

# BIOMASS, or BIOMESS?

## *Carbon Emissions*

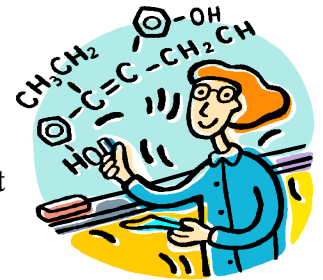
It is often incorrectly assumed that forest growth automatically offsets the carbon emissions from biomass burning, but unless **increased** forest cutting for biomass **increases** overall forest growth over “business as usual” forest growth (not likely), the “carbon debt” from higher biomass stack emissions will **never** be paid back and compounds perpetually. When overall forest growth decreases due to increased cutting for biomass (quite possible), the additional forest removals create a double whammy where stack carbon emissions are higher and carbon sequestration rates are lower.

A recent letter from 90 respected scientists asks congress not to “cook the books” when accounting for CO<sub>2</sub> from bio-energy stating “**clearing or cutting forests for energy, either to burn trees directly in power plants or to replace forests with bio-energy crops, has the net effect of releasing otherwise sequestered carbon into the atmosphere, just like the extraction and burning of fossil fuels. That creates a carbon debt, may reduce ongoing carbon uptake by the forest, and as a result may increase net greenhouse gas emissions for an extended time period and thereby undercut greenhouse gas reductions needed over the next several decades.**”<sup>1</sup>

This “critical accounting error” identified by Princeton University scientists, of ignoring carbon emissions from tree burning is leading to a false reduction of carbon levels on paper but an actual increase in atmospheric carbon levels<sup>2</sup> and igniting a “carbon time bomb” according to European scientists.<sup>3</sup>

The European Environment Agency identified the same accounting error, stating, “**It is widely assumed that biomass combustion would be inherently “carbon neutral” because it only releases carbon taken from the atmosphere during plant growth. This assumption is not correct... If bio-energy production replaces forests, reduces forest stocks or reduces forest growth, which would otherwise sequester more carbon, it can increase the atmospheric carbon concentration. The potential consequences of this bio-energy accounting error are immense.**”<sup>4</sup>

The recently released “Manomet” study used overtly biomass friendly forest cutting assumptions and the results still demonstrated that life cycle carbon dioxide emissions of tree burning biomass electric facilities are worse than coal for 45-75 years, and are worse than natural gas for at least a century. Manomet also demonstrated that tree burning biomass heat facilities are worse than oil for 15-30 years and worse than natural gas for 60-90 years.<sup>5</sup>



National Public Radio reported the Manomet study results in June 2010, “**A new study has found that wood-burning power plants using trees and other “biomass” from New England forests releases more greenhouse gases into the atmosphere than coal over time.**”<sup>6</sup>

As bad as the carbon profile for tree-burning biomass was shown to be in the Manomet study, the report has likely **underestimated** the carbon impacts of tree-fueled biomass due to using biomass friendly modeling assumptions that are unlikely to occur on the ground.<sup>7</sup>

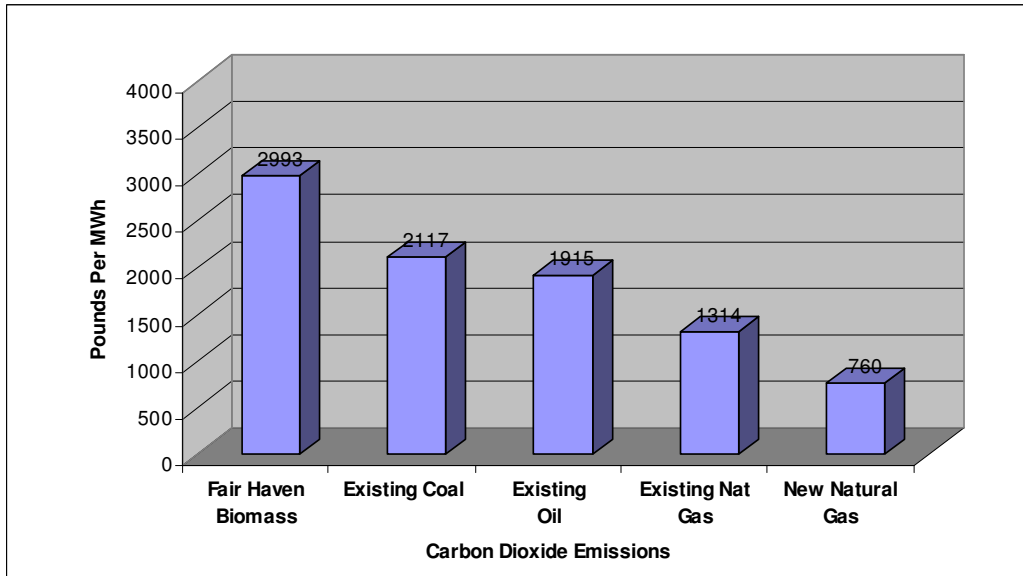
A report by Dr Eric Johnson entitled “Goodbye to Carbon Neutral: Getting biomass footprints right” states: **Most guidance for carbon footprinting, and most published carbon footprints presume that biomass heating fuels are carbon neutral. However, it is recognised increasingly that this is incorrect: biomass fuels are not always carbon neutral. Indeed, they can in some cases be far more carbon positive than fossil fuels.**<sup>8</sup>

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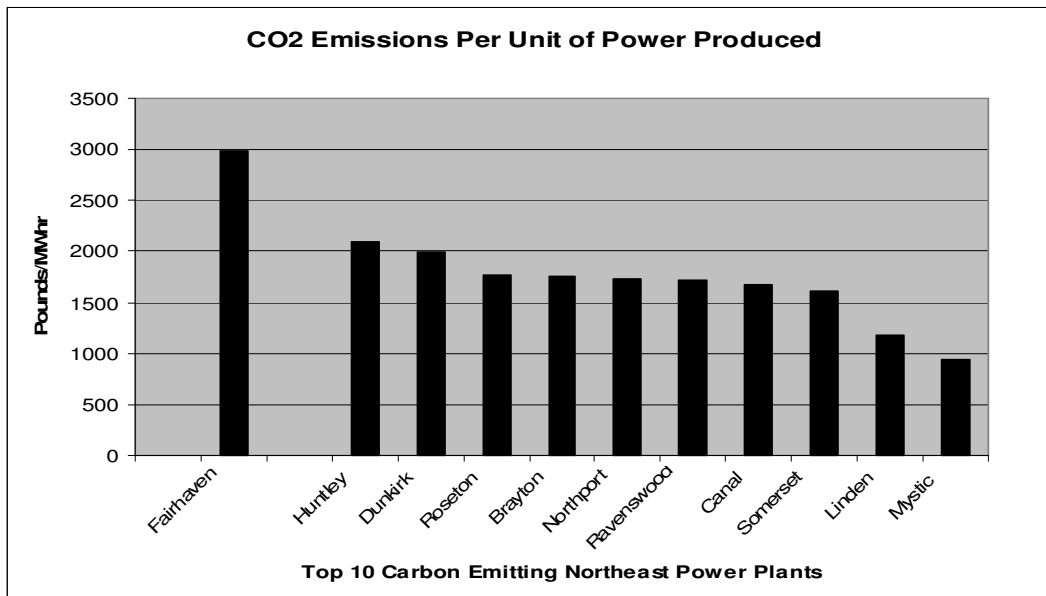
## *Carbon Emissions*

Fairhaven, VT biomass developers say they will emit 2,993 lbs of CO<sub>2</sub> per MWh of energy produced.<sup>9</sup> This compares to 2,117 lbs per MWh for existing coal plants, 1,915 for existing oil plants, 1,314 lbs per MWh for existing natural gas plants and 760 lbs per MWh for new natural gas power plants.<sup>10</sup>

### Fairhaven Wood Biomass Carbon Emission Rate vs Other Fuels



### Fairhaven Biomass Carbon Emissions vs Northeast Worst Polluters<sup>11</sup>



Even more efficient combined heat and power (CHP) wood biomass facilities, which some consider “less bad” than biomass electric production, still emit carbon dioxide at a rate 24% higher than oil and 97% higher than natural gas. New CHP wood burning biomass burners emit about 287 lbs/MMBtu of carbon dioxide, while oil burners emit 232 lbs/MMBtu and natural gas burners about 146 lbs/MMBtu.<sup>12</sup>

Above CHP biomass emissions are based on 75% efficiency but many biomass CHP operations operate at lower efficiency standards which would further increase biomass carbon emissions.

## Footnotes:

- <sup>1</sup> <http://216.250.243.12/90scientistsletter.pdf>
- <sup>2</sup> [www.maforests.org/SCIENCE.pdf](http://www.maforests.org/SCIENCE.pdf)
- <sup>3</sup> [www.birdlife.org/eu/pdfs/carbon\\_bomb\\_21\\_06\\_2010.pdf](http://www.birdlife.org/eu/pdfs/carbon_bomb_21_06_2010.pdf)
- <sup>4</sup> Page 1 [www.eea.europa.eu/about-us/governance/scientific-committee/sc-opinions/opinions-on-scientific-issues/sc-opinion-on-greenhouse-gas](http://www.eea.europa.eu/about-us/governance/scientific-committee/sc-opinions/opinions-on-scientific-issues/sc-opinion-on-greenhouse-gas)
- <sup>5</sup> Slide 13: [www.ct.gov/dep/lib/dep/air/siprac/2010/mass\\_biomass\\_sustainable\\_study.pdf](http://www.ct.gov/dep/lib/dep/air/siprac/2010/mass_biomass_sustainable_study.pdf)
- <sup>6</sup> [www.wbur.org/2010/06/11/wood-power-plants](http://www.wbur.org/2010/06/11/wood-power-plants)
- <sup>7</sup> [www.catf.us/resources/whitepapers/files/201007-Review\\_of\\_the\\_Manomet\\_Biomass\\_Sustainability\\_and\\_Carbon\\_Policy\\_Study.pdf](http://www.catf.us/resources/whitepapers/files/201007-Review_of_the_Manomet_Biomass_Sustainability_and_Carbon_Policy_Study.pdf)
- <sup>8</sup> <http://www.maforests.org/Carbon.pdf>
- <sup>9</sup> Page 8 : [www.anr.state.vt.us/air/Permitting/docs/ConstructionPermits/DRAFTap11015%5B1%5D.pdf](http://www.anr.state.vt.us/air/Permitting/docs/ConstructionPermits/DRAFTap11015%5B1%5D.pdf)
- <sup>10</sup> Department of Energy, Table-1 [www.eia.doe.gov/cneaf/electricity/page/co2\\_report/co2emiss.pdf](http://www.eia.doe.gov/cneaf/electricity/page/co2_report/co2emiss.pdf)  
(Note: DOE chart is in lbs per kwh, multiply by 1000 for lbs per MWh) New power plants average 760 lbs CO2 per MWh, see page 2: [www.colonialpowergroup.com/documents/MarlboroughDisclosureLabel.pdf](http://www.colonialpowergroup.com/documents/MarlboroughDisclosureLabel.pdf)
- <sup>11</sup> Page 1: [www.environmentmassachusetts.org/uploads/90/c0/90c011ba2b26309987e273cd9c34d2b8/moreheatthanlight.pdf](http://www.environmentmassachusetts.org/uploads/90/c0/90c011ba2b26309987e273cd9c34d2b8/moreheatthanlight.pdf)
- <sup>12</sup> See page 22: [www.manomet.org/sites/manomet.org/files/Manomet\\_Biomass\\_Report\\_Chapter2.pdf](http://www.manomet.org/sites/manomet.org/files/Manomet_Biomass_Report_Chapter2.pdf)

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December 3, 2011

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