**Components in a 5-Year Plan for Town**

**Present to Selectmen—both our plan and Rob's material**

* Municipal Buildings
  + Plan for how to improve municipal building efficiency and the conversion to all electric
    - How are we going to get feasibility study/analysis and plans done?
    - Where can we get funding for this?
      * Bank foundations?
      * Private donors?
  + Plan for adding solar and batteries to each site
  + Plan for over-sized generators
    - Add loads?
    - Replace generators with smaller ones?
  + Map, test and rewire emergency panels so they support the intended loads
* Municipal vehicles transition to electric
* Town-wide EV charging plan
  + Where do we need chargers and how many?
  + Who do we assume will use them?
* Outreach to townspeople re resilience, efficiency and transition to all-electric
  + How make information available about steps to going all-electric
    - What information/resources can and should we provide?
  + How track how it's going?
* Where community solar
  + Energy Working Group plan says regional community solar
  + Where might we do this in our town?
* Building Code change to net zero
  + New State climate law says towns can do this
  + Town bylaw stating net zero? (Ashland)
* Other spots for batteries for resilience and to maximize revenue
  + Landfill
  + Any other locations?
* Greater plan for public water access
  + solar and storage at non-critical buildings so can supply water
  + map and plan for how to have public water available across the Town

**From the Resilience Plan**

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

**Fire Station**

**Immediate**

* Lighting improvements- LEDs
* Hot water temp set back at the boiler
* Need a plan for 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
  + Be sure no insulation should go on roof sheathing before this is done

**Midterm**

* Exchange FS oil boiler with 20 kW ASHP (or less once efficiency done)

**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 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
* plan for how to insulate and make Fire Station more airtight.

**Midterm**

* Insulate building, make more airtight
* re-roof before solar is put on this building.
  + Be sure no insulation should go on 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

*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**

* 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
  + Establish a subcommittee to oversee this project
* 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
  + 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 intended 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 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 intended loads
  + Consider re-wiring so generator does all loads in Town Hall?
  + Add EV charger to emergency loads
* Contingency Plan review

**Midterm**

* 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
* 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
  + Select Board wondering 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