



Combined Heat and Power/ Heat Recovery

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 three to five years in many communities.

AEA also provides technical assistance to communities that are interested in innovative heat recovery technology and will assist in technology evaluation.

Current Status: There are currently more than 90 communities in rural Alaska that use recovered heat from the diesel generators for space heating needs. More than 60 additional communities have been identified as having potential opportunity to install heat recovery or expand existing systems.

During the last 10 years, 41 heat recovery systems have been updated or newly installed in rural Alaska. Through the Renewable Energy Grant Fund and Rural Power Systems Upgrade program, six systems have recently started-up, 16 systems are in design and construction phases, and approximately 33 communities have completed studies that show a heat recovery system is feasible.

Program Progress:

A collaboration between the Alaska Native Tribal Health Consortium (ANTHC), AEA, Alaska Village Electrical Cooperative, and representatives from small, independent electrical cooperatives meet 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. Currently, Kotzebue is in the construction phase for an innovative recovered diesel heat to electricity technology, and Unalaska's system is operational. This Organic Rankine Cycle (ORC) technology has the opportunity to use 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.

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OF ENERGY IN ALASKA**
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