

A statement from climate scientists on DOER proposed RPS and APS regulations for bioenergy

Dr. William R. Moomaw, Emeritus Professor and Center Co-director Tufts University

Dr. Philip B. Duffy, President, Woods Hole Research Center, Falmouth MA

Dr. John Sterman, Professor Sloan School of Management Massachusetts Institute of Technology

DOER is proposing to modify both the RPS and APS standards to allow more forest bioenergy to receive subsidies from the Commonwealth. We are writing as climate change researchers to warn the administration of the climate and health damage that these regulations will cause if they are implemented.

We appreciate that Governor Baker has made multiple statements expressing his concern about climate change, and the urgent need to address it. We applaud his membership in the US Climate Alliance and agreeing with other governors to utilize forests as a means for addressing climate change. Unfortunately, the science of climate change and forest ecology clearly indicates that the bioenergy regulations proposed by DOER and supported by the administration would be counterproductive to addressing climate and because they would make the problem worse, are incompatible with the goals of the Massachusetts Global Warming Solutions Act.

Scientific research (much of it conducted in Massachusetts) clearly shows that:

1. Burning wood releases more CO<sub>2</sub> than coal per unit of energy produced.
2. Burning wood is not carbon neutral. Trees will grow back but only if replanted (there is no guarantee this will happen) and the replacement forest takes many decades to absorb an amount of carbon dioxide equal to what was released in combustion. If the forest had been allowed to continue growing, it would have removed and stored more atmospheric carbon in the number of years required for a replacement forest to grow
3. Even with the most generous assumptions burning woods cannot be carbon neutral because of greenhouse gases released from soils following harvesting, transportation of logs to the pellet plant, cutting and drying of the pellets, and transportation to the power plant.
4. Soil carbon that is lost from cut New England forest areas will take much longer to replenish than the above ground carbon (if it recovers at all).
5. The removal of forests halts the capture of carbon dioxide from the atmosphere and thus sacrifices an essential opportunity to address climate change.
6. Burning wood for heat and electricity releases more particulates than coal.
7. Cutting the forests is detrimental to biodiversity including wildlife and ecosystem services.
8. New research refutes the oft-made claim that producing wood for bioenergy will incentivize an increase in the area of forests.

As a leader in addressing climate change, the Commonwealth should be investing in climate solutions that are truly low-carbon, not in wood-burning infrastructure. Furthermore, clean solutions like wind and solar bring important health benefits through reductions in PM<sub>2.5</sub> pollution, and this opportunity will be lost if we increase the burning of wood.

An urgent priority for controlling climate change is to maximize the amount of carbon stored in forests, soils and wetlands. It is estimated that globally forests are absorbing only half of what they are capable because of the way they are currently managed. Furthermore, older forests store and remove the most carbon and store it in the wood of living and dead trees and in soils. The Forest Service and EPA estimate that US forests annually remove less than half as much as the global average relative to our emissions. Massachusetts forests have among the highest carbon density in the Northeast, some three times that of Maine (USFS\*). To meet climate goals, it is critically important that we protect as much of our forests as possible, allow them to grow, and burn less wood and fossil fuels.

We attach several documents that make clear that bioenergy (including so called forest waste) contributes as much or more carbon dioxide to the atmosphere when it is burned than coal, and much more than any other fossil fuels such as oil or gas. This was the finding of the Manomet Report that was commissioned by the Commonwealth nearly 10 years ago. The international scientific community (Intergovernmental Panel on Climate Change\*) has also found this to be true and that burning wood is not carbon neutral. Work by one of us (Sterman\*) carries out a detailed analysis of the emissions from burning wood, including residues, and demonstrates that bioenergy releases more carbon for each unit of heat or electricity produced than coal and other fossil fuels. Research by another MIT scientist, Dr. Susan Solomon, demonstrates that once added to the atmosphere, carbon dioxide from any source increases global average temperatures for a thousand years or more. More recent research demonstrates that our standing forests, as they age and grow, provide the greatest means of carbon removal each year (Moomaw\*). Finally, there is no “waste” in nature. Removing the residues from harvesting timber reduces the carbon and mineral content of the forest soils so that replacement forests will grow more slowly and be less productive than the harvested forest they replace. For the most part, residues mostly become soil carbon.

If the proposed regulations are implemented, they will undermine the goals of the Massachusetts Global Warming Solutions Act endorsed by Governor Baker because burning wood will increase climate change by adding additional heat trapping carbon dioxide to the atmosphere. Furthermore, the release of health damaging particulates and other pollutants from burning wood is inconsistent with Governor Baker’s strong commitment in protecting public health (American Lung Association\*). Massachusetts has the scientific and technological capability to ensure that we do not join those states that deny the science of climate change and make the problem worse, but instead become a national and global leader in finding climate solutions that enhance our economy.

The state can create a regulation to incentivize the burning of wood through subsidies, but nature will not change its laws to comply. One might as well pass a regulation to change the timing of the tides or the progression of the seasons as to pass these regulations that falsely claim that burning wood or wood waste will reduce carbon dioxide in the atmosphere.

We and other scientists offer to work with officials in the state government to ensure that Massachusetts is taking actions that lower the risk of irreversible climate change instead of ensuring that state actions will subsidize practices like burning wood for heat and electricity and make climate change worse.

**Biographies**

One of us is a chemist and professor at Tufts University who was a Lead author of five Intergovernmental Panel on Climate Change and a coordinating lead author of the Special Report on Renewable Energy. The second is a physicist who was a senior climate science advisor in the White House during the Obama administration and is the president of the leading climate research institute, Woods Hole Research Center. The third is Professor of Management at MIT who has conducted the most thorough analysis of the emissions from bioenergy.

[William.moomaw@tufts.edu](mailto:William.moomaw@tufts.edu)

[Pduffy@whrc.org](mailto:Pduffy@whrc.org)

[jsterman@mit.edu](mailto:jsterman@mit.edu)

**\*References and Attachments**