

Chilmark School HVAC Project – Next Steps

- In January, TE2 Engineering was awarded a contract to assess the school and advise us as to our options
- TE2 reported back on April 11 with two approaches for the project
- With UIRSD and Chilmark approval, we can then take the next steps:
 - Contract the design engineering work
 - Hire an OPM
 - Gather bids and contract for Phase 1 construction over the summer
- Project funding is available (~\$269K previously raised and appropriated, plus \$126K likely Chilmark Green Communities grant)

Option 1: VRF Heat Pump System

- VRF (Variable Refrigerant Flow) heat pumps allow multiple interior units for each external unit (the school will likely require multiple external units)
- The VRF system would replace the current oil burning boiler and hydronic (pumped hot water) heat distribution system
- This approach will provide both heating and air conditioning
- Pluses:
 - Heating and cooling by zone – some zones could be in heating mode, others in cooling mode
 - All electric
- Minuses:
 - Lower efficiency in very cold weather (below 10 F) might require either oversized equipment or supplementary backup heating
 - The total refrigerant being used may require multiple subsystems for code compliance

Option 2: ATW Heat Pump System

- ATW (Air-to-Water) heat pumps transfer heat from the outside air to a hydronic (water) system on the interior
- The ATW system would reuse the current water piping and baseboard heaters for heat distribution; however, the current heat distribution is already undersized, so supplemental heating (mini-splits?) would be needed
- This approach will provide both heating and some air conditioning
- Pluses:
 - All refrigerants are outdoors
 - All electric
- Minuses:
 - Lower efficiency in very cold weather (below 10 F) might require oversized equipment
 - Supplementary backup heating definitely needed
 - No simultaneous zone-level heating and cooling
 - Freezing of hydronic water must be avoided

Recommendation

- I strongly favor Option 1, with the added feature of using the current oil-fired boiler system to provide backup heat during the first 2 years of operation after which it can be removed if the need for backup heat is shown not to be required)
- Phase 1 (summer 2020):
 - Design and installation of the heat pump inside and outside units
 - New control system
 - Completion of the current window project (not part of the HVAC project, but important)
 - Acquisition and installation of a backup generator
- Phase 2 (summer 2021):
 - Insulation of attic ceilings
 - Removal of the non-operative air handlers currently in the attic space
 - Move of the existing ERV (ventilation) units from inside the classrooms to the attic spaces
 - Deployment of a new or reconfigured fire sprinkler system, again in the attic spaces