

BEC ESG REPORT

2022



MAY 18, 2023

**Balanced Engineering & Construction Pte Ltd. &
新加坡倍衡工程建築有限公司台灣分行**

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1. Abbreviation 縮寫詞

BEC	Balanced Engineering & Construction Pte Ltd. & Balanced Engineering & Construction Pte Ltd. Taiwan Branch
ESG	Environmental, Social, and Governance
GHG	Greenhouse Gas
CO²	Carbon Dioxide
WWF	World Wild Fund
ROC	Republic of China
BCA	Building Control Authority

2. Company Introduction 公司簡介

Balanced Engineering & Construction Pte Ltd (BEC) is a Singapore-based company that specializes in the design, construction, inspection, repair and maintenance of industrial and commercial chimneys and silos. The company was founded in 2000 and has since completed over 1,000 projects in Singapore and the Asia Pacific region.

BEC is a market leader in its field and has a team of experienced engineers and technicians who are committed to providing high-quality services to its clients. We are also a registered contractor with the BCA and are certified to ISO 9001:2015, ISO 45001:2018, RoofSAFE Contractor and bizSAFE Star.

BEC is committed to providing our clients with the highest quality services and are proud of our reputation as a reliable and trustworthy contractor. We are also committed to sustainability and are always looking for ways to reduce our environmental impact.

BEC 是一家總部位於新加坡的公司，專門從事工業及商業用煙囪和煤灰倉的設計，施工，檢查，維修及保養。本公司成立於 2000 年，至今已在新加坡和亞太地區完成了 1,000 多個工程專案。

BEC 為該領域的市場領導者，擁有一支經驗豐富的工程師及技術人員團隊，致力於為客戶提供高質量的服務。本公司也是新加坡建築管理局的註冊承建商，並通過了國際品質標準 9001 : 2015，國際安全標準 45001 : 2018，高空安全承建商及新加坡星級安全營商認證。

BEC 致力於為客戶提供最優質的服務，並以其作為可靠及值得信賴的承建商的聲譽而自豪。我們還致力於可持續發展，並一直在尋找減少環境影響的方法。

3. Greenhouse Gas Emissions in Taiwan (ROC) 台灣的溫室氣體排放狀況

Greenhouse gas emissions in Taiwan have been increasing in recent years. In 2016, Taiwan emitted 276,724,868 tons of carbon dioxide, an increase of 1.91% from the previous year. CO2 emissions per capita in Taiwan are equivalent to 11.72 tons per person, which is higher than the global average of 4.9 tons per person.

The main sources of greenhouse gas emissions in Taiwan are the energy sector, the industrial sector, and the transportation sector. The energy sector is responsible for about 70% of Taiwan's greenhouse gas emissions, followed by the industrial sector (20%) and the transportation sector (10%).

Taiwan has committed to reducing its greenhouse gas emissions by 20% below 2005 levels by 2030. The government has implemented a number of policies to achieve this goal, including promoting renewable energy, improving energy efficiency, and reducing deforestation.

However, Taiwan still faces a number of challenges in reducing its greenhouse gas emissions. The country is heavily dependent on imported fossil fuels, and it has a relatively small land area for renewable energy development. Additionally, Taiwan's economy is heavily reliant on manufacturing, which is a major source of greenhouse gas emissions.

Despite these challenges, Taiwan is taking steps to reduce its greenhouse gas emissions. The government is committed to achieving its 2030 target, and it is working to develop a more sustainable economy.

Here are some additional details about greenhouse gas emissions in Taiwan:

In 2020, Taiwan's total greenhouse gas emissions decreased by 1.71% compared to 2019. The energy sector was responsible for the largest share of greenhouse gas emissions in 2020, followed by the industrial sector and the transportation sector. Carbon dioxide is the main greenhouse gas emitted in Taiwan, followed by methane and nitrous oxide. Taiwan has committed to reducing its greenhouse gas emissions by 20% below 2005 levels by 2030.

The government has implemented a number of policies to achieve this goal, including promoting renewable energy, improving energy efficiency, and reducing deforestation. Taiwan still faces a number of challenges in reducing its greenhouse gas emissions, including its dependence on imported fossil fuels and its small land area for renewable energy development.

Despite these challenges, Taiwan is taking steps to reduce its greenhouse gas emissions and is committed to achieving its 2030 target.

近年來，台灣的溫室氣體排放量一直在增加。2016 年，臺灣排放二氧化碳 276,724,868 噸，比上年增長 1.91%。臺灣人均二氧化碳排放量相當於每人 11.72 噸，高於全球人均 4.9 噸的平均水準。

台灣溫室氣體排放的主要來源是能源部門、工業部門及運輸部門。能源部門約佔台灣溫室氣體排放量的 70%，其次是工業部門（20%）和運輸部門（10%）。

台灣承諾到 2030 年將溫室氣體排放量比 2005 年的水準減少 20%。

政府已經實施了一系列政策來實現這一目標，包括促進可再生能源，提高能源效率和減少森林砍伐。然而，台灣在減少溫室氣體排放方面仍面臨許多挑戰，包括其對進口化石燃料的依賴及可再生能源開發的土地面積小。

儘管面臨這些挑戰，台灣正在採取措施減少溫室氣體排放，並致力於實現其 2030 年目標。

4. Greenhouse Gas Emissions in Singapore 新加坡的溫室氣體排放狀況

The construction industry in Singapore is a major contributor to greenhouse gas emissions. In 2022. The main sources of emissions from the construction industry are:

- **Materials production:** The production of construction materials, such as cement, steel, and concrete, is a major source of emissions. These materials are made from raw materials that are extracted and processed using energy-intensive methods.
- **Construction activities:** The construction process itself also generates emissions. This is due to the use of heavy machinery, such as excavators and bulldozers, as well as the use of fuel and other energy sources.
- **Building operations:** Once a building is completed, it continues to generate emissions during its operational phase. This is due to the use of energy for heating, cooling, lighting, and other purposes.

“the construction sector was responsible for 20% of the country's total emissions.”

The Singapore government is committed to reducing greenhouse gas emissions from the construction industry. In 2020, the government launched the Singapore Green Building Masterplan 2.0, which aims to achieve net-zero emissions from the built environment by 2050. The masterplan includes a number of measures to reduce emissions from the construction industry, such as:

- Promoting the use of sustainable materials: The government is encouraging the use of sustainable materials, such as recycled materials and low-carbon concrete.
- Improving the energy efficiency of buildings: The government is providing financial incentives to developers who build energy-efficient buildings.
- Promoting the use of renewable energy: The government is promoting the use of renewable energy, such as solar and wind power, in buildings.

The construction industry is a major contributor to greenhouse gas emissions in Singapore. However, the government is committed to reducing emissions from the sector. The measures outlined in the Singapore Green Building Masterplan 2.0 will help to reduce emissions from the construction industry and contribute to Singapore's goal of net-zero emissions by 2050.

新加坡的建築業是溫室氣體排放的主要產生者。

2022 年，建築業的主要排放源是：材料生產：水泥、鋼鐵和混凝土等建築材料的生產是主要的排放源。

- 這些材料由使用能源密集型方法提取和加工的原材料製成。
- 施工活動：施工過程本身也會產生排放物。這是由於使用了重型機械，如挖掘機和推土機，以及使用燃料和其他能源。
- 建築運營：一旦建築物完工，它就會在其運營階段繼續產生排放。這是由於將能源用於加熱、冷卻、照明和其他目的。

建築業佔新加坡溫室氣體總排放量 20%

新加坡政府致力於減少建築業的溫室氣體排放。2020 年，政府啟動了新加坡綠色建築總體規劃 2.0，旨在到 2050 年實現建築環境的淨零排放。總體規劃包括一系列減少建築業排放的措施，例如：

- 促進可持續材料的使用：政府鼓勵使用可持續材料，如回收材料和低碳混凝土。
- 提高建築物的能源效率：政府正在為建造節能建築的開發商提供財政激勵。
- 促進可再生能源的使用：政府正在促進可再生能源的使用，在建築物中採用如太陽能 and 風能。

建築業是新加坡溫室氣體排放的主要貢獻者。但是，政府致力於減少該行業的排放。新加坡綠色建築總體規劃 2.0 中概述的措施將有助於減少建築業的排放，並有助於實現新加坡到 2050 年實現淨零排放的目標。

5. Overview of ESG 環保, 社會責任及公司管治概觀

Environmental 環保	Social 社會責任	Governance 公司管治
<p>It refers to an organization's environmental impact(s) & risk management practices. These include direct & indirect greenhouse gas emissions, management's stewardship over natural resources, and the firm's overall resiliency against physical climate risks (like climate change, flooding, and fires).</p> <p>它指的是組織的環境影響和風險管理實踐。其中包括直接和間接溫室氣體排放，管理層對自然資源的管理，以及公司對物理氣候風險（如氣候變化，洪水和火災）的整體彈性。</p>	<p>It refers to an organization's relationships with stakeholders. Examples of factors that a firm may be measured against include human capital management (HCM) metrics (like fair wages and employee engagement) but also an organization's impact on the communities in which it operates.</p> <p>A hallmark of ESG is how social impact expectations have extended outside the walls of the company and to supply chain partners, particularly those in developing economies where environmental and labor standards may be less robust.</p> <p>它是指組織與利益相關者的關係。衡量公司可能衡量的因素包括人力資本管理（HCM）指標（如公平工資和員工敬業度），還包括組織對其運營所在社區的影響。ESG的一個標誌是社會影響預期如何擴展到公司之外和供應鏈合作夥伴，特別是那些環境和勞工標準可能不太健全的發展中經濟體。</p>	<p>It refers to how an organization is led and managed. ESG analysts will seek to understand better how leadership's incentives are aligned with stakeholder expectations, how shareholder rights are viewed and honored, and what types of internal controls exist to promote transparency and accountability on the part of leadership.</p> <p>它指的是如何領導和管理一個組織。環保，社會責任及公司管治分析師將尋求更好地了解領導層的激勵措施如何與利益相關者的期望保持一致，如何看待和尊重股東權利，以及存在哪些類型的內部控制來促進領導層的透明度和問責制。</p>

6. BEC ESG Policy (English) 環保, 社會責任及公司管治政策 (英文版)

Balanced Engineering and Construction Pte Ltd



Document Type:	EMS MANUAL	Issue / Rev No:	1
Document Name:	ESG POLICY (Eng)	Issue Date:	9 th May 2023
Document No:	EMS 17	Pages:	1 of 1

ENVIRONMENTAL, SOCIAL & CORPORATE GOVERNANCE (ESG) POLICY

The Environmental, Social and Corporate Governance (ESG) framework is embedded into our company's strategy for growth. This will generate value for all organizational stakeholders including our employees, customers, vendors, suppliers, and all other parties associated with it.

Our ESG's framework is founded on the concept of overall sustainable development and recognizes environmental and social considerations in BEC's own business operations and in the construction and engineering activities carried out by the company.

We constantly strive to bring a positive transformation to the society through our business operations and endeavour to conserve natural resources, protect the environment and contribute to welfare of the community at large.

BEC is committed to mitigate the adverse effects of climate change and comply with its ESG policy, applicable laws of the countries and to be responsive to existing and emerging environmental and social concerns on a proactive basis.

EDDIE WILLIAMS
Chief Executive Officer

PETER GREEN
Chief Operating Officer

Controlled Document

BEC ESG Policy (Traditional Chinese) 環保, 社會責任及公司管治政策 (中文版)

Balanced Engineering and Construction Pte Ltd



Document Type:	EMS MANUAL	Issue / Rev No:	1
Document Name:	ESG POLICY (Chinese)	Issue Date:	9 th May 2023
Document No:	EMS 17	Pages:	1 of 1

環保, 社會責任暨公司管治 (ESG) 政策

環保, 社會責任暨公司管治 (ESG) 框架已納入我們公司的增長戰略。這將為所有組織利益相關者創造價值, 包括我們的員工、客戶、賣家、供應商及相關的所有其他各方。

我們的環保, 社會責任暨公司管治(ESG)框架建立在整體可持續發展的概念之上。因此, 在其自身的業務營運中, 以及與之相關的人仕及公司開展的建築工程活動中, 關注環境保護及社會因素。

透過其營運業務我公司不斷努力為社會帶來積極的正面轉變, 並竭盡所能保護天然自然資源及環境, 並為整個社區的福祉創做貢獻。

新加坡倍衡承諾減輕氣候變化帶來的不利影響, 遵守其環保、社會責任暨公司管治(ESG)政策, 各國適用的法律, 並積極應對現有及新出現的環境保護及社會問題。

EDDIE WILLIAMS
行政總裁

PETER GREEN
營運總監

受管制公文

7. Foundational Components of ESG Programme 環保, 社會責任及公司管治計劃的基礎組成部份

We are currently working on our ESG Programme including 5 foundational components:

1. Strategy and commitment: objectives that drive programs forward and ensure continual improvement of performance on ESG issues.
 - Objectives & Goals
 - Materiality
 - Risk management framework including ESG risk
 - ESG Board oversight
 - Alignment with globally accepted standards & frameworks
2. Codes and policies: enterprise-wide systems to operationalize and embed ESG into processes and business strategies.
 - Codes of Conduct or Ethics
 - Supplier Code of Conduct
 - Sustainability Policies (e.g. human rights, compliance, procurement, sourcing, environmental health & safety)
 - Company-wide deployment of sustainable principles
3. Programs and initiatives: action steps and roadmaps to achieve commitments and validate efforts by external third-party.
 - Action planning / roadmaps
 - Environmental and social management programme
 - Management system certifications
 - Renewable energy
 - Awards & recognition
4. Stakeholder engagement: collaboration both inside and outside of an organization to understand and address business impacts.
 - Industry collaborations and membership
 - Value chain engagement on ESG matters (customers, suppliers and employees)
 - Community relations & corporate giving

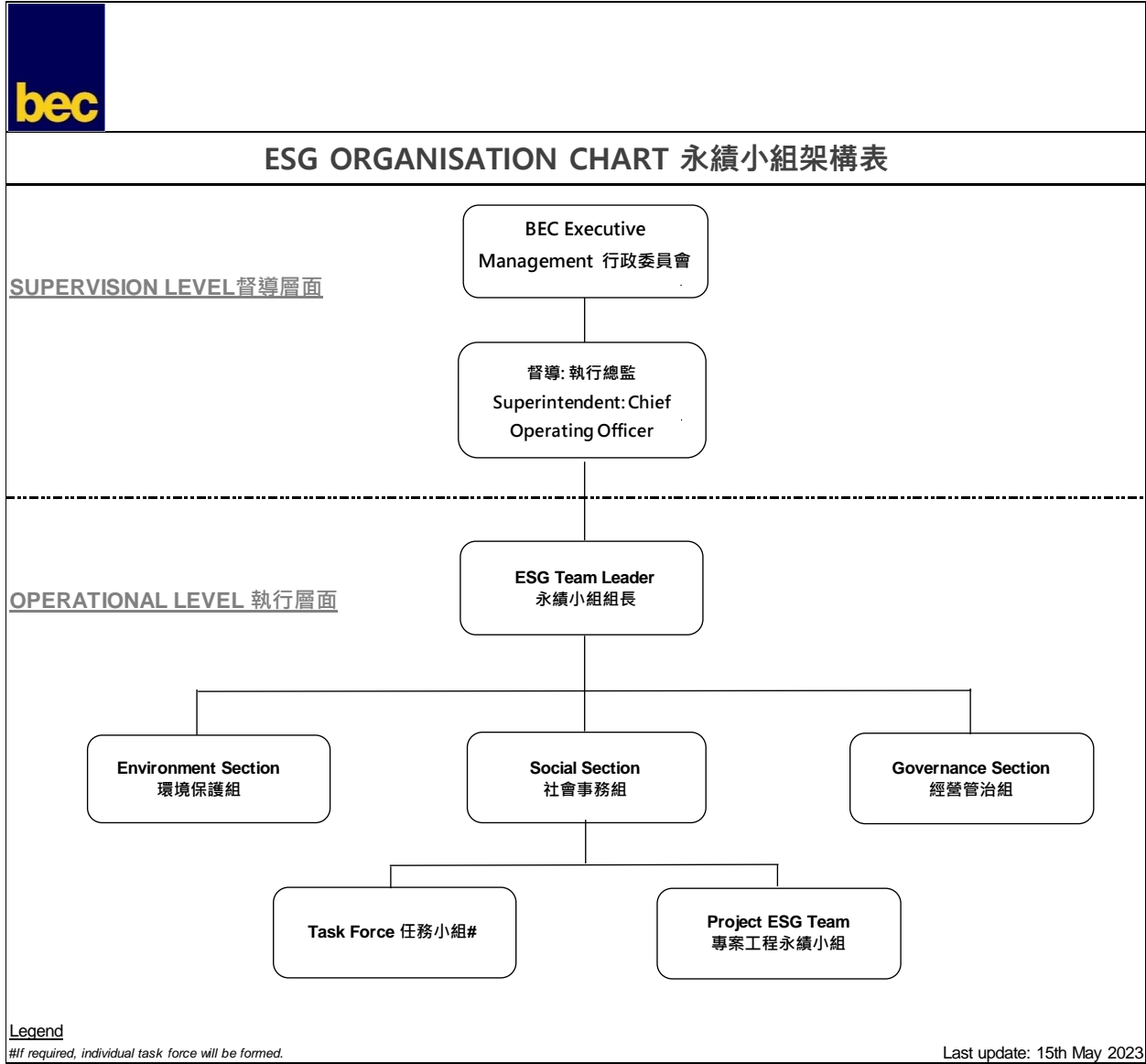
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5. Reporting and disclosure: a communications strategy to disseminate data and ESG information, aimed at making data accessible to the stakeholders that need it most.
 - Integrated report
 - Sustainability report
 - Mainstream report
 - Dedicated webpage
 - Other topic-specific reports (water, climate & deforestation)
 - Data accessibility

本公司目前正在制定環保，社會責任及公司管治計劃書，包括 5 個基本組成部分：

1. 戰略和承諾：推動計劃向前發展並確保持續改進環保，社會責任及公司管治問題績效的目標。
 - 目的及目標
 - 重要性
 - 風險管理框架，包括環保, 社會責任及公司管治風險
 - 環保，社會責任及公司管治委員會監督
 - 與全球公認的標準和框架保持一致
2. 準則及政策：企業範圍的系統，用於實施環保, 社會責任及公司管治並將其嵌入流程和業務戰略中。
 - 行為準則或道德規範
 - 供應商行為準則
 - 可持續發展政策 (例如人權、合規、採購、環境健康與安全)
 - 部署全公司範圍內可持續發展的原則
3. 計劃和舉措：實現承諾及驗證外部第三方努力的行動步驟路線圖。
 - 行動計劃 / 路線圖
 - 環境及社會管理計劃
 - 管理體系認證

- 可再生能源
 - 獎項及嘉許
4. 利益相關者的參與：組織內外的協作，以瞭解並解決業務上的影響。
- 行業合作及成為會員
 - 環保，社會責任及公司管治事務的價值鏈參與（客戶，供應商及員工）
 - 社區關係及企業捐贈
5. 報告及披露：環保，社會責任及公司管治資訊的溝通策略及傳播數據，旨在使最需要數據的利益相關者可以訪問數據。
- 綜合報告
 - 可持續發展報告
 - 主體報告
 - 專用網頁
 - 其他特定主題的報告（水、氣候及森林砍伐）
 - 數據的可訪問性

8. BEC ESG Organisation Chart 永續小組架構圖



9. Declaration of Supplier Alliance for Net Zero Emission 供應商淨零聯盟宣言

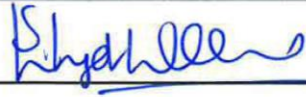
供應商淨零聯盟宣言
Declaration of Supplier Alliance for Net Zero Emission

為因應全球低碳轉型及淨零排放趨勢，應當制定及實施有效的溫室氣體管理目標、管理計畫，減量方法，以淨零排放為目標，致力於減緩氣候變遷造成之不利影響，並期望能結合所有利害關係人共同建構一個氣候正義的社會，與永續長存的生活環境。

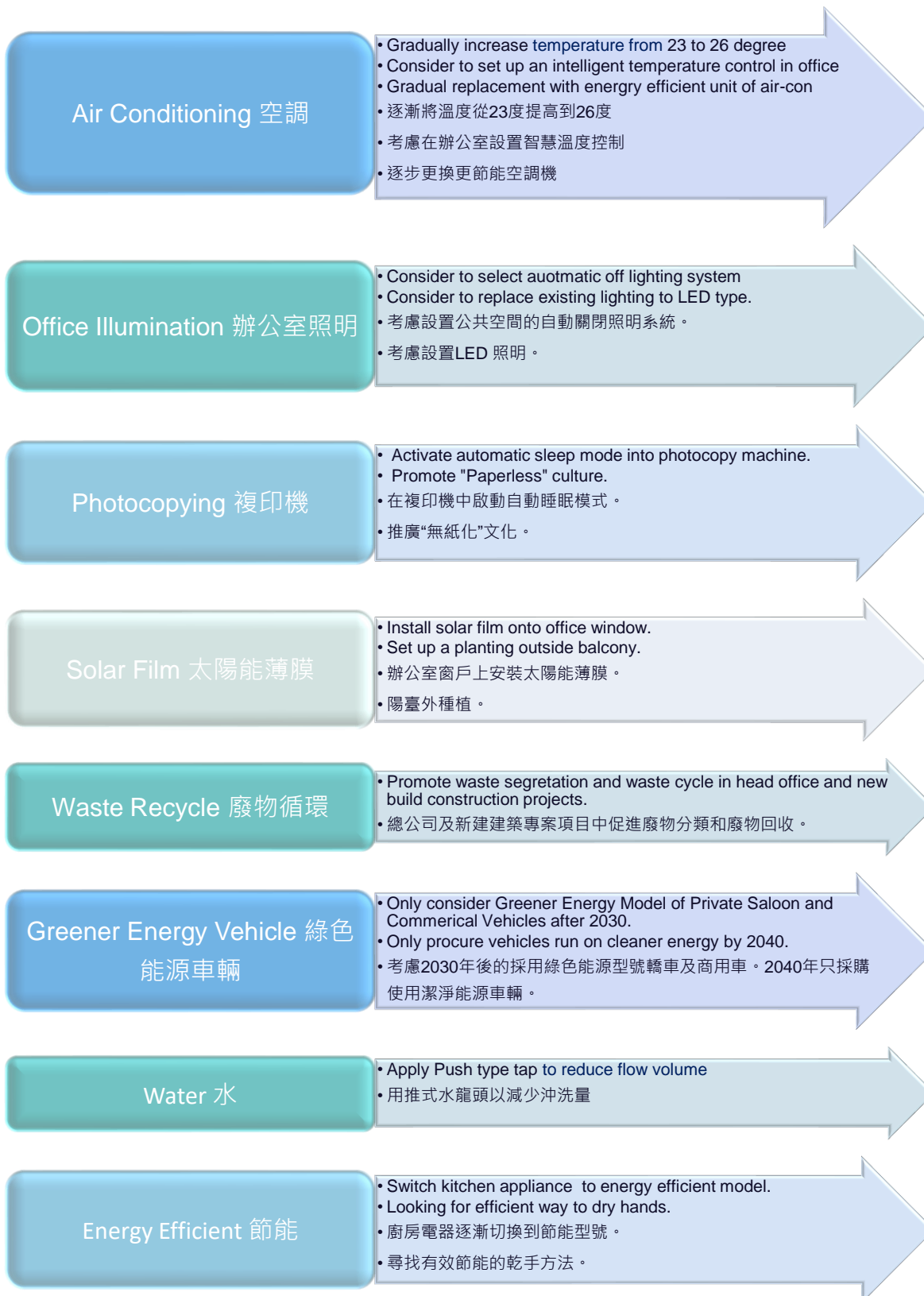
In response to the global trend towards low-carbon transformation and Net Zero emissions, effective targets for managing greenhouse gases, plans, and reduction methods should be established and implemented with the aim of achieving net-zero emissions. We committed to mitigate the adverse effects of climate change and hope to work with all suppliers to build a climate-just society and a sustainable living environment.

新加坡倍衡工程建築有限公司 (供應商) 承諾為以下事項共同努力：
Balanced Engineering & Construction (supplier) committed to work together on following issues: Pte Ltd

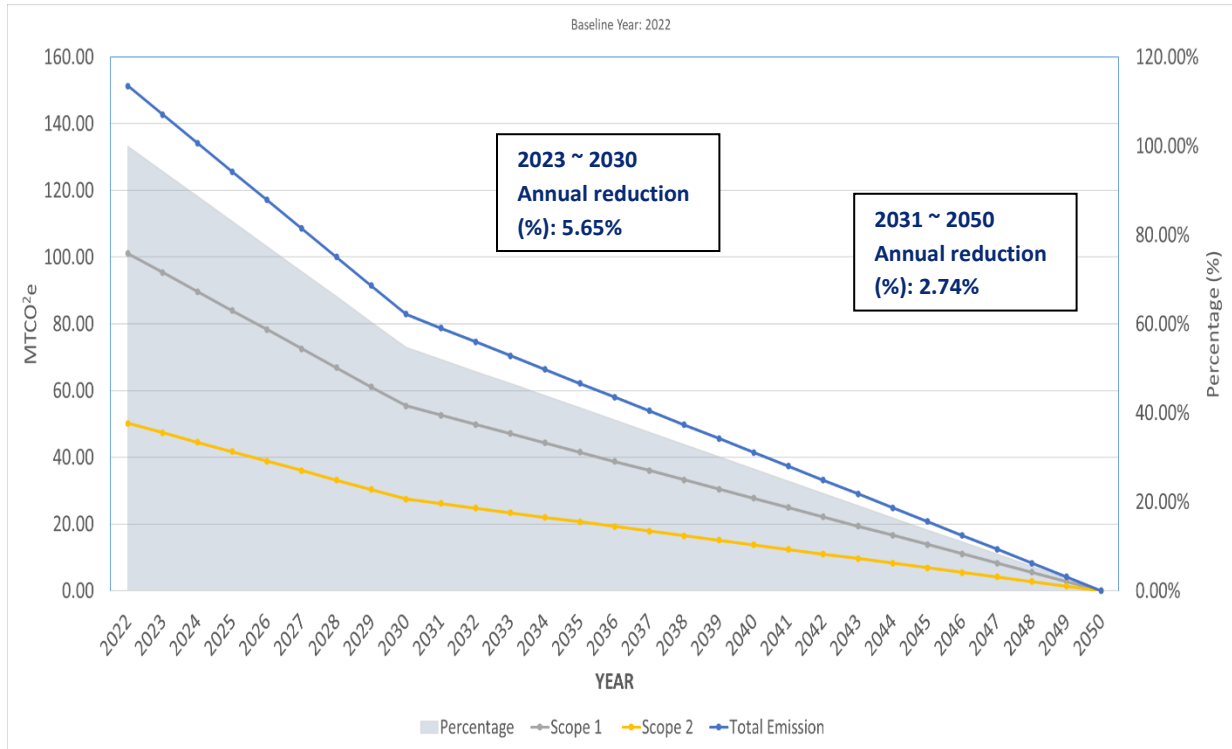


簽署人 Signatory (廠商負責人簽章 signed by responsible person)	<u></u>
電話 Phone	<u>65 - 6778 6858</u>
電子信箱 E-mail	<u>elw@be-con.com</u>
日期 Date	<u>12 - 5 - 2013</u>

10. Short & Long-Term GHG Reduction Strategies 長短期溫室氣體減排策略



11. 2050 Net Zero Roadmap (SBTi 1.5°C) 2050 年淨零排放路線圖



Set Net-Zero Target including a Long-term Science-based Target 設定淨零目, 包括長期碳排放目標

BEC commits to set a long-term science-based target to reach net-zero value chain GHGs emissions by not later than 2050 in line with the SBTi Net-Zero Standard.

BEC 承諾設定一個長期碳排放目標，根據 SBTi 淨零排放標準，不遲於 2050 年實現溫室氣體淨零排放目標。

GHG Emission Reduction Target Trend from 2023 to 2050 減排目標趨勢

Year	Percentage after Reduction	MtCO ₂ e			Annual Reduction %
		Scope 1	Scope 2	Total Emission	
2022	100.00%	101.10	50.20	151.30	0%
2023	94.35%	95.39	47.36	142.75	5.65%
2024	88.70%	89.68	44.53	134.20	5.65%
2025	83.05%	83.96	41.69	125.65	5.65%
2026	77.40%	78.25	38.85	117.11	5.65%
2027	71.75%	72.54	36.02	108.56	5.65%
2028	66.10%	66.83	33.18	100.01	5.65%
2029	60.45%	61.11	30.35	91.46	5.65%
2030	54.80%	55.40	27.51	82.91	5.65%
2031	52.06%	52.63	26.13	78.77	2.74%
2032	49.32%	49.86	24.76	74.62	2.74%
2033	46.58%	47.09	23.38	70.48	2.74%
2034	43.84%	44.32	22.01	66.33	2.74%
2035	41.10%	41.55	20.63	62.18	2.74%
2036	38.36%	38.78	19.26	58.04	2.74%
2037	35.62%	36.01	17.88	53.89	2.74%
2038	32.88%	33.24	16.51	49.75	2.74%
2039	30.14%	30.47	15.13	45.60	2.74%
2040	27.40%	27.70	13.75	41.46	2.74%
2041	24.66%	24.93	12.38	37.31	2.74%
2042	21.92%	22.16	11.00	33.16	2.74%
2043	19.18%	19.39	9.63	29.02	2.74%
2044	16.44%	16.62	8.25	24.87	2.74%
2045	13.70%	13.85	6.88	20.73	2.74%
2046	10.96%	11.08	5.50	16.58	2.74%
2047	8.22%	8.31	4.13	12.44	2.74%
2048	5.48%	5.54	2.75	8.29	2.74%
2049	2.74%	2.77	1.38	4.15	2.74%
2050	0.00%	0.00	0.00	0.00	2.74%

12. ESG Training and Capability-building 環保, 社會責任及公司管治訓練及建構

The ESG and relevant environmental internal and external training will be organised to the managerial and safety staff in Singapore and various Branch Offices.

1. Organize ESG or / and Zero Emission events across various projects.
2. Organize in-house ESG extensive training programme to key managerial and HSE staff.
3. Organize a ESG workshop with Project's Operational Level to set GHG emission reduction target that are align with our target.
4. Support and Participate World-famous Earth Hour initiative organized by WWF.

The below are the example for BEC staff attended ESG related training throughout international institutions.

針對新加坡和各地分公司的管理及安全人員提供環保, 社會責任及公司管治及相關環境內部和外部培訓。

- 在各個項目中組織環保, 社會責任及公司管治 或 / 和 零排放活動。
- 為主要管理人員和職安環員工組織內部環保, 社會責任及公司管治廣泛培訓計劃。
- 組織與專案運營層面的環保, 社會責任及公司管治研討會, 以設定與我們的高水準一致的溫室氣體減排目標。
- 支援及參與世界自然基金會組織的舉世聞名的「地球一小時」倡議。

以下是 BEC 員工在國際機構參加環保, 社會責任及公司管治相關培訓的例子。





CERTIFICATE

This is to certify that

HO WING HONG WINCO
S7269012E

has successfully completed the course of study and passed the prescribed examination of

Environmental Control Officers' Course
Conducted from 5 Apr – 27 May 2010

Examination Date: ***8 Jun 2010***

A handwritten signature in black ink, appearing to read "Ong Eng Kian".

ONG ENG KIAN

DIRECTOR
SINGAPORE ENVIRONMENT INSTITUTE
NATIONAL ENVIRONMENT AGENCY
REPUBLIC OF SINGAPORE

13. ESG Promotion Programme 環保, 社會責任及公司管治計劃

It is a programme that helps us to promote the environmental, social, and governance (ESG) initiatives. Our program provides companies with a variety of resources, including:

- A toolkit that helps companies develop and implement ESG initiatives
- A network of experts who can provide guidance and support
- A platform for sharing ESG best practices

Our ESG Promotion Programme is applied to the head office, workshop and worksite. For the compliance. We are committed to the following:

- Publishing an ESG report
- Setting ESG targets
- Measuring and reporting on their ESG performance
- Engaging with stakeholders on ESG issues

Our ESG Promotion Programme is a valuable resource that are looking to improve our ESG performance. The programme provides us with the tools and support to make a positive impact on the world.

- Create a dedicated ESG section in the company webpage. This will give employees, construction consultants, and clients a room to learn about the company's ESG initiatives.
- Publish annual ESG report. This report provides transparency about our company's ESG performance, including the goals, targets, and progress.
- Get involved in the ESG community. Attend ESG events, networks, workshop and collaborate with other companies on ESG initiatives.
- Support ESG-related causes. Make donations to ESG-related charities or organizations, or volunteer your time to support ESG causes.

By promoting the ESG programme, our staff will help to raise awareness of our company's commitment to sustainability and responsible business practices. This can lead to increased brand awareness, improved employee morale, and enhanced our client's confidence.

該計劃有助於我們促進環保，社會責任及公司管治計劃。我們的計劃為公司提供各種資源，包括：

- 說明公司制定和實施環保，社會責任及公司管治計劃的工具包

- 可以提供指導和支援的專家網路
- 分享環保、社會責任及公司管治最佳實踐的平臺

我們的環保、社會責任及公司管治推廣計劃適用於總部、工場及工地。為了合規，我們致力於以下方面：

- 發佈環保、社會責任及公司管治報告
- 設定環保、社會責任及公司管治目標
- 衡量和報告其環保、社會責任及公司管治績效
- 與利益相關者就環保、社會責任及公司管治問題進行接觸

我們的環保、社會責任及公司管治推廣計劃是旨在改善我們的環保、社會責任及公司管治績效的寶貴資源。該計劃為我們提供了對世界產生積極影響的工具和支援。

在公司網頁中增設專門的環保、社會責任及公司管治部分。這網頁將為員工、建築顧問和客戶提供瞭解公司環保、社會責任及公司管治舉措的媒介。

發佈年度環保、社會責任及公司管治報告。本報告提供了有關我們公司環保、社會責任及公司管治績效的透明度，包括目標、指標和進展。

參與環保、社會責任及公司管治社區。參加環保、社會責任及公司管治活動，加入環保、社會責任及公司管治網路，並與其他公司合作開展環保、社會責任及公司管治計劃。

支持與環保、社會責任及公司管治相關的事業。向與環保、社會責任及公司管治相關的慈善機構或組織捐助

透過推廣環保、社會責任及公司管治計劃，我們的員工將說明提高人們對公司對可持續發展及負責任商業實踐的承諾的認識。同時地，可以提高品牌知名度，提高員工士氣，並增強客戶的信心。

14. GHG Emissions Inventory & Statistic in Singapore Head Office, Maintenance Department & Taiwan Branch 新加坡總公司暨維修部及臺灣分行溫室氣體排放清單及統計表

GHG Inventory Management System

GHG Inventory Management System is a way to organize and structure all the steps and elements needed to estimate, report, review, archive, and improve estimates of GHG emissions and removals. It includes institutional, legal, and procedural arrangements that facilitate management of key inventory tasks during the inventory compilation process like planning, collecting and documenting information about data, documenting steps, reviewing, reporting, archiving, and planning improvements.

溫室氣體排放清單管理系統是一種組織和構建估計、報告、審查、存檔及改進溫室氣體排放量及銷減量估計所需的所有步驟及元素的方法。它包括體制、法律和程序安排，方便於在清單編製過程中管理關鍵清單任務，如規劃、收集及記錄有關數據的信息、記錄步驟、審查、報告、存檔及改進規劃。

GHG Inventory Compilation Cycle 溫室氣體清單週期

Our company proposes the GHG Inventory Management System to manage the 7 stages as the below:

1. Plan
2. Collect
3. Estimate
4. Write
5. Review
6. Finalize and submit report
7. Archive

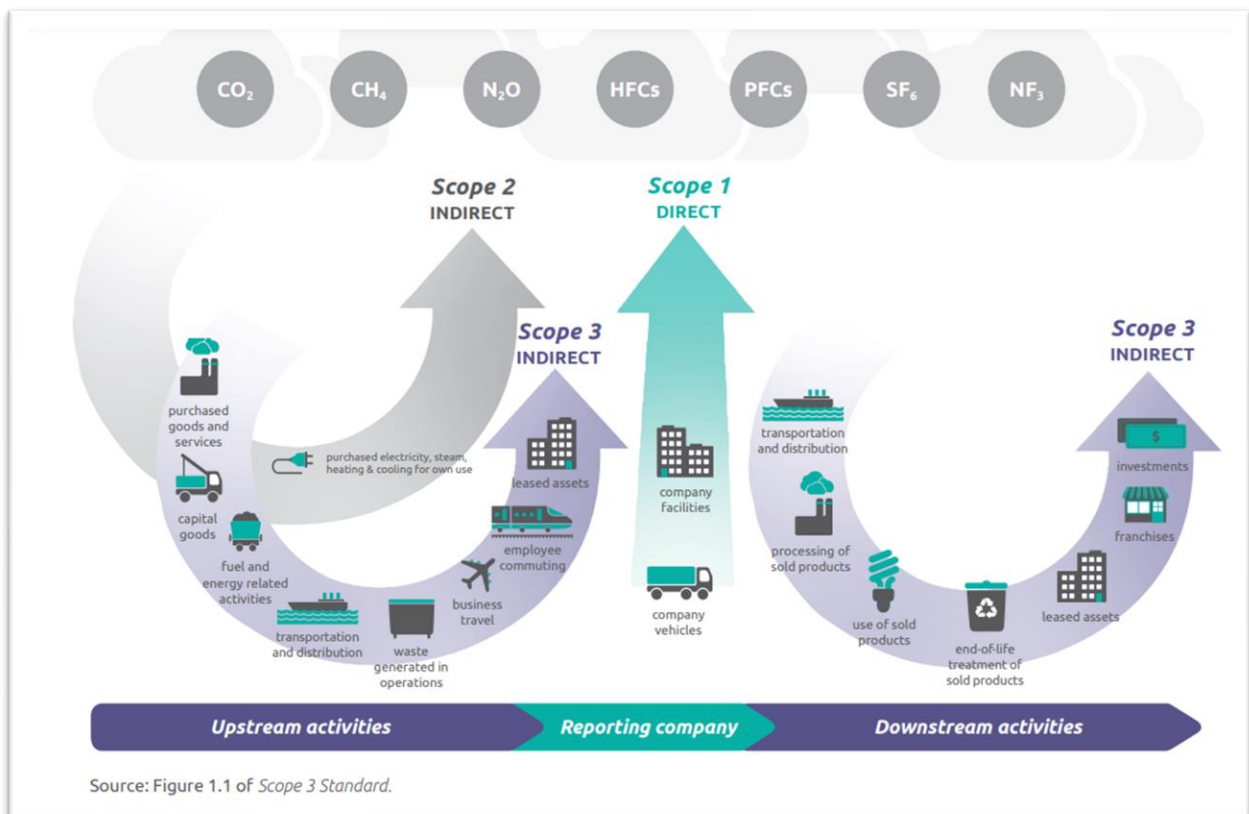
我公司建議建立溫室氣體排放清單管理系統來管理以下 7 個階段：

1. 計劃
2. 收集
3. 估算
4. 撰寫
5. 審查
6. 完成並提交報告
7. 存檔

Scope #1 - #2 GHG Emission Inventory 溫室氣體排放清單

Type 種類	Form 形式	Consumption Unit 消耗單位	Emission Unit 排放單位
Power 能量	Electricity 電力	kWH	MtCO ₂ e 立方米 碳排放
Transportation 運輸	Petrol (Gasoline) 電油	Litre / Gallon	
	Diesel 油渣		
Production Process 生產過程	Waste (solid, biological waste & water discharge) 廢物含固態, 生物及污水	Ton	

Scope 1 & 2 Interpretation 組別#1, #2 圖解



Carbon Dioxide CO² Emission Statistic 溫室氣體排放統計表

Scope #1 - Direct 組別#1- 直接排放

Business Unit (Bus)	Company Vehicle (No)	Litres of Petrol (Gasoline)	MtCO ² e / Annually	Litres of Diesel	MtCO ² e / Annually
Singapore Head Office 新加坡總公司	3	23271.36L	53.4 metric ton	0	0
SG Maintenance Department 新加坡維修部	1	0	0	8082.48L	22.06 metric tons
CTCI Taichung 中鼎台中工程	2	Not applicable 不適用	2.5 metric tons	31.41L	0.086 metric ton
CTCI Hsinta 中鼎興達工程	3	Not applicable 不適用	21.7 metric tons	1831.05L	1.32 metric tons
Total				101.1 metric tons	

Scope #2 - Indirect 組別#2 – 間接排放

Business Unit (Bus)	Electricity consumption (kWh)	Nos. of air-con	Number of fridge	MtCO ² e / Annually	Get Set (number)	Litres of Diesel	MtCO ² e / Annually
Singapore Head Office 新加坡總公司	44,143.87 kWh	12	2	21.1 metric tons	Not applicable 不適用		
SG Maintenance Department 新加坡維修部	4,928kWh	0	0	2.3 metric tons	Not applicable 不適用		
CTCI Taichung 中鼎台中工程	Power supplied by CTCI	7	1	Not applicable 不適用	Power supplied by CTCI 電力由中鼎提供		
CTCI Hsinta 中鼎興達工程	36337.47 kWh	5	1	15.7 metric tons	2	4050L	11.06 metric tons
Total						50.2 metric tons	

Baseline Year Setting 設定基礎年									
Baseline 設定基礎年:	2022			Year					
GHG emissions for that year 當年溫室氣體排放:	151.3			MtCO ² e					
Scope 1 Direct Emissions 直接排放 :	101.1			MtCO ² e					
Scope 2 Direct Emissions 間接排放 :	50.2			MtCO ² e					
Carbon Reduction Target Setting 二氧化碳減排設定									
	2022	2023	2024	2025	2026	2027	2028	2029	2030
Cumulative carbon reduction 類計二氧化碳 減排設定 (%)	0%	5.65%	11.3%	16.95%	22.6%	28.25%	33.9%	39.55%	45.2%
Total carbon reduction 總 二氧化碳減排 (MtCO ₂ e)	0	0	0	0	0	0	0	0	0
Verification of reduction performance 審核減排表現									

Instructions for completing the form :

1. Only the yellow sections need to be filled in.
2. If the manufacturer has not set a baseline year and carbon reduction target, it is recommended to use the most recent audit year as the baseline year.
3. The carbon reduction amount is based on the baseline year and is calculated as "(baseline year - target year) / baseline year".
4. Cumulative carbon reduction amount: If the manufacturer plans to reduce carbon emissions by 5% per year, the carbon reduction target for 2023 is 5%, and for 2024 it is 10%, and so on.

填寫表格的說明：

1. 只需要填寫黃色部分。
2. 如果製造商沒有設定基準年和碳減排目標，建議使用最近的審核年度作為基準年。
3. 碳減排量以基準年為基礎，按“(基準年-目標年)/基準年”計算。
4. 累計碳減排量：如果製造商計劃每年減少5%的碳排放量，則2023年的碳減排目標是5%，2024年的碳減排目標是10%，依此類推。

Reference and Guidance 參考及指導文獻

1. ESG Evolution and Best Practice: A Practical Guide for Corporate Reporting, Schneider Electric, 2022
2. Guidance of GHG Emission Review, Environmental Protection Administrative Executive Yuan, ROC
3. ESG & Net-Zero, CTCI Discover Reliable, 2023
4. Greenhouse Gases Equivalencies Calculator - Calculations and References, Environmental Protection Agency, United States of America
5. Introduction: U.S. EPA Toolkit for Building National GHG Inventory Systems, Environmental Protection Agency, United States of America

END 完