Minutes of the Meeting

Subject : 4th Greenhouse Gas Working Group 2 (GHGWG-2) Meeting
Date : November 22nd & 23rd, 2022
Venue : Swiss Garden Hotel - Bukit Bintang, Kuala Lumpur, Malaysia

Name	Organisation	Status
Peter Callister – In Person	New Britain Palm Oil Limited (NBPOL)	Substantive
Derrick Jovannus – In Person/Virtual	Musim Mas	Alternate
Dita Galina – In Person	Musim Mas	Substantive
William Siow – In Person	IOI	Substantive
Lai Wei Shoon – In Person	IOI	Substantive
Foo Siew Theng – Virtual	Wilmar International	Substantive
Azizul bin Rahman – In Person	Wilmar International	Substantive
Henry Cai – In Person	Permata Hijau Group	Substantive
Low Sim Loo – Virtual	IOI	Alternate
Lynette Tan – Virtual	BASF SE	Observer
Gregor Pasda – Virtual	BASF SE	Observer
Siti Nurhayati Kamaruddin	RSPO Secretariat	Secretariat
Ariel Toh	RSPO Secretariat	Secretariat
Azamuddin Hassan	RSPO Secretariat	Secretariat
Absent with apologies:		
Gotz Martin	*Golden Agri Resources (GAR)*	*Substantive*
Eza Nurain Abdullah	*Sime Darby*	*Substantive*
Hema Nadarajah	*WWF*	*Substantive*
Kamal Seth	*WWF*	*Alternate*

No	Item Descriptions	Main Discussion Points	Action Points	Progress Update
November 22nd, 2022, Tuesday				
1.	Agenda Overview	The Secretariat conducted a round of introductions between physical attendees and the RSPO Secretariat, as well as briefings on the security and logistics of the hotel. The Secretariat then provided members with an explanation of the antitrust statement, consensus-based decision making, and conflict of interest declaration. Then, the Secretariat went over the minutes from the last meeting to see how things were going. William seconded Henry's approval of the meeting minutes. For Day 1, the live spreadsheet calculation used for upstream was: PalmGHG Upstream Information.xlsx The Secretariat provided an overview of the two-day meeting's agenda, which stated that members should concentrate on finalizing and mapping all scope emission categories in the upstream and downstream by ensuring that they are in accordance with GHG Protocol.	For information	N/A
2.	Upstream sector – strengthening the boundary	The meeting began with a discussion of the current PalmGHG system boundary. Suggestion to add Kernel Crusher Plant (KCP) in the boundary, either as a separate unit or as part of the palm oil mill. Wilmar asked if the boundary could be based on RSPO certification, which has two different values because the mill uses the Principles and Criteria (P&C) and the KCP is under Supply Chain Certification (SCC). Permata Hijau suggested adding a dropdown menu to the calculator so that users could choose whether or not their calculation included KCP. The Chair agreed, but the WG will talk about it again on Day 2 - Downstream discussion. (Refer to Item 8) The conversation then moved on to the LUC emission cut-off date and amortisation period.	To refer to Item 8	N/A

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3.	Land Use Change (LUC) Emission Discussion	Brief Context: A cut-off date is used to simplify the calculation of LUC emission by disregarding all LUCs prior to the date and assuming they have zero emission. This is particularly useful in very old estates where determining the previous land cover is extremely difficult. (Gan and Henry, 2016) For your information, the RSPO cut-off date is November 2005; this is when 14 companies adopted the Principles and Criteria (P&C) for a two-year pilot period; this is also the date used in the Remediation and Compensation Procedure (RaCP) to remediate and compensate for land clearance without prior HCV assessment. The first version of the P&C in 2007 stated that: *Criterion 7.3 New plantings since November 2005 have not replaced primary forest or any area required to maintain or enhance one or more High Conservation Values.* ● *An HCV assessment, including stakeholder consultation, is conducted prior to any conversion.* ● *Dates of land preparation and commencement are recorded*. In contrast, the GHG Protocol doesn't talk about cut-off dates like ISCC/RED II did. In ISCC/RED II, the cut-off date was set for January 1, 2008, meaning that areas with high biodiversity value or carbon stocks that were turned into biomass for biofuels on or after January 1, 2008, are not eligible for oil companies' quota fulfilments or tax incentives. The EU Deforestation Regulation, on the other hand, sets the cut-off date as December 31, 2019, 2020, or 2021. While SBTi FLAG, which is aligned with the Accountability Framework initiative, requires companies setting FLAG science-based targets to submit a no-deforestation commitment with a target date no later than 2025, a recommended cut-off year is 2020.	A task force (TF) for LUC has been established by Henry, Dita Galina, and Siew Theng, and they will present the WG with their findings regarding the conservation credit model (LUC amortisation period and land cover sequestration values and models).	In progress

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		The current implication of using the RSPO cut-off date is that, for instance, if the land was originally a forest and degraded in 2012, and a palm oil plantation is developed on the degraded land in 2018, the RSPO would still consider this deforestation. Due to the initial adoption of P&C and RaCP, the WG has no intention of modifying the cut-off date. However, the Working Group has not yet decided whether they will adopt a new cut-off date or keep the existing one. Brief Context: Amortisation is required for carbon accounting because all land conversion emission actually happened in the year of conversion. This creates a situation where the LUC emission is very high in year one but is negative (signifying net sequestration) in the rest of the crop cycle. To balance it out, amortising the land conversion emission over an amortisation period is done. (Gan and Henry, 2016) The PalmGHG calculator estimates the total emissions occurring each year of new planting, adds them all together, and then divides by the number of years in the average crop cycle to determine the average emission per hectare per year. ● RSPO PalmGHG uses 25 years amortisation period ● ISCC/ISPO uses 20 years amortisation period Longer amortisation periods mean lower annual GHG emissions. William, the chair, posed the question that, if the plantation enters its second cycle, only a small portion of the replanted land will have an effect on the change in land use. Due to the fact that this is a minor replanting conversion, the High LUC emission is not reasonable after the first year, and the crop sequestration values should be maintained.		

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		According to Siew Theng, from Wilmar, the LUC emission caused by replanting on mineral soil is minimal or zero, but the only impact that should be concerned at this point is on the peat soil. Harry of Permata Hijau suggested an alternative in response to the statement by having a flat sequestration model instead. It was mentioned in the previous meeting that to adopt ISCC methodology which is using constant value for every cycle year with adjustment on from third to fourth planting year the crop sequestration and LUC emissions value will be zero. In PalmGHG calculator, the GHG fixation and carbon credits have included carbon sequestration in the standing crop and conservation areas as well as GHG avoided by the sale of mill energy co-products (such as electricity sold to the grid or palm kernel shell sold to industrial furnaces). (C´ecile Bessou et al., 2014) Note that the current modelled data for carbon sequestration used is OPRODSIM and OPCABSIM models (Henson, 2005; Henson, 2009) which are specifically designed to estimate oil palm and other plantation biomass (e.g. litter and ground cover) throughout the life of the crop, largely based on Malaysian conditions. OPRODSIM and OPCABSIM produce annual values of standing biomass for the oil palms (above and below-ground), ground cover, frond piles and other plantation litter (shed frond bases and male inflorescences). The total amount of carbon sequestered in the reporting year is calculated by multiplying the area of each year of planting by the amount of carbon sequestered, adding these together, and dividing by the total area to give tC/ha/yr. Field observations revealed that biomass growth and yields are generally lower in the case of outgrowers (Chase and Henson, 2010; Khasanah et al., 2012). To reflect this difference, contrasting simulation scenarios of crop sequestration can be used as default estimates within PalmGHG for mill own crops and out-growers. A “vigorous growth”		

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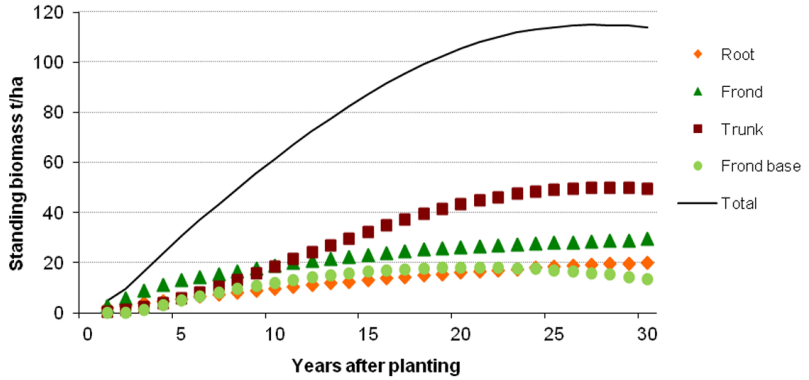
		simulation model is considered for own crops, and an "average growth" simulation is used for out-growers (Figures a and b). Standing biomass in oil palm stands simulated with OPRODSIM (Henson, 2005, 2009) as below:  a) a) Total standing biomass with a vigorous growth with the details of most important biomass components  b)		

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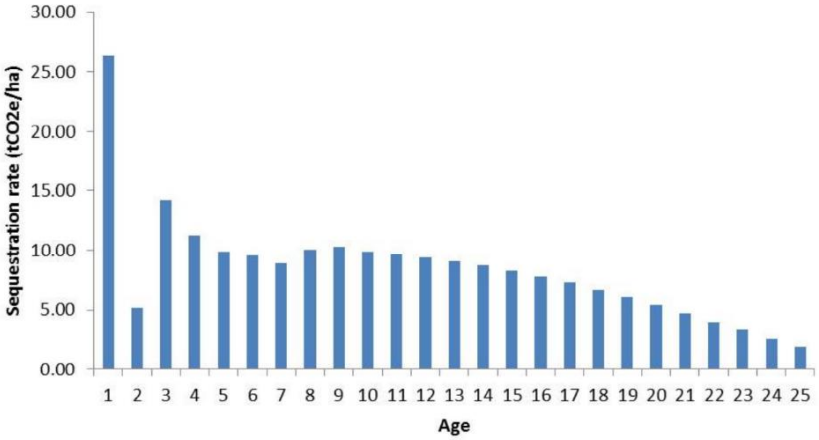
		b) Comparison of total standing biomass with vigorous growth versus average growth.  *Figure 1 Annual sequestration rate of oil palm according to OPRODSIM model* Wilmar continued the discussion by arguing that if the cut-off date and amortization period are altered, the data that PalmGHG has collected since its inception would be rendered unusable for analysis. Whether it should be based on a fixed amortisation period, such as the 20 years recommended by the ISCC, or technologically advanced perennial oil palm with a life cycle of more than 25 years, or maintain the current methodology as it is, and whether allowances should be made for a cut-off year such as 2008, as proposed by the ISCC/RED II, are still under discussion within the working group. The conversation then turned to carbon credits and sequestration in conservation areas, where biomass like palm kernel shells can be stored or used to make another product in exchange for a carbon offset from the plantation's or operation's emissions. The natural carbon storage, which is something the WG could look into. (Refer to Item 8) After that, there was a concern regarding the auditing done by the Certification Body (CB) to ensure that the appropriate values for carbon sequestration are used for the appropriate type of vegetation.		

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		The chair made a suggestion to the members that they should investigate the different sequestration values for various land cover classes for the purpose of revamping conservation block sequestration and evaluate the results of their findings. Ultimately, LUC emissions must be analyzed in a manner that is both actionable and auditable. Henry, Siew Theng, and Dita Galina were brought together to form a task force (TF) with a three-month deadline to recommend a conservation credit model to the WG. A side sharing: Henry discussed a restoration project by Permata Hijau Group (PHG) that is being carried out on degraded land around the Gayo arabica coffee plantation as part of a community-based project. The project entails the sowing of native hardwood seeds (i.e. mulberry) and the subsequent care of those seedlings, which is one of the ways for the conservation and crop sequestration.		
4.	Upstream sector – default values update for estate/plantation	The meeting continued by updating the default values starting with the plantation/estate section of the PalmGHG calculator in PalmGHG Upstream Information.xlsx Using the following formula, the transport emission factor is determined based on the distance between the fertiliser source and the plantation: Emissions factor (kgCO2e/t) = sea transport distance (km) x sea transport emission factor (kgCO2e/km-t) + road transport distance (km) x road transport emission factor (kgCO2e/km-t) As a component of fertilizer emissions, transportation emissions (via sea or land) are covered under Scope 3. The WG should re-evaluate this emission to consider how transportation and product for non-company vehicles (external transportation) is handled.	The Secretariat and GHGWG2 members are to share all relevant and updated materials relating to default values for further deliberation at the next WG meeting.	In Progress

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<tr><th>No</th><th>Item Descriptions</th><th>Main Discussion Points</th><th>Action Points</th><th>Progress Update</th></tr>
<tr><td colspan="5">November 22nd, 2022, Tuesday</td></tr>
<tr><td></td><td></td><td>Henry's paper provides usable data for establishing a downstream default value based on net GHG emissions collected from January 2015 to August 2016 and averaging 1.72±3.57 tCO2e/tCPO. The Secretariat can analyse the most up-to-date data from 2015 to 2021 and calculate an annual average to provide annual estimates, as the information is now obsolete. Unless suppliers have their own baselines, the default value would only be applied to those without a default value. The Secretariat to discuss internally with the Impact unit. The following day will be dedicated to continuing this discussion regarding downstream. The WG to revisit.

Next, other emissions from field operations are accounted for by the fossil fuel used by machinery for transport and mill operations; these emissions are determined using emission factors of 3.12 kg CO2eq/L diesel and 2.75 kg CO2eq/L gasoline.

This consumption of fossil fuels is divided into Scope 1 and Scope 3, with Scope 1 covering fuel combustion and Scope 3 covering transportation. Default values were then calculated using 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2: Energy, Tables 1.4 and 2.2 for segregation of the emission scope.

The following default value in the discussion is the 100-year time-horizon global warming potential (GWP) values from IPCC AR4, 5, and 6 for nitrogen oxide, which are 298, 265 and 273 respectively.

<table>
<tr><td>Greenhouse Gas</td><td>AR1</td><td>AR2</td><td>AR3</td><td>AR4</td><td>AR5</td><td>AR6</td></tr>
<tr><td>Assesment Report Year</td><td>1990</td><td>1995</td><td>2001</td><td>2007</td><td>2013</td><td>2021</td></tr>
<tr><td>Carbon dioxide, fossil (C02)</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td></tr>
<tr><td>Methane, fossil (CH4)</td><td>21</td><td>21</td><td>23</td><td>25</td><td>28</td><td>29.8</td></tr>
<tr><td>Methane, biogenic (CH4)</td><td>18.25</td><td>18.25</td><td>20.25</td><td>22.25</td><td>25.25</td><td>27.2</td></tr>
<tr><td>Dinitrogen monoxide (N2O)</td><td>290</td><td>310</td><td>296</td><td>298</td><td>265</td><td>273</td></tr>
</table>
Comparison between IPCC Assessment Reports for Core GHGs

The Working Group (WG) intends to maintain the current GWP at 298 in accordance with the IPCC Fourth Assessment Report (AR4) until the</td><td></td><td></td></tr>
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		applicability of using the most recent value has been thoroughly investigated. N2O direct and indirect field emissions were calculated based on IPCC Tier 1 (IPCC, 2006). Then, the N2O emission factor is taken from Tier 1 of the IPCC (2006), which is 16 kg N-N2O per hectare per year. Again, the Working Group (WG) intends to maintain the current default values in accordance with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories until the applicability of using the most recent value has been investigated in depth. The WG then moved on to talking about the defaults for liquid biofuels (biodiesel, etc.). The current version of PalmGHG needs the user to provide input for emission factors, also known as user-defined values. For the value of Scope 1 emissions, the Working Group (WG) referred to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories; however, for the value of Scope 3 emissions, the Secretariat must compile the average values input by all of the current PalmGHG users. The Secretariat will access PalmGHG to retrieve information. In accordance with the same recommendations (IPCC, 2006), the CO2 emissions from urea, which are susceptible to significant volatilization losses, are also taken into account. The Working Group (WG) intends to keep the current default values in accordance with the IPCC Guidelines for National Greenhouse Gas Inventories from 2006 until it has been thoroughly investigated whether or not it is applicable to use the most recent value. In this last section's discussion, since no historical reference was available, the emission factor for ground magnesium limestone remained unchanged. The WG made the decision to continue maintaining it as well. As a whole, the focus of the exercise was more on emission scoping than it is on actually updating the default values themselves. This was		

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		because there is a lack of research-backed data that has yet to be found and is applicable for the working group to investigate.		
5.	Upstream sector – default values update for fertiliser	The subsequent activity was fertilizer emission scoping. Initial emphasis was placed on classifying the existing fertilisers in the calculator based on their scope emissions (Scope 1,3 and Biogenics). Henry led the calculation for each scope for each fertiliser by referencing Volume 4 of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Agriculture, Forestry, and Other Land Use. Lynette from BASF then provided the WG with the Fertilizers Europe's table of mineral fertilizer carbon footprint reference values, recognizing that it would be useful for scoping the fertilizers. The Working Group (WG) has requested that the Secretariat conduct a comparative analysis of the Fertilizers Europe's table and the fertilizer that is currently being used. Finally, we discussed the use of EFB and POME as fertilisers. The WG finds this to be a particularly challenging area because of the wide range of possible applications (dry POME, for instance) and the low levels of emission. It is, however, an essential component of emissions accounting. To encourage members to recycle them back into the field, the WG would initially assign zero values to both. Additionally, BASF will disclose the default value used for these two types of fertilizers at the upcoming meeting. Due to the Working Group's consensus that pesticide emissions are negligible, this emission factor will not be included in the calculator in order to prioritize a more pragmatic approach for other elements.	The Secretariat and GHGWG2 members are to share all relevant and updated materials relating to default values for further deliberation at the next WG meeting. The Secretariat is to perform a comparative analysis between the given table and the current one. For POME and EFB being used as fertilisers, BASF will share the pertinent default values.	In progress The Comparative Analysis has been performed by the Secretariat. Refer to the Default Data Fertiliser tab inPalmGHG Upstream Information.xlsx In Progress
6.	Upstream sector – default values update for mills	The conversation progressed to a discussion of mill default values. Emissions resulting from the production of EFB and POME are already incorporated into the assessment of the supply chain. The amounts of EFB and POME, unless measured directly, are calculated from total FFB	The Secretariat and GHGWG2 members are to share all relevant and updated materials	In Progress

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		assuming 0.6725 tPOME/tFFB (Singh, 1999; Schmidt, 2007) and 0.22 tEFB/tFFB (Gurmit, 1995). Depending on what treatment is used, POME can give off different amounts of methane. According to Chase et al. (2010), the amount of methane (CH4) produced per unit of POME during conventional digestion in open ponds is 13.1 kgCH4/tPOME. Nevertheless, options exist for the capture of methane, which is either flared or used as a fuel to generate electricity. Calculations of CH4 production and losses during digestion, flaring, and electricity generation were based on Schmidt (2007) and UK Environment Agency (2002)-derived factors. These three ratios have not yet been discussed in depth by the working group because they are awaiting evidence and a decision from the other absent members. Emissions involving CH4 are calculated in terms of CO2eq using a global warming potential of 22.25 kgCO2eq/kgCH4 instead of 25 kgCO2eq/kgCH4 (IPCC, 2007b) to allow for reduced emissions of biogenic CO2 originally fixed by photosynthesis (Wicke et al., 2008; Muñoz et al., 2013). When CH4 is flared and converted to CO2, these emissions are not accounted for because of their biogenic origin. (C´ecile Bessou, 2016)	relating to default values for further deliberation at the next WG meeting.	

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November 22nd, 2022, Tuesday				
		Carbon accounting and GWPs		

GHG flows from carbon in products	GWP-100 (kg CO_2-eq kg^{-1})			
	Methane oxidation excluded		Methane oxidation included	
	Biogenic CO_2 neutral	Biogenic CO_2 not neutral	Biogenic CO_2 neutral	Biogenic CO_2 not neutral
CO_2 incorporated in biomass	0	-1	0	-1
CO_2 biogenic emitted	0	1	0	1
CO_2 biogenic sequestered	-1	0	-1	0
CO_2 fossil emitted	1	1	1	1
CO_2 fossil sequestered	0	0	0	0
CH_4 biogenic emitted	22.25	25	25	27.75
CH_4 fossil emitted	25	25	27.75	27.75

2007 IPCC GWP-100 for methane biogenic emitted for excluded oxidation. Source

After reaching a conclusion between members, the WG moved forward with the use of IPCC AR4 numbers, with the GWP-100 for CH4 being 25. As the proposed default value, "fossil origin," suggests further inquiry by the WG.

Following additional discussion on GWP, the WG upheld the current value i.e. 25.

The conversation continued about eradicating the percentages of emissions loss that are caused by the insignificant amount of methane that is released during conversion (CH4 lost from digestion, in flare, or gas motor, etc.). As a precautionary measure, it was decided not to eliminate the percentages, but to instead update them. The Secretariat and the WG to provide updated literature in the upcoming meeting.

Another topic that was discussed was the possibility of converting methane into other forms of energy, such as fuel for boilers, that could then be used back in the operation of the facility.

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		It is recommended that the calculator has a provision of a user-defined emission factor, which would vary according to the type of energy converter that the business utilizes. It will be in the form of credits that can be used to reduce the emissions of other businesses; for instance, if the company converts methane to compressed natural gas for use as truck fuel, it could be claimed against diesel emissions. The WG preliminary accepted the circular economy, also known as waste-to-energy conversion, as a carbon credit option in the PalmGHG. This topic will be discussed in greater detail at a later time (Refer to Item 8), and scientific literature will also be cited.		
7.	Calculators' comparison	The discussion then moved on to compare and contrast the RSPO, ISCC, and ISPO methodologies. It was a compilation of findings from RSPO PalmGHG, ISCC and ISPO Calculator-a comparative study (1).pdf by Henry and Gan, 2016. Before we began, Dr. Gregor from BASF introduced us to the Cool Farm Tool (CFT), a GHG calculator developed by the Cool Farm Alliance and utilized by many of Europe's largest food companies. He believes that this is something that the Secretariat as well as the WG might look into further. In addition, the Chair mentioned that MSPO is currently being developed for the calculator; the Secretariat will look over this matter in greater depth. Dr. Gregor then provided a brief overview of potential enhancers/additives for fertilisers that could result in a reduction in emission. He proposed that the WG meet for a session in which they would be briefed on a comparison study of fertiliser without any inhibitors added, and fertiliser that had been treated with nitrification and urease inhibitors. The WG was ecstatic and eagerly anticipating the sharing session, which could prove useful for enhancing the calculator's fertilizer section. The documents were shared by Dr. Gregor as per below: ● Fertilisers Efficiency Enhancers - General Statement FINAL 8.10.2021.pdf	The Secretariat to do a comparative analysis for the CFT calculator. Low SL from IOI shared with the WG the MSPO GHG Calculator draft version 2 that MPOCC has made available for public comment. The Secretariat will check the methodology to see if it is compatible with the currently available calculator. Dr. Gregor to share the comparison study of the fertiliser to WG in the upcoming meeting.	In progress. CFT's fertilizer emission methodology is attached here. A quick check of the MPOCC calculator revealed that it references ISCC and EU law. However, their revised default values may be utilised to update our existing default values. Then, Dr. Gregor shared documents regarding nitrification and urease inhibitors that can be added to standard fertilizers. In the annex document,

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		• Fertilisers Efficiency Enhancers - Annex to the General Statement FINAL 8.10.2021.pdf The conversation then shifted to the inclusion or exclusion of organic carbon in mineral soil. PalmGHG excludes mineral soil organic carbon from its LUC calculation due to a lack of data, whereas ISCC/ISPO includes mineral soil organic carbon and uses default values from European Commission Decision of 10 June 2010, 2010/335/EU (EU, 2010). The WG decided not to include it due to auditing concerns. For every centimetre that the water level is below the peat surface, Hooijer et al. (2010) found that 0.91 tCO2e/ha.yr would be released. This is the default value for CO2 emissions from peat used by the RSPO PalmGHG. ISCC prohibits the planting on peat areas after 1 January 2008, so no peat emission mechanism is included in the ISCC methodology. As the default value was previously agreed upon by the Peatland Working Group 2 (PLWG2), the GWGWG2 has no plans to alter the default value. There will be a change unless there is a change in the most recent and credible scientific research. Nota bene: The current PLWG2 has been dissolved, but it may be reconstituted soon. For Peat N2O emission, PalmGHG used the default value of 16 kgN2O-N/ha.yr from IPCC 2006 (IPCC, 2006), whereas ISPO used the default value of 1.2 kgN2O-N/ha.yr from IPCC 2013 wetland supplement (IPCC, 2014b). The Secretariat to check on the updated value for the emission from IPCC's Task Force on National Greenhouse Gas Inventories (TFI). Using IPCC methodology, the N2O-field emission from 1 kg of applied nitrogen is calculated to be 6.199 kgCO2e/kgN in PalmGHG for field N2O emission. ISCC and ISPO calculators, on the other hand, utilized the default value of 4.87 kgCO2e/kgN specified in ISCC 205. As discussed earlier, the WG will analyse the data from table Fertilizer Europe to recalculate the indirect and direct N2O emission. The Secretariat will conduct an analysis using IPCC and ISCC values.	The Secretariat to check on the latest emission factor for peat nitrous oxide and field emission in IPCC. Will share it at the next meeting.	the WG will determine the N loss reduction factors. A link to FEE was shared as well. https://www.fertilisersefficiencyenhancers.org/ The Secretariat identified the most recent emission factor for peat N2O emission based on the 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetland from Table 2.5, in which the value given is 1.2 kgN2O-N/ha.yr (Direct N2O), which is the same value that ISPO uses. Indirect emission from N2O is yet to be identified.

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		Then, the discussion moved on to allocating the FFB emission to the main products and coproducts. RSPO PalmGHG allocates GHG emission by mass, while ISCC and the ISPO calculator allocate GHG emission by energetic value. Further reading can be found in RSPO PalmGHG, ISCC and ISPO Calculator-a comparative study (1).pdf POME was talked about, and the WG decided to keep using the existing calculation. Biomass and electricity exports have also been talked about before, and this will be a very in-depth discussion later. The meeting was adjourned after the Secretariat provided a recap of Day 1's agenda.		

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8.	Downstream sector – setting up boundary	The working group met on the second day of the meeting to discuss how to set up the boundary and gap analysis. The spreadsheet that was used is as follows: Downstream Information.xlsx As previously mentioned by Henry, there were two approaches: setting the entire site as a boundary and calculating GHG emissions for the entire site, and setting a boundary per plant and calculating GHG emissions for each plant. At the conclusion of the previous meeting, the WG reached a consensus that the second approach should be utilized, and the WG will now begin to investigate this option. Allocating by product means that if 1 million tons of production comes from the palm oil complex and 300,000 tons of it comes from oleochemical, then 30% of emissions could be attributed to oleochemical. It was then proposed that to develop a yield scheme similar to that of CPO and PKO, i.e. 80% for olein and 20% for stearin. If	The Working Group ought to present scientific literature in order to discuss the credit mechanism for the upstream and downstream sectors of palm oil.	In Progress

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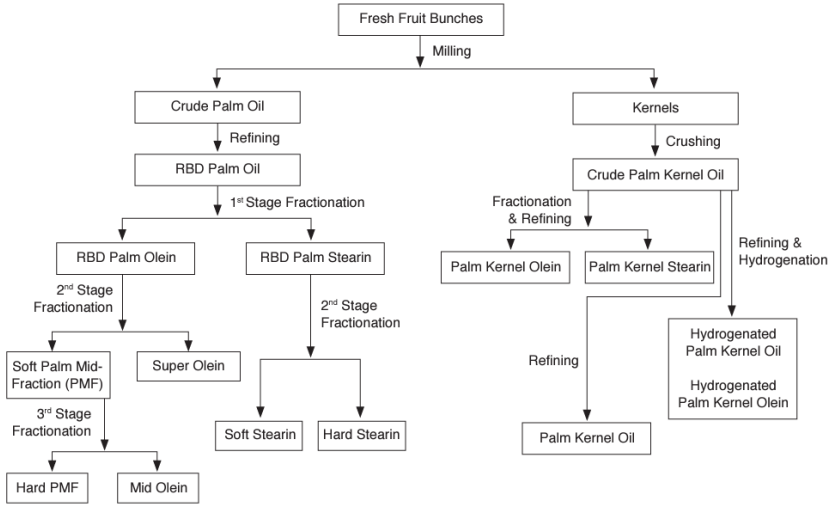
		the company chooses not to have separate operating units, the calculator will automatically proportion itself. By asserting that it would be extremely specific for each product to have its own emission. There is however the option for each plant to have only one emission, regardless of the number of products it produces. For waste and processing residues, it was suggested to follow EU RED's rules, such as whether to include raw materials like Palm Fatty Acid Distillate (PFAD) as residues. Below is the processing of palm oil, palm kernel oil and their fraction for confectionery fats. (Norazura and Noor Lida, 2017)  In the case of storing the product in tanks, it is preferable to use the emission value provided by palm oil suppliers as opposed to calculating emissions on a granular level. Then, Henry illustrated the Approach 1 and Approach 2 in the flip chart below:		

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		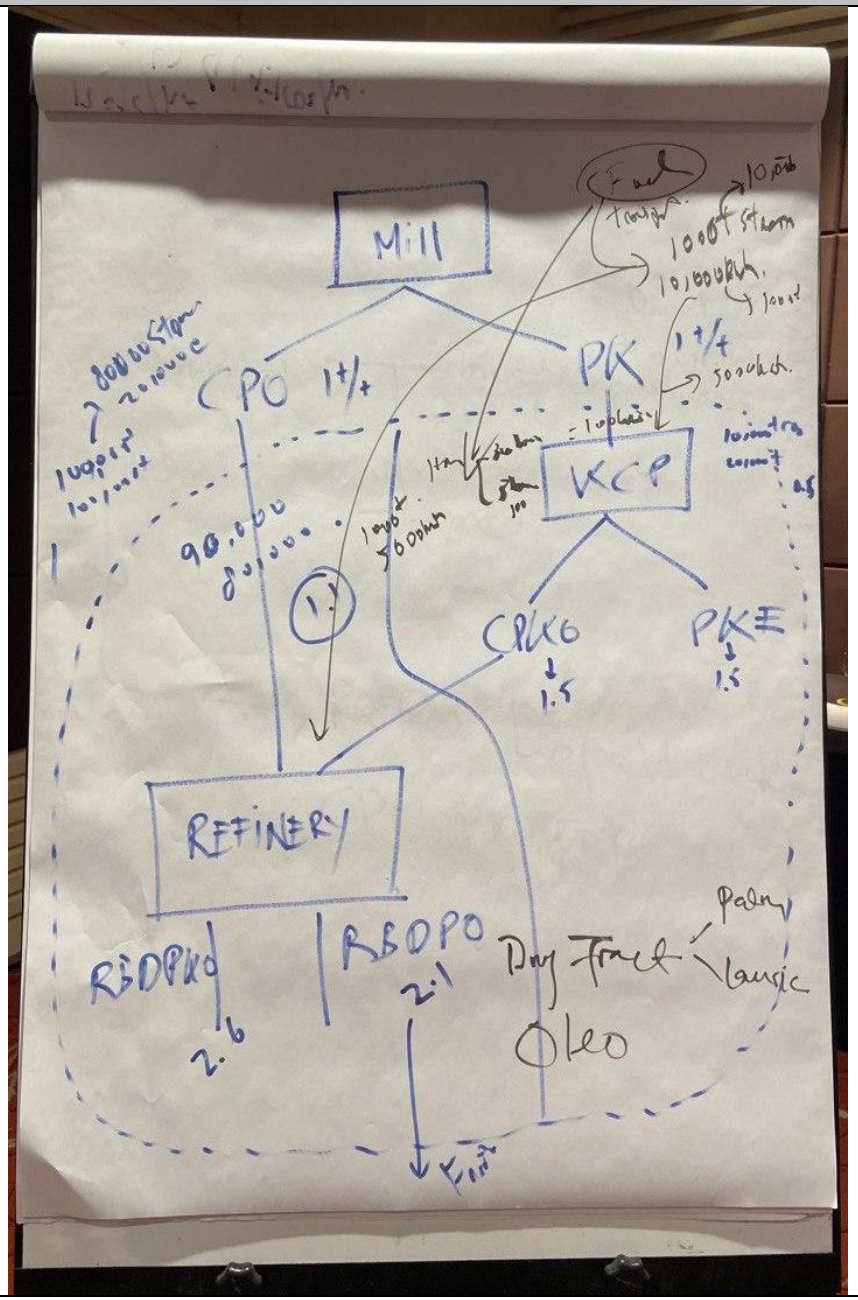		

No	Item Descriptions	Main Discussion Points	Action Points	Progress Update
November 23rd, 2022, Wednesday				
		Approach 1 is a total GHG emission over the entire palm oil complex as shown in the whole dotted circle, while Approach 2 is a per-plant GHG emission. The WG would like to prioritize these two methods first to System Users, with a third, optional method in which the boundary is set on a per-product basis and GHG emissions are calculated for each plantation in the site being considered if more information and resources become available. The conversation veered off into the credit mechanism in the downstream sector. In the current PalmGHG framework, for instance, if an upstream mill exported biomass e.g. Empty Fruit Bunch (EFB) to downstream refineries, the mill could claim credit, whereas for refineries selling biomass the other way round, this would constitute double accounting. The determination of the downstream emission scope will be difficult. For instance, if a refinery generates electricity by burning coal, that counts as a Scope 1 and 2 emission; if it generates electricity by burning biomass, that counts as a Scope 1 biogenic emission. However, going back to the explanation given before, the credit is only going to be considered for the upstream, unless the materials from downstream. Now, the question is whether or not there is eligible carbon credit for downstream. It is something that the WG could investigate and present to the members of the group. The WG will share its findings if relevant material is discovered. Another interesting topic discussed in the credit mechanism was that the companies investing in bio-compressed natural gas (bio-CNG) or other forms of the "circular economy" should be eligible to receive carbon credits for their efforts. The WG will explore how to improve the current mechanism in the calculator. The Working Group also will reevaluate the external conservation area in order to park under the Scope 3 carbon sequestration category.		

No	Item Descriptions	Main Discussion Points	Action Points	Progress Update
November 23rd, 2022, Wednesday				
9.	Downstream Input Data	The subsequent part of the conversation focused on the input data that will be used by the downstream calculator. Downstream Information.xlsx Fuel consumption data consists of coal, diesel, gasoline, natural gas, biomass (Sell EFB, fibres, etc.), medium fuel oil (MFO), biodiesel, and bioethanol. Next would be grid electricity consumption, renewable grid electricity consumption, inhouse solar electricity generation, inhouse wind electricity generation and amount of electricity exported. In the case of credits pertaining to electricity, not only the downstream but also the upstream calculator will be taken into consideration. Lubricants, water treatment chemicals, and other chemicals, such as catalyst and methanol, are among the chemicals used in refinery production (but not waste water chemicals). Waste water treatment is a separate item. The members of the WG will supply the Secretariat with a list of chemicals used. Now, the majority of the list's items covered Scopes 1 and 2. For Scope 3, the methods for calculating GHG emissions are derived from 15 categories (such as purchased goods and services, transportation and distribution, and use of sold products) from the GHG Protocol. The GHG Protocol categories were reviewed to ensure that all possible data inputs were included. Refer to Technical Guidance for Calculating Scope 3 Emissions. The first three categories, purchased goods and services, capital goods, and fuel- and energy-related activities, are already covered. When we purchase palm oil, we will have Scope 1, 2, and 3. We will use our emission factors from PalmGHG, and we can also request that the supplier use the calculator to inform us of the emissions.	The WG (Henry Cai and Lai WS) will help the Secretariat input the values for the emission scopes.	In Progress

No	Item Descriptions	Main Discussion Points	Action Points	Progress Update
November 23rd, 2022, Wednesday				
		The subsequent category is transportation and distribution upstream. This category has not yet been incorporated into the downstream calculator. Additionally, this will be addressed upstream for FFB. This was a discussion of the third party transporter on Day 1. Activities that contribute to waste production are already taken care of. Complex variables, such as business trips, employee commutes, and leased assets upstream, are disregarded. Now the WG moved on to distribution and transportation in the downstream sector. ISCC has a default aggregated value that accounts from upstream to downstream with a single value at the producer's end. This aggregated default value can be used or granular calculations could be performed in the downstream calculator. This will be used for the transport of product to buyer and transport of raw material from the supplier. Excluded categories include the processing of sold products, the use of sold products, the end-of-life treatment of sold products, leased assets downstream, franchises, and investments. In response to a query from Lai WS of IOI, when purchasing CPO or CPKO, the downstream emissions default value can be derived from PalmGHG's emission factor or by averaging supplier values. Similar to what was stated on Day 1 (Refer to Item 2), the PalmGHG will annually release the default values of FFB, CPO, PK, and CPKO. Meanwhile, refineries can use the ISCC default values with or without methane capture while waiting for PalmGHG to release the default values in the future. It was proposed that CPO or PK suppliers in PalmGHG should be required to disclose their emission data. However, the Secretariat must determine which guidelines RSPO members will use to disclose such information, and P&C must enforce those guidelines. The WG		

No	Item Descriptions	Main Discussion Points	Action Points	Progress Update
November 23rd, 2022, Wednesday				
		requested that the Impact unit of the RSPO share the emission statistical analysis conducted for their report in the next meeting.		
10.	Downstream gap analysis	Downstream scoping and Scope 3 emissions will inevitably face the issue of double accounting. However, the WG will methodically establish a clear and robust boundary for it. The Working Group would then like to concentrate on Kernel Crusher Plant (KCP), Refinery, Fractionation, Oleochemical, and Biodiesel operating units for Approach 2. After that, feedstock allocation needs to be completed so that boundary setting can proceed without a hitch. The conversation progressed to the emission baseline (Refer to Item 4). The Secretariat is currently discussing internally and awaiting the outcome of the working group in order to establish an initial baseline for palm oil mills (upstream) that is alignable with SBTi. The WG proposed establishing a baseline for the RSPO using aggregated data from its members, as palm oil mills are too diverse to have a single target. Then, in terms of the reduction of emissions, perhaps the RSPO could target a 5% reduction by the year 2030, for instance. Going back to the last discussion point, the Impact unit needs to share the emission analysis so that the WG can come up with a framework for consideration. The next topic up for discussion was the main points for the following meeting's agenda. 1. The conservation area would not be discussed until a later date, when more members, such as WWF, would be available to participate. It will also be examined how the three risk categories for conservation areas—low, medium, and high risk—affect default values. 2. Claim credit for conservation work done outside of the concession area. Is the area where RaCP is already being implemented eligible for carbon credits or sequestration? How will this be affected by double accounting?	Meeting summary and action items will be compiled	

No	Item Descriptions	Main Discussion Points	Action Points	Progress Update
November 23rd, 2022, Wednesday				
		3. To invite members of the Impact unit to present the GHG emissions analysis to the WG. 4. To get oleochemical experts to talk more about the calculator's downstream side. To seek out a practitioner within the Market Development Standing Committee or Supply Chain Working Group who can provide insight regarding oleochemicals. 5. The WG will send out a list of chemicals and default values, such as cooling water from the IPCC, to be discussed at the next meeting. 6. The Secretariat will report back on the disclosure of GHG emissions by members, noting that reporting will be standardised on a wet basis. 7. The Secretariat will produce a spreadsheet-based calculator before hiring a dedicated calculator developer after all development has been done. Following the meeting, the Secretariat will compile the list of action items and assign a primary contact for each item.		
11.	AOB	The GHGWG2 meeting. The plan is to get together once every three months in person, and once a month for two to three hours of virtual discussion. The IOI Office in Putrajaya, Malaysia, is proposed as the location for the next meeting, which is scheduled for the month of March 2023.	The Secretariat will send a Doodle poll for the next meeting.	It has been shared here: https://doodle.com/meeting/participate/id/enx0WqYb

Annex 1. Revised Meeting Agenda

4th GHGWG2 Meeting

Venue: Swiss Garden Hotel, Kuala Lumpur, Malaysia

Day 1, 22nd November 2022 (Tuesday)

Time	Agenda
9.00am – 9.30am	Review of previous meeting's minutes and progress on actions
9.30am – 10.30pm	Upstream - Strengthen the boundary and update on default values
10.30pm – 10.45pm	Break
10.45pm – 12.30pm	Upstream - Strengthen the boundary and update on default values - cont'd
12.30pm – 2.00pm	Lunch
2.00pm – 3.30pm	Upstream - Comparative analysis of PalmGHG with other tools/mechanisms
3.30pm – 3.45pm	Break
3.45pm – 5.00pm	Upstream - Upstream - Comparative analysis of PalmGHG with other tools/mechanisms - cont'd
5.00pm – 5.30pm	Wrapping Up of Day 1 and Day 2 Highlights
6.00pm	Dinner

Day 2, 23rd November 2022 (Wednesday)

Time	Agenda
9.00am – 10.30am	Downstream - Alignment with ToR & setting up boundary
10.30pm – 10.45pm	Break
10.45pm – 12.30pm	Downstream - Alignment with ToR & setting up boundary - cont'd
12.30pm – 2.00pm	Lunch
2.00pm – 3.30pm	Downstream - Gap Analysis AOB
3.30pm – 3.45pm	Meeting Adjourned

Annex 2: List of Attendance Sheet

List of Participants

No.	List of Attendance	Company	Mode	Attendance (22/11)	Attendance (23/11)
1	William Siow	IOI	Physical		
2	Peter Callister	New Britain Palm Oil Limited	Physical		
3	Henry Cai	Permata Hijau Group	Physical		
4	Foo Siew Theng	Wilmar International	~~Physical~~ Virtual	✓	X
5	Lai Wei Shoon	IOI	Physical		
6	Dita Galina	Musim Mas	Physical		
7	Derrick Jovannus	Musim Mas	Physical		✓ virtual
8	Azizul Rahman	Wilmar International	Physical		
9	Kamal Seth	WWF	Virtual		
10	Hema Nadarajah	WWF	Virtual		
11	Hans Athaide	BASF	Virtual		
12	Ariel Toh	RSPO	Physical		
13	Siti Nurhayati Kamaruddin	RSPO	Physical		
14	Azam Hassan	RSPO	Physical		
15	Muhammad Husaini Che Pi	RSPO	Physical	✓	
16	Akmal Razali	RSPO	Virtual		
17	Eza Nurain	Sime Darby			
18	Low Sim Loo	IOI			
19	Gotz Martin	Golden Agri Resources (GAR)			