Greenhouse Gas Inventory Report

Our Mission:

To provide innovative, clean and efficient energy solutions for a better tomorrow

For the period: January 1, 2016 to December 31, 2016
Published in: March, 2017 by Delta Electronics (Thailand) PCL.

Reported by: Mr. Saroj Ruangsakulraj

Introduction

The global financial crisis is causing massive economic upheaval, but with the world's governments working together, recovery is now in sight. Yet the threat posed by global warming still requires a major breakthrough in international negotiations and a change in modern lifestyles to slow the rate of warming and avert an ecological catastrophe.

With our corporate mission of "To provide innovative, clean and efficient energy solutions for a better tomorrow", DET strive to do our utmost to help slow global warming and reduce our environmental impact and also believe in fulfilling Delta's CSR goals through sound corporate governance, balancing stakeholder interests and social participation.

Responding to climate change is not only a corporation's social responsibility. How to respond to the threat it poses; and take advantage of the opportunities it offers; is something that businesses must look at seriously in their corporate strategies.

Carbon emissions reporting becoming an important topic, there is an increasing move towards greenhouse emissions reporting and disclosure. DET is looking towards best practice in the area of sustainability reporting. Sometimes the information is included in Annual Reports or in annual Sustainability and Corporate Responsibility reports. The format and composition of the information varies widely.

Greenhouse Gas report illustrates for a typical company the strategy, targets, performance, and benchmarking of how the company is working to reduce its impact on and adapt to climate change. Clearly, in order to produce reliable information for such reporting, and to monitor emissions performance and management actions to achieve reductions during the year, companies will need to consider carefully processes, systems, controls and internal reporting requirements.

Contents

1. Company Profile

Delta Electronics (Thailand) Public Company Limited (hereafter DET) was established in 1988. DET is the world's leading manufacturers and distributors; design and development of: Power Conversion Products (such as Switching Power Supply, Adaptor & Charger, AC-DC / DC-DC converter, Telecommunication / Server Power Supply) ; Magnetic products (such as Transformer, Line Filter, Coil) ; Electronic control units / Vision system for Automotive; EMI Filter; Cooling Fan; MTS (Molding, Tooling and Stamping); Solenoid product; PWB Assembly and Transformer. Its operation has now covered several regions i.e. Europe, Middle East, South America and Asia with a total consolidated sales turnover of approximate USD 1 billion.

Delta Electronics (Thailand) Public Company Limited had approximately 9,810 workers during the 2015-year in its Bangpoo Plant 1 & 5 and Wellgrow Plant 6:

Plant	Location	No. of Employee
Plant 1 & 5	Bangpoo	7,138
Plant 6	Wellgrow	3,256
Total		10,394

2. GHG Management

2.1 Guideline of the report

This emissions inventory report has been prepared and written in accordance with the principles set out by the International Standards Organization (ISO) for the quantification and reporting of Greenhouse Gas Emissions and Removals (ISO14064-1).

2.2 Report Principle and Criteria

According to the report complete, consistent, accurate, relevant and transparent information complied principles.

2.3 Base Year

Setting and Adjustment the base year

Set the base year

Base-year Greenhouse Gas Inventory is annually thereafter, DET shall report the inventory of the preceding calendar year. In 2015, DET had built up several areas which consume high amount of electricity. So DET decided the chosen new base year calculated for this report from January 1, 2015 to December 31, 2015.

Adjust the base year

Amendments to the base year by the implementation team by adjustment the internal and external situation, and report to Top management for approval.

Recalculation of the base year's emission

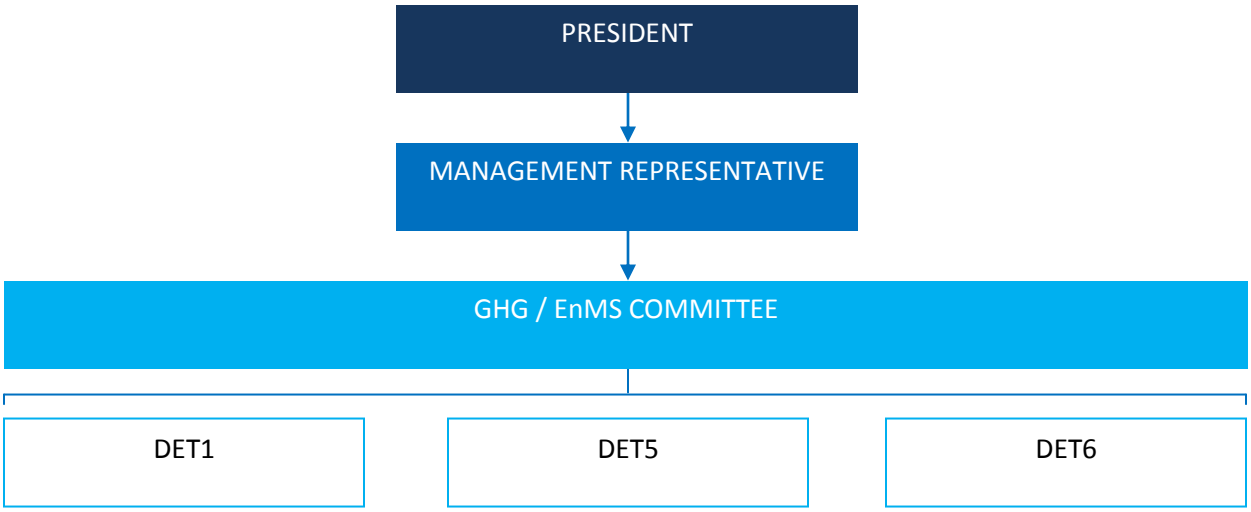
The base year emissions recalculation base-year inventory in the following cases should be re-calculated emissions for more than 5% significance threshold totally:

- When the operation of boundary changes;
- When the source of equity stakeholders / transfer;
- When a change in calculation method.

2.4 Organizational and Operational Boundaries

The company used the operational control-based approach to defining organizational boundaries. Due to the control prescribed nature of the core company, the application of either the control or equity approach is likely to have the same effect. The activity data is gathered from Delta factories in Thailand. The organizational boundary of Delta Electronics (Thailand) PCL. is defined by the purposes of the greenhouse gas (GHG) inventory include core business activities only.

2.5 GHG Organization and Responsibility



Responsibility:

Executive Management Team (Management Representative & GHG / EnMS Committee)

DET's Executive Management Team shall review and ultimately approve DET's annual GHG inventory and Carbon Footprint Report / Strategy. Members of the Executive Management Team will also be responsible for the communication of the Report / Strategy at their plant through meetings and discussions where necessary.

Plant Manager

DET's Plant Manager shall oversee the development of DET's annual GHG inventory and Carbon Footprint Report / Strategy. They shall review DET's annual GHG inventory and Carbon Footprint Report / Strategy, and assume ultimate responsibility for the achievement of targets set.

Concern Department Manager

DET's Manager shall oversee the day-to-day development of DET's annual GHG inventory. They will develop and manage the projects annual communications strategy, arrange documentation to communicate inventory and strategy, arrange and coordinate the project's annual external verification and assurance process.

The Manager shall also provide support to the EMR in the development of DET's annual GHG inventory.

EMR and Plant Representative

DET's EMR, together with members of the Plant Representative Team will gather data from facilities, finance and related dept; and develop an annual GHG inventory with Management Representative. They shall also work cooperatively with external verification and assurance team to allow smooth implementation of process.

DET's Plant Representative shall assist in the provision of data wherever applicable. The team shall ensure the collection of data for annual inclusion in DET's GHG inventory.

2.6 Management Review

As the new base year was set as 2015 for DET reported detailed greenhouse gas emissions, Management Representatives or his assignee shall review and approve Greenhouse Gas Inventory Report. On an annual basis, it shall be reviewed the relevance of DET's performance and the effectiveness of existing monitoring / measurement systems to provide accurate, complete and timely information sets to management team.

2.7 Verification of Greenhouse Gas Inventory Report

This Greenhouse gas Emissions report has been verified by SGS auditor. A positive assurance report has been given over the assertions and quantifications included in this report.

3. Primary Statement of GHG Inventory

3.1 Greenhouse Gas Emissions Sources

Emissions sources were identified with reference to the methodology described in the Greenhouse Gas Protocol and ISO14064-1:2006. Emissions sources Identification was achieved using specific guidance on Scope 3 factors included in ISO14064-1 Annex B and in the Greenhouse Gas Protocol (WBCSD).

These emissions have then been classified into 3 categories. The definition of each has been adapted from the Greenhouse Gas Protocol; the 3 types of emissions are:

- Direct Emissions (Scope 1): from sources that are owned or controlled by DET.
- Indirect Emissions (Scope 2): from generation of purchased electricity consumed by DET.
- Indirect Emissions (Scope 3): Emissions that occur as a consequence of the activities of DET, but occur from sources not owned or controlled by DET. Inclusions of these are determined on DET's aims of the programme.

Actual Emissions

Scope of Emissions	Emission Sources
Scope 1	- Fire Extinguisher (CO_2 type & HFC227ea / FM200 type) - Generator and Fire Pump (Diesel) - Cooling System (HFC134a/R134a & HFC404a/R404a & HFC407c/R407c) - Septic Tank (CH_4) - Company Car (Gasoline) / Company Van (Diesel) - Injection and Welding LPG Cylinder (LPG) - Circuit Breaker (SF_6) - Water Drinking Dispenser (HFC134a / R134a) - Forklift (Diesel)
Scope 2	Electricity purchased from other organization used in: - Delta Electronics (Thailand) Public Company Limited (Plant 1) - Delta Electronics (Thailand) Public Company Limited (Plant 5) - Delta Electronics (Thailand) Public Company Limited (Plant 6)
Scope 3	-Transportation of Raw material, Finished Goods, Bus for employees, Van for employee including Business trip, Ambulance, Transportation of Food & Waste Management Entrepreneur. -Canteen (Liquefied Petroleum Gas) -Industrial & Normal Waste (from Production / Garbage)

Remark:

- No biomass is used in DET operations and therefore no emissions from the combustion of biomass are included.
- No generated electricity from fuel combustion, heat or stream is used in DET operations and therefore no emissions from these sources are included.

3.2 Greenhouse Gas Emissions Inclusions & Exclusions

Scope of Emissions		Emissions Sources
Scope 3	Inclusions:	-Transportation of Raw material and Finished Goods -Transportation of Business trip by Air Freight
	Exclusions:	-Transportation of Bus for employees, Van for employee including Business trip, Ambulance, Transportation of Food & Waste Management Entrepreneur. -Canteen (Liquefied Petroleum Gas) -Industrial & Normal Waste (from Production / Garbage)

Indirect Emissions (Scope 3)

The emissions are occurred as a consequence of the activities of DET, but occur from sources not owned or controlled by DET; therefore some Indirect Emissions (Scope 3) have been ignored.

3.3 Summary of Greenhouse Gas Emissions

Type of Emissions (Tonnes CO_2e*)	2016 Performance
Direct (Scope 1) Emissions:	
- Fire Extinguisher (CO_2 type)	0.03
- Fire Extinguisher (HFC227ea / FM200 type)	0.00
- Generator (Diesel)	4.46
- Fire Pump (Diesel)	1.33
- Cooling System (HFC134a / R134a)	257.40
- Cooling System (HFC404a / R404a)	0.00
- Cooling System (HFC410a / R410a)	0.00
- Cooling System (HFC407c / R407c)	0.00
- Air Compressor System (HFC407c / R407c)	40.09
- Septic Tank (CH_4)	0.49
- Company Car (Gasoline)	19.24
- Company Van (Diesel)	27.04
- Injection LPG Cylinder	0.33
- Welding LPG Cylinder	0.05
- Circuit Breaker (SF_6)	0.00
- Water Drinking Dispenser (HFC134a / R134a)	0.00
- Forklift (Diesel)	74.63
Total Direct (Scope 1) Emissions	425.09
Indirect (Scope 2) Emissions:	
All purchased electricity in owned buildings.	
Total Indirect (Scope 2) Emissions	41,461
Total Gross Controlled Emissions (Scope 1 and Scope 2)	**41,886**
Indirect (Scope 3) Emissions:	
- Transportation of Raw material and Finished Goods	27,570
- Transportation of Business trip by Air Freight	742
Total Indirect (Scope 3) Emissions	28,311
Total Gross Controlled Emissions (Scope 1 - Scope 3)	**70,197**

**Data expressed in carbon dioxide equivalent units.*

Quantity of Greenhouse Gas separated by type of emissions

Area	CO_2	CH_4*	N_2O*	HFCs*	PFCs*	SF_6*	Ton. CO_2-e
Scope 1	124.9	0.9	1.8	297.5	0	0	425.1
Scope 2	41,461	0	0	0	0	0	41,461
Scope 3	28,311	0	0	0	0	0	28,311
Total Gross Controlled Emissions	**69,896.9**	**0.9**	**1.8**	**297.5**	**0**	**0**	**70,197**

Note: Greenhouse Gas Emissions Rate follows Global Warming Potential from IPPC GWP2007

3.4 Data Collection Quantification of Methodologies

The next table is shown the details of the sources, the relevant data, and the emission factors, which have been used. All factors have been approved by DET. The amount of CO_2e has been calculated by multiplying the activity data sources by DET by the relevant emission factors. As this is the first year that DET has produced these figures, there are no changes in methodology to report.

Emission or Removal Sources	Data Unit	Emission Factors	Global Warming Potential	Factor Sources
Electricity	kWh	0.5813	1.00	TGO Database updated April 30, 2013 with reference to Thailand Grid Mix Electricity LCI Database 2552 (2009)
Diesel (Stationery Combustion)	Liter	CO2 = 2.70 CH4 = 0.000109 N2O = 0.0000219 CO2e = 2.708	1.00	TGO Database updated April 30, 2013 with reference to IPCC Vol.2 table 2.2, DEDE IPCC Vol.2 table 3.2.1, 3.2.2, PTT
Diesel (Mobile Combustion)	Liter	CO2 = 2.70 CH4 = 0.000142 N2O = 0.000142 CO2e = 2.7446	1.00	
Gasoline (Mobile Combustion)	Liter	CO2 = 2.18 CH4 = 0.00104 N2O = 0.000101 CO2e = 2.2376	1.00	
Truck 10 wheels / B5 / 16 tons (No-load)	Km	0.5851	1.00	CFP Guideline; 3rd Edition
Truck 10 wheels / B5 / 16 tons (Full-load)	Ton-km	0.0529	1.00	CFP Guideline; 3rd Edition
Truck 6 wheels / B5 / 8.5 tons (No-load)	Km	0.4043	1.00	CFP Guideline; 3rd Edition
Truck 6 wheels / B5 / 8.5 tons (75%-load)	Ton-km	0.0838	1.00	CFP Guideline; 3rd Edition
Pick-up 4 wheels / 7 tons (No-load)	Km	0.2395	1.00	CFP Guideline; 3rd Edition
Pick-up 4 wheels / 7 tons (Full-load)	Ton-km	0.2136	1.00	CFP Guideline; 3rd Edition
LPG (Stationery Combustion)	Kg	CO2 = 3.11 CH4 = 0.0000493 N2O = 0.00000493 CO2e = 3.1133]	1.00	TGO Database updated April 30, 2013 with reference to IPCC Vol.2 table 2.2, DEDE IPCC Vol.2 table 3.2.1, 3.2.2, DEDE
LPG (Mobile Combustion)	Kg	CO2 = 2.77 CH4 = 0.00306 N2O = 0.00000986 CO2e = 2.8449	1.00	
Ship Container	Ton-km	0.01	1.00	CFP Guideline; 3rd Edition
Air (Outbound)	Ton-km	0.57	1.00	HP Global Citizenship Report 2009 (World Resource Institute GHG Protocol)
Sea (In Land)	Ton-km	0.01	1.00	CFP Guideline; 3rd Edition (Environmental Footprint of Surface Freight Transportation, Lawson Economics Research Inc, 2007)
Refrigerant (HCFC22 or R22)	Kg	1.00	HCFC = 1,810	IPCC2007
Refrigerant (HFC134a or R134a) Refrigerant (HFC404a or R404a) Refrigerant (HFC23 or R23) Refrigerant (HFC407c or R407c) Fire Extinguisher (HFC227ea or FM200)	Kg	1.00	HFC134a = 1,430 HFC404a = 3,922 HFC23 = 14,800 HFC407c = 1,774 HFC227 = 3,220	IPCC2007 / Guidelines for Utilization of R407c – Tecumseh Products Company (updated in August 2009)
Circuit Breaker (SF_6)	Kg	1.00	22,800	IPCC2007
Waste (Paper)	Kg	2.93	1.00	CFP Guideline; 3rd Edition
Waste Water (Industrial)	m3	0	1.00	IPCC Volume 5 : Wastewater Treatment and Discharge
Waste Water (Domestic) for CH_4	m3	0.48	25	IPCC Volume 5 : Wastewater Treatment and Discharge

3.5 References for Emission Factors

- CO_2 Emission Factor Sourced from: Thailand National Data Base
- CO_2 Emission Factor Sourced from: Electricity Generating Authority of Thailand (EGAT) 2011
- ISO14064-1 GHG Part 1: Specification for Quantification, Monitoring and Reporting of Entity Emissions and Removal
- Google Map (http://map.google.co.th/maps?hl=th&tab=wl)
- ISO14040 Environmental Management – Life Cycle Assessment – Principles and Framework
- ISO14044 Environmental Management – Life Cycle Assessment – Requirements and Guidelines
- Carbon Footprint Product Guideline (TGO) – 3rd Edition
- Carbon Footprint Organization Guideline (TGO) – July 2011
- AA1000: A Standard for Ethical Performance
- PAS2050: Assessing the Life Cycle Greenhouse Gas Emissions of Goods & Services
- ISO26000: Guidance on Social Responsibility
- IPCC Volume 5: Wastewater Treatment and Discharge
- http://www.searates.com/reference/portdistance
- http://www.timeanddate.com/

3.6 Uncertainty Management

This Greenhouse Gas Inventory report has been assessed and evaluated the uncertainty rating. The rating is 24 points which focus on Electricity consumption (98% of GHG Inventory). The rating is 18 points which focus on Transportation system (Company's car and van). The rating is 16 points which focus on Septic Tank (Domestic Wastewater). The rating is 12 points which focus on Fire Fighting System, Diesel used in Electricity Backup System, Refrigerant, LPG used in Welding & Injection Process, Transportation for Raw Material & Finished Goods and Business trip by Air Freight which has been shown the activity data is moderated data quality which comes from the regular measurement eq. Meter Reading, Purchase Order, etc.; and Emission factors is uncertainty of data quality which comes from Manufacturer to provide coefficient. And the rating is 6 points which focus on Transportation system (Forklift).

Explanation: Greenhouse Gas Inventory and the estimated operation itself on the scientific uncertainty, to achieve the purpose of continuous improvement of data quality, therefore, uncertainty is evaluated. IPCC uncertainty is used in more complex calculation. DET adapts Delta Group Guideline for the model of uncertainty which provided by the way of class distinction specify below.

The uncertainty of inventory operations can be divided into model uncertainty and parameter uncertainty. Since the pattern is more complex uncertainty, therefore, not be included in this assessment of the range of uncertainty. Parameter uncertainty refers to the uncertainty of quantitative parameters. Activity data and Emission factors include the uncertainty of activity data differentiate the following 3 levels:

- Automatic Continuous Measurement
- Regular Measurement (Meter reading, Purchase order)
- Own Estimation

Note: Order of score is 6-1; the higher score the better the response data, the lower score the uncertainty; will Emission Factors in 6 categories:

- Measurement / Material and Energy balance coefficient
- Manufacturer to provide coefficient
- Regional Emission Factors
- National Emission Factors
- International Emission Factors

Value Type	Data Quality Level		
Activity Data	**X=6-5 Points**	**Y=4-3 Points**	**Z=2-1 Points**
	Automatic Continuous Measurement	Regular Measurement (Meter Reading, Purchase Order)	Own Estimation
Emission Factors	**A=6-5 Points**	**B=4-3 Points**	**C=2-1 Points**
	- From Measurement / Quality Factor - Manufacturer to provide coefficient	- Regional Emission Factors - National Emission Factors	International Emission Factors

The qualitative analysis of uncertainty assessment method adopted, in the following table will be divided into 6 overall data quality as the following table:

Rating	Overall Level of Scoring Data	Explanation
First Class	1 - 9	High uncertainty, Data quality is very poor.
Second Class	10 - 18	Uncertainty, Moderate data quality.
Third Class	19 - 27	Slightly uncertainty, Data quality is good.
Fourth Class	28 - 36	Uncertainty is very low, Excellent data quality.

4. Future Opportunity

4.1 Performance Overview and Monitoring

DET shall review the future targets and ensure the remain appropriate for the business and industry, therefore continuous to drive DET's performances and associated management reward by planning, implementing and documenting the actions; to monitor Greenhouse Gas Inventory through the meeting to maintain GHG information management quality and; to reduce or prevent Greenhouse Gas Emissions which is apart of Energy Saving project.

The target information is based on estimates and assumptions that are subject to significant inherent uncertainties, which may be difficult to predict and may be beyond control. As with most forward looking information, there can be no assurance that targets will be realized.

4.2 Greenhouse Gas Reduction and Removal

DET will have a management plan in place for managing and reducing emissions by early 2014 with the aim to be carbon emissions reduction by the end of 2020. DET reflects to the Energy Saving Action Plan to reduce the electricity intensity by 30% (Electricity consumed / Revenue) based on 2014 actual by 2020.

Statement TH14/7895GG

Greenhouse Gas Verification Statement

The inventory of Greenhouse Gas emissions in year 2016 of

Delta Electronics (Thailand) Public Company Limited

Bangpoo Site:

a) 714 Soi E5, Moo 4, Bangpoo Industrial Estate (E.P.Z.), Pattana 1 Road, Tambol Phraksa, Amphur Muang, Samutprakarn 10280, Thailand

b) 909 Soi 9, Moo 4, Bangpoo Industrial Estate (E.P.Z.), Pattana 1 Road, Tambol Phraksa, Amphur Muang, Samutprakarn 10280, Thailand

Wellgrow Site:

111 Moo 9, Wellgrow Industrial Estate, Bangna-Trad Road, Tambol Bangwua, Amphur Bangpakong, Chachoengsao 24180, Thailand

has been verified in accordance with ISO 14064-3:2006 as meeting the requirements of

ISO 14064-1:2006

Scope 1 (Direct GHG Emissions) = 425.09 tonnes of CO_2e
Scope 2 (Indirect GHG Emissions) = 41,461 tonnes of CO_2e
Scope 3 (Other Emissions) = 28,311 tonnes of CO_2e

Authorized by

Montree Tangtermsirikul
General Manager
Date: 2 May 2017

SGS 14064-1 0212
SGS (Thailand) Ltd.
100 Nanglinchee Road, Chongnonsee, Yannawa,
Bangkok 10120, Thailand
t (02) 6781813 f (02)6780620 www.sgs.com

SGS has been contracted by Delta Electronics (Thailand) Public Company Limited (hereinafter referred to as "DET"), 909 Soi 9, Moo 4, Bangpoo Industrial Estate (E.P.Z.), Pattana 1 Road, Tambol Phraksa, Amphur Muang, Samutprakarn 10280, Thailand, for the verification of direct and indirect Greenhouse Gas emissions in accordance with

ISO 14064-3: 2006

as provided by Delta Electronics (Thailand) Public Company Limited (hereinafter referred to as "DET"), 909 Soi 9, Moo 4, Bangpoo Industrial Estate (E.P.Z.), Pattana 1 Road, Tambol Phraksa, Amphur Muang, Samutprakarn 10280, Thailand, in the GHG Assertion in the form of GHG report covering GHG emissions of the period 01 January 2016 to 31 December 2016.

Roles and responsibilities

The management of DET is responsible for the organization's GHG information system, the development and maintenance of records and reporting procedures in accordance with that system, including the calculation and determination of GHG emissions information and the reported GHG emissions.

It is SGS's responsibility to express an independent GHG verification opinion on the GHG emissions as provided in the GHG Assertion for the period 01 January 2015 to 31 December 2015.

SGS conducted a third party verification of the provided GHG assertion against the principles of ISO 14064-1:2006 and ISO 14064-3:2006 in the period 13 March 2017 to 17 March 2017. The verification was based on the verification scope, objectives and criteria as agreed between DET and SGS on 10 January 2017.

Level of Assurance

The level of assurance agreed is that of reasonable assurance.

Scope

DET has commissioned an independent verification by SGS Thailand of reported GHG emissions of DET arising from MARKETING, DESIGN, DEVELOPMENT AND MANUFACTURING OF: POWER CONVERSION PRODUCTS (SUCH AS SWITCHING POWER SUPPLY, ADAPTOR & CHARGER, AC/DC, DC/DC, DC/AC CONVERTER, TELECOMMUNICATION / SERVER POWER SUPPLY); MAGNETIC PRODUCTS (SUCH AS TRANSFORMER, LINE FILTER, COIL); ELECTRONIC CONTROL UNITS / VISION SYSTEM; EMI FILTER; COOLING FAN; MTS (MOLDING, TOOLING

AND STAMPING); SOLENOID PRODUCT, PWB ASSEMBLY AND TRANSFORMER, to establish conformance with ISO 14064 principles within the scope of the verification as outlined below.

This engagement covers verification of emission from anthropogenic sources of greenhouse gases included within the organization's boundary and is based on ISO 14064-3:2006.

- Title or description activities: GHG verification for DET in year 2016
- Location/boundary of the activities:
  - Bangpoo Site:
    a) 714 Soi E5, Moo 4, Bangpoo Industrial Estate (E.P.Z.), Pattana 1 Road, Tambol Phraksa, Amphur Muang, Samutprakarn 10280, Thailand
    b) 909 Soi 9, Moo 4, Bangpoo Industrial Estate (E.P.Z.), Pattana 1 Road, Tambol Phraksa, Amphur Muang, Samutprakarn 10280, Thailand
  - Wellgrow Site:

    111 Moo 9, Wellgrow Industrial Estate, Bangna-Trad Road, Tambol Bangwua, Amphur Bangpakong, Chachoengsao 24180, Thailand
- Organizational boundary: Operational control approach
- Physical infrastructure, activities, technologies and processes of the organization: MARKETING, DESIGN, DEVELOPMENT AND MANUFACTURING OF : POWER CON VERSION PRODUCTS (SUCH AS SWITCHING POWER SUPPLY, ADAPTOR & CHA RGER, AC/DC, DC/DC, DC/AC CONVERTER, TELECOMMUNICATION / SERVER P OWER SUPPLY); MAGNETIC PRODUCTS (SUCH AS TRANSFORMER, LINE FILTE R, COIL); ELECTRONIC CONTROL UNITS / VISION SYSTEM FOR AUTOMOTIVE; EMI FILTER; COOLING FAN; MTS (MOLDING, TOOLING AND STAMPING); SOLEN OID PRODUCT, PWB ASSEMBLY AND TRANSFORMER
- GHG sources, sinks and/or reservoirs included: Sources as presented in the inventory spreadsheet provided by DET
- Types of GHGs included: CO_2, CH_4, N_2O, HFCs, PFCs, SF_6
- Directed actions: NA
- GHG information for the following period was verified: 01 January 2016 to 31 December 2016
- Intended user of the verification statement: Private

Objective

The purposes of this verification exercise are, by review of objective evidence, to independently review:

- Whether the GHG emissions are as declared by the organization's GHG assertion

- The data reported are accurate, complete, consistent, transparent and free of material error or omission.

Criteria

Criteria against which the verification assessment is undertaken are the principles of ISO 14064.

The IPCC 2007 AR4 GWP values are applied in this inventory.

Materiality

The materiality required of the verification was considered by SGS to 5%, based on the needs of the intended user of the GHG Assertion.

Conclusion

DET provided the GHG assertion based on the requirements of ISO14064-1: 2006. The GHG information for the period 01 January 2016 to 31 December 2016 disclosing emissions of 41,886.09 metric tonnes of CO_2 equivalent (Summation of emission Scope 1 and Scope 2) and 28,311 metric tonnes of other CO_2 emissions (Scope 3) are verified by SGS to a reasonable level of assurance, consistent with the agreed verification scope, objectives and criteria.

SGS's approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions information and the controls in place to mitigate these. Our examination includes assessment, on a test basis, of evidence relevant to the amounts and disclosures in relation to the organization's reported GHG emissions.

We planned and performed our work to obtain the information, explanations and evidence that we considered necessary to provide a reasonable level of assurance that the GHG emissions for the period 01 January 2016 to 31 December 2016 are fairly stated.

We conducted our verification with regard to the GHG assertion of DET which included assessment of GHG information system, monitoring and reporting plan/protocol. This assessment included the collection of evidence supporting the reported data, and checking whether the provisions of the protocol reference, were consistently and appropriately applied.

In SGS's opinion the presented GHG assertion

- is materially correct and is a fair representation of the GHG data and information, and
- is prepared in accordance with ISO14064-1:2006 on GHG quantification, monitoring and reporting.

Confidentiality

The reports and attachments may contain relevantly confidential information of the clients. In addition to being submitted as governmental application or certification documents, the reports and attachments are not allowed to be edited, duplicated, or published without the clients' agreement in written form.

Avoidance of Conflict of Interest

The reports and attachments are completely complied with the standards and procedures that related-authorities established. The reports and attachments of auditing process are conduct with fairness and honesty. If not, the auditing institution not only has to bear the relevant compensation duties, but also to receive legal charge and punishment.

This statement shall be interpreted with the GHG assertion of DET as a whole.

Verifier Group

Above statements coincide with auditing process with fairness and impartiality, and aim at the emission of year 2016 of clients.

Lead Verifer: Nuthaa B.