

## Contract Details

### Contract Type:

Energy Efficiency; Energy Savings  
Performance Contract; Guaranteed  
Energy Savings

### Facility Size:

38,710 sq. feet

### Energy Project Size:

\$600,000

### Energy Savings:

1,744,572 kWh annually

## Summary

In cooperation with the Alaska Energy Authority and grants from the Village Energy Efficiency Program (VEEP), Whole Village Retrofit (WVR) and the Energy Efficiency and Conservation Block Grant (EECBG), Ameresco secured funding for energy saving measures in Emmonak. Eight buildings, including one school, reaped the benefits of energy upgrades bolstered by Ameresco's project engineering design and implementation experience. Various efficiency measures were chosen and local contractors were utilized, helping to stimulate the local economy.



The Emmonak police department had multiple mechanical thermostats, but only one appeared to be working. The heating system was also in need of maintenance and repair.



Ameresco devised an energy savings performance contract (ESPC) and a training program for the City so they could benefit from energy efficiency and conservation measures, while learning how to be better environmental stewards.

## Customer Benefits

With the help of the Alaska Energy Association (AEA) and the Alaska Housing Finance Corporation (AHFC), Ameresco helped the City of Emmonak implement over \$600,000 worth of energy upgrades. With Ameresco's guidance, the City was able to identify and take advantage of 19 energy conservation opportunities (ECOs). Emmonak benefited from various upgrades ranging from building envelope improvements, to lighting retrofits, to HVAC equipment enhancements. Long-term effectiveness of the installed ECOs was augmented by an educational training program delivered by Ameresco. In order to design and develop the correct project and training program for the City, Ameresco needed to have an in-depth understanding of the special needs of the population.

## Accolades

*"We are very excited and impressed with the new EK2 boiler installation at City Hall. We are showing everyone we can in the community these new boilers because we are very happy with them and the project with Ameresco."*

*- Martin Moore  
Emmonak City Manager*

## Environmental Benefits

Through the partnership with Ameresco, Emmonak will reduce its carbon footprint. The annual green benefits from this carbon reduction are equivalent to:

- ▶ the reduction of 1,326 tons of CO<sub>2</sub>
- ▶ the removal of 236 cars from the road
- ▶ the planting of 257 acres of pine forests

The project helps reduce the need for energy from traditional power plants fueled by fossil fuels.

## Services Provided

Ameresco provided door weather-stripping upgrades to reduce air infiltration into the buildings. A thermal insulation upgrade installed blown-in roof insulation on existing building envelopes to decrease energy use. Insulation can be added to roofs to increase or renew their insulating ratings (R-value). To improve insulating values of the windows and exterior openings and reduce the negative energy effects of the sun's rays, energy efficient windows with improved heat transfer resistivity were installed. Installing energy efficient, insulated doors improved U-values of the current hollow metal doors, single-pane glass doors, and un-insulated bay doors connected to conditioned spaces. At the Emmonak public works building, the installation of an insulated floor will decrease the amount of heat loss. The building had a dirt floor, and an insulated floor lowered the building's fuel usage.

Installing or repairing existing control systems is an important step in effectively minimizing energy demand and use. A control system that is operating properly will also result in O&M savings, improved comfort, and energy savings. Ameresco installed programmable thermostats in City buildings to ensure proper HVAC scheduling and included the dryer heating system in the Emmonak Washeteria (laundromat).

Replacing the outdated mechanical thermostats with 7-day programmable thermostats allows a building's HVAC system to be scheduled to operate in comfortable conditions while occupied and allow for night set-backs when un-occupied. At the police department and the water treatment plant, Ameresco

## About the City of Emmonak

Emmonak is located at the mouth of the Yukon River, 10 miles from the Bering Sea, on the north bank of Kwiguk Pass, and in the Yukon Delta National Wildlife Refuge. The area encompasses 7.5 sq. miles of land and 1.1 sq. miles of water. Temperatures range from -25 to 79 °F. Precipitation averages 19 inches per year, while snowfall averages 50 to 60 inches per year. The City experiences a seasonal economy as a center for commercial fishing, purchasing, and processing on the lower Yukon River. The City is accessible by air and water, as there are no roads connecting to the City.

### Learn more at

[http://www.commerce.state.ak.us/dca/commdb/CIS.cfm?comm\\_boro\\_name=Emmonak](http://www.commerce.state.ak.us/dca/commdb/CIS.cfm?comm_boro_name=Emmonak).

## About Ameresco

Ameresco, Inc. (NYSE:AMRC) is one of the leading energy efficiency and renewable energy services providers. Our energy experts deliver long-term customer value, environmental stewardship, and sustainability through energy efficiency services, alternative energy, supply management, and innovative facility renewal all with practical financial solutions. Ameresco and its predecessors have constructed billions in projects throughout North America.

For more information about Ameresco and our full-range of energy efficiency and renewable energy solutions, please visit [ameresco.com](http://ameresco.com) and [alaska.ameresco.com](http://alaska.ameresco.com).



Air filters in need of replacement.

## Services Provided (cont.)

redesigned the respective heating system flow to be more efficient.

Lighting upgrades replaced T-12 fluorescent lighting and magnetic ballasts with T-8 lamps and electronic ballasts. High intensity discharge (HID) lighting systems in the medium and high bay areas such as the water treatment plant, maintenance shops, and school were replaced with T-5 fluorescent fixtures. HID lighting is often used in areas with high ceilings or roof structures. The fixtures generate high luminous flux, are reasonably energy efficient, and are long lasting. Such systems often remain illuminated continuously since the re-strike times make periodic switching in irregularly occupied spaces a nuisance. Continuous operation of HID fixtures reduces the overall energy efficiency of lighting systems designed around their use. Newer, high output fluorescent sources are characterized by quick warm-up with instant light output and improved efficiency.

Occupation Sensors were installed to detect and shut off lighting in unoccupied spaces. Ameresco used typical sensing technologies, such as infrared, ultrasonic, and audible sound, which are often combined in one sensing unit to avoid shutting off lights in an occupied area by mistake. There are various mechanical systems operating with inefficient motors throughout the City, and replacing them with National Electrical Manufacturers Association (NEMA) premium efficiency motors could increase energy efficiency by 2-3%.

A comprehensive recommissioning of the boilers in each building was necessary to optimize system operations. Ameresco made efforts such as replacing, repairing, calibrating or installing sensors or switches; correcting air linkages; conducting combustion efficiency test services; and cleaning combustion chambers and stacks. Many of the existing units in the village were original to the buildings they served, and had reached the end of their useful service life. Replacing existing hot-water heating boilers with more energy efficient units reduces energy use, improves system operations, and reduces maintenance costs. In some locations, a storage tank was installed to replace the building's domestic water heater. Additionally, the inefficient fuel oil burning domestic water heaters (DWHs) were replaced with more efficient electric models. Because the cost of fuel is so high in Emmonak, the cost-saving potential in fuel oil vs. electric is quite high, and this measure is expected to generate savings to merit its installation.

Un-insulated or poorly insulated hot water pipes result in unnecessary heat gain/loss and lead to longer run times for boilers. Ameresco installed insulation where it was non-existent and replaced it in areas where it was damaged.

Ameresco installed a waste oil heater at the public works building to eliminate the fuel oil burner. The fuel oil burner was a Modine model POR145B with a heating capacity of 145MBH. The burner had a hand-written install date of 1999, but occupants informed Ameresco that the heater had been scavenged at another date, so this install date was inaccurate and the burner was likely older.



City Hall functions as a hotel and community center, as well as home to the City's offices. Boiler replacement and the installation of energy efficient windows were among the modifications Ameresco installed.