



## EXECUTIVE SUMMARY



**VEEP Village Work  
For The Alaska Energy Authority  
OCTOBER 3<sup>RD</sup> , 2012**

Ameresco worked with the Alaska Energy Authority (AEA) in providing energy and water efficiency retrofits, and energy system optimization solutions to remote Alaskan Villages. Ameresco employs over 900 people; more than 200 of these employees are licensed Professional Engineers (PE) or hold professional certifications in the energy field. As an independent energy solutions provider, Ameresco has no alliances or affiliations that require our clients to use a particular technology or product brand. There are no other business lines or priorities competing for company resources. This independence allows our engineers to focus on the best lifecycle solution for each individual customer's needs regardless of technology or manufacturer.

Ameresco's involvement with the Village Energy Efficiency Program (VEEP) program included energy efficiency projects applied in 14 remote village sites throughout Alaska. These sites include Akiachak, Alakanuk, Beaver, Emmonak, Fort Yukon, Holy Cross, Kaltag, Kipnuk, Kotlik, Koyukuk, Newtok, Nikolai, Pilot Station and Shageluk. As one of AEA's qualified service providers selected for participation in the VEEP program, Ameresco successfully:

- Complied with all Grant requirements, terms, and conditions imposed on the Village under this Grant
- Contacted the Villages within the appropriate regions
- Entered into an agreement with each Village
- Conduct an energy audit or a needs assessment either in person or through phone contact
- Developed and implemented work plans
- Conducted and coordinated procurement and shipping of materials
- Worked with the Villages to encourage the use and training of local labor
- Provided the installation of the identified energy efficiency measures
- Provided reporting to the Authority and to the Villages.

While complying with the above items, Ameresco followed a similar process with each village project. Site visits were initiated by Ameresco engineers and construction managers to each location to gather energy related information. The audit identified existing types, conditions, operating modes, and energy consumption profiles for a variety of buildings, facilities and systems. The audit also identified all cost-effective system and facility modifications, adjustments, alterations, additions, and retrofits. Systems investigated during the audit included heating, ventilation, interior and exterior lighting, process exhaust, domestic hot water, motors, building envelopes, utility metering systems, and energy management control systems (EMCS). Options for advanced electric meter systems were considered if they did not already exist.

Audit reports were generated for each village. These reports described opportunity for over 300 various energy saving upgrades. Due to funding limitations, all measures could not be completed, but they were included and considered in the 'ECOs Not Funded' section of the final audit reports. The ability to choose the most suitable and economically viable ECMs was a result of an iterative process in which the individual villages, AEA and Ameresco took part in. Once ECMs were selected, contractor solicitation and material procurement phases were initiated. Detailed scopes of work were developed and performance specifications were prepared for the contractors to bid from. Contractors were selected based on best value and issued contracts.

Ameresco coordinated with the material and equipment manufactures as well as local logistics firms to get supplies to these remote sites for the contractors. Village officials were contacted through the State of Alaska website to facilitate pick up and storage of materials from the remote air strips. When possible, the local village workforce was utilized to execute energy upgrade implementation. However, utilizing the local workforce was typically not possible due to the complexity of skillset required to most efficiently, effectively and safely complete the necessary work.

Final project implementation was successful on every level. Extensive preplanning, engineering, cost control, and the employment of construction management best practices enabled problems to be identified and dealt with in a timely manner. Virtually all but the smallest of field issues were quickly addressed and eliminated by Ameresco, the Village and the Contractors on site with little to no impact on cost or schedule.

Regarding success highlights, Ameresco had the opportunity to help develop special programs to select villages. More specifically, in conjunction with the Alaska Housing Finance Corporation (AHFC), the AEA and the Alaska Craftsman Home Program (ACHP), Ameresco was able to help develop an LED swap program that was initiated at Fort Yukon, Alakanuk and Emmonak. With this program, traditional 60-watt incandescent bulbs and other less efficient lights were traded with more efficient 7-watt LED lights. As a result, cumulatively, these communities are projected to save over \$6,500 per year. The communities were engaged through an energy fair, which utilized local resources and cultural understandings to attract participants.

Ameresco also experienced particular challenges while working on VEEP projects. In particular, at times securing materials at the village sites proved difficult. On a few instances, materials went missing and were not identified as missing until the contractor needed the materials for actual construction. This caused delay in construction and added costs to the project. To address this problem, Ameresco identified a point of contact from the Village who was willing to take responsibility for the materials. This solution has been extremely effective thus far. Another recurring challenge involved lack of extra material that could be used to address extenuating circumstances on site. This challenge was identified early on and contractors have since been required to travel to village sites equipped with certain, specific alternate parts that can be used in case extenuating circumstances do take issue. This extra step in preparations has been effective in addressing problems that arise from existing conditions that are substandard and was critical to deliverance of on-time completion and reduced costs and delays.

Benefits to Alaska and more specifically VEEP grant recipients include reduced fossil fuel consumption and improved building occupant comfort. This directly impacts community sustainability, improves environmental positioning and opens opportunity to put the money resulting from the energy savings upgrade projects towards other improvements for the villages.

Many of the energy efficiency-related issues and problems that Ameresco discovered at villages revolved around equipment not being up to industry standards and systems not being maintained appropriately. As a result of the lack of maintenance and proper operation, the equipment installed under this grant will fail exponentially faster than their properly maintained counterparts. There is a huge push to implement new housing units as well as electrical and mechanical systems at village sites. However, there is not enough being done to guarantee that those implementations will be maintained and operated properly. Funding needs to be put aside to address maintenance issues and train qualified individuals or execute maintenance contracts for these costly installations.

Often, after installations are completed and final adjustments are made and documented, the end user adjusts or tampers with the settings. More often than not, these adjustments and tampering negate the energy efficiency component of the installation and often leaves the equipment operating less than optimal. Newer equipment will typically operate differently than older equipment. At the village scale, this is often not taken into consideration when adjustments are made. Additional training or the application of a 'hands-off' policy which includes the use of a service provider would be beneficial. Particularly the 'hands-off' policy could help keep new equipment operating at peak efficiency and be a valuable solution to this problem.

Ameresco recommends completing all unfunded ECMs for the benefit of the village. There are still many items that would greatly reduce operating costs for these villages. Additionally, projects would benefit from more time to develop and research ECMs and generate more input from competing groups within the village, including individuals and bodies such as a city manager, the tribe and the utility. A mutual understanding between the different operating bodies will encourage better use of money and efforts.

Through this VEEP project experience, Ameresco has become familiar with village dynamics and how those dynamics impact energy efficiency project execution. Throughout the project experience, problems as well as successes were identified. Ameresco continued to adjust and adapt accordingly in order to deliver quality solutions to the end customer, while complying with the necessary regulating bodies. As a result of the knowledge and experience gained, Ameresco believes that this VEEP experience will bolster improved continuation of village energy efficiency solutions deliverance throughout remote Alaska.