Exhaust Heat Recovery for Rural Alaskan Diesel Generators

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Background: Number of Alaskan Villages - 183 (remote area)  
Total Diesel Power Generation (2005): 374,207 MWh (individual systems)  
(Exhaust Heat Recovery Never Been Considered due to the concerns of back pressure increase, soot deposition, and corrosion.)  
Goal of This Project: Evaluate feasibility, economic effect, and the above concerns.  
Selected Application: Space and water heating (For best overall benefit. Also proposed by AEA.)


Results and Conclusion (350 hours test):  
> System is reliable and consistent.  
> No effect on engine performance.  
> No corrosion spots were observed  
> Amount of heat recovered is equivalent to 16% of the energy contained in the fuel consumed. (Exhaust heat was recovered with HX exhaust outlet temperature high enough to avoid major maintenance problems).  
> Soot is not expected to cause significant maintenance problem.  
> Pay back time for a 100% use of recovered heat would be 3 to 4 years at fuel price of $3/gal. (Parameters: Initial, Operation, and maintenance costs. In rural villages fuel, travel, and shipping are costly.)