

# **Alaska Energy Authority**

## **Renewable Energy Fund Application – Heat Pump Best Practices Checklist**

The following checklist contains detail items that are critical to the success of a Renewable Energy Fund application. The intent of the checklist is to aid applicants in the submission of a comprehensive project proposal.

### **Economic Analysis**

- Assumptions and their sources are clearly identified:
  - Heat demand (monthly)
  - Cost of diesel and electricity
  - System COP range
  - Parasitic loads
  - Fuel conversion efficiency of existing system
  - Estimated maintenance and operating costs; rationale of the estimates discussed
  - Estimated replacement intervals and cost for key system components
- How do fuel and electricity cost projections compare to those used by AEA in proposal review?

### **Design Considerations**

- Average and peak heat loads
- Assumed system COP range
- Assumed heat source temperature range (ground, air, water)
- Thermal conductivity test (or flow test for open loop systems)
- How is heat pump system sized relative to peak load? Would a hybrid system improve the project economics?
- What is the anticipated utilization of the heat pump system's capacity on an annual basis?
- The integration of the proposed system into the existing heating system is discussed, including thermal storage if planned. Are changes to existing heat delivery system needed?
- Efficiency upgrades anticipated?
- What monitoring equipment will be installed and how will system data be collected and transmitted?

### **Existing Heating System**

- The design of the existing system is clearly described including the operating temperature range.
- Is the current system at or near the end of its design life?
- Will the system be removed or maintained for backup or peaking?

### **Environmental/Permitting**

- Contaminated sites database checked

### **Site control**

- Site control must be finalized before construction funds are committed. Site control for pipelines and transmission or distribution power lines may be established using easements or utility right-of-ways so long as the period of the agreement meets or exceeds the intended life of the project
- Proof of valid title to the land and/or written documentation of any private agreements is required.
- The landowner must warrant that there are no liens or encumbrances on the property.
- Final proof of ownership shall be the certificate to plat.
- The grantee shall be responsible for resolving any land ownership disputes between state and/or federal entities, local landowners, native corporations, municipalities, boroughs and community organizations, or other entities.
- If the project site is adjacent to or near an airport or runway, the grantee must research FAA permit requirements, existing or pending leases and easements, and DOT expansion or relocation plans
- Land transfers required for project development shall be recorded with the appropriate District Recording office and a copy of the recordation provided to the AEA grant manager

### **List of reference websites**

- <http://www.cchrc.org/ground-source-heat-pumps>
- <http://www.igshpa.okstate.edu/publication/manuals.htm#5>
- <http://www.seventhwave.org/new-technologies/variable-refrigerant-flow-vrf>
- <http://www.seventhwave.org/hygchp>
- <http://www.retscreen.net/ang/home.php>
- [http://dnr.alaska.gov/mlw/survey/unorganized\\_borough/unorgborough.htm](http://dnr.alaska.gov/mlw/survey/unorganized_borough/unorgborough.htm)

### **Common Pitfalls**

- Mismatch between assumed heat loads and what fuel records indicate