**Specifics from the CLEAR report (Resilience plan)**

**July 2021**

**1. Public Safety Building (PSB)**

**Fire Station**

**Immediate**

* Lighting improvements- LEDs
* Hot water temp set back at the boiler
* **Feasibility Study needed--** how to insulate and make more airtight.
  + Challenge re building louvers and given the big fire truck space
  + Challenge to be sure insulation is put in right places
* Re-roof before solar is put on this building
  + *Determine if insulation should go on top of roof sheathing before this is done*

**Midterm**

* Insulate building better, make more airtight
* Exchange FS oil boiler with a cold climate air source heat pump (ASHP)

**Long Term**

* Possible exchange of water heater to hybrid electric heat pump one

**Police Station**

**Immediate**

* Lighting improvements- LEDs
* Fix setting on water heater (or heaters)

**Midterm**

**Generator**

* Look at whether Highway Dept loads could/should be added to generator to protect generator health
* Add EV charger to emergency panel
* *Heat pumps for Fire Station will also increase electrical load and generator load*

**Install Solar**

* Use of micro-inverters on solar modules to mitigate shade issues on PSB roof

**2. Fire Station One-** *this is a low occupancy building.*

**Immediate**

* Lighting improvements- LEDs
* Ice machine should be turned off and drained when not actively in use
* **Feasibility Study needed**-- how to insulate and make Fire Station more airtight.

**Midterm**

* Insulate building, make more airtight
* Re-roof before solar is put on this building.
  + *Determine if insulation should go on top of roof sheathing before this is done*
* Solar and batteries for this building
  + Good payback on adding solar to this building (see page 22)

**Long Term**

* ASHPs to replace current heating system
  + Generator over-sized.
  + Add to load by switching to ASHPs after efficiency done
* Possible exchange of water heater to heat pump one

**"Move the Mission?"**

*Could/should back up communications center go to PSB?*

**3. School**

This is a BIG project. School was built from 1974-1995. Varying levels of insulation and airtightness.

*Cape Light Compact and Green Communities are phasing out fossil fuel to fossil fuel equipment exchanges. Will need to move towards electric BUT hard to get enough heat unless thermal improvements done first.*

***Green Communities requires we meet 20% energy reduction within 5 years.***

**Immediate**

* + Establish a subcommittee to oversee this project
  + *UIRSC is creating an environment committee to oversee School work*
* Learn how School and Town interact in terms of paying for building projects
  + Learn process for how to approach school project
* Have Marc Rosenbaum present his NH school project so people have a vision of what the WT School could be
* **Do a Feasibility Study** to prepare a multi-year master plan for:
  + how to insulate, make more airtight, replace windows, review and improve ventilation equipment, move towards air source heat pumps
* improvements to make it shelter-ready
* other improvements the School needs/wants
* **Figure out what we can do via Green Communities program that would not be wasted in move towards 100% electric**
  + Lighting improvements- LEDs and occupancy sensors in hallways
    - Cape Light Compact study has been done. Report awaited.
  + Electrically commutated motors (ECMs) for walk-in refrigerator fans
  + Fix existing solar system—needs a new inverter?
  + Replace parts in classroom unit ventilators and improve controls?
* Map, test and rewire emergency panels so they support the critical loads
  + - Have one of the three emergency panels power the loads in the intended shelter area

**Midterm**

***Depending on results of Feasibility Study…***

* Install variable refrigerant flow ductless air source heat pumps to replace current heating with oil boilers (start with some individual classrooms?)
* Exchange of 2 electric water heaters to be 1 hybrid electric heat pump one
* Upgrade windows in shelter area to withstand high winds
* Rethink current ventilation system?
* (Install ECMs and variable speed drives for water pumping of heat and hot water around the building—***wouldn't do this if go to all-electric***)

**Long Term**

* Determine best places to do solar
* Best roof has many ventilation units puncturing roof
* Is there a new approach to ventilation that would be better?
* Is there a ground area that would be good and not too far from school?
* Is the flat roof area really not good?
* Install solar and batteries sufficient to power intended shelter area
* Kitchen propane water heaters?

**4. Library**

**Immediate**

* Lighting improvements- LEDs and occupancy sensors
* Be sure heat and cool settings are correct and that systems are working together
  + heating set point 68-70 degrees
* Rewire emergency panel so it supports the required critical loads
* CVEC Round 6
  + Installation of solar and batteries

**Midterm or Long Term?**

* Replace water heater with heat pump water heater
* Add solar canopy to increase back-up solar capacity?

**5. Town Hall**

**Immediate**

* Lighting improvements- LEDs
* Turn off computers and monitors at night
* VTA battery installation with connection to Town Hall emergency panel?
* Generator over-sized
  + Map, test and rewire emergency panels so they support the critical loads
  + Consider re-wiring so generator does all loads in Town Hall?
  + Add EV charger to emergency loads
* Contingency Plan review

**Midterm- "Move the Mission?"**

* Back-up servers at Library?

**Long Term**

* Building analysis
  + Ventilation improvements so more efficient?
  + Conversion to ducted air-source heat pumps
  + If move to ASHPs, will also potentially increase generator load
* Replace heating system with ASHPs
* Replace propane water heaters with heat pump water heaters
* Solar
  + Agreement with Preservation Trust and Eversource to bring solar power over from Grange roof?

**6. Howes House**

**Immediate**

* Contingency Plan review- "Move the Mission?"
* Review options for supporting Howes House and pick one
  + Small battery to power propane boiler so freeze protection?
  + OR hook up to library generator
    - requires going from 3 phase to single phase and Eversource permission
* Coordinate the various heating systems coordinated better so using the most optimal one when it is very cold
  + Get advice from "a specialist"
    - Write out instructions for Howes House staff so they know what to do
    - Use heat pump most when above freezing
    - Use propane boiler most when below freezing
    - Consider turning off breakers for electric resistance heaters with consideration of possible freezing issues
    - Set thermostats accordingly

**Midterm to Long Term**

* Needs to be better insulated—particularly second floor and roof/attic
  + Determine what the upper floor of HH could be used for
* Canopy in Library Parking Lot?
* To supplement library power supply
* OR to provide power directly to Howes House