STELLENBOSCH COMMUNITY RECYCLING PROJECT

Verification of the avoided greenhouse gas emissions due to recycling activities at Stellenbosch Community Recycling Project between June 2019 and May 2022

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EXECUTIVE SUMMARY

The Green House conducted an independent verification of the avoided greenhouse gas (GHG) emissions due to the recovery and recycling activities at Stellenbosch Community Recycling Project (CL Waste & Scrap Metal Trust and CL Waste Scrap Metal (Pty) Ltd).

Reporting period: 1 June 2019 – 31 May 2022

Methodology: GHG emissions avoided were estimated using the "closed loop approximation method" presented in the Greenhouse Gas Product Life Cycle Accounting and Reporting Standard, adhering to the project boundaries as discussed in the CDM Small-scale Methodologies AMS-III.AJ. and using DEFRA 2021 conversion factors.

Emission reductions achieved: 39,977 tonnes CO_2e

	Mass recycled (tonnes)	Emission factor (tonnes CO_2e/tonne)	Avoided emissions (tonnes CO_2e)
Cardboard and paper			
Cardboard	17,244	1.12	19,290
Newspaper	513	1.20	613
Paper	2,977	1.20	3,560
Mixed cardboard and paper	732	1.17	853
Glass			
Glass	1,583	0.56	891
Metals			
Aluminium	537	8.11	4,349
Brass	24	2.38	58
Copper	45	2.38	106
Lead	7	2.38	16
Stainless steel	79	2.38	188
Steel	3,501	1.34	4,703
Zinc	92	2.38	220
Mixed metals	2	2.03	5
Mixed construction metals	91	2.38	217
Plastics			
PET	1,518	0.89	1,352
HDPE	254	0.90	230
LDPE	461	0.79	362
Mixed plastics - Flexible	1,278	0.66	847
Mixed plastics - Rigid	4,147	0.51	2,119
TOTAL	**35,085**		**39,977**

Is the project real?

The project is real and operational, across three primary sites and various sites located at shopping centres.

Is the described technology in place and functioning in accordance with its design specification?

The Green House witnessed that recyclable material is purchased from formal and informal waste collectors at the primary sites, as well as collected and transported to the primary sites in numerous vehicles. Recyclable material is also collected at the satellite shopping centre sites. The material is sorted, processed and stockpiled for sale using on-site equipment where required, before the processed material is transported and sold to numerous buyers. These operations divert waste that would otherwise have ended up in landfill.

Are the estimates of greenhouse gas emissions reduction reasonable in terms of accepted international standards and unbiased towards buyer or seller?

The estimates presented in this report are based on a life cycle view consistent with the appropriate internationally accepted standards and thus are a reasonable representation of the emissions avoided due to Stellenbosch Community Recycling Project operations. The estimates are conservative with respect to the calculation of the avoided emissions achieved by the project.

Is there a discernible impact on poverty alleviation?

The project provides approximately 85 permanent jobs and is an accessible income opportunity in impoverished areas. Furthermore, it allows informal waste collectors to sell recyclable materials and earn an income. It therefore has a discernible impact on poverty alleviation.

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1 INTRODUCTION

The Stellenbosch Community Recycling Project (collective of CL Waste & Scrap Metal Trust and CL Waste Scrap Metal (Pty) Ltd) is a family run business that was started in Stellenbosch during 1996. Since then, they have grown significantly, with current operations including three primary waste collection sites in Stellenbosch, Killarney and Strand, as well as five satellite sites located at shopping centres across the greater Cape Town region. Although the business has been operating since 1996, the recycling service they perform is not mandated by law within South Africa. This lack of mandate means that the latest statistics[1] indicate that less than 19% of South African waste is recycled, with the recycling percentage dropping to 13% if organic recycling tonnages (composting) is excluded. Current predictions are that waste tonnages will increase, meaning that recycling rates are likely to decrease with time[2]. The Western Cape, and especially municipalities such as Stellenbosch, also have severe landfill space limitations and as such, there is a need for measures, such as recycling, that divert material from landfill[3]. Together these factors indicate the important, but non-commonplace, role that the Stellenbosch Community Recycling Project perform within the Western Cape waste sector

The primary waste collection sites purchase recyclable materials from waste collectors, as well as collect recyclable material from across the greater Cape Town region in company-owned vehicles. This collection covers businesses and organisations that have dedicated Stellenbosch Community Recycling Project recycling bin(s) for the collection of recyclable materials, as well as businesses/organisations needing one-off collections (e.g. one-off collection of scrap metal from demolition sites). In addition, the Stellenbosch site purchases recyclable materials from informal waste collectors ("waste-preneurs" or "landfill pickers"), who primarily source their materials from household and business waste streams destined for landfill or directly from the Stellenbosch landfill site. The satellite sites collect recyclable materials from their respective shopping centres, including materials produced by businesses within the centre and consumers utilising the centre. The collected waste at each site is sorted, processed as necessary (compacted, baled etc.) and sold to downstream recycling companies for further processing and production of recycled material. The Stellenbosch Community Recycling Project currently has approximately 85 permanent employees, and contracts a number of part-time employees during peak periods, such as over the December/January holiday season. This uplifts the community through income generation. The Stellenbosch site also provides an income stream for informal waste collectors, who number up to 600 per day during peak season, allowing these individuals to earn money from material that has been deemed waste by other individuals. As well as generating income for their employees and informal waste collectors, the diversion of material from landfill reduces the demand for virgin material production and results in avoided GHG emissions in the lifecycle of the processed materials.

The avoided GHG emissions have allowed the project to be registered under the Credible Carbon voluntary-market carbon registry, which trades certified African carbon projects that make a direct impact on poverty.

This report documents the verification process, conducted by The Green House, to confirm the avoided emissions and the eligibility of the project in terms of the Credible Carbon registration requirements. These requirements include answering the following questions:

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[1] Department of Environmental Affairs (2018) South Africa State of Waste Report. Available from: https://soer.environment.gov.za/soer/UploadLibraryImages/UploadDocuments/141119143510_state%20of%20Waste%20Report_2018.pdf
[2] Department of Environment, Forestry and Fisheries (2020) National Waste Management Strategy 2020. Available from: https://www.dffe.gov.za/sites/default/files/docs/2020nationalwaste_managementstrategy1.pdf
[3] Green Cape (2022) Waste Market Intelligence Report. Available from: https://www.greencape.co.za/assets/WASTE_MIR_7_4_22_FINAL.pdf

- Is the project real?
- Is the described technology in place and functioning in accordance with its design specification?
- Are the estimates of greenhouse gas emission reductions reasonable in terms of accepted international standards and unbiased towards buyer or seller?
- Is there a discernible impact on poverty?

The report covers the 36-month period from the start of June 2019 to the end of May 2022. The methodology for the independent assessment is described in Section 2, followed by the assessment findings in Section 3. Section 4 presents a set of recommendations.

2 VERIFICATION METHODOLOGY

Verification of the Stellenbosch Community Recycling Project's ongoing activities and the avoided GHG emissions through recycling activities was undertaken through a site visit, data collection from available records and calculations based on the data. These steps are described below.

2.1 Site Visit

The Green House conducted a site visit on 12 July 2022 to meet with Francois van Wyk, Shaun Styger and staff members at their three primary waste collection sites (Stellenbosch, Killarney and Strand), as well as one of the satellite shopping centre sites. The sites, current operations and company assets were inspected, and the electronic data records were confirmed to exist.

2.2 Data collection

The key data required to assess emissions savings is the tonnage of material recovered, disaggregated by material type, as well as the fuel and electricity consumption for company operations. The Stellenbosch Community Recycling Project weigh all recyclable material entering their sites, with the mass used to determine payments due to the waste collectors and businesses/organisations collected from, as well as ensuring that the sites are operating effectively (i.e. that mass into the site equals mass processed and sold onto recyclers). The payment rate amount is dependent on material type and therefore all material types are weighed separately on entry. As part of each transaction, the mass measurements per material type are immediately recorded on the Stellenbosch Community Recycling Project's accounting system together with the amount paid.

Spend on electricity for the three primary sites, as well as fuel use for all company owned vehicles was also available from the accounting system. This spend data covers the period from the start of March 2020 to the end of May 2022 for electricity and the period from the start of March 2021 to the end of May 2022 for fuel. The electricity spend data includes some spend on municipal water, while the fuel spend data includes some spend on oil and other minor maintenance. Both sets of spend data therefore slightly overestimate actual spend on energy for the Stellenbosch Community Recycling Project's operations.

2.3 Calculation of GHG emissions avoided

The avoided GHG emissions from the recovery and recycling of material were estimated according to the "closed loop approximation method" as described in the Product Life Cycle Accounting and Reporting Standard[4] of the Greenhouse Gas Protocol (GGP), adhering to the project boundaries discussed in the Clean Development Mechanism (CDM) Small-scale Methodology: *Recovery and recycling of materials from solid waste AMS-III.AJ*[5]. The CDM methodology prescribes equations and values to calculate the emissions avoided due to recycling operations. However, the metals methodology only considers steel and aluminium, while the paper and cardboard methodology only considers avoided landfill decay emissions (i.e. not emission differences between the production of virgin and recycled paper/cardboard). Metals, paper and cardboard are key materials recovered and recycled by the the Stellenbosch Community Recycling Project and as such the use of this methodology would not accurately reflect avoided emissions. The DEFRA 2021[6] emission conversion factors were therefore applied to calculate all avoided emissions associated with materials recycling.

The avoided emissions were calculated by comparing the life cycle emissions of the relevant materials in a base case versus the recycled project case, as is required in both the GGP and CDM methodologies. The life cycle assessment considers the material's entire value chain, including raw material extraction, manufacturing processes, use and disposal. This ensures that all emissions produced in the recycling processes and downstream processing are accounted for.

The system boundary for both the base and project case is shown in Figure 1. The base case involves virgin material production, manufacturing, use and subsequent disposal to landfill. The assumption that all waste is sent to landfill (rather than, for example, incineration) is appropriate as the City of Cape Town and the Stellenbosch Municipality, in which the Stellenbosch Community Recycling Project operates, disposes of all non-recycled waste to landfill[7]. Recyclable material purchased from informal waste collectors is directly diverted from landfill, as they collect material from waste containers or the landfill site directly.

The project case consists of closed loop recycling, which occurs when recycled material substitutes for virgin material in a similar quality application. Over a quarter (27%) of emission savings relate to glass and metal, which when recycled substitutes directly for virgin material as in the closed loop recycling assumption. The recycled cardboard, paper and plastic materials may directly replace virgin material or be recycled to a lower-value product; however, it would still substitute for virgin material that would otherwise be used. Open loop recycling results in greater emission savings per tonne of material recycled, as the processing requirements are lower and consequently the emissions associated with recyclate production are decreased. The application of the closed loop calculation method is therefore applicable and conservative. Calculated emission savings are also permanent, as the

[4] Greenhouse Gas Protocol (undated), Product Life Cycle Accounting and Reporting Standard, World Resource Institute. Available from: http://www.ghgprotocol.org/product-standard#supporting-documents

[5] Clean Development Mechanism (2017), Small-scale Methodologies: Recovery and recycling of materials from solid waste version 7.0, UNFCCC. Available from: https://cdm.unfccc.int/methodologies/DB/R22750M155F84YR0D4YVYOS0CLSCII

[6] DEFRA (2022), Government emission conversion factors for greenhouse gas company reporting - Conversion factors 2021, United Kingdom. Available from: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2021

[7] It is noted that the Stellenbosch Municipality has investigated the use of waste incinerators for the treatment of waste for a number of years; however, the incinerator is not is use and is not registered on the South African Waste Information Centre (SAWIC - http://sawic.environment.gov.za/sawis-license/licenses/index/page:60/sort:FacilityType.name/direction:asc).

Stellenbosch Community Recycling Project's operations ensure that recyclable material is diverted from landfill and recycled, thus avoiding virgin material production.

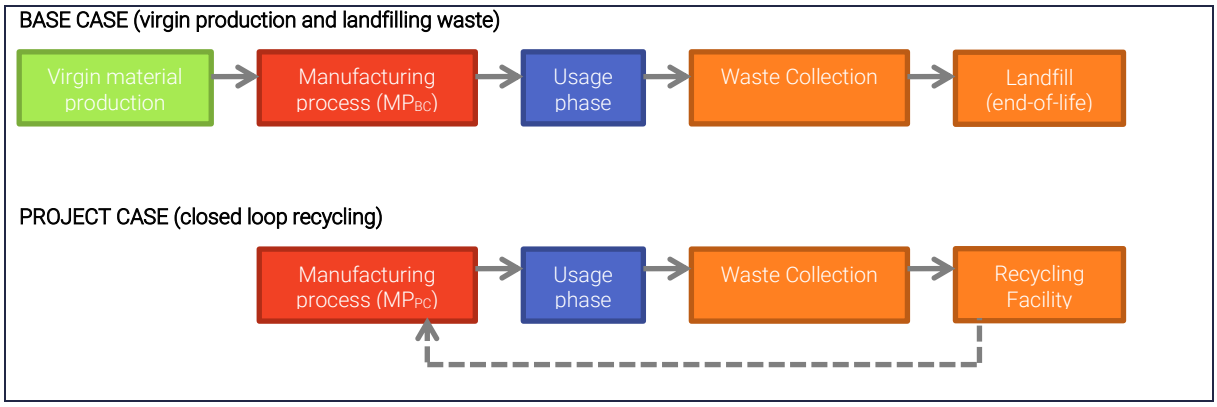

Figure 1: Process Map illustrating Base case vs. Project case

The DEFRA emission conversion factors database includes factors for "material use" and "material disposal". The material use factor includes extraction, primary processing, manufacture and transportation of material to the point of sale. In the case of closed loop recycling, the material use factor is the production of recyclate that occurs at the downstream recyclers supplied by the Stellenbosch Community Recycling Project. The material disposal factor includes waste collection, transport, processing and emissions associated with landfilling or recycling of the material. In the case of the Stellenbosch Community Recycling Project, these are the emissions associated with electricity and fuel use for material collection and processing. The usage phase emissions are common to both the base and project case and are consequently excluded. The avoided emissions factors were calculated using the equation listed in the box below. Overall emissions avoided could then be calculated by multiplying the material's avoided emissions factor by the mass of material sold to the various downstream processors.

$$Avoided\ emissions\ factor = Base\ case\ emissions\ factor - Project\ case\ emissions\ factor$$

$$= (Virgin\ material\ production + Landfilling\ emissions) - (Closed\ loop\ source\ production + Closed\ loop\ recycling\ emissions)$$

As noted above, the closed loop recycling emissions are the emissions resulting from electricity and fuel use for recyclable material collection and processing at the Stellenbosch Community Recycling Project's sites. Therefore, instead of utilising the default DEFRA emission conversion factor, these emissions were based on the Stellenbosch Community Recycling Project's electricity and fuel data.

The electricity and fuel spend data was converted to consumption data based on electricity[8] and fuel[9] pricing data. These data were used to calculate the electricity and fuel use per tonne of recyclable material, with average values used to estimate total consumption for periods where data was not available (i.e. for June 2019 to March 2020 for

[8] **Stellenbosch**: Regular PP tariff extracted from Stellenbosch Municipality's Tariff Book (Stellenbosch Municipality (2022/2021/2020) Appendix 3: Tariffs. Available from: https://stellenbosch.gov.za/documents/). **Strand**: Small Power Users <1300 kWh/month tariff extracted from City of Cape Town's Tariff Book (City of Cape Town (2022) Annexure 6 – Tariffs, fees and charges book. Available at: https://resource.capetown.gov.za/documentcentre/Documents/Financial%20documents/Electricity%20Consumptive%20Tariffs.pdf). **Killarney**: Business Rate 1 tariff extracted from Eskom's Schedule of Standard Prices (Eskom (2022) Schedule of Standard Prices 1 April 2022 to 31 March 2023. Available at: https://www.eskom.co.za/distribution/wp-content/uploads/2022/03/Schedule-of-standard-prices-2022_23.pdf).

[9] Monthly 0.05% diesel and 95 unleaded petrol coastal prices (SAPIA (2022) Old Fuel Prices. Available at: https://www.sapia.org.za/Overview/Old-fuel-prices)

electricity and June 2019 to March 2021 for fuel). Emissions associated with electricity consumption were calculated utilising South Africa's grid emission factor (2019/2020: 0.93 kg CO_2e/kWh; 2020/2021 & 2021/2022: 0.95 kg CO_2e/kWh)[10], while emissions from fuel consumption were calculated utilising South African specific fuel emission factors (Diesel: 2.87 kg CO_2e/L; Petrol: 2.43 kg CO_2e/L)[11].

2.4 Limitations

It is acknowledged that the use of the UK emission conversion factors for calculations is not necessarily representative of the South African context, but at present there are no South African specific factors available and the data that is available does not allow for calculation of these factors. The UK factors are, however, expected to be conservative and underestimate the avoided emissions due to a number of factors, including:

- Electricity from the South African grid is produced mainly from coal and the South African electricity emissions intensity (0.93/0.95 kg CO_2e/kWh) is therefore higher than the UK grid emissions intensity (0.21 kg CO_2e/kWh). As such, any electricity savings achieved by South African recycling operations would be associated with higher GHG emission savings than those achieved from the same electricity savings in the UK. The emission conversion factors presented by DEFRA present the life cycle emissions as a whole and therefore the emissions associated with electricity usage cannot be disaggregated and updated using the South African electricity emissions intensity factor.
- Landfill gas is widely captured and flared or utilised in the UK, reducing the GHG emissions from landfilling of material such as cardboard. Landfill gas capture is not widely used in South Africa and consequently avoided disposal would be associated with higher avoided emissions.

The Greenhouse Gas Protocol states that avoided landfill emissions are accounted for upstream, by the generator of the waste, and the reduced emissions from the use of recycled over virgin material are accounted for downstream, by the user of the recycled material. The emission reductions therefore do not form part of the Stellenbosch Community Recycling Project's carbon footprint, meaning that there is a risk of double-counting the avoided emissions if upstream or downstream value chain stakeholders are claiming their associated emission reductions. For carbon credit projects such as this one it is important that the boundaries are clearly defined and that it is communicated to the downstream processor that the recycling emission reductions have already been accounted for by the Stellenbosch Community Recycling Project.

Currently none of the upstream or downstream value chain stakeholders have registered carbon credits with the Clean Development mechanism (CDM)[12], the Verified Carbon Standard (Verra)[13], the Gold Standard[14] or Credible Carbon. South Africa's current Carbon Tax Act only allows carbon credits from the CDM, Verra or Gold Standard to

[10] Calculated using the approach presented in the NBI South Africa's Grid Emission Factor report (NBI (2013), South Africa's Grid Emission Factor, MAC Consulting for Exxaro. Available from: https://www.nbi.org.za/wp-content/uploads/2016/08/South-Africas-Grid-Emission-Factor-Mar-13.pdf) and the latest Eskom data (Eskom (2021), Eskom Integrated Report, Johannesburg. Available from: https://www.eskom.co.za/investors/integrated-results/).
[11] South African fuel calorific values (DEA (2017) Technical Guidelines for Monitoring, Reporting and Verification of Greenhouse Gas Emissions by Industry (Annexure D). Available at: https://www.dffe.gov.za/sites/default/files/legislations/technicalguidelinesformrvofemissionsbyindustry_0.pdf) and IPCC 2006 Guidelines emission factors (IPCC (2006) 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Available at: https://www.ipcc-nggip.iges.or.jp/public/2006gl/) Utilising AR4 global warming potentials, as utilised by the DEFRA emission conversion factors.
[12] CDM (2022) Project search. Available at: https://cdm.unfccc.int/Projects/projsearch.html
[13] Verra (2022) Project and credit summary. Available at: https://registry.verra.org/app/search/VCS/All%20Projects
[14] Gold Standard (2022) Impact registry. Available at: https://www.goldstandard.org/resources/impact-registry

offset carbon tax liability[15] and therefore it is assumed these four registries cover all registered carbon credits within South Africa. As such, no other carbon credit projects overlap the boundaries of the current the Stellenbosch Community Recycling Project boundary.

3 FINDINGS

The following findings of the assessment are reported.

3.1 Site visit

Site visits undertaken by The Green House confirmed that the Stellenbosch Community Recycling Project's various sites are in existence and that the Stellenbosch Community Recycling Project operates as a collector, sorter, processor, transporter and seller of recyclable waste. Transportation equipment, including trucks and trailers (Figure 2), were witnessed to be in an operational state and in use for both the collection of material and subsequent delivery to buyers. Observations were also made of the staff recording tonnages (Figure 3) and processing the received material, with stockpiles of material waiting to be transported to buyers being evident (Figure 2). At the Stellenbosch site, informal waste collectors coming to sell their collected material were also observed (Figure 4). Equipment, such as forklifts, compressors, balers and scales, are used as required in this process. Discussion with the management team indicated that the Stellenbosch Community Recycling Project currently has about 85 full-time employees. The site visits also confirmed that the operations occur in impoverished areas and as such they provide an accessible income opportunity to help alleviate poverty.

[15] National Treasury (2019) Carbon Tax Act, 2019 (Act No. 1556) Available at: https://www.sars.gov.za/wp-content/uploads/Legal/SecLegis/LAPD-LSec-Carbon-Reg-2019-01-Regulation-1556-GG-42873-29-November-2019.pdf

Figure 2: Baled material on a Stellenbosch Community Recycling Project trailer, ready for transport to buyers

Figure 3: Recording of recyclable material tonnages above a small scale

Figure 4: Informal waste collectors delivering their material to Stellenbosch site

3.2 Data collection

The Stellenbosch Community Recycling Project provided accounting system data detailing the tonnages of recyclable materials purchased and this was used to establish the tonnages processed during the assessment period. A summary of the data is presented in

Table 1.

Table 1: Verified recyclable material collections [tonnes]

Site	Stellenbosch			Strand	Killarney	Shopping centres
Period	June 2019 – May 2020	June 2020 – May 2021	Jun 2021 – May 2022	Jun 2021 – May 2022	Jun 2021 – May 2022	Jun 2021 – May 2022
Cardboard and paper						
Cardboard	4,053	5,299	5,306	1,015	718	853
Newspaper	224	137	122	14	15	0.5
Paper	1,151	929	733	95	50	19
Mixed cardboard and paper	73	237	171	18	80	152
Glass						
Glass	461	392	703	25	2	
Metals						
Aluminium	181	160	190	0.3	5.5	
Brass	8	7	10		0.0	
Copper	11	15	19			
Lead	2	3	2			
Stainless steel	29	22	28		0.0	
Steel	1,164	1,104	1,216	2.8	14.5	0.3
Zinc	26	29	37		0.3	
Mixed metals	1	1	1			
Mixed construction metals	15	37	39		0.0	
Plastics						
PET	547	312	565	15	37	41
HDPE	62	53	98	4	0.3	36
LDPE	101	122	133	7	21	78
Mixed plastics - Flexible	368	407	356	28	59	61
Mixed plastics - Rigid	1,430	1,221	1,452	21	23	
Other						
Batteries	29	41	36			
Electrical item - IT	0.1	0.0	0.6		0.2	
Electrical item - Small	0.2	0.2	0.2			
Used beverage carton				3	5	2

The Stellenbosch Community Recycling Project's electricity and fuel invoices were also available from their accounting system and these were used to calculate emissions associated with transport and processing. A summary of this data is presented in Table 2. This energy consumption translates to 30 kg CO_2e/tonne of recyclable material purchased by the Stellenbosch Community Recycling Project (c.f. DEFRA's default emission conversion factor of 21 kg CO_2e/tonne).

Table 2: Verified energy consumption data

	Units	June 2019 – May 2020	June 2020 – May 2021	Jun 2021 – May 2022
Diesel	L	58,398*	61,873*	83,654
Petrol	L	1,773*	1,879*	3,304
Electricity	kWh	98,782*	96,795	131,056
Energy intensity				
Diesel	L/tonne	5.88*	5.88*	5.68
Petrol	L/tonne	0.18*	0.18*	0.22
Electricity	kWh/tonne	9.94*	9.19	9.71

* - Estimated value, based on average intensity data from available information

3.3 Calculation of GHG emissions avoided

The total estimated GHG emissions avoided through the Stellenbosch Community Recycling Project's activities are 39,977 tonnes CO_2e. A detailed breakdown by material type is provided in Table 3, which shows the avoided emissions factor as well as the emissions avoided per material.

DEFRA does not currently provide closed loop recycling emission conversion factors for electronic goods, including batteries. As such, life cycle emission factors for these materials could not be accurately established and therefore, to be conservative, these materials were excluded from avoided emission calculations.

Table 3: Verified avoided GHG emissions

	Mass recycled (tonnes)	Emission factor (tonnes CO_2e/tonne)	Avoided emissions (tonnes CO_2e)
Cardboard and paper			
Cardboard	17,244	1.12	19,290
Newspaper	513	1.20	613
Paper	2,977	1.20	3,560
Mixed cardboard and paper	732	1.17	853
Glass			
Glass	1,583	0.56	891
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Mixed plastics - Flexible	1,278	0.66	847
Mixed plastics - Rigid	4,147	0.51	2,119
TOTAL	**35,085**		**39,977**

3.4 Response to the Credible Carbon Registry questions

In light of the above, The Green House provides the following responses to the Credible Carbon Registry assessment questions:

Is the project real?

The project is real and operational, across three primary sites and various sites located at shopping centres.

Is the described technology in place and functioning in accordance with its design specification?

The Green House witnessed that recyclable material is purchased from formal and informal waste collectors at the primary sites, as well as collected and transported to the primary sites in numerous vehicles. Recyclable material from shopping centres is also collected at the satellite shopping centre sites. The material is sorted, processed and stockpiled for sale using on-site equipment where required, before the processed material is transported and sold to numerous buyers. These operations divert waste that would otherwise have ended up on landfill.

Are the estimates of greenhouse gas emissions reduction reasonable in terms of accepted international standards and unbiased towards buyer or seller?

The estimates presented in this report are based on a life cycle view consistent with the appropriate internationally accepted standards and thus are a reasonable representation of the emissions avoided due to the Stellenbosch Community Recycling Project's operations. The estimates are conservative with respect to the calculation of the avoided emissions achieved by the project.

Is there a discernible impact on poverty?

The project provides approximately 85 permanent jobs and is an accessible income opportunity in impoverished areas. Furthermore, it allows informal waste collectors to sell recyclable materials and earn an income. It therefore has a discernible impact on poverty alleviation.

4 RECOMMENDATIONS

The following are offered for consideration regarding future operations and assessments at the Stellenbosch Community Recycling Project

- If South African specific emission factors become available, these must be used to ensure more representative emission calculations. Due to the conservative nature of the DEFRA emission factors (see Section 2.4), use of local emission factors will most likely increase the calculated avoided emissions.
- If electronic goods emissions factors become available, these should be applied to the electronic goods recycled by the Stellenbosch Community Recycling Project
- The claimed recycling credits involve the risk of double counting if the upstream producers or downstream purchasers of the recycled material claim the avoided emissions. The Stellenbosch Community Recycling Project should be aware that ownership of the emission savings might require negotiation in the future.
    - This is not an issue in the current audit, as no recycling carbon credits have been registered in South Africa under the Clean Development mechanism (CDM), the Verified Carbon Standard (Verra) or the Gold Standard programmes that would result in the double counting of the Stellenbosch Community Recycling Project's emission savings