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Program Fact Sheet: Combined Heat and Power/ Heat Recovery

**Current Status:** There are currently over 90 communities in rural Alaska that utilize recovered heat from the diesel generators for space heating needs. In the last 10 years, 38 heat recovery systems have been updated or newly installed in rural Alaskan communities. Through the Renewable Energy Fund and Rural Power Systems Upgrade program, 3 systems have recently started-up, 20 systems are in construction phase, 5 systems are completing design, and approximately 32 communities have completed studies that show a heat recovery system is feasible.

**Program Background:**

Combined Heat and Power (CHP) is the concurrent production of electricity or mechanical power and useful thermal energy from a single source of energy. CHP may be regarded as a supply-side energy efficiency measure. Typical applications for heat recovery are environmental space heat for community buildings and augmented electric power generation.

In diesel generating systems that are commonly used in rural Alaska, approximately 30 percent of the fuel is transformed into electrical energy and 60 percent of the fuel is transformed into heat energy. This heat energy that is normally wasted into the atmosphere can be recovered from the exhaust stack, jacket water, and charge air. The most efficient use of recovered heat is to use it directly for space heating, domestic hot water, or for tempering municipal water supplies to prevent freezing and facilitate treatment. The heat recovery systems are an extremely attractive investment with paybacks of 3-5 years in many communities. Over 60 additional communities in rural Alaska have been identified as potential opportunities to install recovered heat systems or to expand existing systems.

**Program Progress:**

A collaboration between the Alaska Native Tribal Health Consortium (ANTHC), AEA, Alaska Village Electrical Cooperative, and a representative from small, independent electrical cooperatives meets annually to prioritize communities for heat recovery feasibility studies. Up to seven studies are completed annually with funding from ANTHC and AEA. The studies provide all of the required information for a community to apply for design and construction funding for their heat recovery system.

This program also investigates innovative technology for recovered heat applications in rural Alaska. Currently Unalaska and Kotzebue are in the design phase for an innovative recovered diesel heat to electricity technology. This Organic Rankine Cycle (ORC) technology has the opportunity to utilize recovered diesel heat in application where building heat is not feasible. Cordova and Tok have completed the installation of this ORC technology. Initial testing has shown that the economics of these systems are challenging even for rural Alaska.

This program provides technical support to communities that are interested in innovative heat recovery technology and will assist in technology evaluations.