

Date: November 21, 2015

MEMORANDUM

To: Tom Fee

From: Joel Yuen

Re: Insular ABCs Initiative Phase III

Subj: Energy Audit Implementation Plan

We are currently in the process of developing an energy audit implementation plan as part of our Phase III scope of services for the insular schools. This memo provides an update on this activity. A brief recap of the Phase II energy audit findings are presented first followed by a summary of our recent round of consultations with the territories.

1. Recap of Phase II Energy Audit Findings

Table 1 below (p. 20 in the Phase II report) provides an overview of the energy conservation measures (ECMs) that were initially recommended for each insular area, the potential annual savings in utility costs, the estimated amount of time needed to payback Energy Conservation Measure (ECM) investments (simple payback), and the percent of utility cost reduction based on the original assessment completed in 2013. At that time, the total annual savings across all territories was estimated at \$8.7 M (2013 dollars) at a total investment cost of \$68.8 M for the Primary ECMs that were recommended.

Table 1. Overview of Previous Energy Audit ECM Recommendations	Am. Samoa	CNMI	Guam	USVI	Totals
ECMs - Electric					
New Solar Hot Water or Heat Recovery System					
Replace T12 Fixtures with T8 LED					
Replace T8 Fluorescent Lamps with T8 LED					
Programmable Thermostats for AC					
Roofmount 30-200 KW PV system					
Fix Supply Air Discharge Duct Leaks					
New Lighting Controls					
New VFDs/High Efficiency Booster Pump Motors					
New Heat Recovery/ Desuperheater System					
Insulate Non-insulated Roofs					
Replace AC Systems with High Efficiency Units					
Retrofit with Ultra Low Flow Plumbing Fixtures					
Total Investment (\$M) - Primary ECMs	\$9.10	\$11.30	\$13.60	\$34.80	\$68.80
Simple Payback (years) - Primary ECMs	8	7	8	8	8
Investment Capitalization (years) - Primary ECMs	10	9	9	9	9
Dollar Savings (millions per year) - Primary ECMs	\$1.10	\$1.50	\$1.70	\$4.40	\$8.70
Percent Reduction in Utility Costs - Primary ECMs	55%	40%	20%	56%	39%
	ECM Recommended – Primary Recommendation				
	ECM Recommended– Other, feasible if funding permits				

2. Updated Phase II Energy Audit Analysis

Based on our follow-up survey, several ECM's have been implemented, primarily for replacing T-12 with T-8 lighting in all of the territories, and also selective replacement of plumbing fixtures with low flow fixtures in the schools in the USVI. Our updated analysis, which has been revised to reflect the implementation of T-8 lighting retrofits in all territories, and selective replacement with low flow plumbing fixtures in USVI, is summarized in Table 2 below:

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Table 2. Overview of Updated Energy Audit ECM Recommendations	Am. Samoa	CNMI	Guam	USVI	Totals
ECMs - Electric					
New Solar Hot Water or Heat Recovery System					
Replace T12 Fixtures with T8 LED	NA	NA	NA	NA	
Replace T8 Fluorescent Lamps with T8 LED					
Programmable Thermostats for AC					
Roofmount 30-200 KW PV system					
Fix Supply Air Discharge Duct Leaks					
New Lighting Controls					
New VFDs/High Efficiency Booster Pump Motors					
New Heat Recovery/ Desuperheater System					
Insulate Non-insulated Roofs					
Replace AC Systems with High Efficiency Units					
Retrofit with Ultra Low Flow Plumbing Fixtures					
Total Investment (\$M) - Primary ECMs	\$9.10	\$11.10	\$14.10	\$35.00	\$69.30
Simple Payback (years) - Primary ECMs	8	7	9	8	8
Investment Capitalization (years) - Primary ECMs Based on 3% Interest Rate	10	8	10	10	10
Dollar Savings (millions per year) - Primary ECMs	\$1.08	\$1.50	\$1.64	\$4.18	\$8.40
Percent Reduction in Utility Costs - Primary ECMs	55%	61%	19%	54%	40%
Total Investment (\$M) – All Feasible ECMs	\$12.30	\$23.70	\$65.60	\$53.40	\$154.90
Simple Payback (years) – All Feasible ECMs	10	13	15	11	12
Investment Capitalization (years) – All Feasible ECMs Based on 3% Interest Rate	12	17	20	13	16
Dollar Savings (millions per year) - All Feasible ECMs	\$1.20	\$1.84	\$4.40	\$5.00	\$12.44
Percent Reduction in Utility Costs - All Feasible ECMs	60%	71%	50%	64%	59%
	ECM Recommended – Primary Recommendation				
	ECM Recommended– Other, feasible if funding permits				
	Not proposed				

The updated analysis, which includes the retrofit of the recently installed T-8 with LED linear lamps for an additional 30% improvement in energy efficiency for lighting, suggests that the implementation of the Primary ECM's will still be cost effective, with the total annual savings for all territories for all Primary ECM's totaling \$8.4 Million at a total investment cost of \$69.3 Million. The total annual savings for all territories including all additional feasible ECM's, including replacement of all of the air conditioning equipment with high efficiency units, and the replacement of all plumbing fixtures with low flow plumbing fixtures, would increase to \$12.4 Million at a total investment cost of \$154.9Million. The implementation of these additional feasible ECM's would also have a significant positive impact on addressing the Deferred Maintenance (DM) for the replacement and maintenance on these items.

3. Summary of Recent Round of Consultations

Based on our Phase III site visits, the availability of funding opportunities to address the DM and to implement the recommended ECM improvements in each school district (summarized in Table 3) is very limited:

TABLE 3. SUMMARY OF FUNDING OPPORTUNITES TO ADDRESS DM AND TO IMPLEMENT ECM IMPROVEMENTS								
School District	Utility incentives	DOE Funding	DOI Funding	Additional Territory Funding (\$M)	Total DM (\$M)	Total Additional Recommended Priority ECM Cost (\$M)	Total Estimated Energy Savings for Implementation of the Priority ECM's. (\$M)	ESPC Program
American Samoa	ASPA: grants are used to improve the utility services such as transformer replacement	Some Grants	\$5 Million (\$1M per year for 5 years)	None	\$9.80	\$9.10	\$1.08	Currently under development None in Place ; lighting retrofits completed
CNMI	CUC: no funding available	Some Grants	\$5 Million (\$1M per year for 5 years)	None	\$12.40	\$11.10	\$1.50	None in Place; lighting retrofits completed
Guam	GPA: limited incentives for DSM rebates	Some Grants	\$5 Million (\$1M per year for 5 years)	May draw from Operating Funds, Privatization program being considered	\$60.80	\$14.10	\$1.64	Not Accepted by DOE; currently administered by GPA; lighting retrofits completed
USVI	WAPA: limited incentives for DSM rebates	Limited	\$5 Million (\$1M per year for 5 years)	\$3.10	\$69.00	\$35.00	\$4.18	In Place- Administered by VI Energy Office; lighting and plumbing retrofits completed

Based on this overview, it is apparent that there is currently inadequate funding to address DM and to implement the recommended ECM's identified from our energy audit to reduce the ongoing utility costs for these schools. In order to address this funding shortfall, our recommendation is that Energy Savings Performance Contracts (ESPCs) should be considered as an alternative contracting mechanism that would allow the schools to cover some of the required capital improvements without having to rely on direct government appropriations, tax receipts or bonds. The ESPCs would use private financing to cover the up-front costs and install and maintain the system improvements, while allowing the school districts to repay the loans using the utility savings realized by the improvements over the life of the contracts.

At this time, only the USVI has an effective ESPC program in place to support the implementation of energy saving measures and other related improvements within the schools. The USVI ESPC program is administered by the VI Energy Office (VIEO), which currently manages an ESPC open end contract with two short listed ESPC contractors: Energy Systems Group, Indianapolis, Inc., and FPL Energy Services, Inc., a subsidiary of NextEra Energy, Inc. This contract covers ESPC work for multiple departments, including the hospital, the port authority, the correctional system, and other agencies besides the school district. VIEO has already successfully implemented two ESPC task orders in 46 of the schools (Task Orders No. 001 and 002) for lighting retrofits, and plumbing fixture conversions to low flow fixtures. These two contracts with a total value of about \$17.6M have been successfully completed (paid for with ARRA funds and bond funds, respectively), and are saving over \$4M per year in utility costs. Task Order No. 003 for the installation of new kitchen equipment in most of the schools with a projected cost of \$1.9M and a projected savings of \$243,000 per year was also developed, but the VIDE has since elected not to authorize this task order due to their concerns on perceived value versus the contracting costs. Since these contracts have been financed at relatively high interest rates (near 5 to 7%) due to USVI's relatively low credit rating, the projects yield simple project paybacks in the range of 5 to 7 years. It is possible to have additional ESPC task orders developed with simple paybacks in the range of 10 to 15 years if the interest rates could be lowered with good credit rating to around 3%, which would allow these contracts to fund either additional DM or longer term ECM's under the ESPC program.

American Samoa is currently establishing programs for renewable energy and ESPC through the AS Renewable Energy Committee (ASREC) and the AS Power Authority. ASREC has plans to invite investors to the ESPC programs for school projects (e.g., PV and battery storage) that would target projected simple paybacks in the range of 20 - 25 yrs. Savings will be shared by schools and investors. ASREC has 6 local contractors in-place including local contractors and Hawaii contractors.

The Guam Power Authority manages an ESPC program for the territory to implement ECM's at the airport and for other agencies, but the Guam DOE has to date not been amenable to using GPA's ESPC program for the schools citing high overhead costs and concerns on the overall financial responsibility on how the ESPC set-up costs and auditing costs would be covered.

CNMI currently does not have an ESPC program in place and the school district does not have the finances to implement an ESPC program utilizing their own resources. It should also be noted that the PSS is delinquent in keeping up with its utility bill payments to the local utility agency, the CUC, so the opportunity to borrow money under ESP contracting is restricted without federal government backing.