

Puleng Technologies (Pty) Ltd

Greenhouse Gas Emissions Assessment for the 2018 calendar year



30th July 2019

Version 1.0

The Carbon Report | a division of sustainableIT®

sustainableIT

1st Floor Block B, North Park, Black River Park

2 Fir Street

Observatory

Cape Town

T +27 21 003 8033

www.thecarbonreport.co.za

DISCLAIMER

This report is based on activity data gathered by the client and has not been verified. The Carbon Report bears no responsibility for the accuracy of the primary data provided by Puleng Technologies.

Table of Contents

Project Summary.....	3
Introduction	4
Project scope and inventory boundary.....	4
GHG Inventory	6
Greenhouse gas emission calculation detail.....	8
Understanding uncertainty and disclaimer	9
Base year and base year recalculation/adjustment policies	10
Abbreviations.....	11
Glossary of terms	12
References	13

Project Summary

Lead consultant	Teresa Legg	
Client	Puleng Technologies (Pty) Ltd	
Objective	Annual Greenhouse Gas Emissions Assessment of Puleng Technologies (Pty) Ltd for the financial year ending 31 December 2018	
Methodology	Greenhouse Gas Protocol Corporate Accounting and Reporting Standard (Revised)	
Project Scope	<p><i>Entity:</i> Puleng Technologies (Pty) Ltd</p> <p><i>Location:</i> Southern Africa</p> <p><i>Time period:</i> 1 January 2018 to 31 December 2018</p> <p><i>GHG emission sources:</i> Direct including mobile and stationary fuel combustion Indirect including purchased electricity, paper use and business travel</p> <p><i>GHGs:</i> CO₂, CH₄, N₂O, HFC</p>	
Contact details	<p><i>Client:</i> Errol Irwin Puleng Technologies (Pty) Ltd Block A Riverview Park Cnr. Janadel Ave and Bekker Road Extension 100 Midrand erroli@puleng.co.za</p>	<p><i>Consultant:</i> Teresa Legg The Carbon Report 1st Flr, Block B, Black River Park 2 Fir Street Observatory, Cape Town teresa@thecarbonreport.co.za</p>

Introduction

Puleng Technologies is a user and data management practice that assists IT and business with building an efficient, collaborative governance, risk and compliance (GRC) program.

The Carbon Report has been engaged to perform an annual assessment of Puleng Technologies' greenhouse gas emissions inventory for the calendar year ending 31 December 2018; which this report delivers.

The emissions identification, estimation and reporting process conform to the requirements and principles of the Greenhouse Gas Protocol Corporate Accounting and Reporting Standard.

Calculation methodologies and emission factors are sourced from UK Government conversion factors for Company Reporting and Eskom's Annual Integrated Report.

Project scope and inventory boundary

Time period

1 January 2018 to 31 December 2018

Base year

2009 (Recalculated)

Boundary consolidation approach

Operational Control

Organisational

Legal

Puleng Technologies (Pty) Ltd

Physical

Block A, Riverview Park, Cnr. Janadel Ave and Bekker Road, Extension 100, Midrand (616m²)

Operational (activities)

Category	Emission source	Greenhouse Gases
Direct emissions	Mobile fuel combustion in company owned vehicles	CO ₂ , CH ₄ , N ₂ O
	Stationary fuel combustion in generators	CO ₂ , CH ₄ , N ₂ O
Indirect emissions	Purchased Electricity	CO ₂
	Material use: paper	CO ₂ , CH ₄ , N ₂ O
	Business travel	CO ₂ , CH ₄ , N ₂ O

Excluded emissions ¹	Fugitive emissions: deemed immaterial	HFC
---------------------------------	---------------------------------------	-----

¹ Immateriality guideline: Emission source activities believed to make up less than 5% of total emissions are believed to be immaterial.

GHG Inventory

Puleng Technologies' greenhouse gas emissions for the year ending 31 December 2018 were as follows:

Table 1: Total greenhouse gas emissions by Scope

Scope	Emission Source Category	metric tonnes CO ₂ e	% increase / decrease from base year
Scope 1	Mobile fuel combustion	6.59	
	Stationary fuel combustion	0.81	
	Total Scope 1 emissions	7.40	55%
Scope 2	Purchased electricity – location based	163.20	
	Total Scope 2 emissions	163.20	117%
Total Scope 1 + 2 emissions		170.60	
Scope 3	Material use paper	0.44	
	Business travel	69.85	
	Total Scope 3 emissions	70.29	230%
All Scopes	Total Scope 1, 2 + 3 emissions	240.89	138%

Table 2: Greenhouse gas emissions intensity

Emissions intensity	2018	% increase / decrease from base year ²
Total emissions per full time employee ³	2.62 tCO ₂ e	16%
Site specific ⁴ emissions per m ²	0.27 tCO ₂ e	122%

² Recalculated base year emissions.

³ 92 employees (full time equivalent)

⁴ Area intensity includes stationary combustion and electricity consumption only.

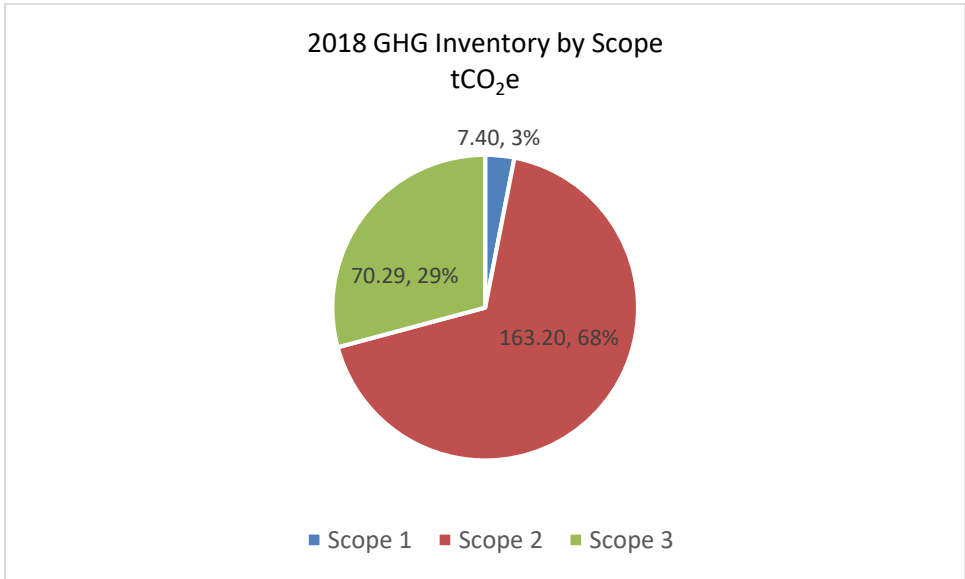


Figure 1: Total greenhouse gas emissions by Scope.

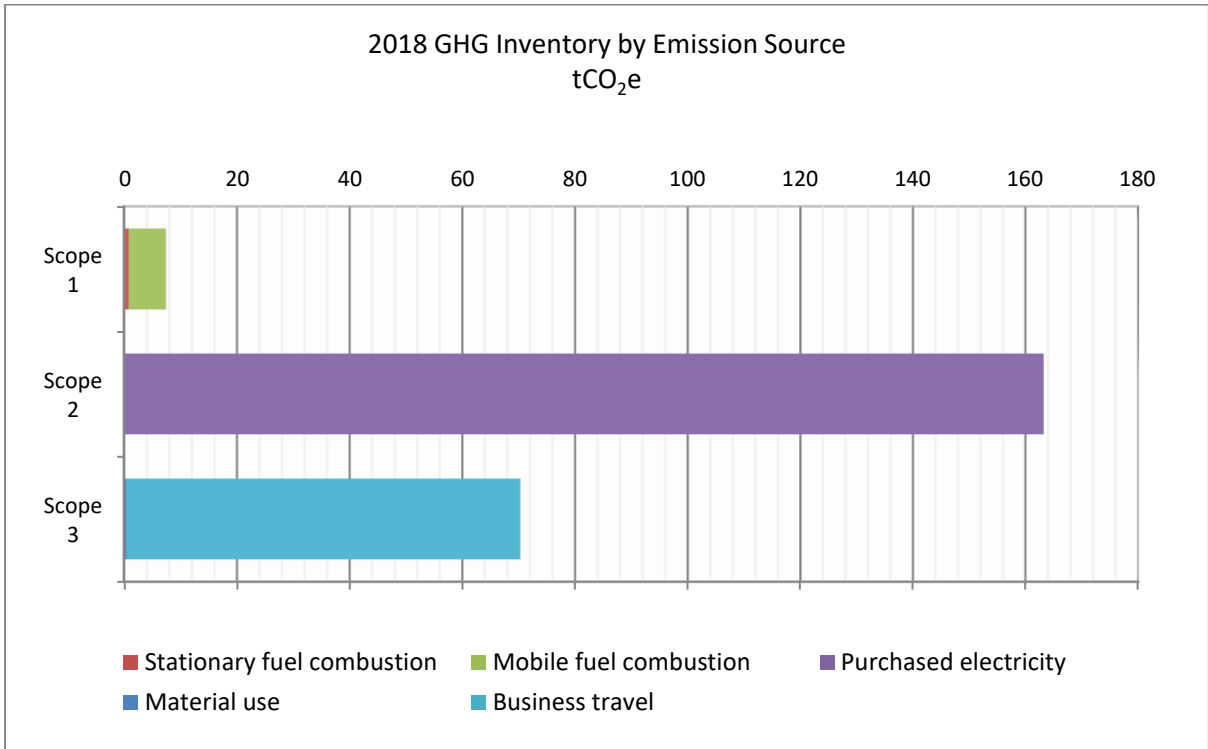


Figure 2: Greenhouse gas emissions by emission source.

Greenhouse gas emission calculation detail

Direct emissions

Table 3: Calculation of fuel combustion emissions

Emission source	UOM	kg CO ₂ e per unit ⁵	Consumption	t CO ₂ e
Company Vehicles: 100% mineral petrol fuel	Litres	2.30531	2 857	6.59
Generator: 100% mineral diesel fuel	Litres	2.68779	302	0.81

Indirect emissions

Table 4: Calculation of purchased electricity emissions

Emission source	UOM	kg CO ₂ e per unit ⁶	Consumption	t CO ₂ e
Purchased electricity	kWh	0.95000	171 790	163.20

Table 5: Calculation of paper use emissions

Emission source	UOM	kg CO ₂ e per unit ⁷	Consumption	t CO ₂ e
Material use: paper	tonne	955.6535	0.46 ⁸	0.44

Table 6: Calculation of business travel emissions

Emission source	UOM	kg CO ₂ e per unit ⁹ (with RF & WTT)	Consumption	t CO ₂ e
Regional economy class	p.km	0.1772	183 878	32.58
Long haul economy class	p.km	0.15530	239 987	37.27

⁵ UK Government conversion factors for Company Reporting, 2018.

⁶ Eskom Annual Integrated Report, 2018.

⁷ UK Government conversion factors for Company Reporting, 2018.

⁸ Weight calculated from 185 reams of A4 80gm copy paper.

⁹ UK Government conversion factors for Company Reporting, 2018. Includes well to tank (WTT) emissions. Factors include an uplift factor and a radiative forcing factor.

Understanding uncertainty and disclaimer

There are uncertainties associated with greenhouse gas inventories which can be broadly categorised into scientific uncertainty and estimation uncertainty.

Scientific Uncertainty

Scientific uncertainty arises when the science of the actual emission and/or sequestration process is not sufficiently understood and the emission factor is uncertain. For example, many of the direct and indirect emissions factors associated with global warming potential for emission estimates involve scientific uncertainty. Analysing and quantifying such scientific uncertainty is extremely problematic and is beyond the scope of most company's inventory efforts. The emissions factors used in this report are based on reliable sources and all are referenced throughout the document, however, all are subject to scientific uncertainty.

Estimation Uncertainty

Estimation uncertainty arises any time greenhouse gas emissions are quantified. Therefore, all emission or removal estimates are associated with estimation uncertainty. Estimation uncertainty can be further classified into two types: model uncertainty and parameter uncertainty.

- *Model uncertainty* refers to the uncertainty associated with the mathematical equations (i.e. models) used to characterise the relationships between various parameters and emission processes. For example, model uncertainty may arise either due to the use of an incorrect mathematical model or inappropriate parameters (i.e. inputs) in the model. Like scientific uncertainty, estimating model uncertainty is beyond the scope of most company's inventory efforts. Any model uncertainty is beyond the scope of this report.
- *Parameter uncertainty* refers to the uncertainty associated with quantifying the parameters used as inputs (e.g. activity data, emission factors, or other parameters) to estimation models. Parameter uncertainties can be evaluated through statistical analysis, measurement equipment precision determinations, and expert judgment.

This report is based on activity data gathered by the client. The Carbon Report bears no responsibility for the accuracy of the primary data provided by Puleng Technologies. The primary data that this report has been based on has not been verified.

Base year and base year recalculation/adjustment policies

Base year

Base year 2009 Recalculated

Total and Scope 3 emissions have been recalculated.

Base year adjustments

When tracking your organisation's emissions over time, it is important to compare like with like. Therefore, in the event of structural or other changes the base year emissions may need to be recalculated.

In accordance with the GHG Protocol, The Carbon Report recommends that base year emissions are adjusted in the event of:

- Structural changes such as mergers, acquisition and divestments; where the facility existed in the base year.
- Outsourcing and in-sourcing of emitting activities where activities were not reported in the base year under scope 2 or 3.
- Changes in calculation methodology or improvements in the accuracy of emissions factors or activity data; where significant.
- Discovery of significant errors

Organic growth or organic decline does not necessitate adjustments to the baseline.

The Carbon Report recommends the following readjustment policies:

Structural changes:

A company that acquires, merges with or divests of another company should include; or exclude in the case of divestment; the emission sources from the acquired, merged or divested company in the acquiring/divesting company's base year inventory (and current year inventory) where the base year falls prior to the structural change.

Where a structural change occurs in the middle of a reporting year, the GHG Protocol recommend that emissions are not pro-rated, and total annual emissions are applied to the full base year and the full reporting year.

Methodology Changes

For a change in calculation methodology, we recommend that the GHG Inventory from the base year forward is updated. Changes due to an updated emissions factor will become necessary when the emission factor data becomes available. A change in an emission factor will cause an update to the year the emission factor applies to.

If an error has occurred, and its impact on emissions is significant, we recommend it is corrected and the change noted.

Abbreviations

CH₄	Methane
CO₂	Carbon dioxide
CO₂e	Carbon dioxide equivalent
FTE	Full time equivalent of employee
GHG	Greenhouse gases
GWP	Global warming potential
HFC	Hydro fluorocarbon
IPCC	Intergovernmental Panel on Climate Change
N₂O	Nitrous oxide
NF₃	Nitrogen trifluoride
PFC	Perfluorocarbons
SF₆	Sulphur hexafluoride
UOM	Unit of measure
WBCSD	World Business Council for Sustainable Development
WRI	World Resources Institute

Glossary of terms

Boundaries – The inventory boundaries to determine which emissions are accounted for and reported. Boundaries include organisational, operational and geographic.

Carbon footprint – The total greenhouse gas emissions caused directly and indirectly by an organisation, typically over a period of 12 months.

CO₂e – Carbon dioxide equivalent – standardisation of all measured greenhouse gases to reflect its warming equivalent to carbon dioxide (CO₂). This is used to evaluate different greenhouse gases against a common basis.

Direct emissions – GHG emissions from facilities or sources owned or controlled by the reporting company, e.g. generator, company owned vehicles, etc.

Emissions – The release of greenhouse gases into the atmosphere.

Emission factor – Conversion factor to translate activity data, e.g. tonnes of fuel consumed, into emission data.

GHG – Greenhouse gases. Under the GHG Protocol standard seven gases are accounted for, namely carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride and nitrogen trifluoride.

GHG Inventory – A listing of the GHG emissions and sources that are attributable to the company.

GHG Protocol – GHG Protocol Corporate Accounting and Reporting Standard.

Indirect emissions – emissions that are a consequence of the operations of the reporting company, but occur at sources owned or controlled by another company.

Operational boundary – The boundary to establish the operations and sources of emissions included in the GHG Inventory.

Organisational boundary – The boundary to establish business units or entities of an organisation included in the GHG Inventory. An equity or control approach can be taken.

Reporting Period – the period of time, typically a calendar or financial year for which the report covers.

Scope 1 emission – Direct emission from company-owned or controlled equipment, vehicles or corporate jets.

Scope 2 emission – Indirect emission from the consumption of purchased electricity.

Scope 3 emission – Indirect emission from other activities associated with the activities of the company, e.g. commuting travel, business air travel and paper consumption.

References

Eskom, 2018. *Eskom Annual Integrated Report 2018.*

UK Government, 2018. *UK Government conversion factors for Company Reporting, version 1.0, 2018.*

World Resources Institute and World Business Council for Sustainable Development. *The Greenhouse Gas Protocol Corporate Accounting and Reporting Standard (Revised Edition).*

World Resources Institute. *GHG Protocol guidance on uncertainty assessment in GHG inventories and calculating statistical parameter uncertainty.*