit Memo
Step 6
• Final Inspection
Step 7
• Subsidy Process

APPENDIX

Sample Bank Approval Memo

(will differ between banks in name and format)

APPROVAL MEMO – HOUSING

Committed $	**Date:**	**Officer:**
Request		
Client Name	….	
Purpose	$XX,XXX.XX Total Commitment XXX.XX Fees XXX.XX Inspection XXX.XX Cost Overrun	
Amount Requested	Facility 1: $XX,XXX.XX Facility 2: $XX,XXX.XX	
Owner Equity $ & %	$	%
Facility Type	…	
Term	…	
Rate	…	
Repayments	…	
Fees	…	
Recommendation		
Credit Score	…	
Recommendation	…	
Risk rating score	…	
Rating rationale	…	
Policy exceptions	…	
Repayment Source Evaluation		
Source	**Quality**	
1….	…	
2….	…	
Collateral Evaluation		
1….	…	
2….	…	
Implementation		
Structuring		
Approvals		