

ECOBOARD PLANT Life Cycle Analysis



Summary per kg of finished product

	Energy MJ/kg	GWP CO2 eqv /kg	GWP CO2 eqv /kg
Straw	0.000	-1.781	-1.781
MDI	3.009	0.169	0.169
Production	2.392	0.562	0.562
Transport to Europe	5.997	0.367	0
Packaging	2.683	0.066	0.066
Total	14.080	-0.618 from asia	-0.984 - CO2 / Kg local factory

Notes

1 No burden has been associated with the "waste" wheat straw thus no energy input is shown

2 total CO2 emissions for the product include a negative value due to carbon storage in the straw

3 MDI production figures have been adapted from european data and thus a factor of 2.29 is applied to compensate for the higher CO2 emissions (per kWh) in China

4 packaging is assumed to be 0.02857kg HDPE per kg of product in the absence of "cling wrap" data or exact weights

Total	Produced in asia	-0.618 - CO2 / Kg
	Transport from asia	-0.367 - CO2 / Kg
	Produced in EUROPE	-0.984 - CO2 / Kg

	kg	CO2	
Capacity Factory	97,000,000	-0.984	-95,400,008 kg CO2 stored per factory / year
Wood saved 97 %	94,090,000	-1.65	-155,248,500 kg CO2

Total **-250,648,508** kg CO2



While each kilogram of dried tree is storing .45 kilograms of carbon, it is removing more than a kilogram of carbon dioxide from the atmosphere. This is because each carbon dioxide molecule contains two oxygen atoms. Using the data from above, this means that each carbon dioxide molecule has an atomic mass of $12 + 2(16) = 44$, of which only 12 due to the carbon. Therefore, for each atom of carbon stored in a tree, 44 atomic mass units of carbon dioxide is removed from the atmosphere. This means that each kilogram of dried tree corresponds to (1 kg of dried tree) \times (.45 kg of C/1 kg of dried tree) \times (44 amu of CO₂/12 AMU of C) = 1.65 kg of CO₂ >

Source : <http://esa21.kennesaw.edu/activities/trees-carbon/trees-carbon.pdf>

CO2 extra absorbed by saved trees / Yr

94,090,000 -0.50 **-47,045,000** kg CO2 / Yr

Tree oxygen production varies by tree size. Based on data from Minneapolis, Minnesota (Nowak et al. 2006b), trees 1–3 dbh produced \approx 2.9 kg O₂/year (6.4 lb O₂/year); trees 9–12 dbh: 22.6 kg O₂/year (49.9 lb O₂/year); 18–21 dbh: 45.6 kg O₂/year (100.5 lb O₂/year); 27–30 dbh: 91.1 kg O₂/year (200.8 lb O₂/year); and greater than 30 dbh: 110.3 kg 2/year (243.2 lb O₂/year). An average tree of about 10 dbh and about 40 kg will produce about 20 kg 2/year or about 0,50 kg C2 per kg wood

<http://joa.isa-arbor.com/request.asp?JournalID=1&ArticleID=2998&Type=2>

Oxygen extra produced by saved trees

94,090,000 0.307692307692308 **28,950,769** kg O2 / Yr

These statements do not take into account the types of trees, the number of trees per acre, the hours of sunlight, whether they are deciduous or coniferous, if the climate is warm or cold, if the trees are young or mature.

However, using the factoid that "One acre of trees removes 2.6 tonnes of CO₂ per year" the equivalent oxygen production rate would be about 1.6 tonnes per year. For 1000 acres 1.6 thousand tonnes.

http://wiki.answers.com/Q/How_much_oxygen_does_1000_acres_of_trees_produce#ixzz1JfmXVori

