

FOLLOW THE TREE

The story of
carbon in trees

DATA

OVERALL

General CO ₂ Data	
Density of carbon dioxide at standard pressure and 15 °C (kg/m ³)	1.87
Sphere packing density	0.64
Pile angle of repose	45°
Wood Data	
Relative molecular mass CO ₂ (g/mol)	44.01
Relative atomic mass carbon (g/mol)	12.01
Density of wood from sitka spruce ¹ (kg/m ³)	350
Sitka spruce carbon content (kg C per m ³)	175
Sitka spruce carbon content (kg CO ₂ per m ³)	641.23

¹ Value supplied by Wood for Good

THE TREE STORY

Volume of wood per tree (m ³)	1.14	²
Therefore mass CO ₂ per tree (kg)	731.01	
Wood plank dimensions (m)	2.4 x 0.1 x 0.05	
Plank volume (m ³)	0.012	
Number of planks in 1.14 m ³ (Average volume of wood in clearfell tree)	95	

² Value supplied by Wood for Good

THE HECTARE STORY

Age	Stage	Number Trees/ha remaining	Thinnings Harvested (m ³)	Sawlog Harvested (m ³)	CO ₂ Sequestered (kg)
20	1st Thinning	1,064	70	0	44,886
25	2nd Thinning	700	65	5	44,886
30	3rd Thinning	521	41	29	44,886
35	4th Thinning	412	21	49	44,886
40	Clearfell	0	252	419	303,303
		Total	832	503	482,849

Age	Stage	Cumulative Thinnings (m ³)	Height of stack (metres) with base dimensions 9.4 m x 9.4m	Cumulative Sawlog (m ³)	Height of stack (metres) with base dimensions 9.4 m x 9.4m
20	1st Thinning	70	0.79	0	0
25	2nd Thinning	205	2.32	5	0.07
30	3rd Thinning	382	4.32	35	0.40
35	4th Thinning	580	6.56	84	0.95
40	Clearfell	832	9.42	503	5.69

³ Thinning - The first return, John Casey

⁴ Wood properties and uses of Sitka spruce in Britain, J Moore

THE HOUSE STORY

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The House	
Volume of wood (m ³)	24.9
Volume CO ₂ (m ³)	10,220
Mass carbon dioxide (kg)	19,112.23
Number of spheres (1 kg)	19,112
Height of pile (m)	23.5

The Estate (84 Houses)	
Volume of wood (m ³)	2,091.38
Volume CO ₂ (m ³)	858,517
Mass carbon dioxide (kg)	1,605,427.63
Number of spheres (1 tonne)	1,605
Height of pile (m)	102.91

All New Homes in UK (200,00 Houses)	
Volume of wood (m ³)	4,979,470
Volume CO ₂ (m ³)	2,044,089,166
Mass carbon dioxide (kg)	3,822,446,740
Number of spheres (1 tonne)	3,822,447
Height of pile (m)	1,374.17

REFERENCES

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