Ideas for Automated Forest Monitoring project

Many potential things to measure

Light for photosynthesis

Water and nutrients for growth

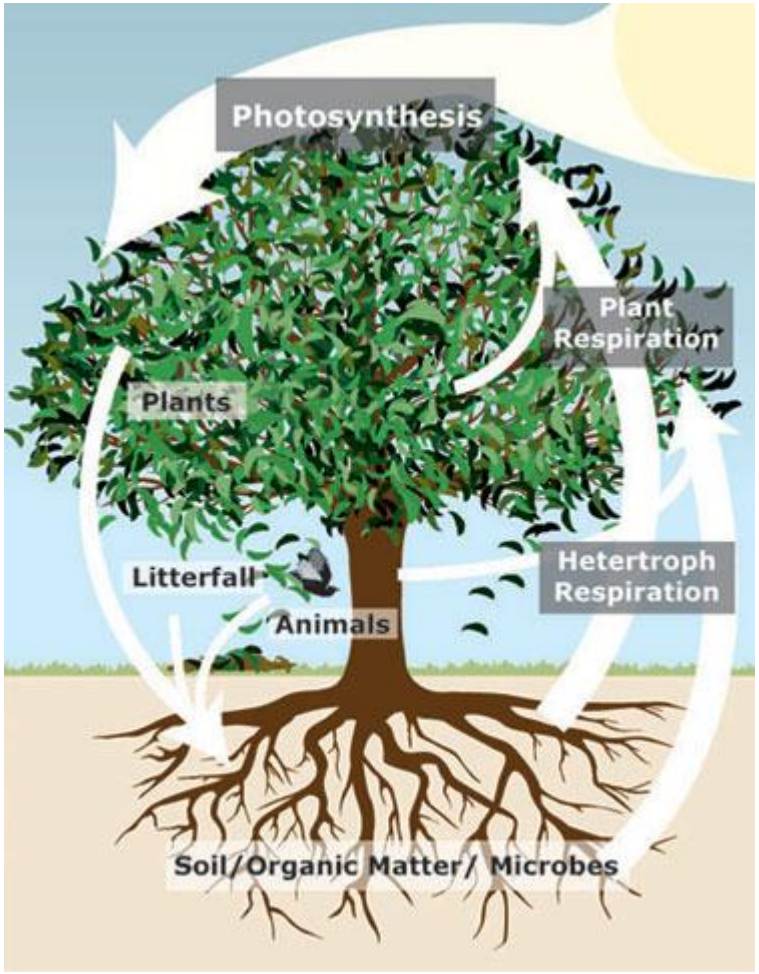
Soil processes

Temperature patterns

CO_2 fluxes (sink or source)

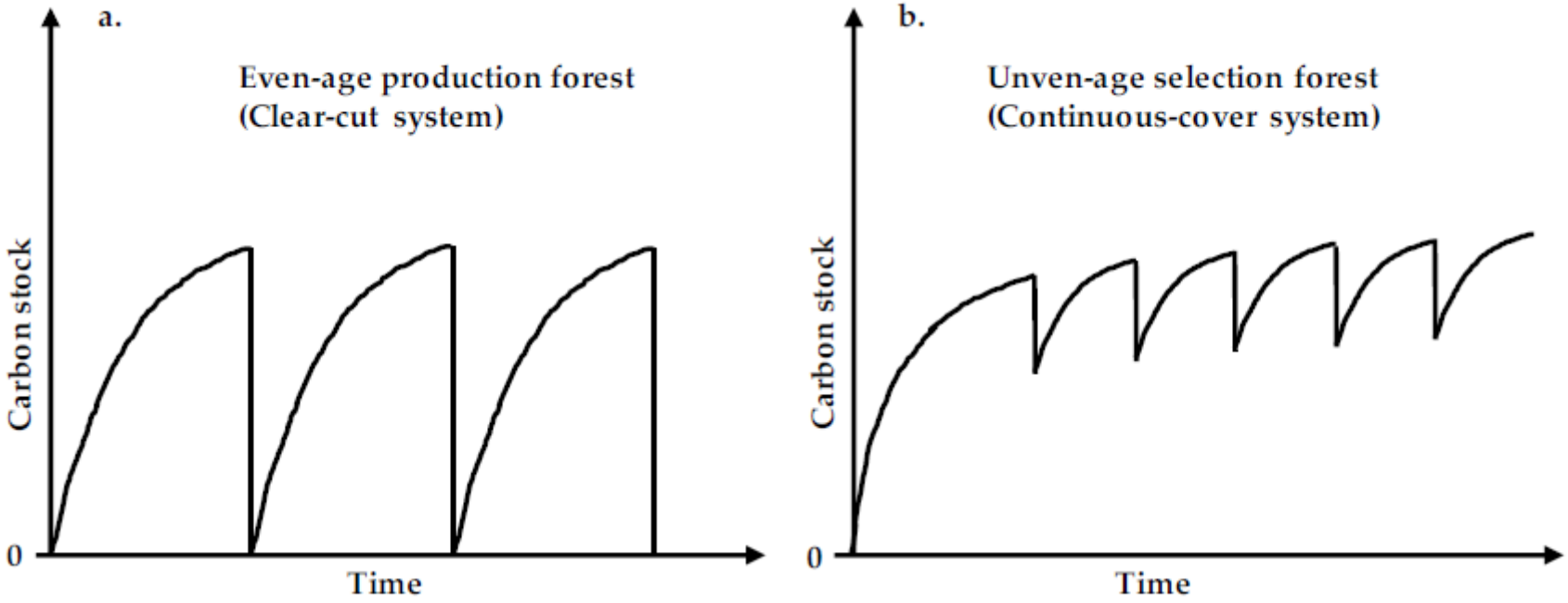
Presence of animals (birds, bats, bears)

……



CO_2

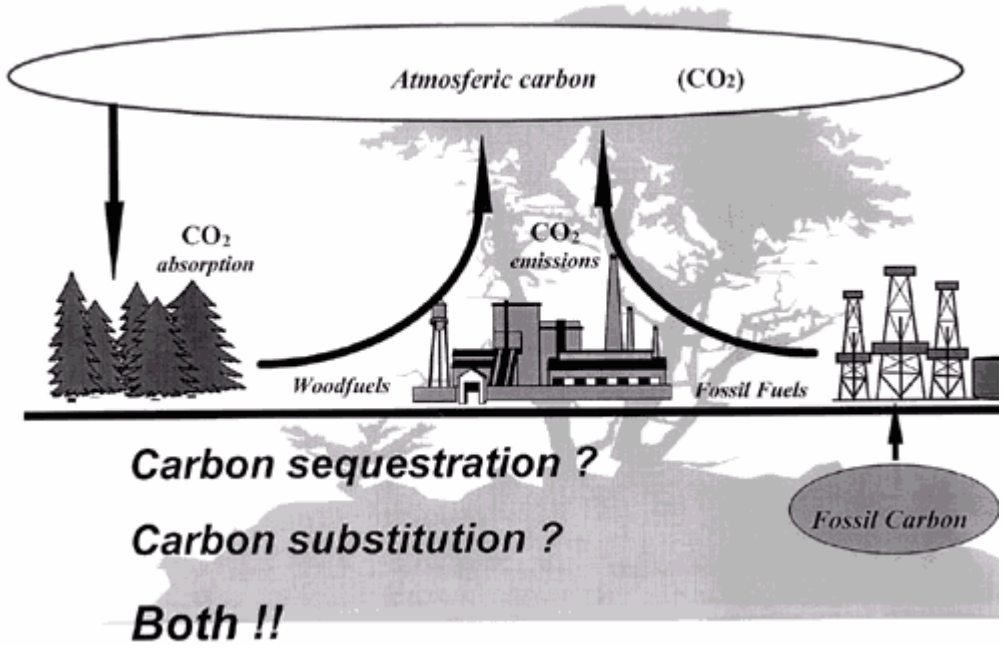
Forests store carbon!



When forests (trees) are harvested, the carbon store of course decrease

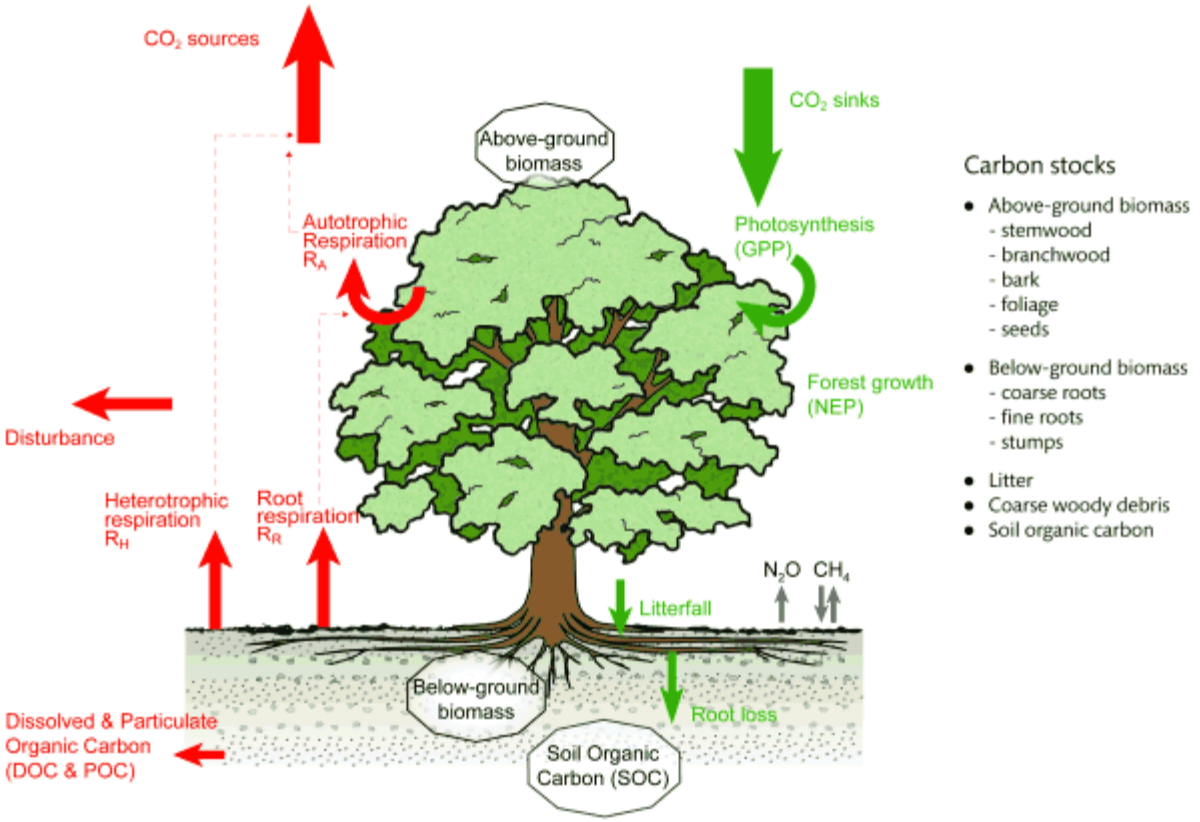
End use matters!

Substitution!



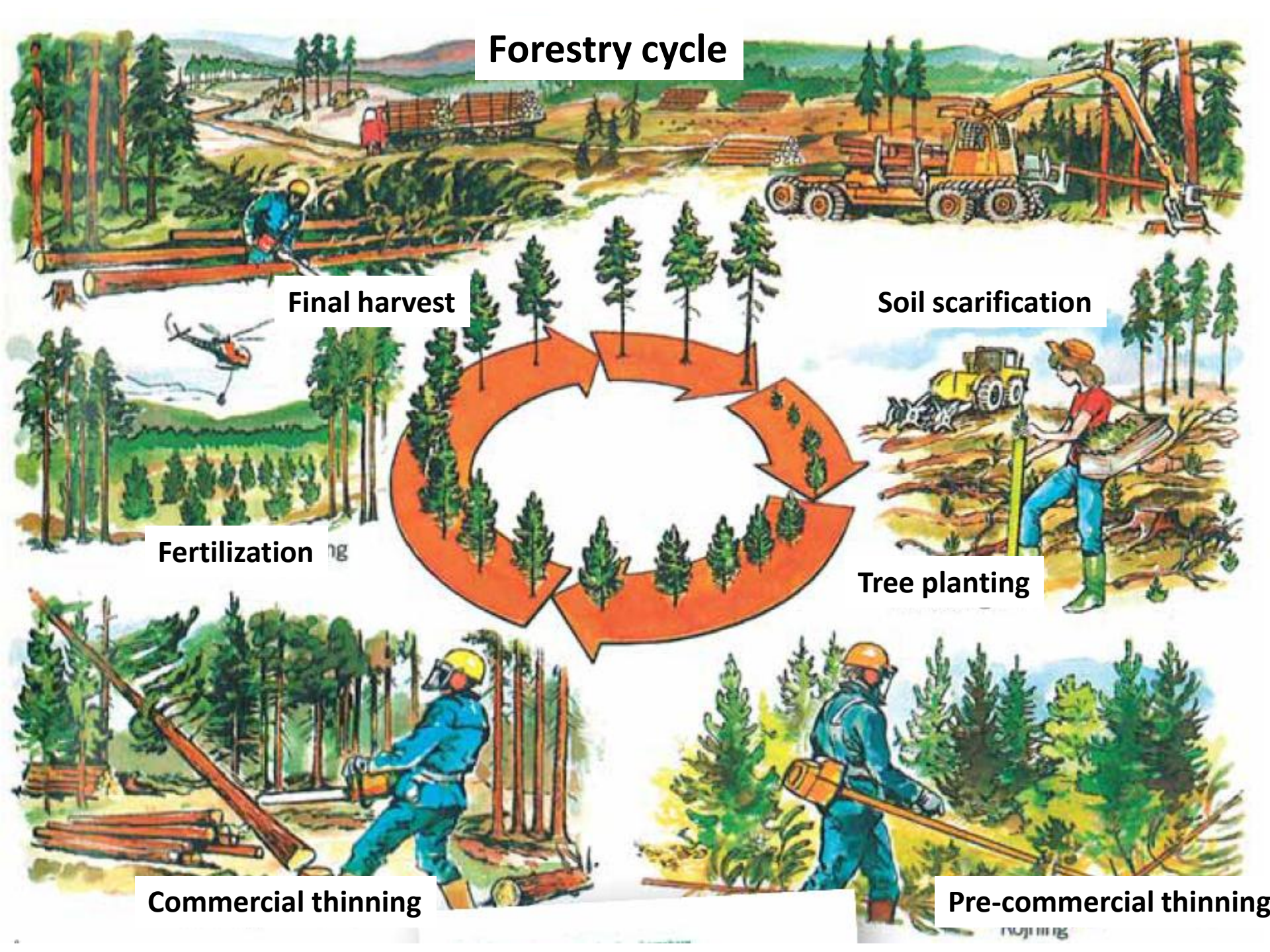
Not just energy! E.g. building material, substituting concrete, cement with wood!

Carbon balance in forests



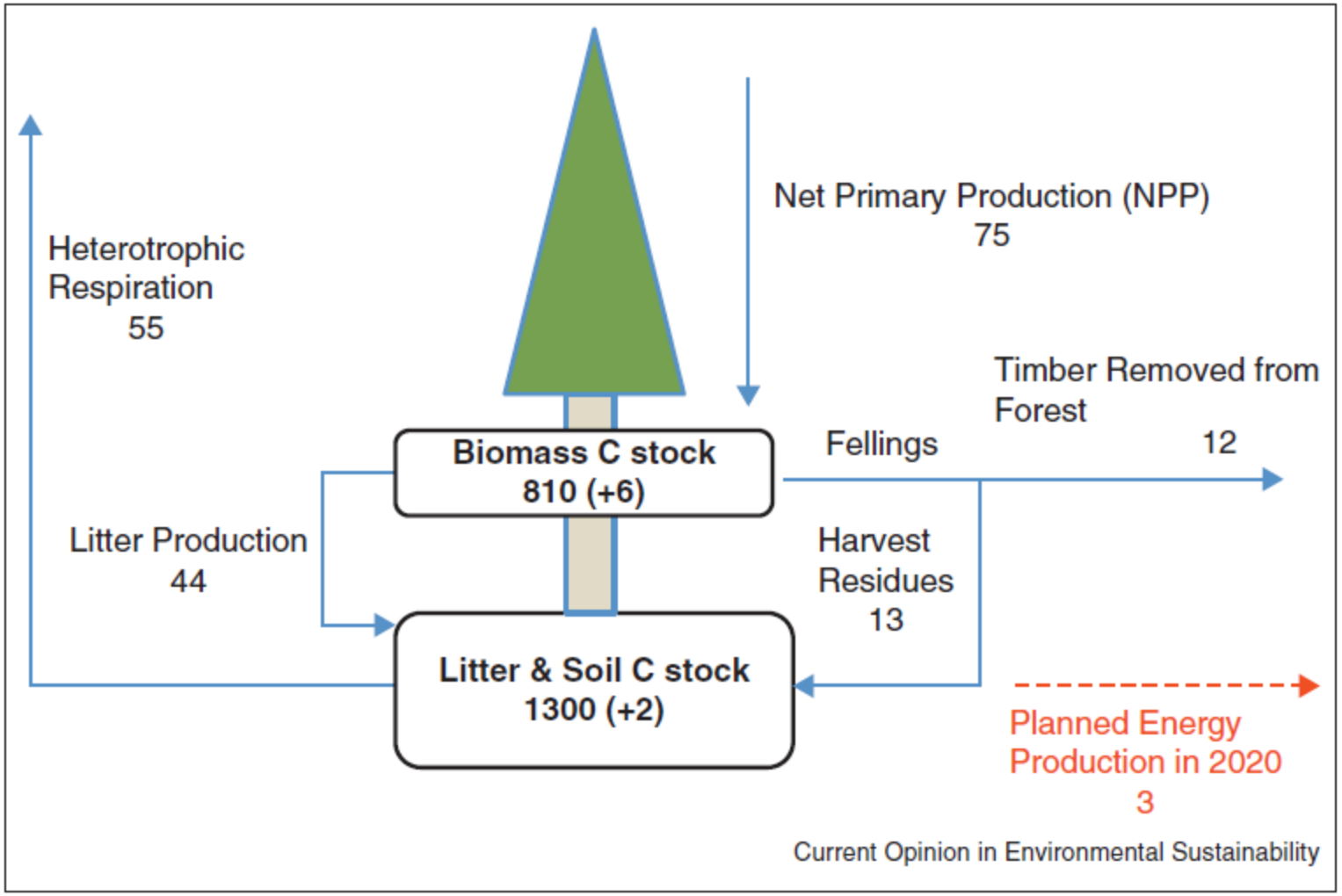
Substitution yes, but what happens in the forest?

Forestry cycle

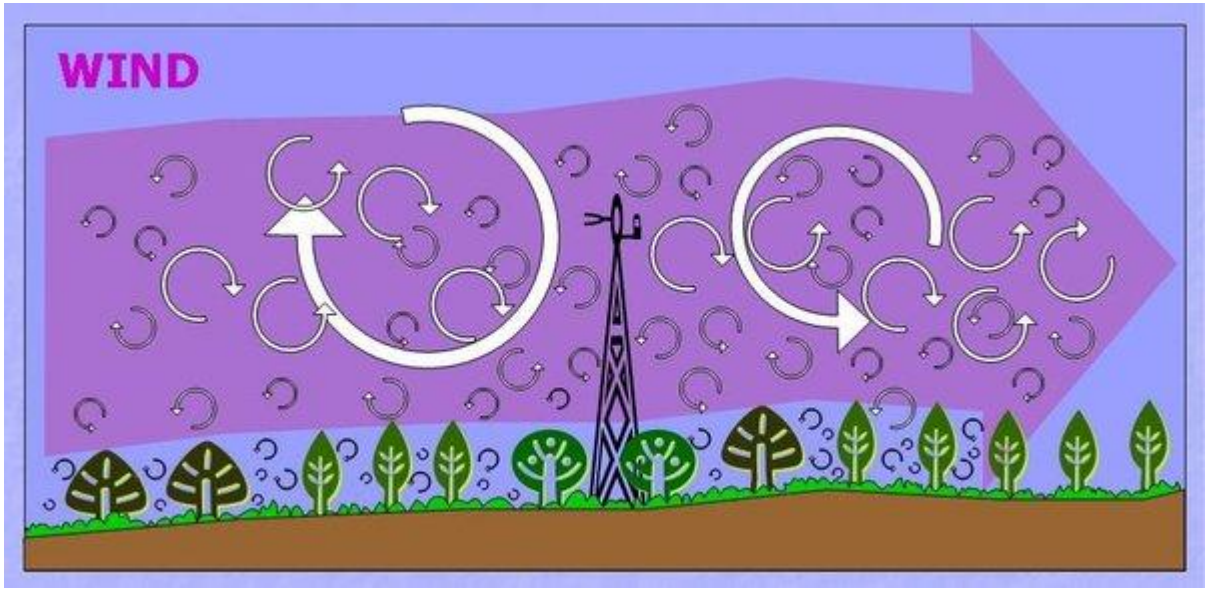


Clear-cuts are atmospheric carbon sources for X number of years
Litter decomposition + increased soil respiration

Stump harvest increasingly considered
Most likely increase soil respiration significantly
More or less no data available…


Heterotrophic
Respiration
55
Net Primary Production (NPP)
75
Timber Removed from
Forest
Fellings
12
Biomass C stock
810 (+6)
Litter Production
44
Harvest
Residues
13
Litter & Soil C stock
1300 (+2)
Planned Energy
Production in 2020
3
Current Opinion in Environmental Sustainability

Eddy covariance estimates



Measuring the vertical movement of CO_2. Often in a single ”tower” – no spatial resolution in the forest
Note! There are also other green house gases to consider!

To understand the full carbon story in substitution scenarios we need better understanding on the carbon balance within the soil!

I recommend reading
Vanhala et al. 2013. *Forest bioenergy at the cost of carbon sequestration*