**This sheet estimates the time zero CO2 emmission equivalent (tons) associated with one ton wood energy CO2 emission taking into account the difference in land carbon due to use of wood from forest thinnings. The estimat uses the forest carbon curves used by Massachusetts from the Manomet study and assumes a 100 yr time horizon**

| | CO2 radiative forcing response function parameters | | | | | | |
|---|---|---|---|---|---|---|---|
| | Source : IPCC 4th Assessment report - Physical Science Basis p 231 footnote a | | | | | | |
| ao | 0.217 | | | | | | |
| a1 | 0.259 | | | T1 | 172.9 | yrs | |
| a2 | 0.338 | | | T2 | 18.51 | yrs | |
| a3 | 0.186 | | | T3 | 1.186 | yrs | |

## For wood biomass from forest thinnings

**Tons Time zero CO2 emission equivalent per ton of biomass CO2 emission**

**0.67780**

Source: Massachusetts Renewable Portfolio - Biomass Policy Regulations
http://www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/biomass/renewable-portfolio-standard-biomass-policy.html
http://www.mass.gov/eea/docs/doer/renewables/biomass/ma-rps-regulation-overall-efficiency-and-ghg-analysis-guideline-doer-081712.xlsx

**Forest and Non-Forest Carbon Deficit Function Parameters**

see Worksheet *Carbon Deficit Analyses* for derivation of carbon accounting functions for Eligible Biomass from Residues and Thinnings

| | | | |
|---|---|---|---|
| **Biomass from Residues** | Decay Rate Half Life, years | 5.5 | Eligible Biomass Fuel can come from Forest or Non-Forest Residues and Forest Thinnings, each of which has substantially different carbon deficit functions. DOER provides these representative temporal functions for which the carbon impacts of Residues and Thinnings are evaluated. DOER bases these functions on the averaging of results presented in the Manomet study on the Total (Forest) Stand Carbon and on other literature for the decay of non-forest residues (see Tab "Carbon Deficit Analys" in this workbook). DOER recognizes that carbon sequestration recovery and residue decay rates will depend on specific forest conditions, harvest activity, residue sources, but puts forward these representative functions to enable reasonable and practicable implementation of the GHG Analysis required in 225 CMR 14.00 regulation. |
| **Biomass from Thinnings** | Trendline | Coefficient: 1.1239 / Exponent: -0.012 | |

**This sheet estimates the time zero CO2 emmission equivalent (tons) associated with one ton wood energy CO2 emission taking into account the difference in land carbon due to use of wood from forest thinnings. The estimat uses the forest carbon curves used by Massachusetts from the Manomet study and assumes a 100 yr time horizon**

| | CO2 radiative forcing response function parameters | | | | | | |
|---|---|---|---|---|---|---|---|
| | Source : IPCC 4th Assessment report - Physical Science Basis p 231 footnote a | | | | | | |
| ao | 0.217 | | | | | | |
| a1 | 0.259 | | | T1 | 172.9 | yrs | |
| a2 | 0.338 | | | T2 | 18.51 | yrs | |
| a3 | 0.186 | | | T3 | 1.186 | yrs | |

**For wood biomass from forest thinnings**

**Tons Time zero CO2 emission equivalent per ton of biomass CO2 emission**

**0.66507**

Source: Massachusetts Renewable Portfolio - Biomass Policy Regulations
http://www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/biomass/renewable-portfolio-standard-biomass-policy.html
http://www.mass.gov/eea/docs/doer/renewables/biomass/ma-rps-regulation-overall-efficiency-and-ghg-analysis-guideline-doer-081712.xlsx

**Forest and Non-Forest Carbon Deficit Function Parameters**

see Worksheet *Carbon Deficit Analyses* for derivation of carbon accounting functions for Eligible Biomass from Residues and Thinnings

| | Decay Rate Half Life, years | | |
|---|---|---|---|
| **Biomass from Residues** | 5.5 | | |
| | Trendline | | |
| **Biomass from Thinnings** | Coefficient | Exponent | |
| | 1.1239 | -0.012 | |

Eligible Biomass Fuel can come from Forest or Non-Forest Residues and Forest Thinnings, each of which has substantially different carbon deficit functions. DOER provides these representative temporal functions for which the carbon impacts of Residues and Thinnings are evaluated. DOER bases these functions on the averaging of results presented in the Manomet study on the Total (Forest) Stand Carbon and on other literature for the decay of non-forest residues (see Tab "Carbon Deficit Analys" in this workbook). DOER recognizes that carbon sequestration recovery and residue decay rates will depend on specific forest conditions, harvest activity, residue sources, but puts forward these representative functions to enable reasonable and practicable implementation of the GHG Analysis required in 225 CMR 14.00 regulation.

**This sheet estimates the time zero CO2 emmission equivalent (tons) associated with one ton wood energy CO2 emission taking into account the difference in land carbon due to use of wood from forest thinnings. The estimat uses the forest carbon curves used by Massachusetts from the Manomet study and assumes a 100 yr time horizon**

| | CO2 radiative forcing response function parameters | | | | | | |
|---|---|---|---|---|---|---|---|
| | Source : IPCC 4th Assessment report - Physical Science Basis p 231 footnote a | | | | | | |
| ao | 0.217 | | | | | | |
| a1 | 0.259 | | | T1 | 172.9 | yrs | |
| a2 | 0.338 | | | T2 | 18.51 | yrs | |
| a3 | 0.186 | | | T3 | 1.186 | yrs | |

**For wood biomass from forest thinnings**

**Tons Time zero CO2 emission equivalent per ton of biomass CO2 emission**

**0.66507**

Source: Massachusetts Renewable Portfolio - Biomass Policy Regulations
http://www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/biomass/renewable-portfolio-standard-biomass-policy.html
http://www.mass.gov/eea/docs/doer/renewables/biomass/ma-rps-regulation-overall-efficiency-and-ghg-analysis-guideline-doer-081712.xlsx

**Forest and Non-Forest Carbon Deficit Function Parameters**

see Worksheet *Carbon Deficit Analyses* for derivation of carbon accounting functions for Eligible Biomass from Residues and Thinnings

| | | | |
|---|---|---|---|
| **Biomass from Residues** | Decay Rate Half Life, years | | |
| | 5.5 | | |
| **Biomass from Thinnings** | Trendline | | |
| | Coefficient | Exponent | |
| | 1.1239 | -0.012 | |

Eligible Biomass Fuel can come from Forest or Non-Forest Residues and Forest Thinnings, each of which has substantially different carbon deficit functions. DOER provides these representative temporal functions for which the carbon impacts of Residues and Thinnings are evaluated. DOER bases these functions on the averaging of results presented in the Manomet study on the Total (Forest) Stand Carbon and on other literature for the decay of non-forest residues (see Tab "Carbon Deficit Analys" in this workbook). DOER recognizes that carbon sequestration recovery and residue decay rates will depend on specific forest conditions, harvest activity, residue sources, but puts forward these representative functions to enable reasonable and practicable implementation of the GHG Analysis required in 225 CMR 14.00 regulation.