1. **Address the use of biomass for appropriately scaled institutional and residential thermal heat generation for climate mitigation, co-benefits, and impacts while preventing the expansion of biomass for industrial-scale commercial electricity production.** [*NOTE: the Ag and Eco subcommittee has not had time to engage with Cross-Sector mitigation on this important but complex topic – on either the substance or whether oversight of certain topics fall within CSM or Ag and Eco's purview - nor sufficient time to research, understand and offer more specific actions on this topic. Please note that Ag and Ecosystem Subcommittee <u>does not</u> have consensus agreement on all recommended actions that follow – some individual actions are opposed by some individual subcommittee members.]*

   Definition: As used in this section, "biomass" means material from trees, woody plants, or grasses, including limbs, tops, needles, leaves, and other woody parts, grown in a forest, woodland, farm, rangeland, or wildland-urban environment that is the product of forest management, land clearing, ecosystem restoration, or hazardous fuel reduction treatment (from Biomass Energy Developing Working Group, Final Report, Vermont Legislative Council, January 2012)

   a. Prohibit the expansion of current, and/or construction of any new, large-scale, industrial electric generation biomass facilities in the State of Vermont. Existing facilities shall:
      a. Set GHG emissions reduction targets, to be incorporated into operations license(s).
      b. Remediate negative impacts to surrounding communities, cultural/historical/archeological sites and/or resources, and to the State of the Vermont's residents, air quality, and natural resources.
      c. Source material from within the state of Vermont, ensuring appropriate oversight of harvest activities for all wood products procured for use.
      d. If such facilities operations cannot be sufficiently improved to address the above, then the facilities be closed should and job transition assistance provided to employees.
      e. Expansion is defined as an increase in the physical footprint, emissions, or any increased impact on adjacent communities and natural and cultural resources.

Improvements without expansion may include changes that result in increased efficiency with no increase in footprint, reductions in GHG emissions, other air pollutants or impacts to the community.

b. Utilize existing research (*such as Buchholz, T., Gunn, J.S. and Saah, D.S., 2017. Greenhouse gas emissions of local wood pellet heat from northeastern US forests. Energy, 141, pp.483-491*) to inform if and under what conditions biomass in institutional or residential applications for thermal or combined heat/power applications could provide for a transition away from fossil fuel use, reduce GHG emissions, and have not net impact on Vermont's forests for storage and sequestration.

c. The following GHG impacts should be accounted for when developing policy and/or associated regulations for biomass:
    a. all greenhouse gas emissions associated with producing the fuel (including extraction or harvesting, manufacturing, or processing, transportation)
    b. greenhouse gases emitted by the fuel when used
    c. efficiency of the heat generation system being used
    d. carbon stocks in the forest

d. The following considerations should be accounted for if permitting any new pellet producing facility(s) in the state:
    a. Pellet production must be from combined sawmill residue (i.e., sawdust) or other byproducts of forest product manufacturing (i.e., cants, bark, etc.) and biomass—generally produced as a byproduct of harvesting associated forest products. Sourcing criteria should be established restricting biomass to a maximum percentage that is effectively monitored and enforced [*see Buchholz, Gunn, Saah in* Energy, *December 2017*].
    b. Monitoring and enforcement must ensure that harvest levels are maintained, with no net increase resulting in an increased demand for pellet fiber (increased demand in pellet fiber is offset by reductions in other markets); shifting existing harvest of pulpwood volume to pellets. Procurement standards ensuring sustainable forest management which protect ecosystem integrity should be developed, applied, and monitored

e. Regulate, including preventing, if necessary, flow of wood pellets or similar commercial scale wood-derived energy products based on research in "b" above to ensure sustainable harvesting of "net GHG-reducing" pellets (i.e., composition, source wood, etc.).
f. In addition, develop a program of education and outreach, as well as technical assistance, to encourage appropriate methods and practices when using wood heat, while also ensuring oversight and regulation of those appropriate methods and practices.

Preliminary Assessment of Strategy against Criteria
Impact: Through research and appropriate oversight and management, seeks to ensure that biomass for thermal heat is sustainable and reduces GHG emissions.
Equity: Prevents expansion of industrial-scale biomass for electricity's adverse and inequitable impacts to people and land and provides clear guidelines for biomass for thermal heat in Vermont. Strategies utilizing biomass for energy will also be inequitable to the land and other natural resources unless it is implemented in a specific, regulated, and enforced manner regarding both emissions and source wood impacts.
Cost-effectiveness: Through conducting research and improving regulation and oversight, as this strategy intends, if implemented appropriately, can ensure biomass for thermal heat in Vermont is utilized in a healthy and viable way. The intent is to utilize biomass without unintended and adverse consequences, including costs to people, air, land, and climate.
Co-Benefits: Carefully managed biomass may help sustain natural lands for a host of storage, sequestration, and resilience purposes, provide a means of affordable heat to Vermonters, and provide income to Vermont's forestry sector.
Technical Feasibility: Yes