

MEMO

TO Climate Emergency Programme Board

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Review of GW's Internal Cost Carbon Values

Background

The Council's Carbon Reduction Policy requires that:

"GW will...

"treat both the global social cost of carbon and the cost of offsetting as additional to a Participant's obligations under the NZ Emissions Trading Scheme, or other Government obligations in relation to the cost of carbon, and include these costs in the financial assessments for all business cases.

"provide an annually updated price for the global social cost of carbon and carbon offsetting, to be used by staff in financial analyses."

and that among the tools and guidelines provided to staff will include 'Internal GW carbon price values'.

The reasoning behind the policy is that the cost of carbon is mostly ignored in financial decision making because its true cost is socialised across the globe and to future generations in the form of climate impacts. For the most part it is not paid by the polluter (i.e. it is an 'externality' in economic parlance). By including a carbon price associated with these socialised costs, this unfair advantage held by more polluting options is reduced. Without it, the weighting carbon emissions are given in decision making is somewhat arbitrary, despite what a policy might say. Use of a cost estimate for offsetting covers the other case, where carbon emissions from a project are mitigated (for example by tree planting), but ensures that the cost for this is properly factored in.

ELT agreed initial prices for these two costs on 29 June 2020, based on advice from Treasury, Finance and Strategy. They also agreed that they would be reviewed annually. These values have now been reviewed.

Global Social Cost of Carbon (GSCC)

Current value: \$350/tonne CO₂e

Recommended value: no change

Estimates on GSCC vary very widely because they require the combination of detail models of complex systems (both climatic and socio-economic) each with their own uncertainties and assumptions. A 2019 meta study found that values ranged from -US\$13.36/tCO₂ to US\$2,386.91/tCO₂¹.

In the last year, new estimates of the GSCC have been produced. The latest study² adds improvements to an existing model (PAGE) that incorporates the updated climate science, the effects of climate variability, low probability high impact risks (such as sudden ice-sheet collapse) and persistent effects from climate damages. Depending how many of the new assumptions and modules were added to the existing model, the GSCC they calculated increases, in some cases dramatically. However, the results from the improved PAGE model also support a GSCC similar to that adopted by GW.

Overall, there is no new evidence presented by scientific literature compelling enough to modify the GSCC value used at GW. Hence no change to the value is recommended. But it should be borne in mind that the true costs of climate change may be far higher than we think, and that regardless these costs will fall disproportionately on the Global South, who are simultaneously least culpable for causing the climate problem and have lower capacity to deal with the losses and damages that will result from it. This underscores the importance of GW's carbon reduction policy.

The cost of offsetting

Current value: \$50/tonne CO₂e

Recommended value: adopt Treasury's published future carbon cost estimates in their publication

"Guide for departments and agencies using Treasury's CBAX tool for cost benefit analysis". The values from the latest edition at time of writing (Sept 2021) are reproduced below³.

¹ <https://doi.org/10.1016%2Fj.jclepro.2018.11.058>

² <https://iopscience.iop.org/article/10.1088/1748-9326/ac1d0b>

³ <https://www.treasury.govt.nz/publications/guide/cbax-tool-user-guidance>

Table 1: Recommended Shadow Emission Values, NZD\$ (2021) per tonne of CO₂-equivalent

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Low	42	48	55	61	67	73	79	85	91	97	101	105	108	112
Central	63	72	81	90	99	108	118	127	136	145	150	156	162	167
High	84	96	108	120	132	144	156	168	180	192	200	207	215	223

Year (cont.)	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Low	116	120	124	127	131	135	139	143	146	150	154	158	162	165	169	173
Central	173	179	184	190	196	201	207	213	218	224	230	236	241	247	253	258
High	230	238	245	253	260	268	275	283	291	298	306	313	321	328	336	343

Year (cont.)	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060
Low	175	177	178	180	182	184	186	187	189	191
Central	266	274	282	291	299	308	318	327	337	347
High	361	379	398	417	438	460	483	507	533	559

Year (cont.)	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070
Low	193	195	197	199	201	203	205	207	209	211
Central	357	368	379	391	402	414	427	440	453	466
High	587	617	648	680	714	750	787	827	868	911

When ELT adopted the value of \$50/tonne CO₂e as the cost of offsetting, the traded price of carbon units in the emissions trading scheme was less than \$30/tonne CO₂e. As of 6 October 2021, the price was \$64.50/tonne CO₂e. Another development that occurred since was the first reference values for 'shadow' carbon prices were published by the NZ Treasury, recommended by them for use in financial cost benefit analysis (CBA). These values are given as a range for each year, with a central estimate.

The \$50/tonne CO₂e value was adopted on the basis that it was the approximate real cost for GW to establish new native forest on its own land, our preferred method of offsetting, and we had no other reputable external reference to use. That has changed. The NZ Treasury values also reflect the opportunity cost represented by offsetting, given that any emissions units GW generates from its restoration work could be sold at market value.

Hence, we recommend that GW use the central estimate of the high and low carbon price values published by NZ Treasury as the cost of offsetting in its financial analyses for business cases.