



# Guidance for calculating the Long-Term Carbon Benefit.

For projects claiming removals or reductions of baseline GHG emissions, or for conservation and restoration projects where events, such as sea level rise, may cause a loss of project area and associated biomass and/or soil organic carbon stocks, the maximum quantity of GHG emission reductions or removals that may be claimed from the biomass and soil organic carbon pool is limited to the net GHG benefit generated by the project 100 years after its start date, as follows:

$$NER_{max} = NER \text{ at } t = 100$$

Also note that  $NER_{max}$  must be corrected for uncertainty by estimating the total uncertainty for the project activity using the procedures outlined in the respective methodology.

## Scenario

A mangrove reforestation project is expected to reforest up to 4050 hectares of degraded land. The land is devoid of other biomass and the baseline carbon stocks are zero. The project will plant 500 hectares annually, with a 70% sampling survival rate. The forecasted annual GHG removals is 2 tCO<sub>2</sub>e/hectare. It is expected that sea level rise will submerge 30% of the project area in one event forecasted 60 years after the project start date. As per the methodology used, the Soil Organic Carbon stocks are not expected to be impacted, but the aboveground biomass will be submerged and completely lost.

Based on this scenario, the following estimates were produced:

Year	Cumulative Hectares Planted of survived plantation and sea level rise (max)	tCO2e	tCO2e	tCO2e	tCO2e	SCUs
t		Project Removals	Project Scenario Carbon Stocks	PET-PET-1	LTCB-(PET-PET-1)	
0	0	0	0	0	536,970.00	
1	350	700.00	700.00	700.00	536,970.00	700.00
2	700	1,400.00	2,100.00	1,400.00	536,270.00	1400.00
3	1050	2,100.00	4,200.00	2,100.00	534,870.00	2100.00
4	1400	2,800.00	7,000.00	2,800.00	532,770.00	2800.00
5	1750	3,500.00	10,500.00	3,500.00	529,970.00	3500.00
6	2100	4,200.00	14,700.00	4,200.00	526,470.00	4200.00
7	2450	4,900.00	19,600.00	4,900.00	522,270.00	4900.00
8	2800	5,600.00	25,200.00	5,600.00	517,370.00	5600.00
9	3150	6,300.00	31,500.00	6,300.00	511,770.00	6300.00
10	3500	7,000.00	38,500.00	7,000.00	505,470.00	7000.00
11	3850	7,700.00	46,200.00	7,700.00	498,470.00	7700.00
12	4050	8,100.00	54,300.00	8,100.00	490,770.00	8100.00
13	4050	8,100.00	62,400.00	8,100.00	482,670.00	8100.00
14	4050	8,100.00	70,500.00	8,100.00	474,570.00	8100.00
15	4050	8,100.00	78,600.00	8,100.00	466,470.00	8100.00
16	4050	8,100.00	86,700.00	8,100.00	458,370.00	8100.00
17	4050	8,100.00	94,800.00	8,100.00	450,270.00	8100.00
18	4050	8,100.00	102,900.00	8,100.00	442,170.00	8100.00
19	4050	8,100.00	111,000.00	8,100.00	434,070.00	8100.00
20	4050	8,100.00	119,100.00	8,100.00	425,970.00	8100.00
21	4050	8,100.00	127,200.00	8,100.00	417,870.00	8100.00
22	4050	8,100.00	135,300.00	8,100.00	409,770.00	8100.00
23	4050	8,100.00	143,400.00	8,100.00	401,670.00	8100.00
24	4050	8,100.00	151,500.00	8,100.00	393,570.00	8100.00
25	4050	8,100.00	159,600.00	8,100.00	385,470.00	8100.00
26	4050	8,100.00	167,700.00	8,100.00	377,370.00	8100.00
27	4050	8,100.00	175,800.00	8,100.00	369,270.00	8100.00
28	4050	8,100.00	183,900.00	8,100.00	361,170.00	8100.00
29	4050	8,100.00	192,000.00	8,100.00	353,070.00	8100.00
30	4050	8,100.00	200,100.00	8,100.00	344,970.00	8100.00
31	4050	8,100.00	208,200.00	8,100.00	336,870.00	8100.00
32	4050	8,100.00	216,300.00	8,100.00	328,770.00	8100.00
33	4050	8,100.00	224,400.00	8,100.00	320,670.00	8100.00
34	4050	8,100.00	232,500.00	8,100.00	312,570.00	8100.00
35	4050	8,100.00	240,600.00	8,100.00	304,470.00	8100.00
36	4050	8,100.00	248,700.00	8,100.00	296,370.00	8100.00
37	4050	8,100.00	256,800.00	8,100.00	288,270.00	8100.00
38	4050	8,100.00	264,900.00	8,100.00	280,170.00	8100.00

39	4050	8,100.00	273,000.00	8,100.00	272,070.00	8100.00
40	4050	8,100.00	281,100.00	8,100.00	263,970.00	8100.00
41	4050	8,100.00	289,200.00	8,100.00	255,870.00	8100.00
42	4050	8,100.00	297,300.00	8,100.00	247,770.00	8100.00
43	4050	8,100.00	305,400.00	8,100.00	239,670.00	8100.00
44	4050	8,100.00	313,500.00	8,100.00	231,570.00	8100.00
45	4050	8,100.00	321,600.00	8,100.00	223,470.00	8100.00
46	4050	8,100.00	329,700.00	8,100.00	215,370.00	8100.00
47	4050	8,100.00	337,800.00	8,100.00	207,270.00	8100.00
48	4050	8,100.00	345,900.00	8,100.00	199,170.00	8100.00
49	4050	8,100.00	354,000.00	8,100.00	191,070.00	8100.00
50	4050	8,100.00	362,100.00	8,100.00	182,970.00	8100.00
51	4050	8,100.00	370,200.00	8,100.00	174,870.00	8100.00
52	4050	8,100.00	378,300.00	8,100.00	166,770.00	8100.00
53	4050	8,100.00	386,400.00	8,100.00	158,670.00	8100.00
54	4050	8,100.00	394,500.00	8,100.00	150,570.00	8100.00
55	4050	8,100.00	402,600.00	8,100.00	142,470.00	8100.00
56	4050	8,100.00	410,700.00	8,100.00	134,370.00	8100.00
57	4050	8,100.00	418,800.00	8,100.00	126,270.00	8100.00
58	4050	8,100.00	426,900.00	8,100.00	118,170.00	8100.00
59	4050	8,100.00	435,000.00	8,100.00	110,070.00	8100.00
60	2835	5,670.00	310,170.00	-124,830.00	101,970.00	0.00
61	2835	5,670.00	315,840.00	5,670.00	101,970.00	5670.00
62	2835	5,670.00	321,510.00	5,670.00	96,300.00	5670.00
63	2835	5,670.00	327,180.00	5,670.00	90,630.00	5670.00
64	2835	5,670.00	332,850.00	5,670.00	84,960.00	5670.00
65	2835	5,670.00	338,520.00	5,670.00	79,290.00	5670.00
66	2835	5,670.00	344,190.00	5,670.00	73,620.00	5670.00
67	2835	5,670.00	349,860.00	5,670.00	67,950.00	5670.00
68	2835	5,670.00	355,530.00	5,670.00	62,280.00	5670.00
69	2835	5,670.00	361,200.00	5,670.00	56,610.00	5670.00
70	2835	5,670.00	366,870.00	5,670.00	50,940.00	5670.00
71	2835	5,670.00	372,540.00	5,670.00	45,270.00	5670.00
72	2835	5,670.00	378,210.00	5,670.00	39,600.00	5670.00
73	2835	5,670.00	383,880.00	5,670.00	33,930.00	5670.00
74	2835	5,670.00	389,550.00	5,670.00	28,260.00	5670.00
75	2835	5,670.00	395,220.00	5,670.00	22,590.00	5670.00
76	2835	5,670.00	400,890.00	5,670.00	16,920.00	5670.00
77	2835	5,670.00	406,560.00	5,670.00	11,250.00	5670.00
78	2835	5,670.00	412,230.00	5,670.00	5,580.00	5580.00
79	2835	5,670.00	417,900.00	5,670.00	0.00	0.00
80	2835	5,670.00	423,570.00	5,670.00	0.00	0.00
81	2835	5,670.00	429,240.00	5,670.00	0.00	0.00
82	2835	5,670.00	434,910.00	5,670.00	0.00	0.00
83	2835	5,670.00	440,580.00	5,670.00	0.00	0.00

84	2835	5,670.00	446,250.00	5,670.00	0.00	0.00
85	2835	5,670.00	451,920.00	5,670.00	0.00	0.00
86	2835	5,670.00	457,590.00	5,670.00	0.00	0.00
87	2835	5,670.00	463,260.00	5,670.00	0.00	0.00
88	2835	5,670.00	468,930.00	5,670.00	0.00	0.00
89	2835	5,670.00	474,600.00	5,670.00	0.00	0.00
90	2835	5,670.00	480,270.00	5,670.00	0.00	0.00
91	2835	5,670.00	485,940.00	5,670.00	0.00	0.00
92	2835	5,670.00	491,610.00	5,670.00	0.00	0.00
93	2835	5,670.00	497,280.00	5,670.00	0.00	0.00
94	2835	5,670.00	502,950.00	5,670.00	0.00	0.00
95	2835	5,670.00	508,620.00	5,670.00	0.00	0.00
96	2835	5,670.00	514,290.00	5,670.00	0.00	0.00
97	2835	5,670.00	519,960.00	5,670.00	0.00	0.00
98	2835	5,670.00	525,630.00	5,670.00	0.00	0.00
99	2835	5,670.00	531,300.00	5,670.00	0.00	0.00
100	2835	5,670.00	536,970.00	5,670.00	0.00	0.00

As per the table above, the maximum SCUs the project will be able to issue over a 100 year period is 536,970 tCO<sub>2</sub>e. By year 79, no further SCUs will be permitted for issuance as the Long Term Carbon Benefit will have been met.

To explore alternative scenarios, please see the 'Long-Term-Carbon-Benefit\_Tool'.