Training Course on "Management of Carbon Footprint"

Ir Sophia Lau

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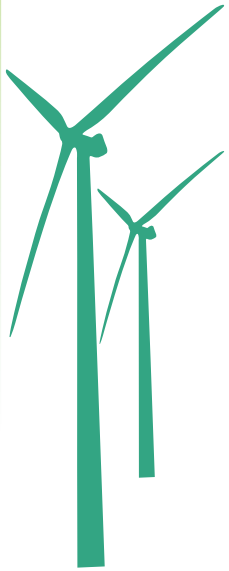
ASEL Consulting Company

20th anniversary 2020 GREEN COUNCIL 環保促進會

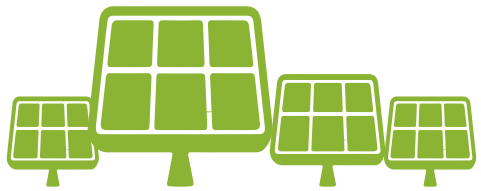
Session 1
How to Conduct Carbon Audit ?
09:30 – 10:30



By Ir Sophia Lau

Director, ASEL Consulting Company

29th June, 2020



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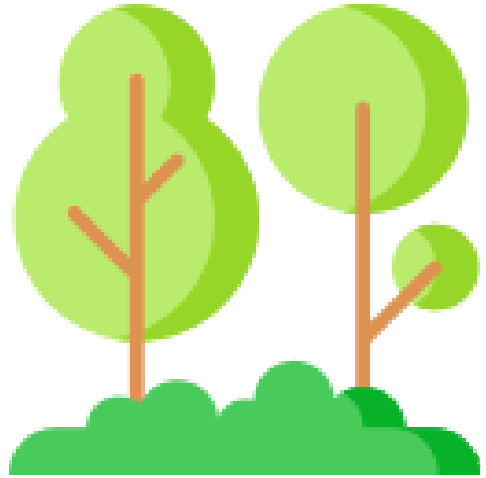
To manage carbon emissions, the first step you have to do, is to quantify your carbon emissions by conducting carbon audit.

So, what is Carbon Audit?



What is Carbon Audit ?

- Carbon Audit or Greenhouse Gas (GHG) Accounting, is a mechanism to account and report on greenhouse gas (GHG) emissions based on common standards and protocols

- Quantifies the total greenhouse gases produced directly and indirectly from a business or organisation's activities. Also known as a carbon footprint, it is an essential tool, providing your business with a basis for understanding and managing its climate change impacts.

Support Government's Reduction Target

Functions of Carbon Audit

Functions:

- Help you to understand your emissions profile
- Help you to understand your emissions sources
- Identify key emissions sources and work out corresponding effective carbon reduction measures

Support Government's Reduction Target

Measuring your carbon footprint will also enable you to:

- Prepare for future greenhouse gas legislation
- Manage carbon risk exposure and identify areas for improvement
- Improve efficiency and cut costs through reduced energy consumption
- Gain credibility by demonstrating environmental responsibility
- Motivate and engage staff by involving them in carbon reduction plans

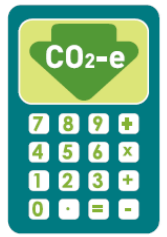
Reduce Operational Cost


Improve Organisation's Image


Demonstrate Corporate Responsibilities


Staff Engagement

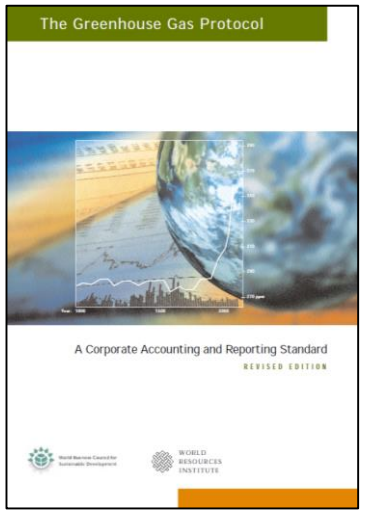

Meet Stakeholders' Expectation

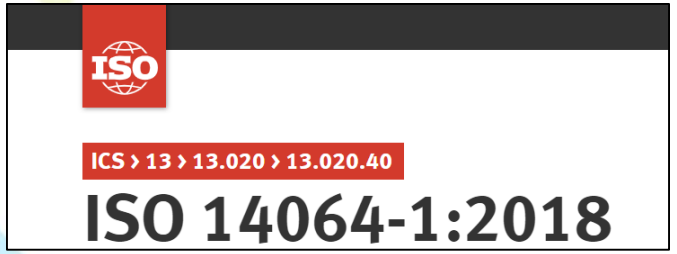


Support Government's Reduction Target

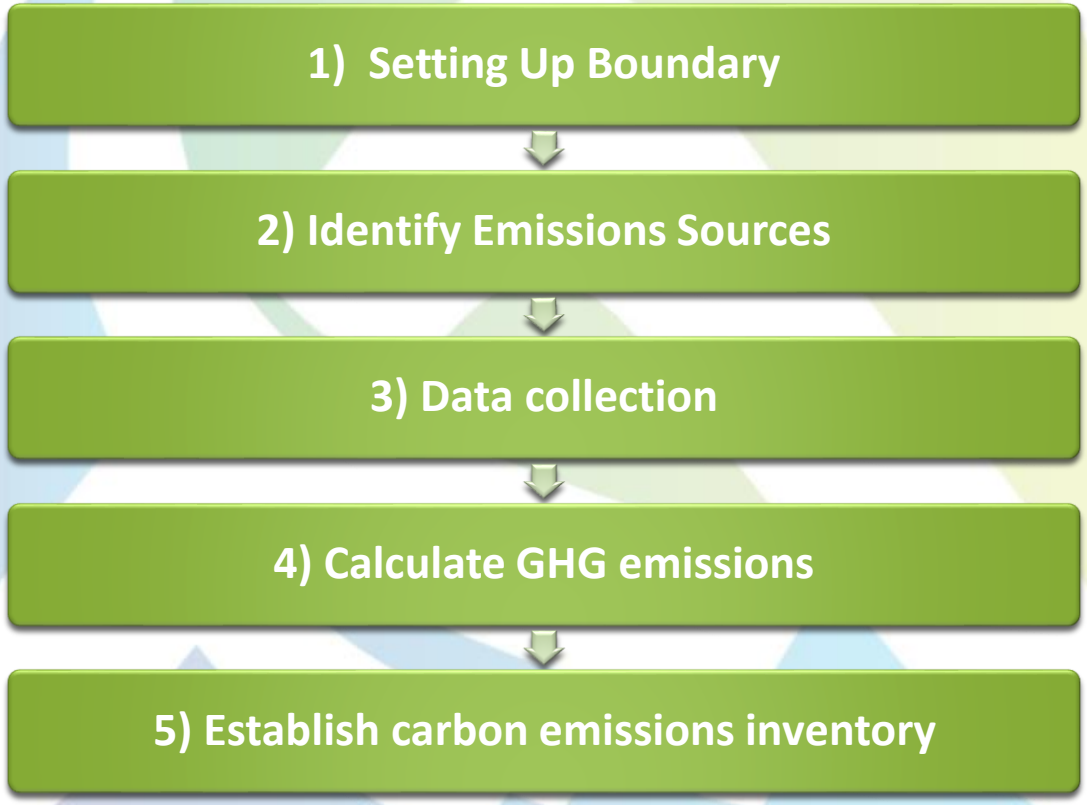
Carbon Audit Guidelines

- The “Greenhouse Gas Protocol” published by World Resources Institute and World Business Council for Sustainable Development
- “Guidelines to Account for and Report on Greenhouse Gas Emissions and Removals for Buildings (Commercial, Residential or Institutional Purposes) in Hong Kong” published by EMSD and EPD in July 2008 (2nd edition Feb 2010)
- **ISO 14064-1:2018** Greenhouse gases — Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals



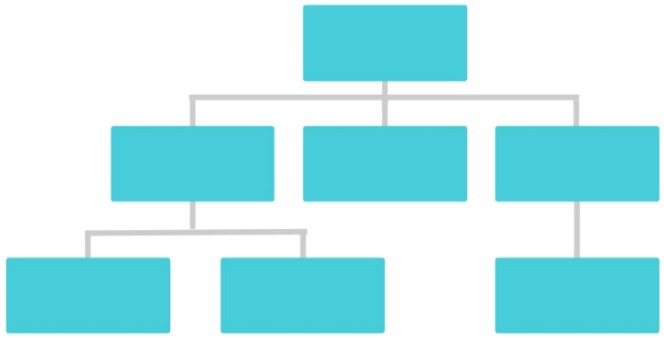


Carbon Audit Step by Step



1) Setting Up Boundary

① Organization Boundary

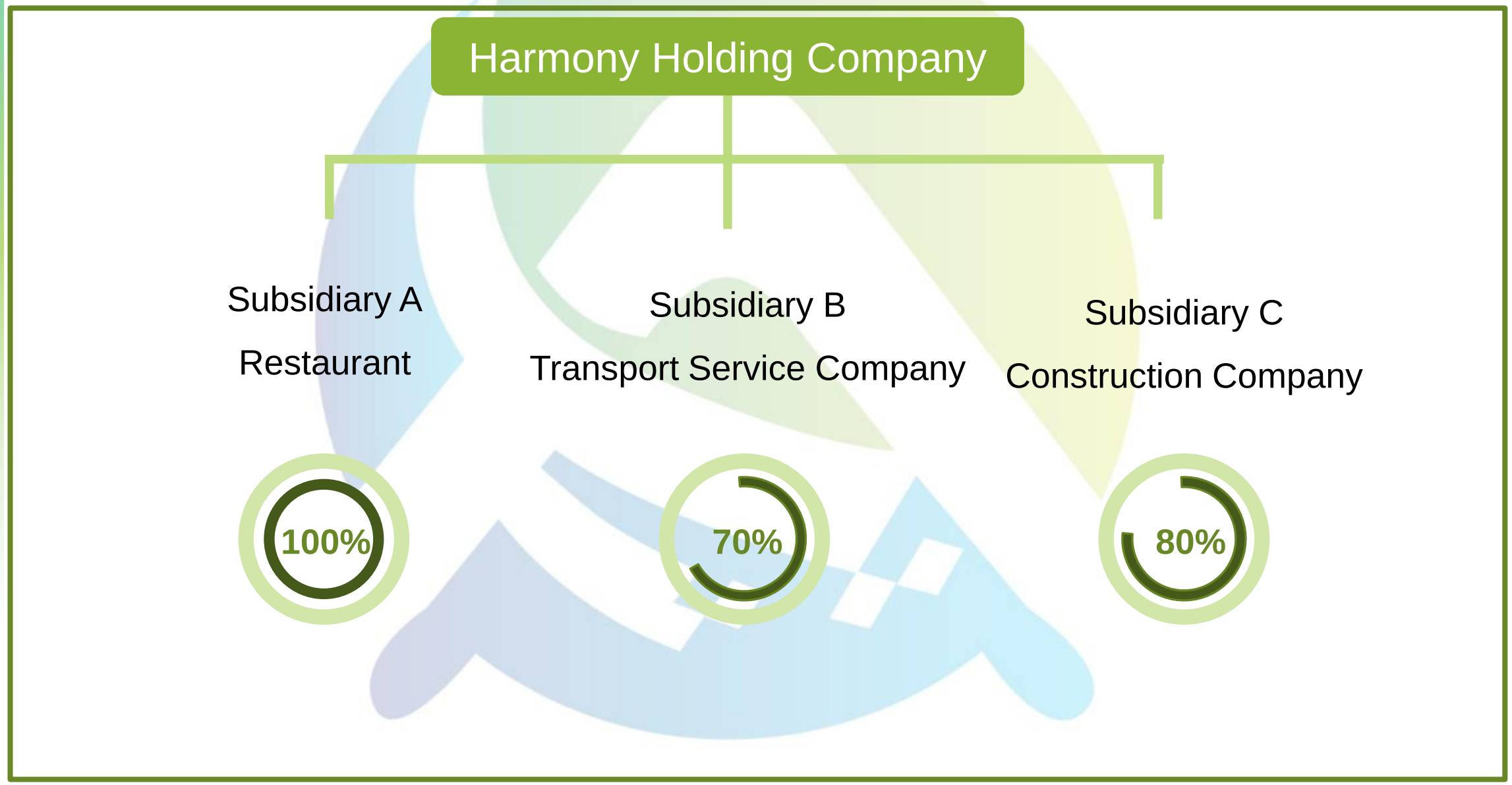


- Equity Approach
- Control Approach

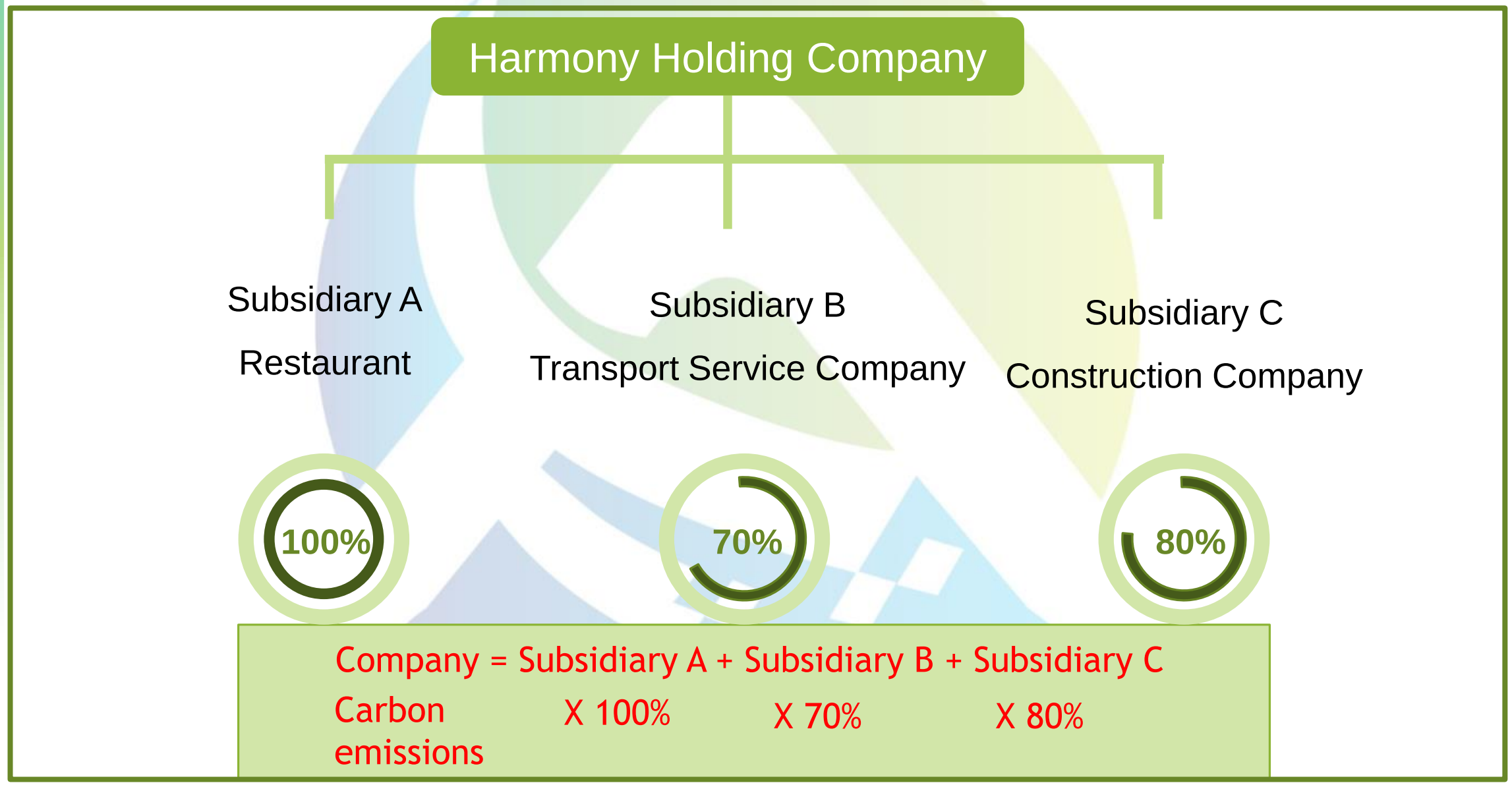
② Operational Boundary

- Scope 1
- Scope 2
- Scope 3

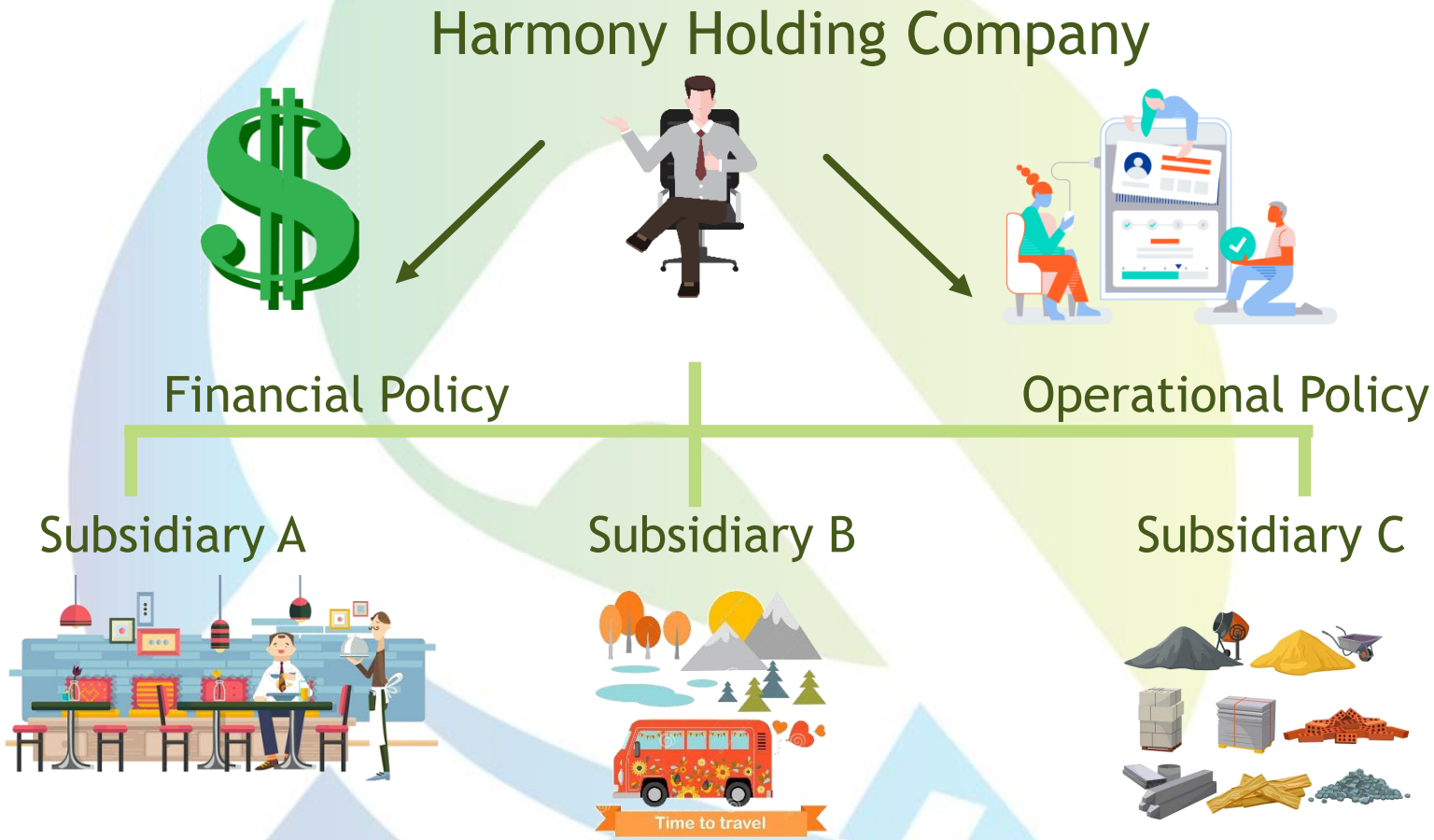
1) Organizational Boundary - Example



If you choose “Equity Approach” :

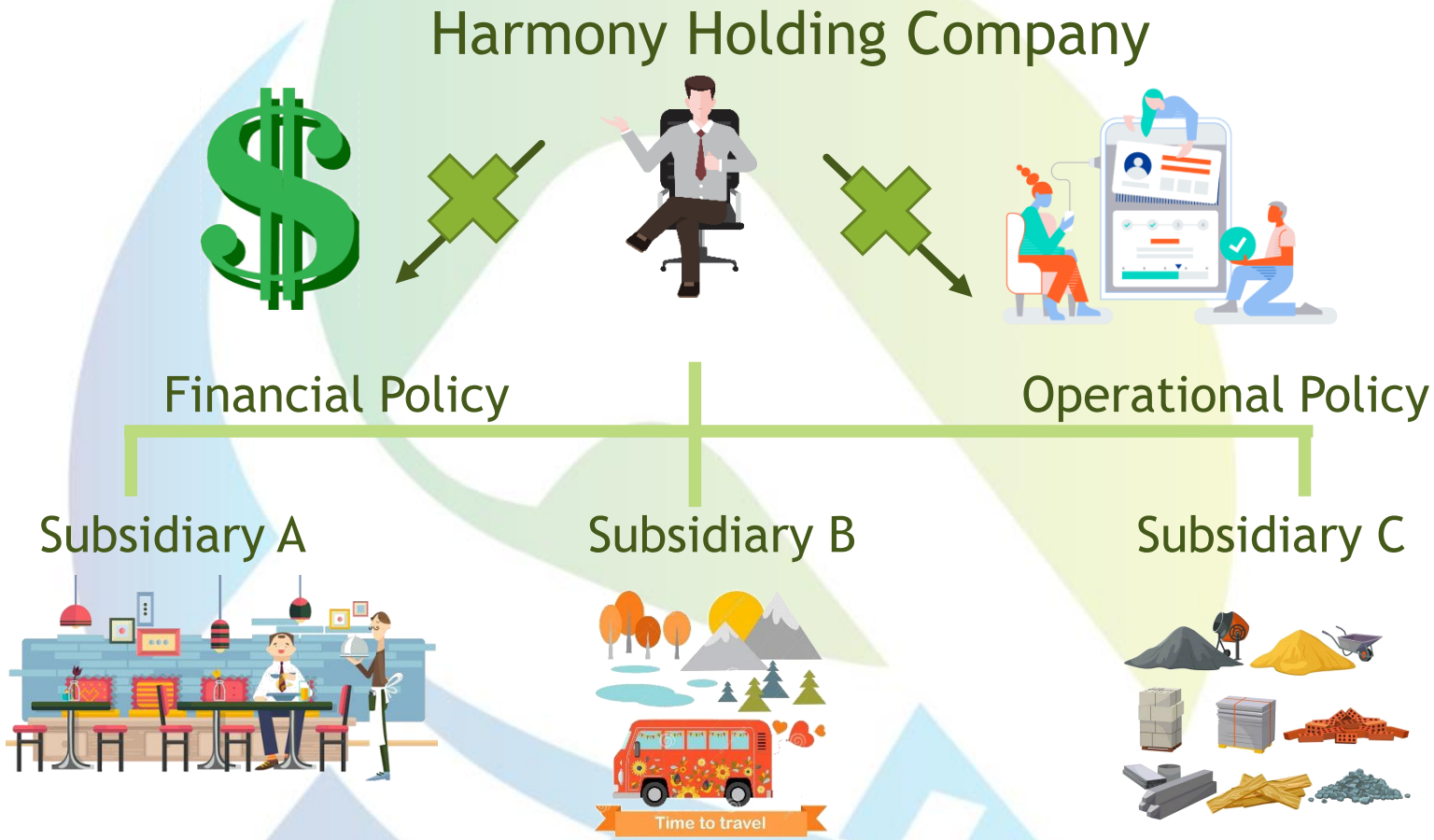


If you choose “Control Approach” :



Harmony Company =	Subsidiary A +	Subsidiary B +	Subsidiary C
Carbon emissions	x 0%	x 0%	x 0%

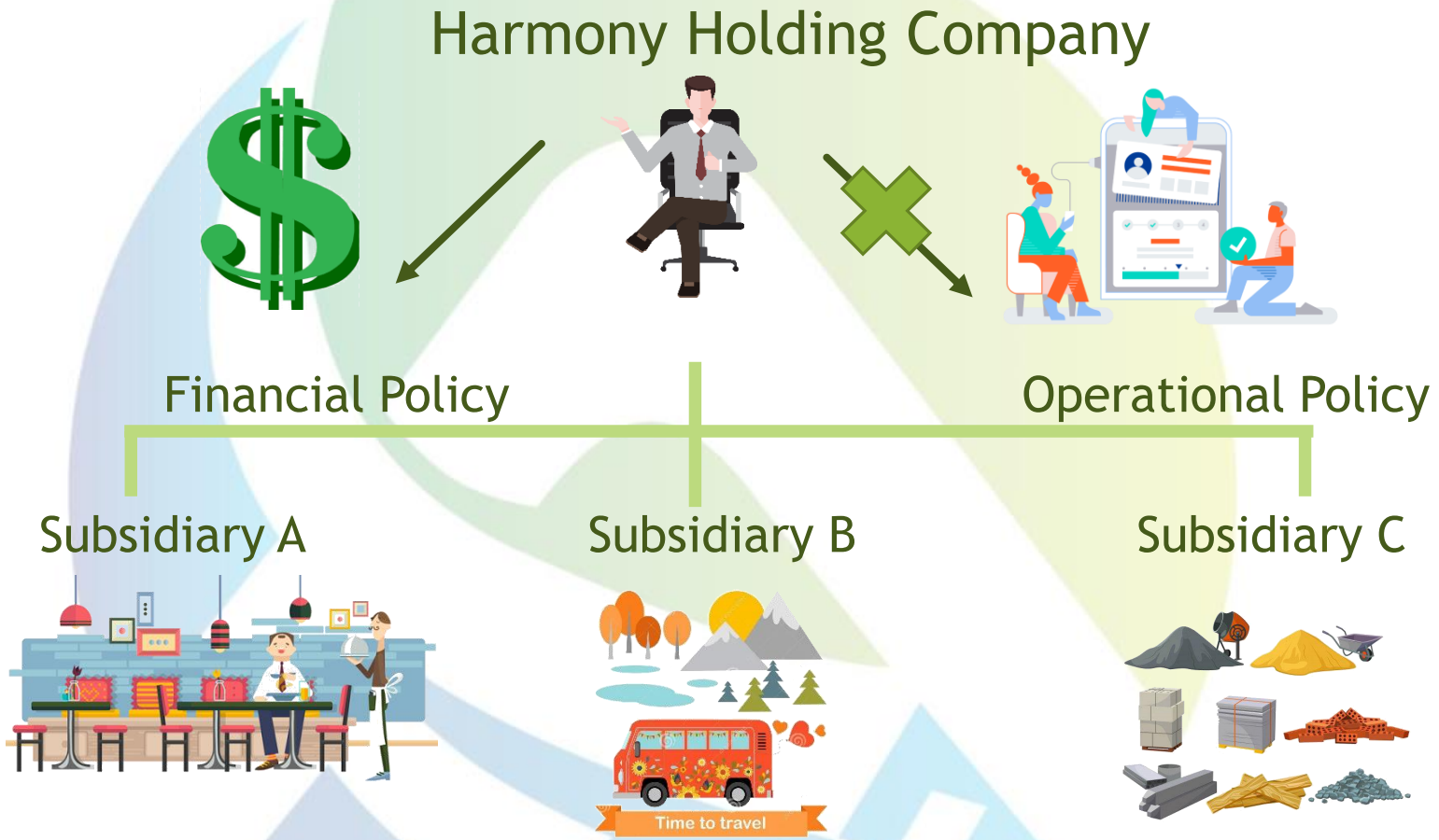
If you choose “Control Approach” :



Harmony Company	= Subsidiary A	+ Subsidiary B	+ Subsidiary C
Carbon emissions	x 0%	x 0%	x 0%

When you choose “Control Approach” and if you have either control over:

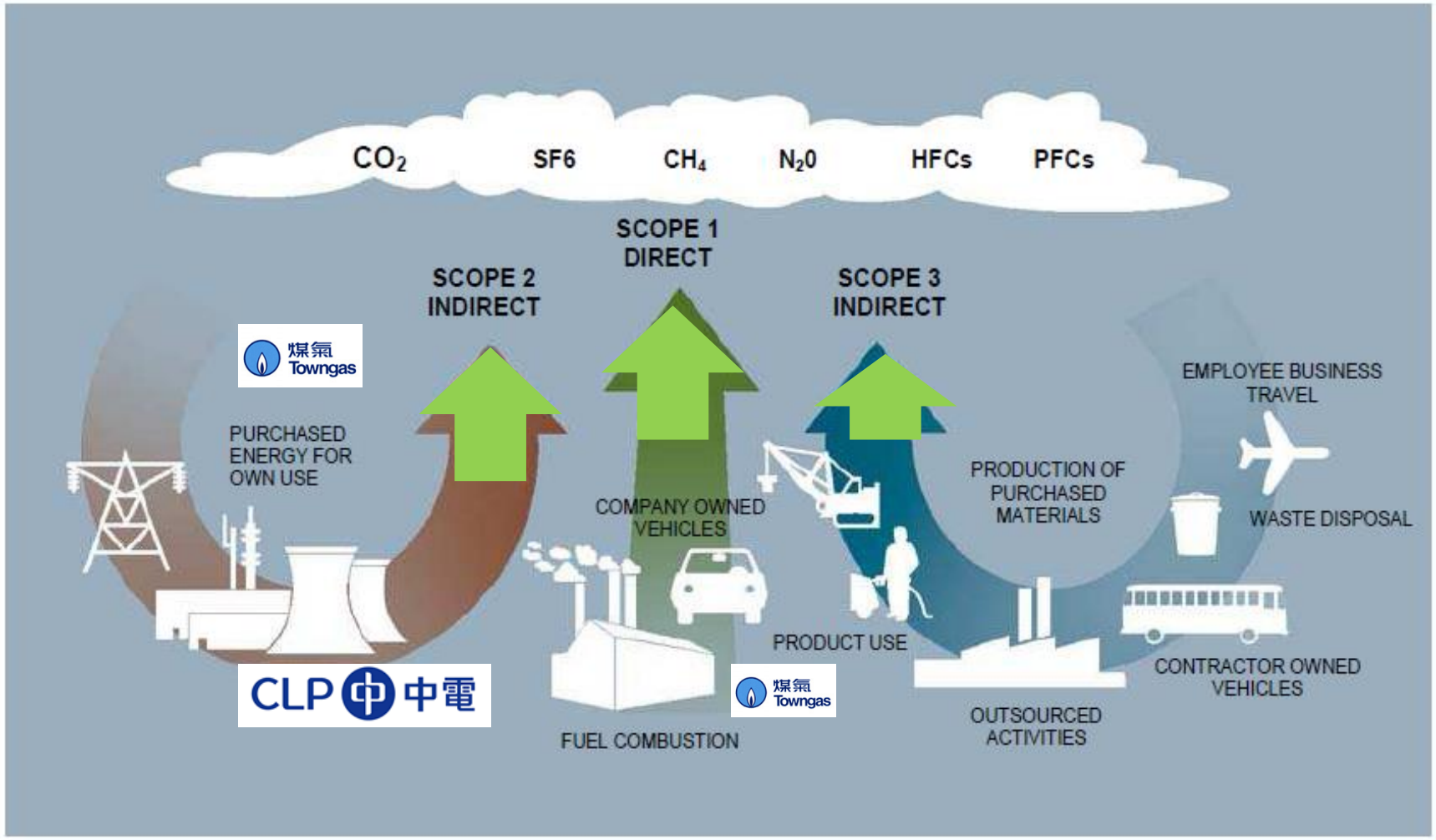
Scenario 3



Harmony Company =	Subsidiary A +	Subsidiary B +	Subsidiary C
Carbon emissions	x 100%	x 100%	x 100%

Operational Boundary

To define which operational activities at a facility are included in the inventory.



Step 2 Identify Emission Sources

<u>Scope 1</u>: Direct Emissions (direct control)

- Generators
- Vehicle/ ground services equipment emissions
- Use of towngas
- Leakage from the use of refrigerants

<u>Scope 2</u>: Indirect Emissions from the use of energy

- Use of electricity
- Use of towngas

<u>Scope 3 (Optional)</u>: Other Indirect Emissions associated with company's activities

- Electricity consumed due to water consumption / sewage disposal
- GHGs released from Waste disposal at landfill (paper)

(EPD,EMSD guideline)

Let's look at the operations of the three subsidiaries under Harmony Holding Company

Harmony Holding Company

Subsidiary A	Subsidiary B	Company C
Restaurant	Transport Service Company	Construction Company

Subsidiary A - Harmony Restaurant

1

2

3

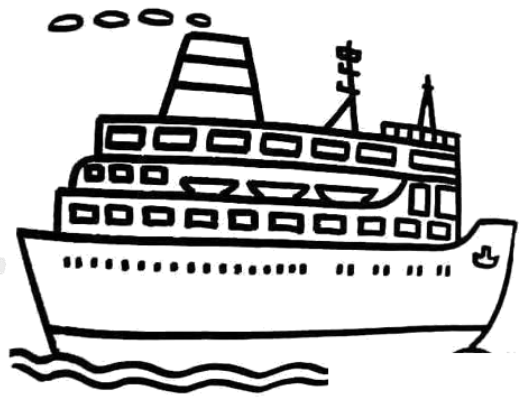
4

5

Subsidiary B –Transport Services Company

1

2



3

4

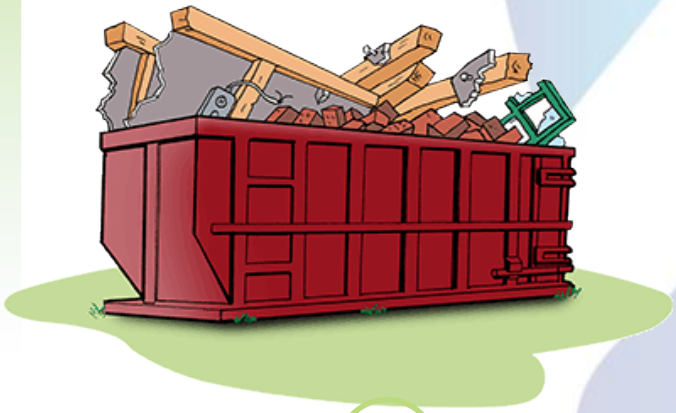
Subsidiary C – Harmony Construction

1

2

3

4



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Subsidiary A – Harmony Restaurant

- Use of water for food washing
- Use of electricity to keep food cold
- Use of fuel in transportation of food to restaurant

- Use of fuel, towngas for cooking
- use of electricity in the kitchen, oven, lightings etc.

- Use of water in making juice, soup or cooking
- use of water in cleaning the table
- Generation of waste e.g. straw
- Use of water in dish washing

- Disposal of waste by truck
- Decomposition of waste at the landfill

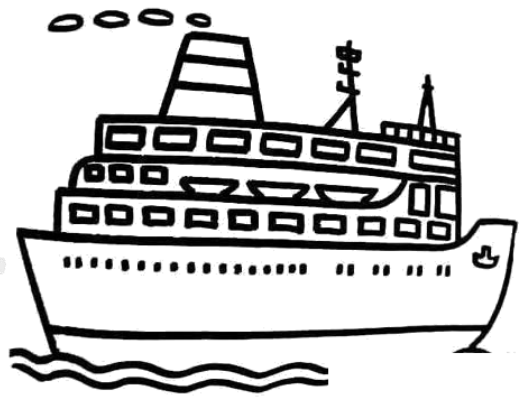
- use of electricity for air-conditioning, lightings, music etc.
- Generation of waste e.g. tissue paper
- Refrigerants used in cooling system

Subsidiary B –Transport Services Company

- Use of fuel

- Emissions from fuel combustions

- Water from washing
- Energy from ground equipment use



4

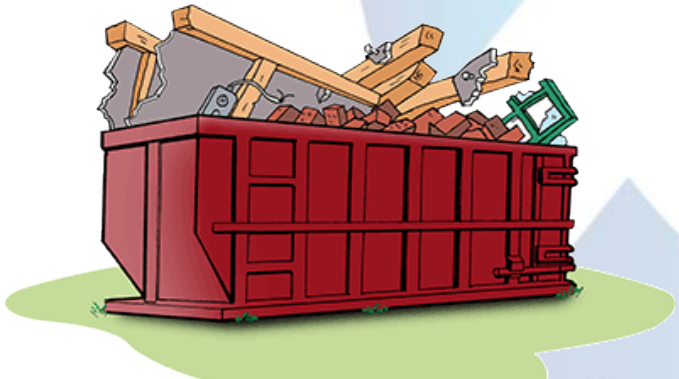
3

Subsidiary C – Harmony Construction

- Use of fuel in transportation raw materials to the construction site

- Use of fuel in materials delivery within construction site

- Use of fuel i.e. diesel in powered mechanical equipment
- Use of water for dust suppression



- Disposal and treatment of construction waste

- Use of electricity, water, papers in site office

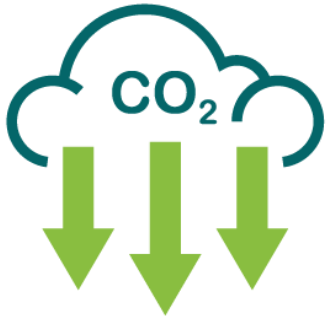
Step 2 Identify Removal Sources

Emissions Removal

- Each Newly Planted tree in the company's boundary will remove 23kg of CO_2 per year on site.

- trees that are capable to reach 5m in height

(Under EPD/EMSD guideline)

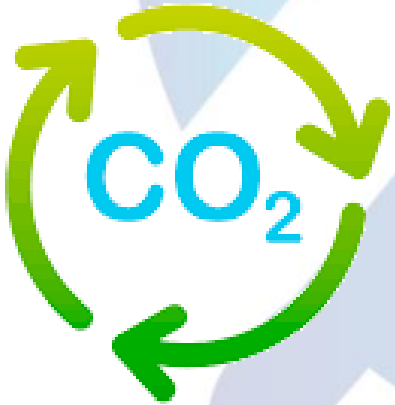


Step 3 – Data Collection

Table	Emission Type	Data Source
Scope 1	Fixed Source - Generator etc.	-Fuel invoice -Filling record
	Mobile Source -Vehicle -Ships -Aircraft	-Fuel invoice -Filling record
	Emissions from refrigerants leakage	- Refilling record
	Emissions Removal from Newly planted trees	- Property management / landscape contractor
Scope 2	Electricity Consumption	- Electricity bills
	Towngas	- Towngas bills
Scope 3	Waste paper disposed to landfill	-purchasing record, recycling record -Purchasing Dept, Admin office, waste collector
	Fresh water consumption	- Water bills
	Sewage disposal	- Water bills

Step 4 - Calculate GHG Emissions

1 tonne of Carbon Dioxide is equivalent to a balloon **10 metres** in Diameter!



Step 4 - Calculate GHG Emissions

- Carbon Dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulphur hexafluoride (SF_6)

} "CO_2-e" (tonnes)

- **Carbon dioxide equivalent** (**CO_2-e**) describes how much global warming a given type and amount of greenhouse gas may cause, using the functionally equivalent amount or concentration of carbon dioxide(CO_2) as the reference.

CO2-e	=	GHG emissions	X	Global Warming Potential (GWP)

Global Warming Potential (GWP) (updated in 2014 IPCC AR5)

Global warming potential (GWP) is a measure of how much a given mass of greenhouse gas contributes to global warming relative to CO_2.

	GWP
Carbon Dioxide (CO_2)	1
Methane (CH_4)	28
Nitrous oxide (N_2O)	265
Hydrofluorocarbons (HFCs)	12-14,800
Perfluorocarbons (PFCs)	7,300-12,200
Sulphur hexafluoride (SF_6)	22,800

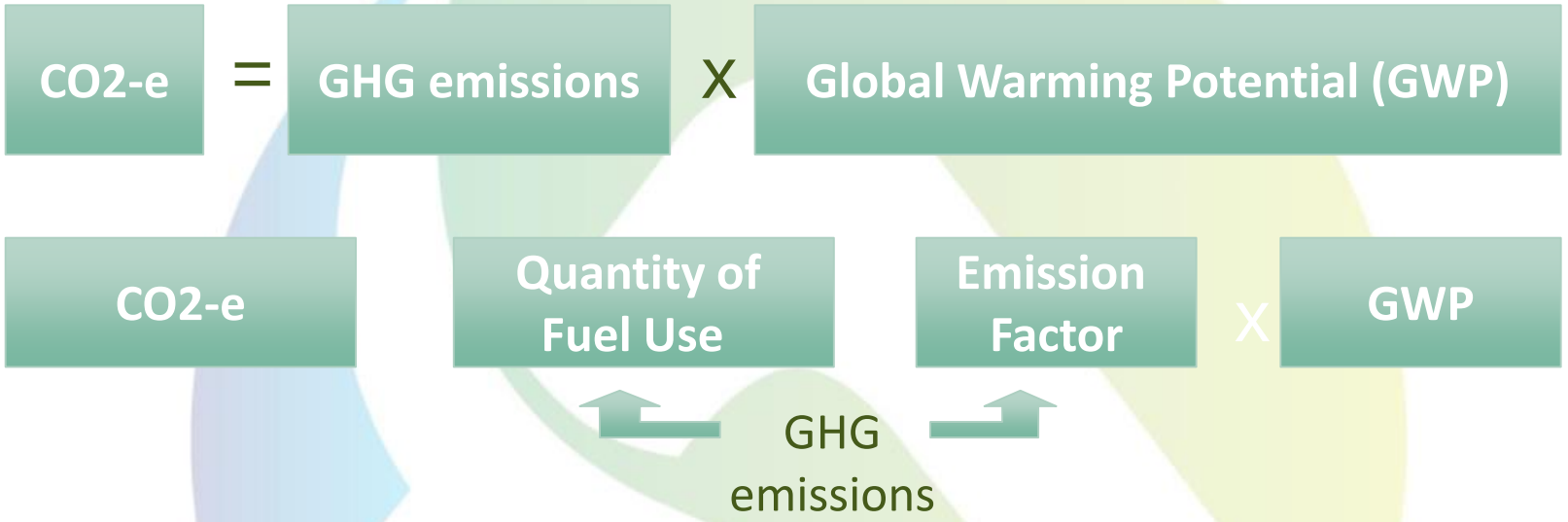
← example

Example for 1 tonne of CH_4

28 tonnes of CO2-e = **1 tonne of CH4** X **28**

Source: IPCC 5th Assessment Report ,2014

How to calculate emissions?



- Emission factors describe how much of greenhouse gases will be emitted during the burning of a particular fuel source.
- Emission factors are preferably time- and country-specific

Emission Factors are usually publicly available.

Samples of CO_2 Emissions Factors

1. Emissions factor for vehicle fuels

Fuel Type	Emission factors	Unit
Diesel Oil	2.614	kg/litre
Unleaded Petrol	2.360	kg/litre
LPG	1.679	kg/litre

2. Emissions factors (EF) for Towngas (kg CO_2-e/Unit of Towngas purchased)

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EF	0.735	0.693	0.592	0.593	0.628	0.620	0.618	0.610	0.62	0.60	0.6	0.599	0.592

3. Emission factors (EF) for electricity use in HK (in kg CO_2-e/kWh)

Power Company	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2017	2018	2019
CLP	0.56	0.53	0.52	0.53	0.57	0.54	0.56	0.54	0.59	0.58	0.51	0.51	0.50
HEC	0.98	0.98	0.92	0.91	0.83	0.84	0.79	0.79	0.79	0.79	0.78	0.79	0.81

Source: Guidelines to Account for and Report on GHG emisions and removals for buildings in HK 2010 Edition

Establish Carbon Emission Inventory

Calculation tools :

- Excel files
- Online Carbon calculator
- Off the shelf carbon calculator

"Low Carbon Living Calculator"

https://www.carboncalculator.gov.hk/en

CARBON CALCULATOR

Carbon Footprint Calculator For Individuals And Households

This carbon calculator is provided free to use

Show you care for the environment and communities across the World by Carbon Offsetting.

You can support Carbon Offsetting Projects that both tackle climate change and support impoverished communities across the world. Just click the 'Offset' button after you have finished your calculation. It takes only a few easy clicks and costs only a few Pounds/Dollars/Euros per tonne CO_2. **You also get a personalised Certificate recognising your offsetting - makes an ideal gift too!**

Language: English (United States)

Why create an account?

Like 8.4K people like this. Sign Up to see what your friends like.

Welcome | House | Flights | Car | Motorbike | Bus & Rail | Secondary | Results

Welcome to the web's leading carbon footprint calculator

First, please tell us where you live: [why?]

Country: Hong Kong

Carbon footprint calculations are typically based on annual emissions from the previous 12 months
Enter the period this calculation covers (optional):

from to Save

Next, select the appropriate tab above to calculate the part of your lifestyle you are most interested in, e.g. your flights.
Or, visit each of the tabs above to calculate your full carbon footprint.

Following your calculation, you can offset / neutralise your emissions through one of our climate-friendly projects.

House >

add our CO_2 calculation tools to your website

https://www.carbonfootprint.com/calculator.aspx

End of Session 1

How to Conduct Carbon Audit

10:30 – 10:45 Break

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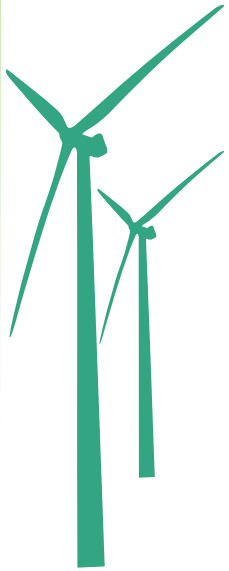
20th anniversary 2020 GREEN COUNCIL 環保促進會

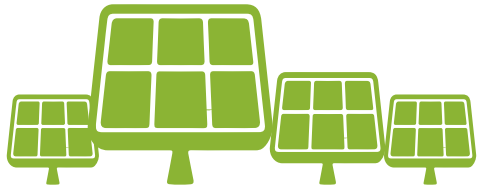
Session 2a
Carbon Reporting and Verification
10:45 – 12:00

By Ir Sophia Lau

Director, ASEL Consulting Company

29th June, 2020





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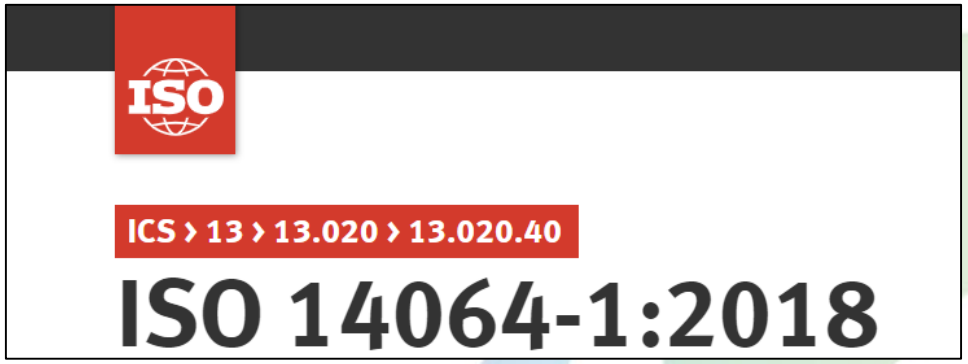
Carbon Reporting Standards

Carbon Reporting Standard / GHG reporting guideline

- Greenhouse Gas Protocol
- EPD, EMSD guideline
- Standard ISO 14064: 2018



- standard identifies three key aspects for developing a greenhouse gas inventory for organization. These aspects include setting inventory boundaries, quantifying GHGs, and reporting GHGs.
- relevance, completeness, consistency, accuracy, and transparency
- ISO 14064 are generally consistent with, and in most cases are derived from, those identified by the broadly recognized Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard developed by the World Business Council for Sustainable Development and the World Resources Institute.

GHG Protocol vs ISO 14064

GHG Protocol	ISO 14064
• identifies, explains, and provides options for GHG inventory best practices. • explaining how to do it	• establishes minimum standards for compliance with these best practices. • identifying what to do
organizations developing GHG inventories, especially those that will seek independent verification, can benefit from using both the standard and the protocol as references.	

Means of Carbon Reporting

- Sustainability reporting, ESG reporting
- Environmental report
- Annual report
- Company website
- Hong Kong Carbon Footprint Repository
- Carbon Disclosure Project
- Task Force on Climate-related Financial Disclosure(TCFD)

Carbon Footprint Repository

EPD Launched the Carbon Footprint Repository (CFR) (www.carbon-footprint.hk/) on 15 December 2014 for listed companies to disclose their carbon footprint.

Stock Code	Name of Listed Company 2017-03-06	Hang Seng Industry Classification	Reported GHG Emissions in total (Tonnes CO_2-e)		Company Related Information provided by the Listed Companies for the Last Reporting Period			Summary of Carbon Footprint provided by Listed Companies	CDP form / ESG report / Others	Remarks
			2013	2014	Full-time-equivalent Employee	Gross Floor Area (m^2)	Revenue (HK$ million)			
404	Hsin Chong Construction Group Ltd.	Properties & Construction	—	17,229	—	—	—	CFR00404-14-1	—	—
896	Hanison Construction Holdings Ltd.	Properties & Construction	—	—	—	—	—	—	—	—
939	China Construction Bank Corporation - H Shares	Financials	—	—	—	—	—	—	—	—
1186	China Railway Construction Corporation Ltd. - H Shares	Properties & Construction	—	—	—	—	—	—	—	—
1447	SFK Construction Holdings Ltd.	—	—	—	—	—	—	—	—	—
1459	Jujiang Construction Group Co., Ltd. - H Shares	—	—	—	—	—	—	—	—	—
1500	In Construction Holdings Limited	Properties & Construction	—	—	—	—	—	—	—	—

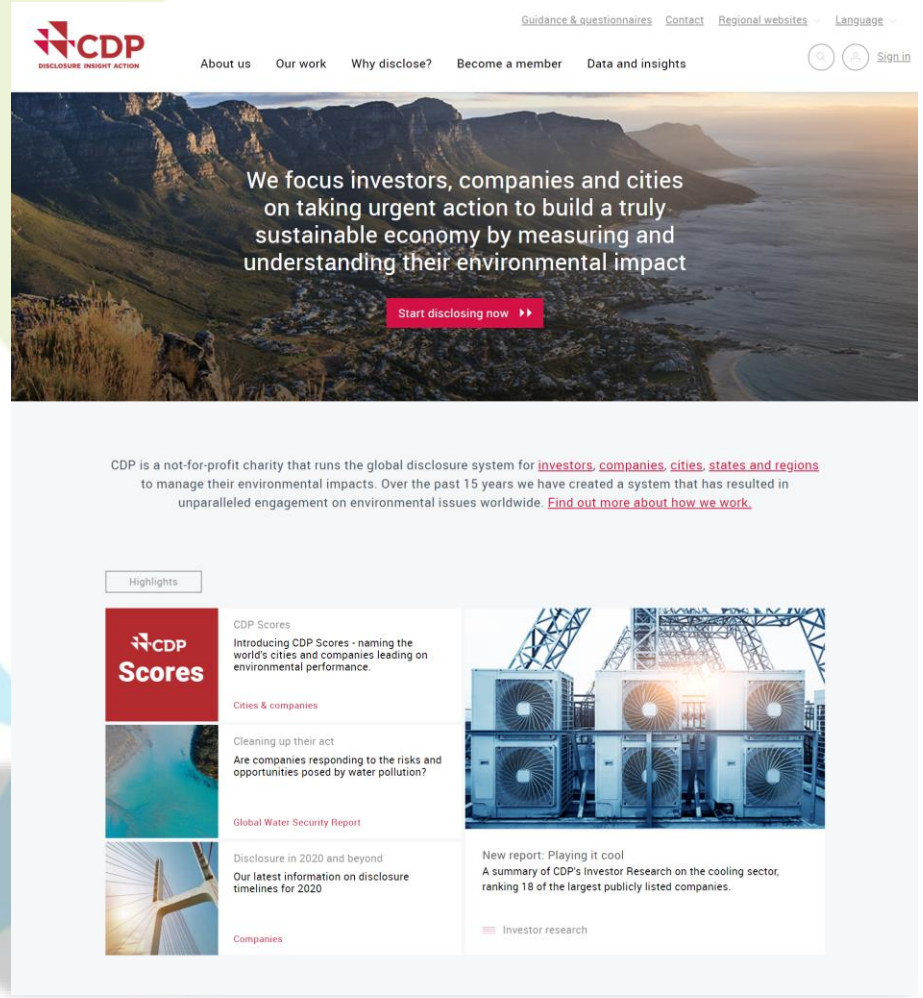
https://www.carbon-footprint.hk/node/72?order=construction

CDP Overview

- ✓ Established in 2000
- ✓ Independent , not-for-profit ,London-based organization
- ✓ Largest database of corporate climate change information
- ✓ Only global climate change reporting System

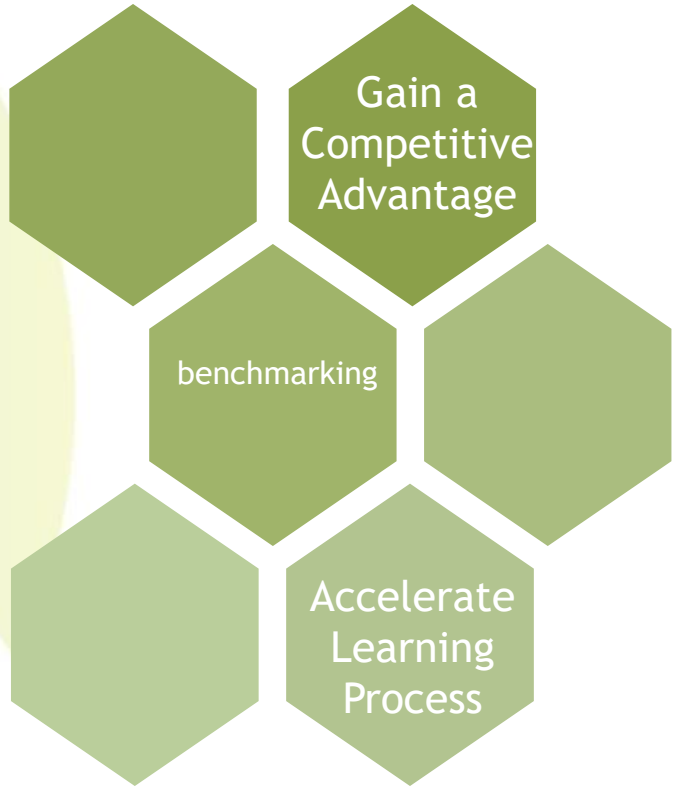
Supports companies and cities :

- ✓ disclose the environmental impact of major corporations.
- ✓ build a sustainable economy by measuring and understanding their environmental impact
  Areas of focus: Climate change, Water , Forests



The Value of Disclosing to CDP

- ✓ High and growing market demand for environmental disclosure
- ✓ Protect and improve the company's reputation
- ✓ Boost the competitive advantage
- ✓ Get ahead of regulation
- ✓ Uncover risks and opportunities (it ask the right questions)
- ✓ Rack and benchmark progress
- ✓ Share best practice



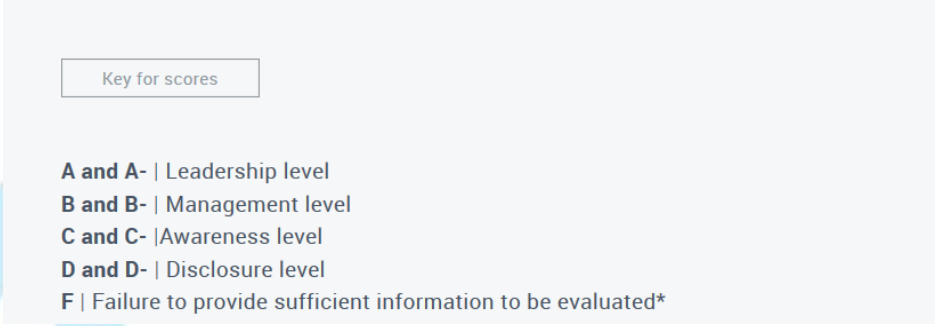
CDP Scoring System

Our scoring measures the comprehensiveness of disclosure, awareness and management of environmental risks and best practices associated with environmental leadership, such as setting ambitious and meaningful targets. (CDP,2019)

CDP helps companies to collect, report and structure their data by asking the right question in their questionnaire

CDP Scores

By scoring companies and cities, CDP aims to incentivize and guide them on a journey through disclosure towards becoming a leader on environmental transparency and action. In 2019, over 8,400 companies and 920 cities, states and regions disclosed through CDP.



investors or customers through CDP's programs.

sustainable future.

Explore the full scores

The full set of publicly available climate change, forests and water security scores can be explored below – use the search bar to view the score for specific companies or browse with the filter tools. The sector column indicates whether the company was scored for their answers to sector-specific questions, which were introduced in 2018.

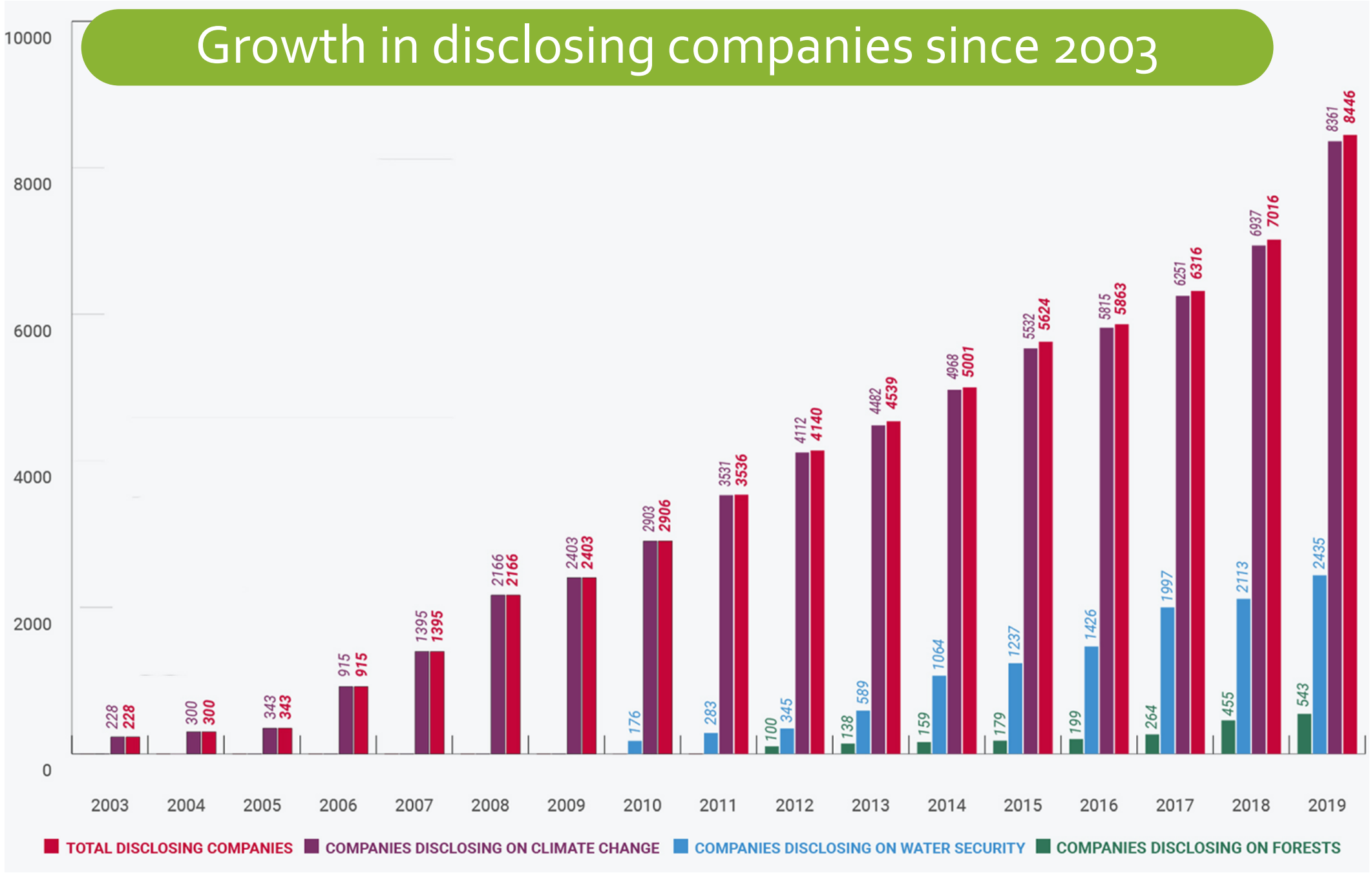
Jump to...
The A List
The full scores

Company Name: Cathay Pacific Air | Country: --- 选择 --- | Region: --- 选择 --- | Sector: Climate Cha... | Score: Climate Chan... | Sector: Water Secur... | Score: Water Securi... | Sector: Forests: | Score: Forests Timb... | Score: Forests Palm: | Score: Forests Cattl...

更多过滤器 重置

	Company Name	Country	Region	Sector: Climate Ch	Score: Climate Cha	Sector: Water Secu	Score: Water Secu	Sector: Forests	Score: Forests Tim	Score: Forests Palı	Score: Forests Cat	
1	Cathay Pacific Airways Limited	China, Hong Kong Special Administrative Region	Asia	Transport services	B	N/A	Not Requested	N/A	Not Requested	Not Requested	Not Requested	No
1	New World Development	China, Hong Kong Special Administrative Region	Asia	General	C	N/A	Not Requested	N/A	Not Requested	Not Requested	Not Requested	No
1	CLP Holdings Limited	China, Hong Kong Special Administrative Region	Asia	Electric utilities	B	Electric utilities	B-	N/A	Not Requested	Not Requested	Not Requested	No
1	Swire Pacific	China, Hong Kong Special Administrative Region	Asia	Transport services	B	N/A	Not Requested	N/A	Not Requested	Not Requested	Not Requested	No

Growth in disclosing companies since 2003



Task Forced on Climate- Related Financial Disclosure

Figure 2

Core Elements of Recommended Climate-Related Financial Disclosures

Governance
The organization's governance around climate-related risks and opportunities

Strategy
The actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning

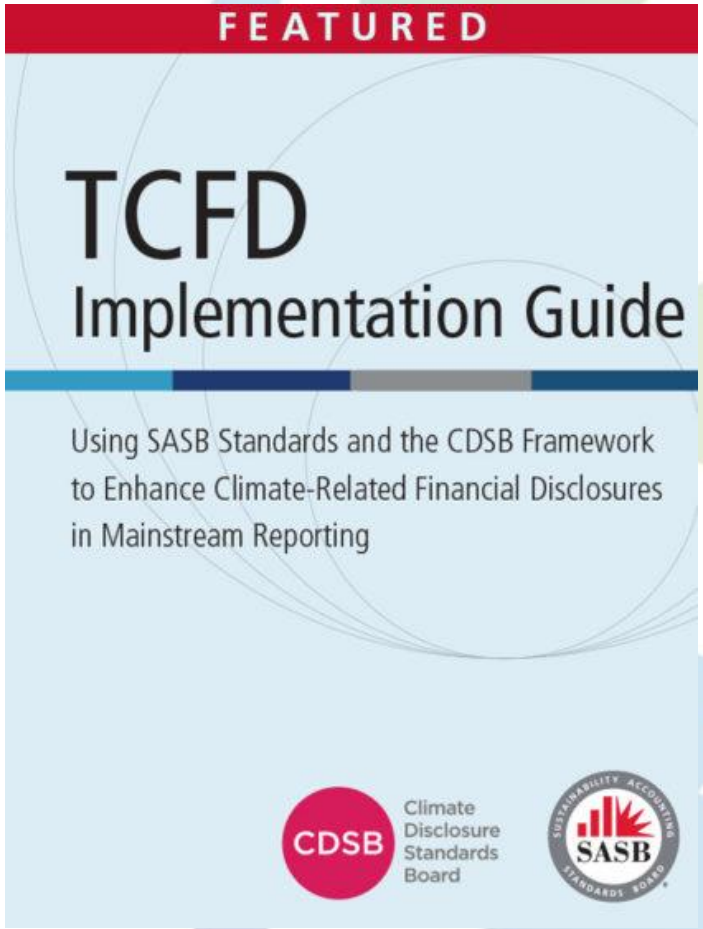
Risk Management
The processes used by the organization to identify, assess, and manage climate-related risks

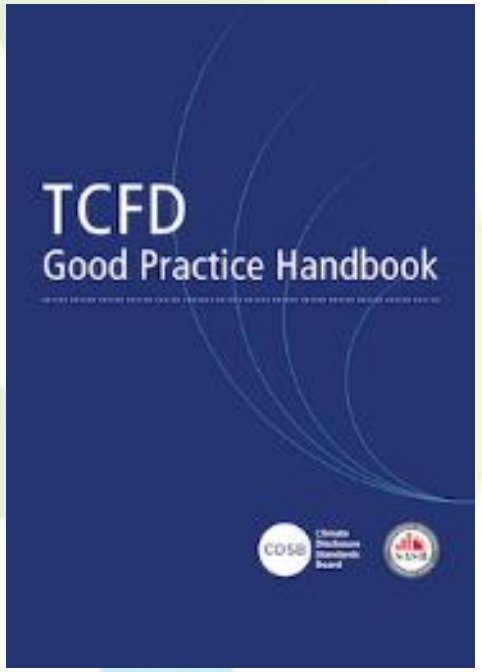
Metrics and Targets
The metrics and targets used to assess and manage relevant climate-related risks and opportunities

What is TFCD

Governance	Strategy	Risk Management	Metrics and Targets
Disclose the organization's governance around climate-related risks and opportunities.	Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.	Disclose how the organization identifies, assesses, and manages climate-related risks.	Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.
Recommended Disclosures	**Recommended Disclosures**	**Recommended Disclosures**	**Recommended Disclosures**
a) Describe the board's oversight of climate-related risks and opportunities.	a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	a) Describe the organization's processes for identifying and assessing climate-related risks.	a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.
b) Describe management's role in assessing and managing climate-related risks and opportunities.	b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	b) Describe the organization's processes for managing climate-related risks.	b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.
	c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.

What is TFCD





https://www.fsb-tcfd.org/about/#

ESG / Sustainability Reporting

Examples of Aspects and KPI

Aspects	"Comply or explain" Provision KPIs	Recommended Disclosures
Environment		
A1 Emissions	• Air emission, greenhouse gases, waste	
A2 Use of Resources	• Energy, water, use of packaging materials	
A3 The Environment and Natural Resources	• Policies on • Significant and natural	

HKEX 香港交易所

▶ GRI 300 Environmental

	Element	Contents
301	Materials	• Materials used by weight or volume
302	Energy	• Energy consumption within the organization
303	Water and Effluence	• Total volume of water withdrawn, discharge and consumption
304	Biodiversity	• Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas
305	Emissions	• GHGs, Ozone Depleting Substances, NOx, SOx etc.
306	Effluence and waste	• Water discharge by quality and destination ; Waste by type and disposal method
307	Environmental Compliance	• Non-compliance with environmental laws and regulations
308	Supplier environmental assessment	• New suppliers that were screened using environmental criteria • Negative environmental impacts in the supply chain and actions taken

Global Reporting Initiative™

What is Carbon Verification?

A process to :

- independently verify the accuracy of data and carbon footprint
- Fundamental to provide credibility, reassuring internal and external stakeholders that the carbon footprint of your organization is accurate, complete and compliant with the major GHG reporting standards.
- Transparency of your carbon footprint calculations gives you real integrity.

Benefits of verifying your carbon footprint

- Compliance - demonstrates to external stakeholders that the footprint is transparent, credible and reliable. And assures reporting is accurate, relevant and consistent over time for internal management reporting
- Increase sales - differentiates you from competitors within your supply chain and supports tendering requirements
- Manage reputational risk - demonstrates data is reliable and robust enough to withstand media scrutiny
- Improve corporate reputation – transparency gives confidence to stakeholders
- Attract investment - demonstrates integrity of data
- Work towards carbon neutrality - a proven best practice calculation allowing you to focus on the most efficient abatement programs and helps you to avoid purchasing more offset credits than necessary

ISO 14064 – Part 3

- Part 3 of ISO 14064 established for the first time a process for conducting a verification of a GHG assertion, such as an organization's GHG inventory report.
- These principles include independence, ethical conduct, fair presentation, and due professional care.
- Establishes "fundamentals" for the verification :

✓ the verification level of assurance (defined as either limited or reasonable)

✓ objectives

✓ criteria

✓ scope, and

✓ materiality

pwc

羅兵咸永道

ents

Independent practitioner's limited assurance report
To the board of directors of CLP Holdings Limited

We have undertaken a limited assurance engagement in respect of the selected sustainability information of CLP Holdings Limited (the "Company") listed below and identified as the numbers shaded in orange in the Key Performance Metrics (Appendix I) appended to this report (the "Identified Sustainability Information").

Identified Sustainability Information
The Identified Sustainability Information for the year ended 31 December 2019 is summarised below:

Governance
- Convicted cases of corruption reported to the Audit & Risk Committee (cases)
- Breaches of Code of Conduct reported to the Audit & Risk Committee (cases)

Safety
Fatalities (number)
- Fatalities - employees only
- Fatalities - contractors only

Fatality Rate (number per 200,000 manhour)
- Fatality Rate - employees only
- Fatality Rate - contractors only

Lost Time Injury (number)
- Lost Time Injury - employees only
- Lost Time Injury - contractors only

Lost Time Injury Rate (number per 200,000 manhour)
- Lost Time Injury Rate - employees only
- Lost Time Injury Rate - contractors only

Days Lost (number)
- Days Lost - employees only

Environment
Resource Use & Emissions
- Nitrogen oxides emissions (NO_x) (kt)
- Sulphur dioxide emissions (SO_2) (kt)
- Particulates emissions (kt)

Non-hazardous liquid waste (kl)
- Produced
- Recycled

Non-hazardous solid waste (t)
- Produced
- Recycled

Hazardous liquid waste (kl)
- Produced
- Recycled

Hazardous solid waste (t)
- Produced
- Recycled

Total water withdrawal (Mm^3)

GHG Emissions & Climate Vision 2050
GHG Emissions
GHG emissions - on an equity basis (kt)
- Scope 1 CO_2e
- Scope 2 CO_2e

Scope 3 CO_2e by category
- Category 1a: Purchased goods and services (products)
- Category 3: Fuel- and energy-related activities
- Category 11: Use of sold products

GHG emissions - on an operational control basis (kt)
- Scope 1 & 2 CO_2e (from power generation)
- Scope 1 & 2 CO_2 (from power generation)

Climate Vision 2050
Performance against targets - on an equity basis
- Carbon dioxide emissions intensity of CLP Group's generation portfolio (kg CO_2/ kWh)
- Total renewable energy generation capacity (% (MW))
- Non-carbon emitting generation capacity (% (MW))

Performance against targets - on an equity plus long-term capacity and energy purchase basis
- Carbon dioxide emissions intensity of CLP Group's generation portfolio (kg CO_2/ kWh)
- Total renewable energy generation capacity (% (MW))
- Non-carbon emitting generation capacity (% (MW))

CLP Power Hong Kong - carbon emissions intensity of electricity sold
- CO_2e emissions intensity of electricity sold by CLP Power Hong Kong (kg CO_2e/ kWh)
- CO_2 emissions intensity of electricity sold by CLP Power Hong Kong (kg CO_2/ kWh)

Operations
Generation capacity by asset type (%(MW))
Total generation capacity - based on an equity basis
- Coal
- Gas
- Nuclear
- Renewables

End of Session 2a

Carbon Reporting and Verification

ASEL Consulting Company

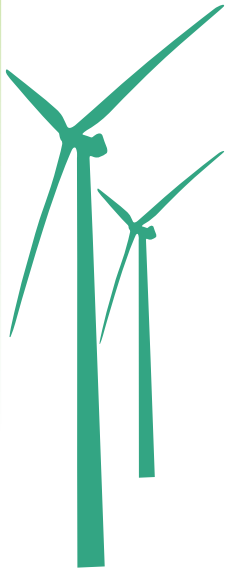
20th anniversary 2020 GREEN COUNCIL 環保促進會

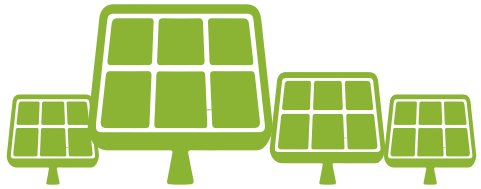
Session 2b
Carbon Target Setting
10:45 – 12:00

By Ir Sophia Lau

Director, ASEL Consulting Company

29th June, 2020





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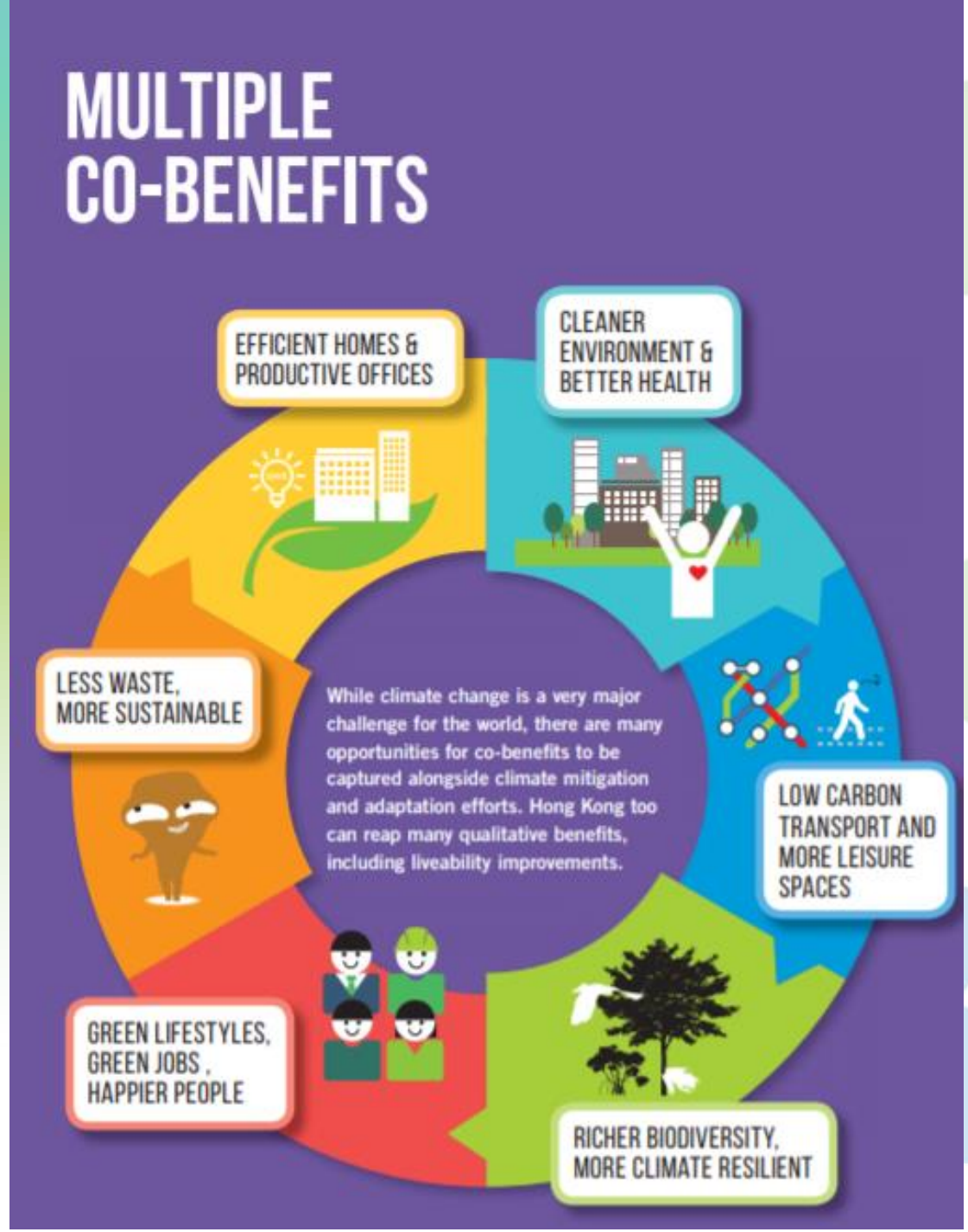
Why do we need to set Target?

- Minimizing and Managing GHG Risks
- Achieving Cost Savings and Stimulating Innovation
- Preparing for Future Regulations
- Demonstrating Leadership and Corporate Responsibility
- Participating in Voluntary Programmes and mandatory programmes

Setting Reduction Target- Purpose

- Any robust business strategy requires setting targets for revenues, sales, and other core business indicators, as well as tracking performance against those targets. Likewise, effective GHG management involves setting a GHG target.

- As companies develop strategies to reduce the GHG emissions of their products and operations, corporate-wide GHG targets are often key elements of these efforts, even if some parts of the company are or will be subject to mandatory GHG limits.



Benefits of pursuing a Target

https://www.climateready.gov.hk/files/report/en/HK_Climate_Action_Plan_2030+_booklet_En.pdf

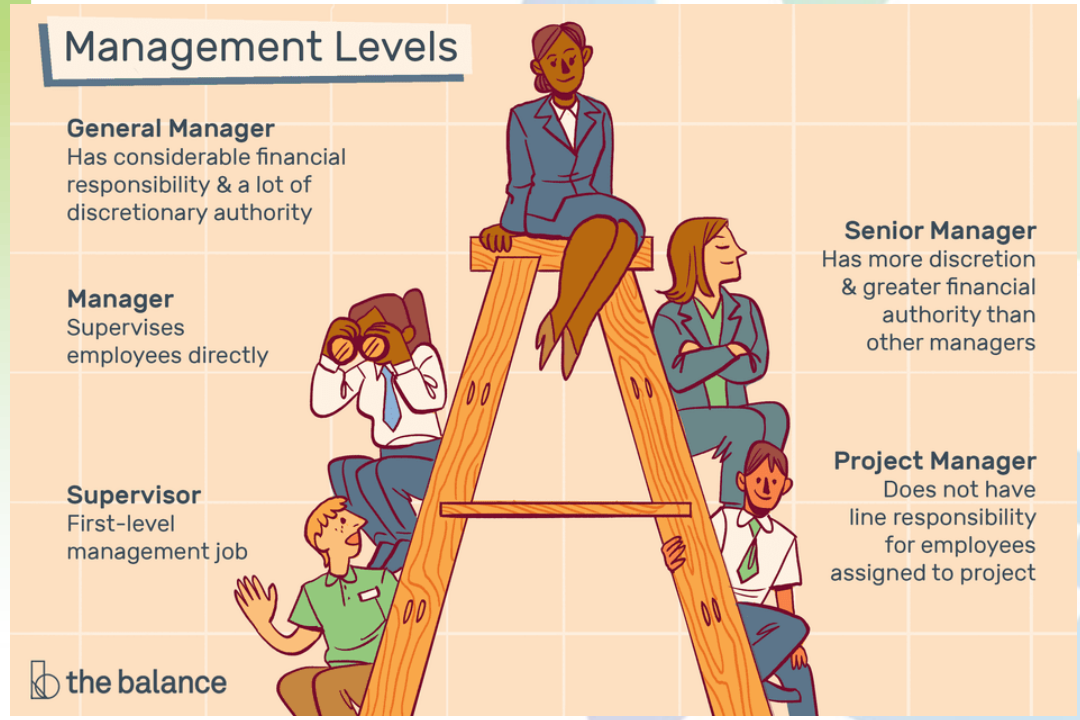
Key Components of a Target

Keys Steps in Setting Target

1. Obtain senior management commitment
2. Decide on the target type
3. Decide on the target boundary
4. Choose the target base year
5. Define the target completion date
6. Decide on the use of offsets or credits
7. Decide on the target level
8. Track and report progress

Keys Steps in Setting Target

1. Obtain Top / Senior Management Commitment

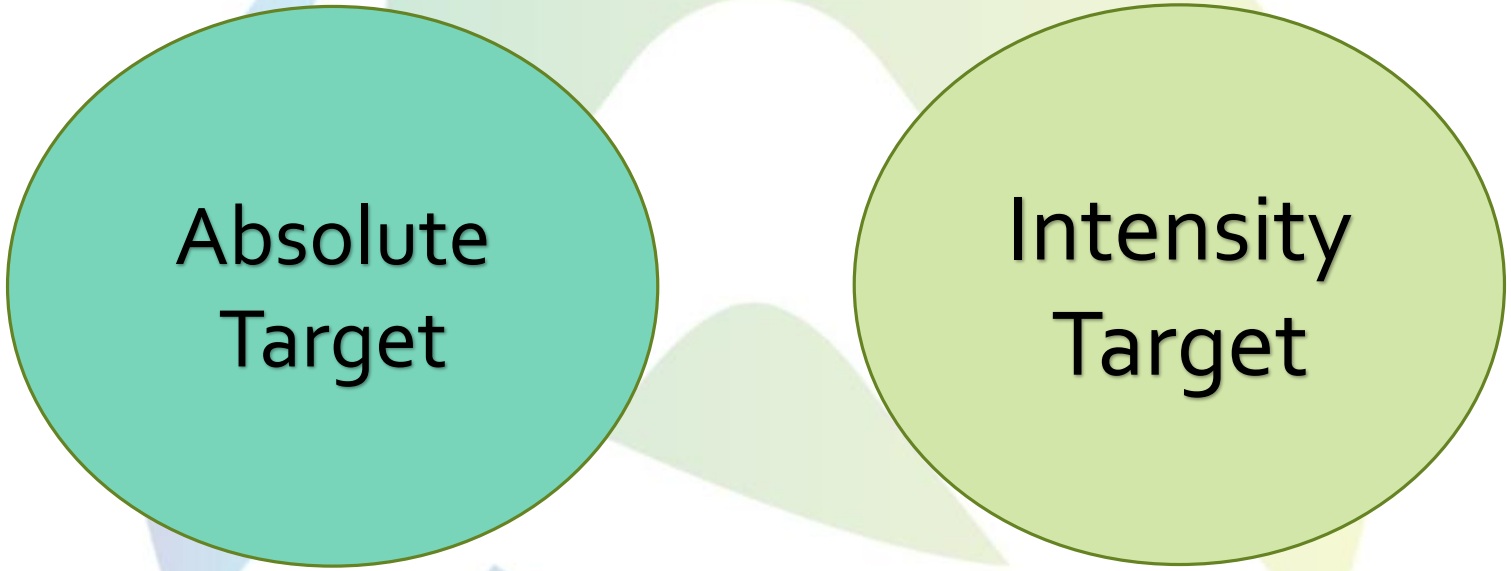


Ask yourself:

- What is your position in the target setting process ? i.e. CEO? Environmental staff ? Consultant?
- Which levels are you seeking authority / approval from ? i.e. Board level? CEO ? Director ? Department head ?

Keys Steps in Setting Target

2. Decide on the target type



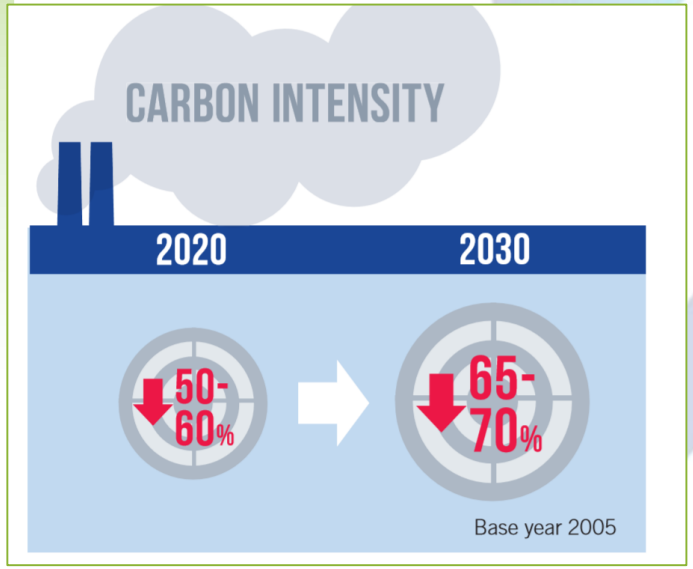
reduce absolute emissions over time

reduce the ratio of emissions relative to a business metric over time

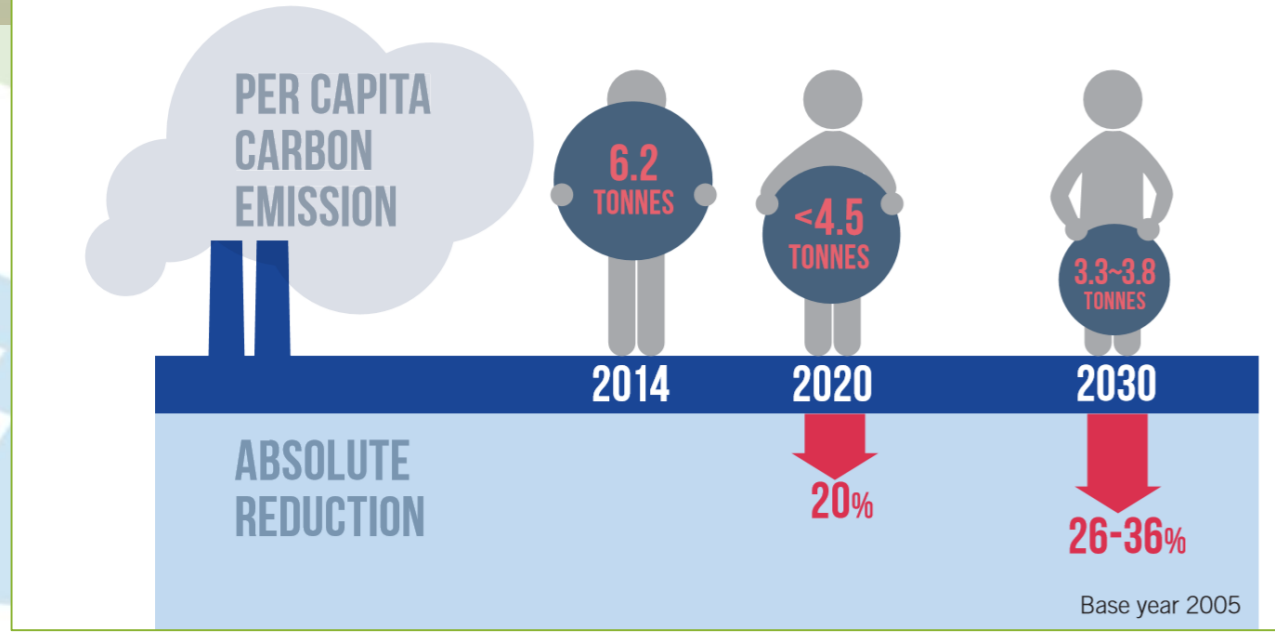
Hong Kong Target

CARBON EMISSIONS AND HONG KONG

Hong Kong will reduce its carbon intensity by 65% to 70% by 2030 using 2005 as the base



HONG KONG'S EXPECTED ABSOLUTE CARBON EMISSIONS REDUCTION AND PER CAPITA CARBON EMISSIONS LEVEL IN 2020 AND 2030



Absolute Reduction Target

ABSOLUTE TARGETS reduce absolute emissions over time

(Example: reduce CO2 by 25 percent below 1994 levels by 2010)

Advantages

- Designed to achieve a reduction in a specifed quantity of GHGs emitted to the atmosphere
- Environmentally robust as it entails a commitment to reduce GHGs by a specified amount
- Transparently addresses potential stakeholder concerns about the need to manage absolute emissions

Disadvantages

- Target base year recalculations for significant structural changes to the organization add complexity to tracking progress over time
- Does not allow comparisons of GHG intensity effiency
- Recognizes a company for reducing GHGs by decreasing production or output (organic decline)
- May be dfficult to achieve if the company grows unexpectedly and growth is linked to GHG emissions

Intensity Reduction Target

INTENSITY TARGETS reduce the ratio of emissions relative to a business metric over time

(Example: reduce CO2 by 12 percent per PRODUCTION UNIT between 2000 and 2008)

Advantages

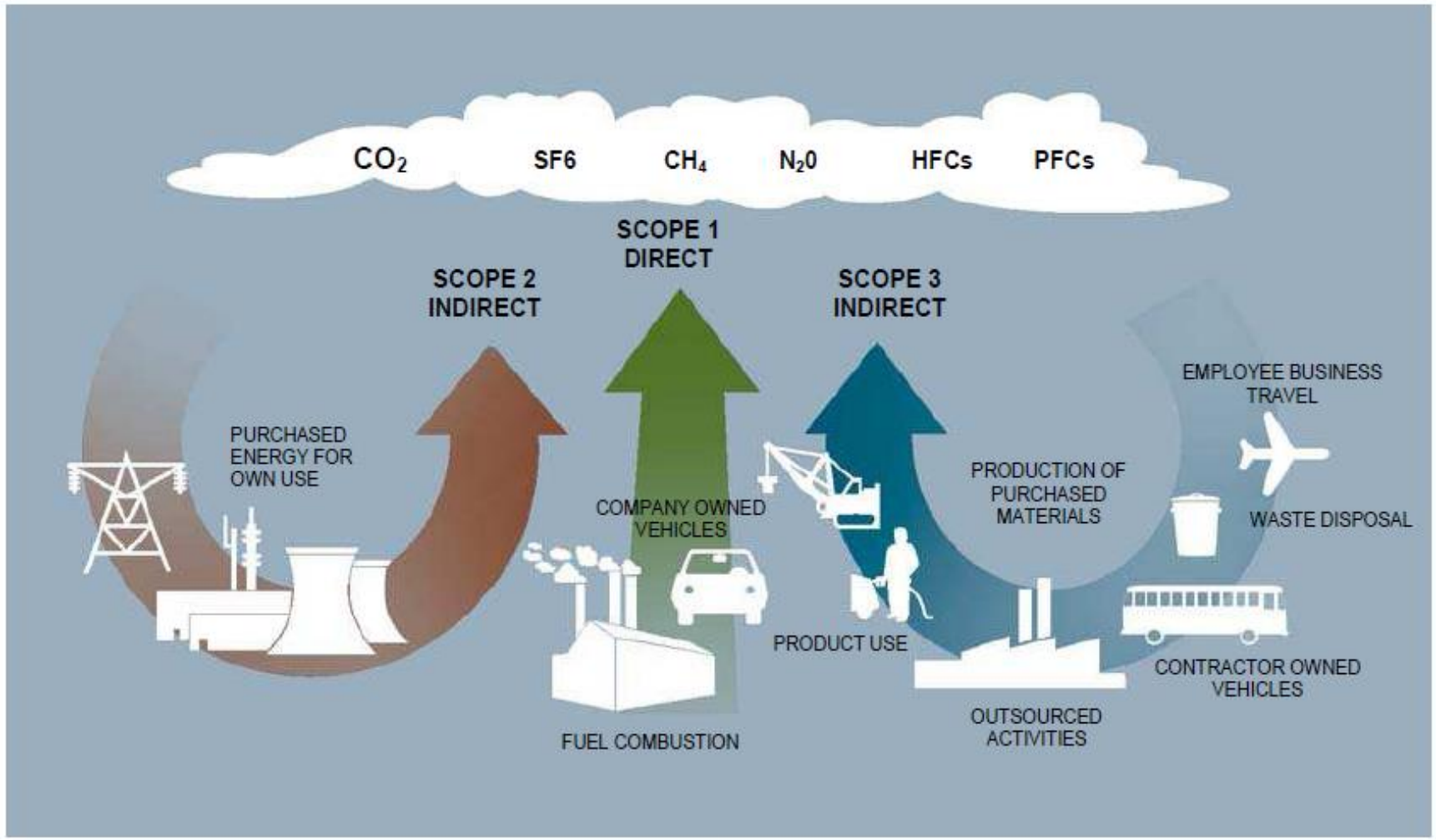
- Reflects GHG performance improvements independent of organic growth or decline
- Target base year recalculations for structural changes are usually not required (see step 4)
- May increase the comparability of GHG performance among companies

Disadvantages

- No guarantee that GHG emissions to the atmosphere will be reduced- absolute emissions may rise even if intensity goes down and output increases
- Companies with diverse operations may find it difcult to define a single common business metric
- If a monetary variable is used for the business metric, such as dollar of revenue or sales, it must be recalculated for changes in product prices and product mix, as well as inflation, adding complexity to the tracking process

Keys Steps in Setting Target

3. Decide on the target boundary



4.Choose the target base year

—Completeness of date

—Future growth

—Industry reference

Keys Steps in Setting Target

5. Define the target completion date

- Short term 3- 5 years
- Mid term 5- 15 years
- Long term > 15 years

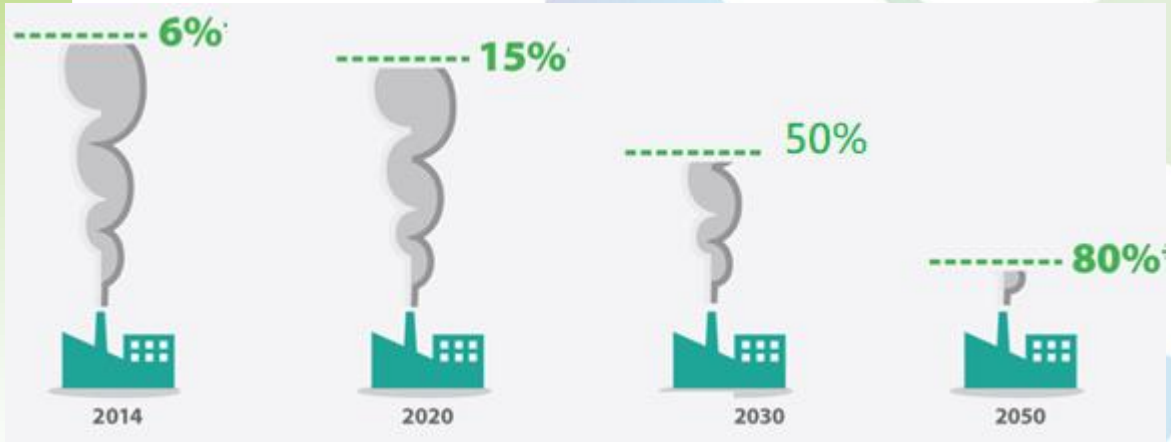
Indicative only

- Understand your future growth
- Technology available
- Economic environment
- Legislation requirement

6. Decide on the use of offsets or credits

Keys Steps in Setting Target

7. Decide on the target level



8. Track and report progress

- Is it a publicly announced target?
- Do you need to report on a regular basis?
- Tracking involve data submission, carbon emission calculations, verification

What are Science-based Targets?

SCIENCE BASED TARGETS

DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

"Science-based targets (SBTs) are in line with what the latest climate science says is necessary to meet the goals of the Paris Agreement-to limit global warming to well-below 2° 0 above pre-industrial levels and pursue efforts to limit warming to 1.5° C"

Science-based targets provide companies with a clearly defined pathway to future-proof growth by specifying how much and how quickly they need to reduce their greenhouse gas emissions.

The Science Based Targets initiative (SBTi) is supported by CDP, UN Global Compact,WRI, and WWF to bring corporate emission targets in line with the climate goals from the Paris Agreement.

UN GLOBAL COMPACT

WORLD RESOURCES INSTITUTE

CDP

DRIVING SUSTAINABLE ECONOMIES

WWF

Efforts to Reduce Carbon Emissions/Greenhouse gas emissions

China

To lower carbon dioxide emissions per unit of GDP by 60% to 65% from the 2005 level by 2030.

Hong Kong

To reduce its carbon intensity by 65% to 70% using 2005 as the base by 2030.

HKIA

To further reduce carbon intensity by 10 % using 2015 as the base by 2020.

U.S

24 states have committed to reducing emissions 26 to 28 percent below 2005 levels by 2025

Canada

80% net emissions reductions below 20 05 levels by 2050.

Australia

26-28% below 2005 by 2030

End of Session 4

Carbon Target Setting

12:00 – 14:00 Lunch

ASEL Consulting Company

20th anniversary 2020 GREEN COUNCIL 環保促進會

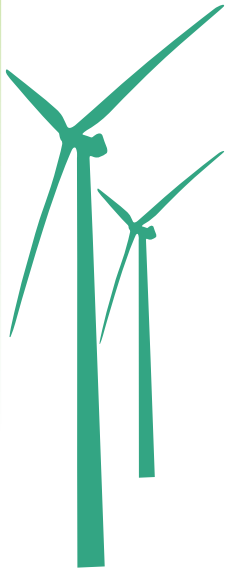
Session 3
Carbon Reduction Measures

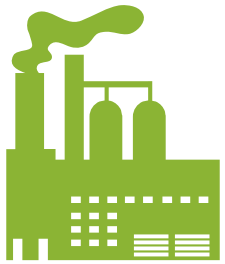
14:00 -15:15

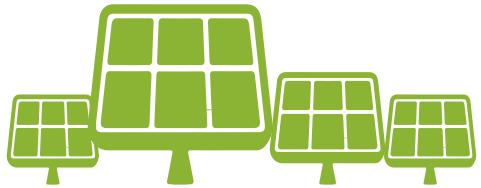
By Ir Sophia Lau

Director, ASEL Consulting Company

29th June, 2020







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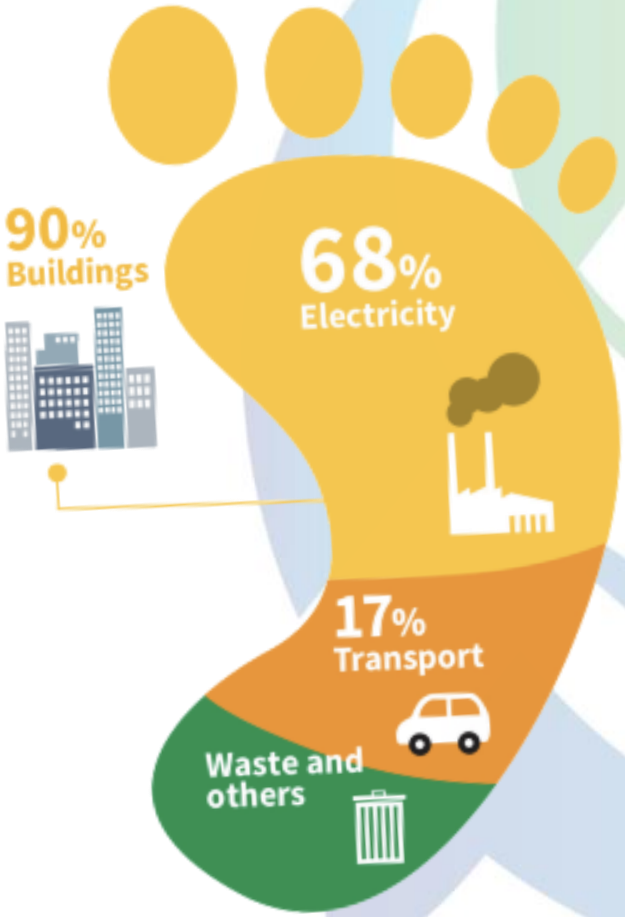
Carbon Reduction Measures

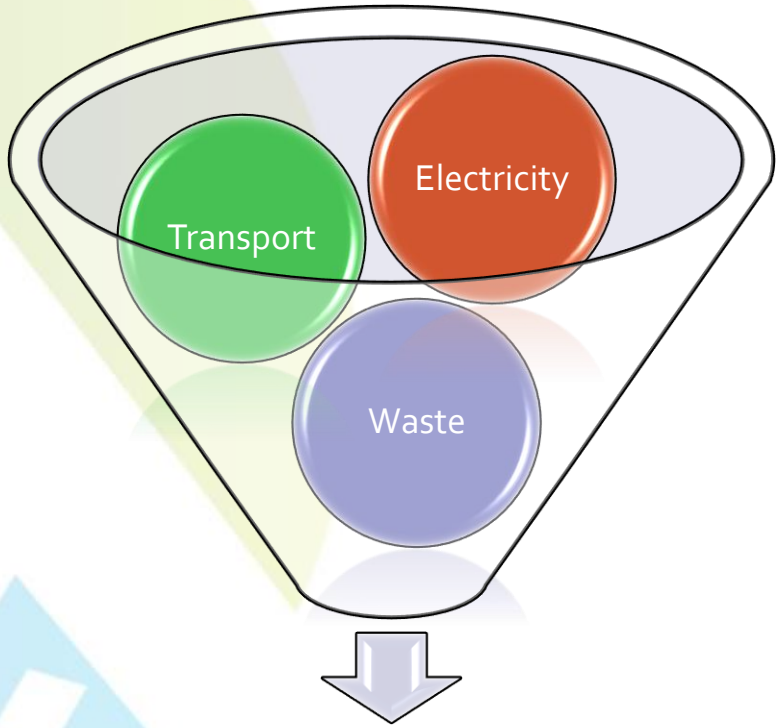
- Developed based on the carbon audit report / inventory developed
- Focus should be put in the big emission sources
- Practical and effective measures for short term targets
- Aspirations for long term targets

Carbon Reduction Measures – The focus



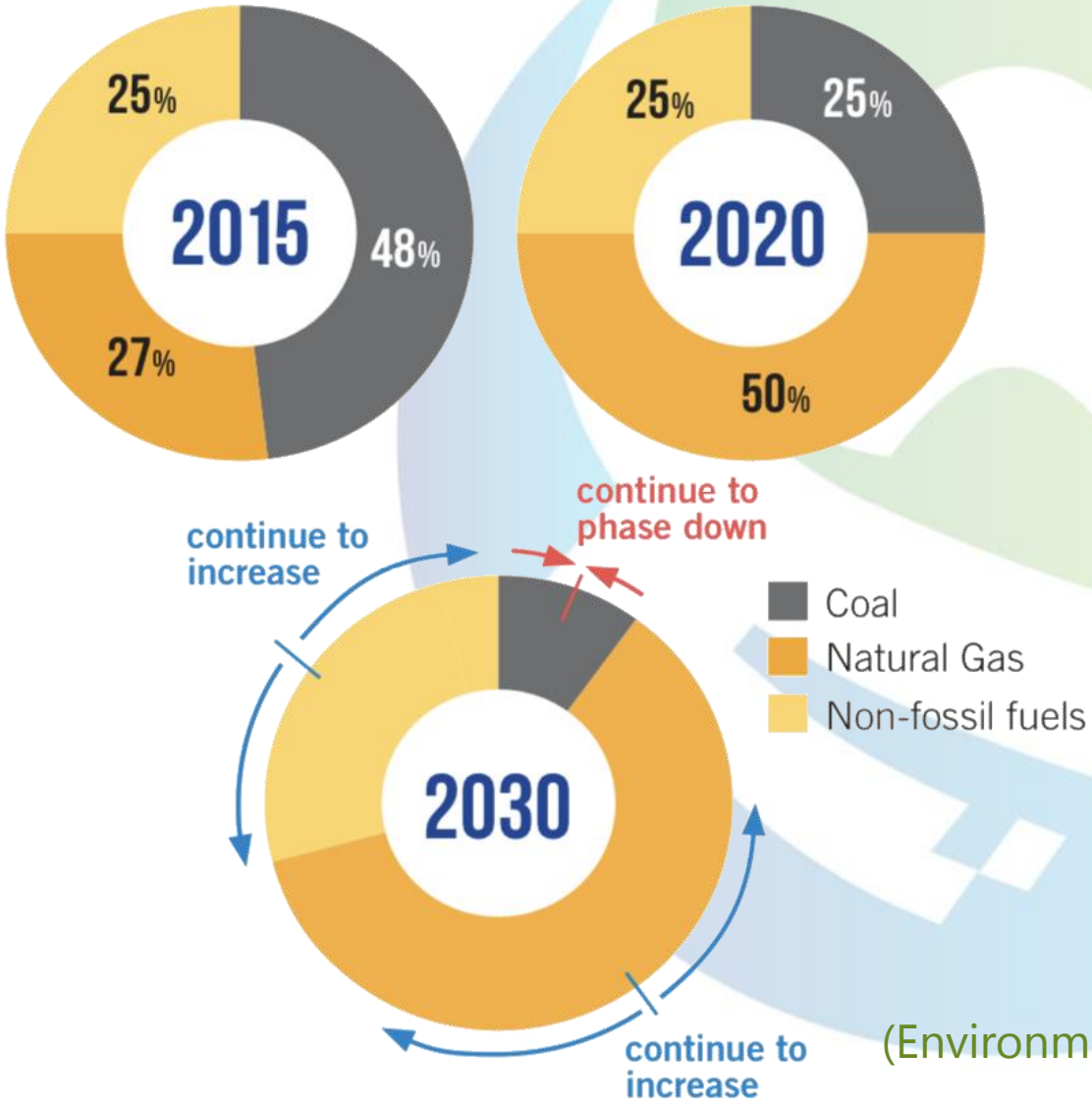
Hong Kong GHG Emissions

(Environment Bureau 2015)



Emissions Reduction

Emissions from Electricity Generation



Increase in the use of:

- Natural Gas
- Renewable energy
  - -Wind
  - -solar energy
  - -Hydropower

Decrease in the use of Coal

(Environment Bureau 2018)

Emissions from Electricity Used in Buildings

HKGBC
BEAM Plus
綠建環評

NB New Buildings

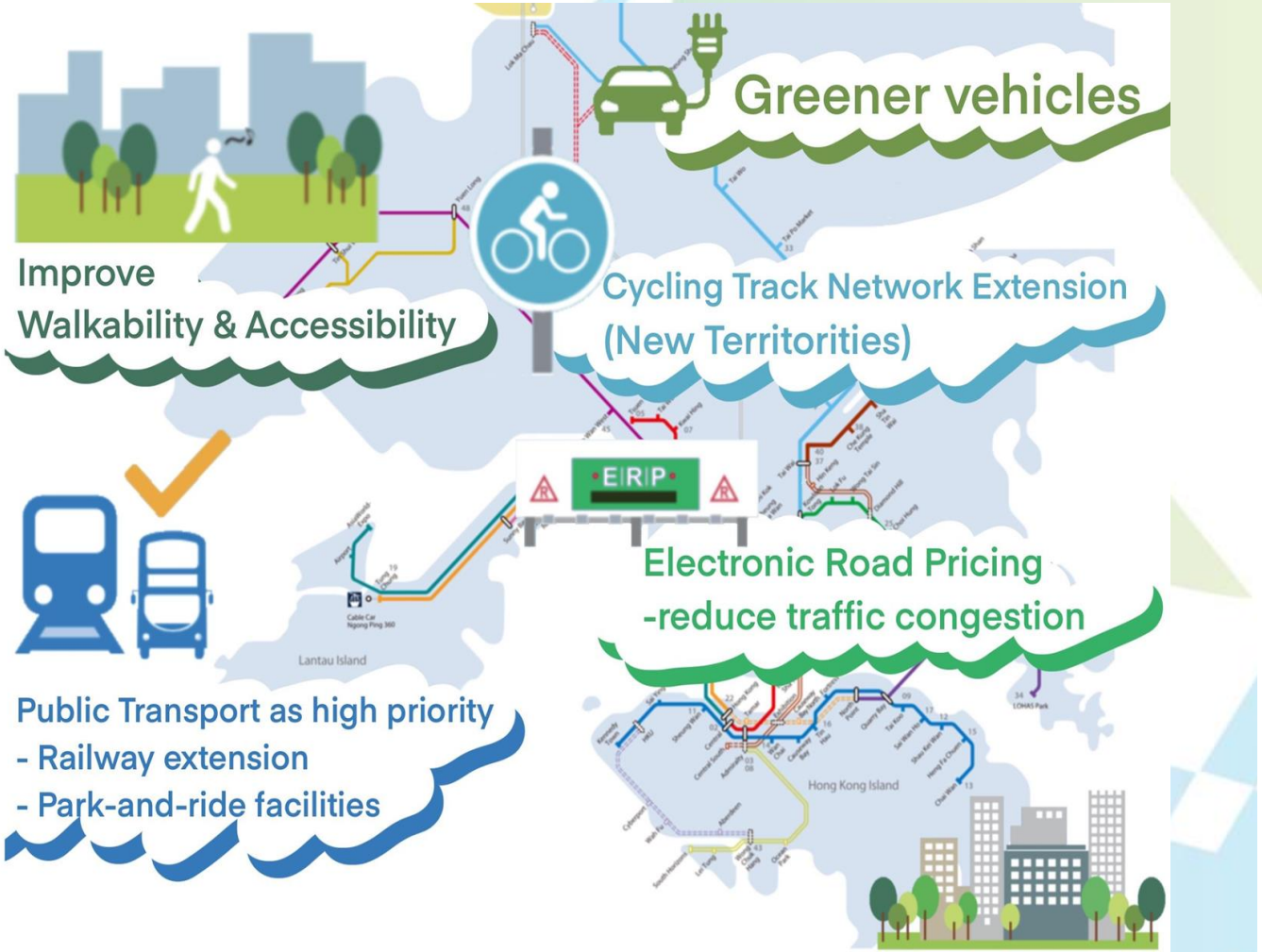
EB Existing Buildings

BI Interiors

ND Neighbourhood

(HKGBC 2020)

Emissions from Transportation



Transport


NEW VEHICLE TECHNOLOGIES USES AND TRIALS
Hybrid light bus
Electric light goods vehicles
Electric bus
Hybrid light goods vehicles
Electric taxi
Hybrid medium goods vehicles
Supercapacitor bus
Hybrid bus

Emissions from Waste

- Reduce, reuse and recover wastes

Low Carbon Living

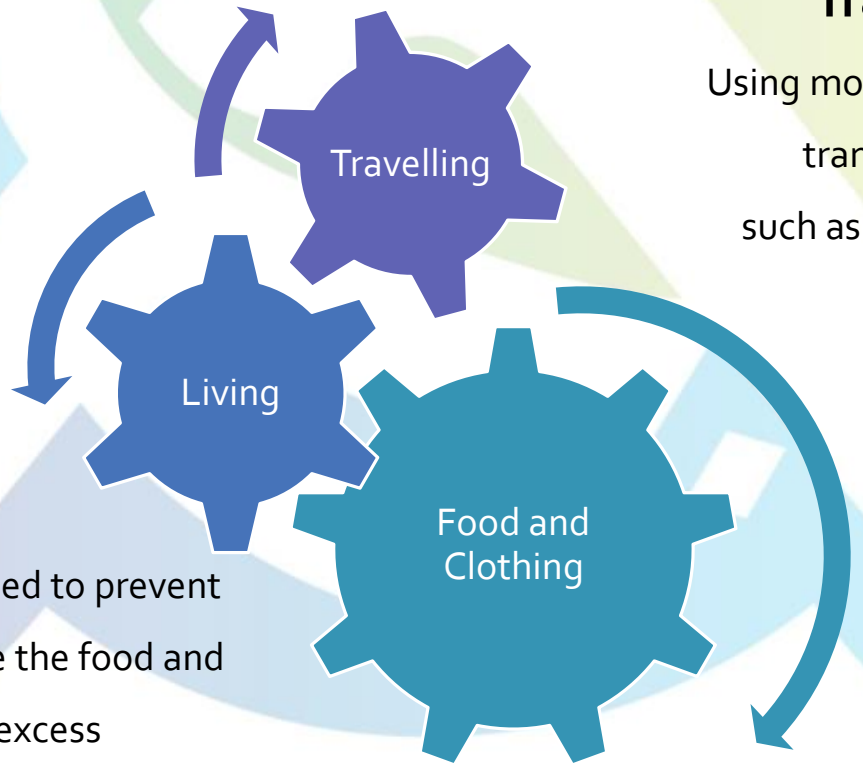
- Adopting low-carbon lifestyle among individuals and households could reduce carbon emission

Travelling

Using more public mean of transportation,
such as MTR and buses

Living

Switching off the electrical appliances when they are idle



Purchase the quantity we need to prevent wastage. Donate and recycle the food and clothes if they are in excess

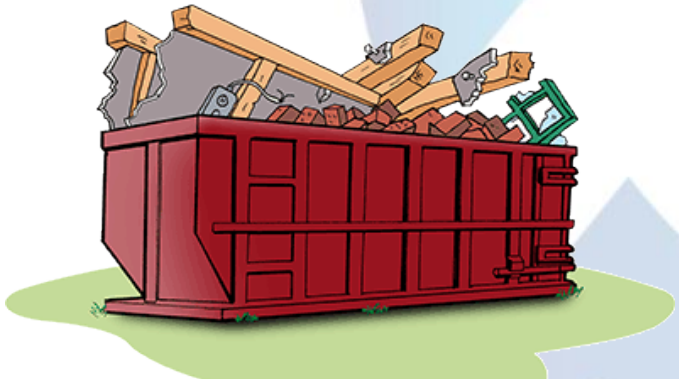
Low Carbon Living

Case Study 1 – Construction Company

- Use of fuel in transportation raw materials to the construction site

- Use of fuel in materials delivery within construction site

- Use of fuel i.e. diesel in powered mechanical equipment
- Use of water for dust suppression



- Disposal and treatment of construction waste

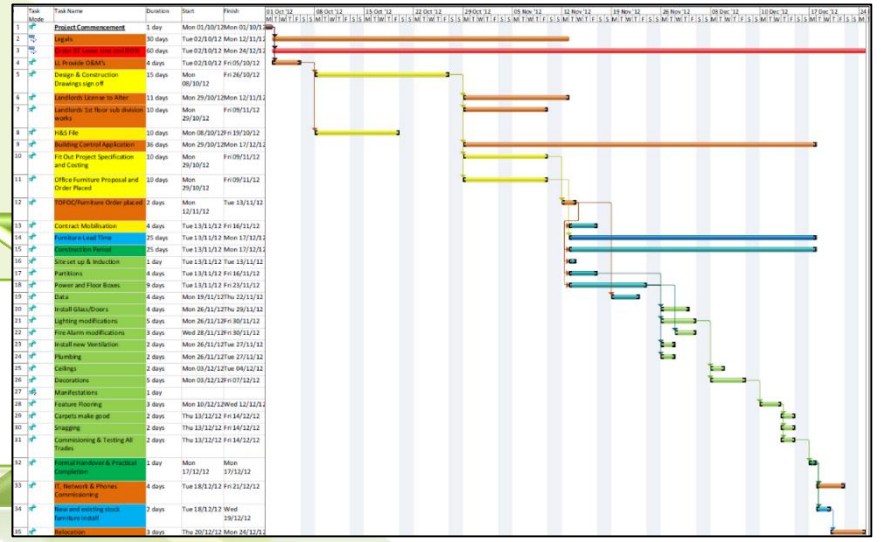
- Use of electricity, water, papers in site office

Case Study 1 – Reduction Measures in Construction Sites

1) Planning

Programme

Develop a Realistic Programme



- Follow the most updated project requirement / drawings
- Carefully list all activities required according to the procedure/method statement
- Avoid missing items
- Avoid "redo"

1) Planning

Procurement

機械種類 Machine Type :

機械商業名稱及型號 Machine Trade Name & Model :

機械序號 Machine Serial Number :

引擎廠名及型號 Engine Make & Model :

EPD-A-12Z45-20X1

根據《空氣污染管制(非道路移動機械)(排放)規例》給予的核准

Approval given under the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation

Green Procurement / sub-contractor management

- Give priority to purchase from nearby sources
- Accurate order of materials
- place order according to actual needs
- Selection of equipment with low emissions (NRMM labels)
- To manage diesel consumption i.e. provision by main contractor or sub-contractor?

2) Construction Works

Equipment Utilization

Fully utilize machines, accurately estimate the no. of machines to be used, avoid idling

- Use of generators on site e.g. Would a larger power generator more energy efficient than using several smaller size generators to cover one large area ?
- Avoid idling of machines
- Select appropriate size of machines
- Eliminate construction equipment and machinery with low efficiency and high energy consumption

2) Construction Works

Emissions Control

Reduce emission from the burning of fossil fuel

- ✓ Switch off idling machines
- ✓ Use of permanent power instead of generator as far as possible
- ✓ Use of Biofuel (B5) for construction equipment e.g. generator
- ✓ LED lights used for all temporary lighting in construction sites

2) Construction Works

Use of Energy

Use of permanent power / renewable energy

- Connect to permanent power source as far as possible
- use of rechargeable batteries for equipment e.g. torch to reduce waste
- use of solar powered flash light

2) Construction Works

Water

Reduce construction wastewater

Examples:

- ✓ Reuse wastewater from wheel washing machines for dust suppression
- ✓ Reuse wastewater generated from SI boring machines

3) Maintenance

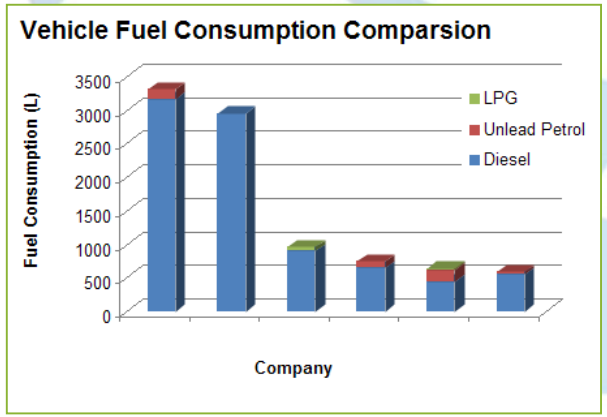
Machinery maintenance

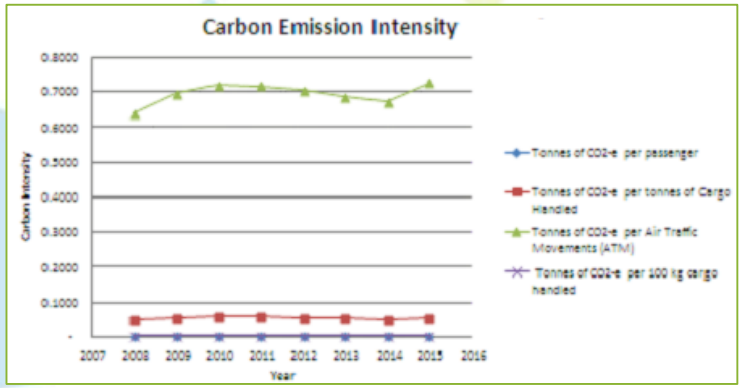
- ✓ Regular machines check-up to ensure efficiency
- ✓ Regular check up to avoid dark smoke emissions
- ✓ Regular replacement of filter and lube oil

4) Monitoring

Performance review

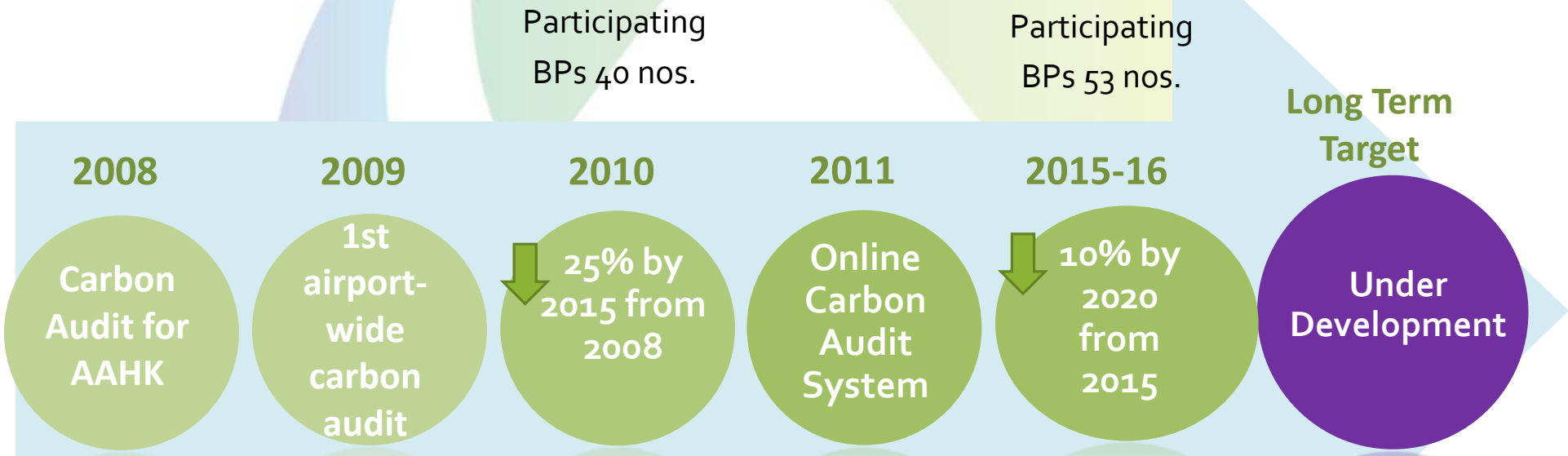
- Closely monitor energy consumption
- Conduct carbon audit
- Produce emission inventory and compare results





Case Study 2 – Hong Kong International Airport

Case Study – Hong Kong International Airport



Setting a Long-term Airport-wide Carbon Reduction Target

11 May 2020

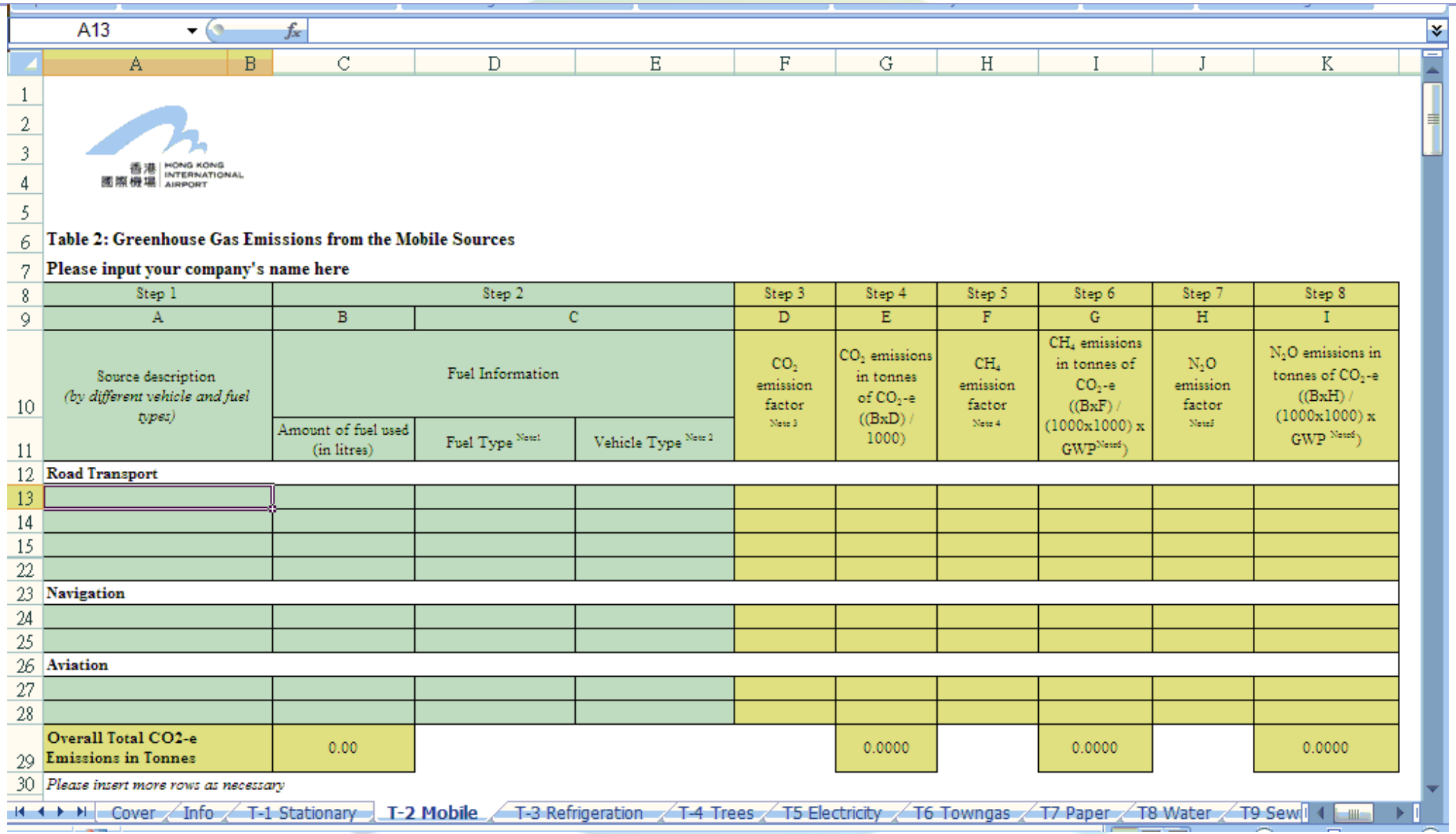
As HKIA is reaching the end of its current carbon reduction target, the Airport Authority (AA) launched a study to set a new 15-year airport-wide carbon reduction target in April 2020. While the AA's current and previous five-year carbon reduction pledges aim to reduce the carbon intensity of airport operations, the HKIA's 2035 target will focus on achieving absolute emissions.

The new target will take into account various emissions reductions opportunities, including accelerating the transition from a diesel to an electric-powered airside vehicle and ground services equipment fleet, and seeking low carbon electricity from the grid.

In brief, the study will encourage the whole airport community and the key energy parties to work together to achieve decarbonisation as a key component of Hong Kong's low carbon economy.

Click HERE to learn more about HKIA's carbon management.

- To encourage our business partners to join the HKIA carbon audit, AA firstly developed an user-friendly carbon calculation tool



香港國際機場 HONG KONG INTERNATIONAL AIRPORT

Table 2: Greenhouse Gas Emissions from the Mobile Sources

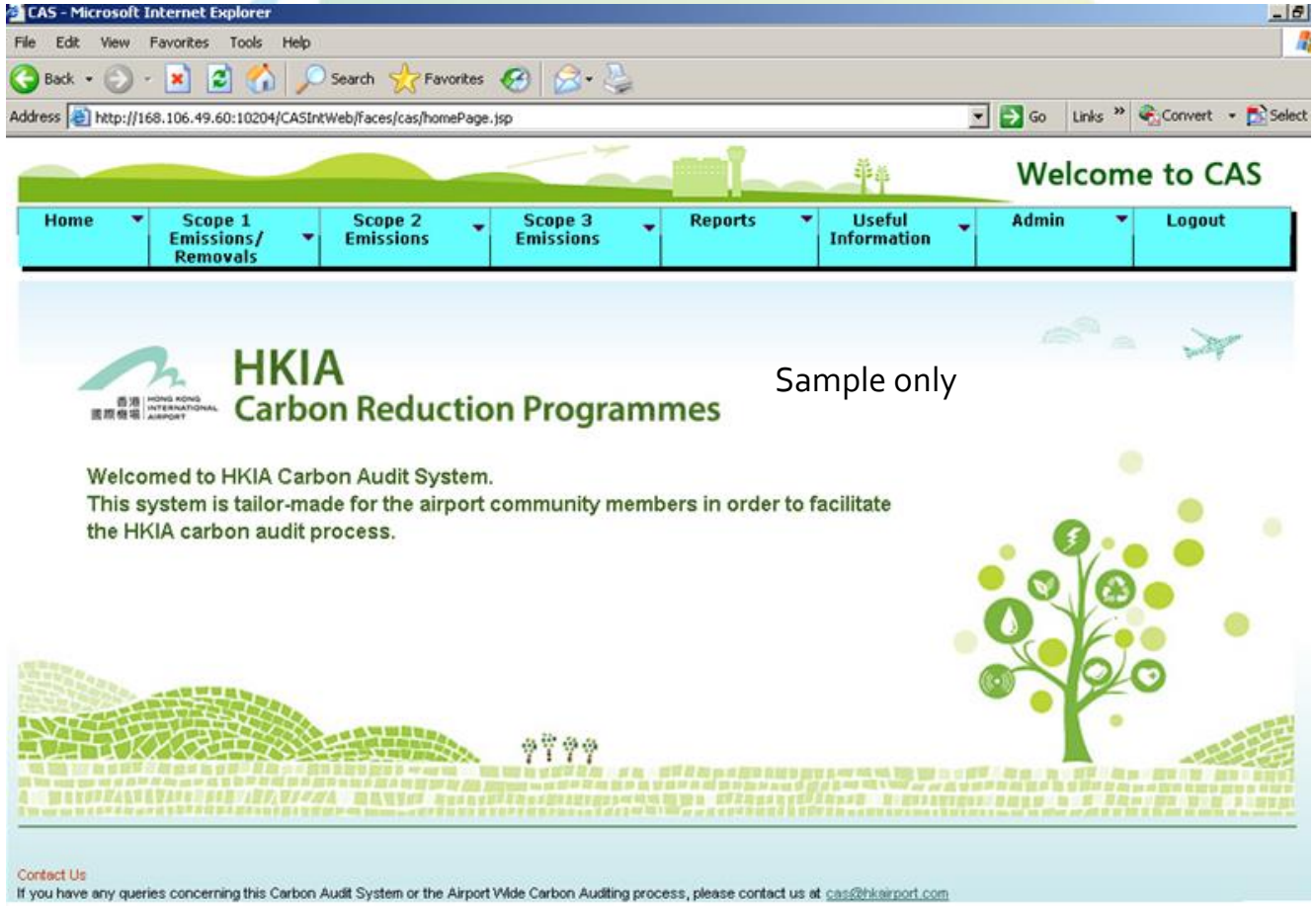
Please input your company's name here

Step 1	Step 2			Step 3	Step 4	Step 5	Step 6	Step 7	Step 8
A	B	C		D	E	F	G	H	I
Source description *(by different vehicle and fuel types)*	Fuel Information			CO_2 emission factor Note 3	CO_2 emissions in tonnes of CO_2-e ((BxD) / 1000)	CH_4 emission factor Note 4	CH_4 emissions in tonnes of CO_2-e ((BxF) / (1000x1000) x GWP Note6)	N_2O emission factor Note5	N_2O emissions in tonnes of CO_2-e ((BxH) / (1000x1000) x GWP Note6)
	Amount of fuel used (in litres)	Fuel Type Note1	Vehicle Type Note 2						
Road Transport									
Navigation									
Aviation									
Overall Total CO2-e Emissions in Tonnes	0.00				0.0000		0.0000		0.0000

Please insert more rows as necessary

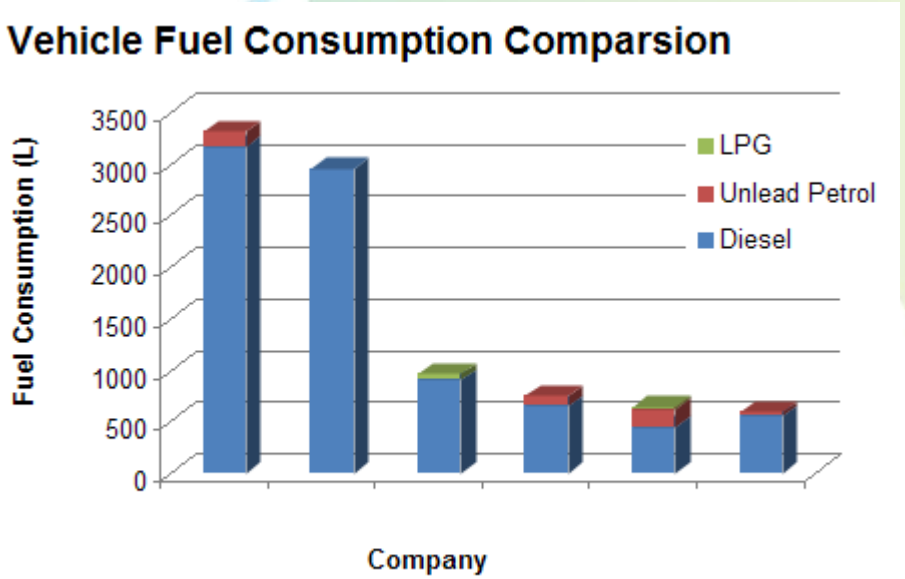
Cover | Info | T-1 Stationary | T-2 Mobile | T-3 Refrigeration | T-4 Trees | T5 Electricity | T6 Towngas | T7 Paper | T8 Water | T9 Sew

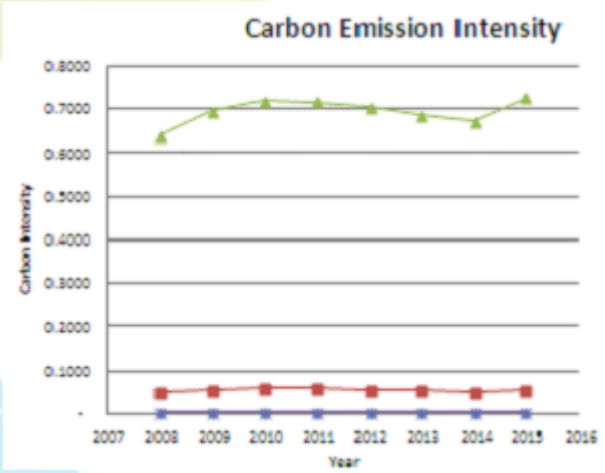
Examples of Carbon Audit Software



Sample only

Production of Various Reports by Software





Sample only

Carbon Reduction Measures

Upgrade FGP & PCA and replace refrigerants

Installations of LED lightings

Solar Panel Trial
(car park 2)

Green roof at seawater pump house

Reconfiguring air-conditioning systems

Vehicle Emissions Control

Electric Vehicles

LPG refueling station

SINOPEC

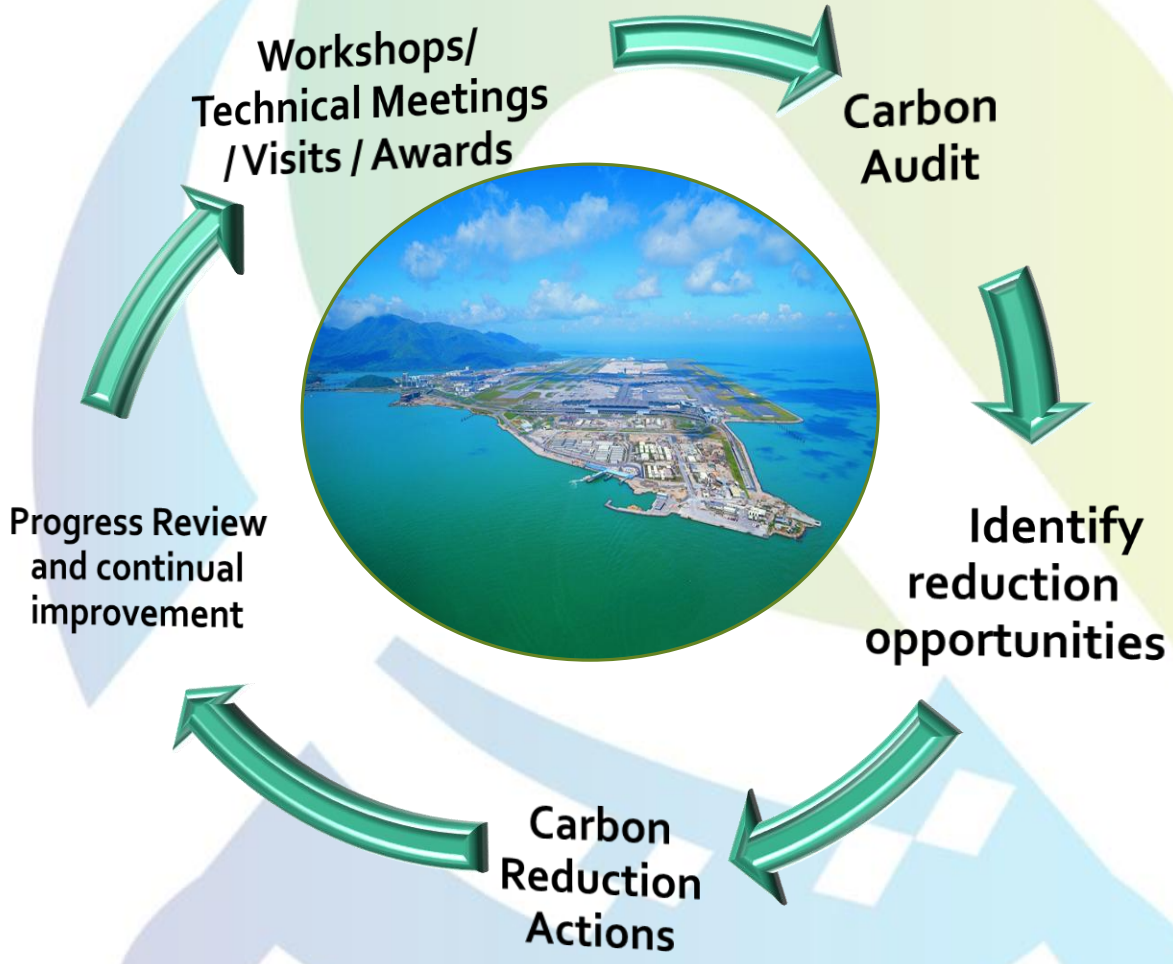
B5 refueling station

Quick charger

Electric Ground service Equipment

- All airside saloon in HKIA must be EV by 2017

Overview



The carbon management cycle

End of Session 3

Carbon Reduction Measures

15:15 – 15: 30 Break

ASEL Consulting Company

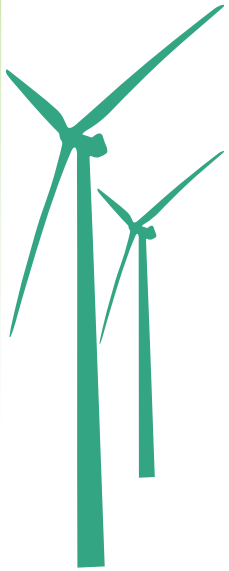
20th anniversary 2020
GREEN COUNCIL
環保促進會

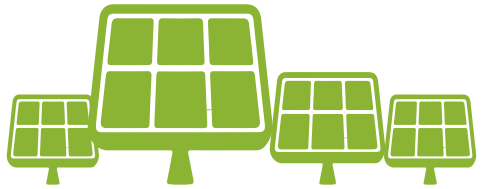
Session 4
Carbon Offsetting
15:30 – 16:30

By Ir Sophia Lau

Director, ASEL Consulting Company

29th June, 2020





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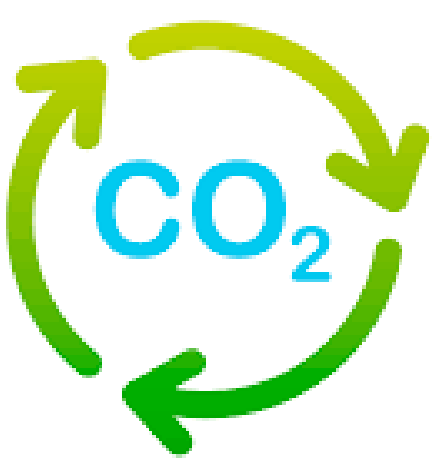
What is Carbon Offsetting?

- "A climate action that enables individuals and organizations to **compensate** for the **emissions** they **cannot avoid**, by supporting worthy projects that **reduce emissions somewhere else**" (United Nations Carbon Offset Platform, 2020)
- Unit: Tonnes of Carbon Dioxide-Equivalent (CO_2e)



One carbon credit = One ton of carbon dioxide

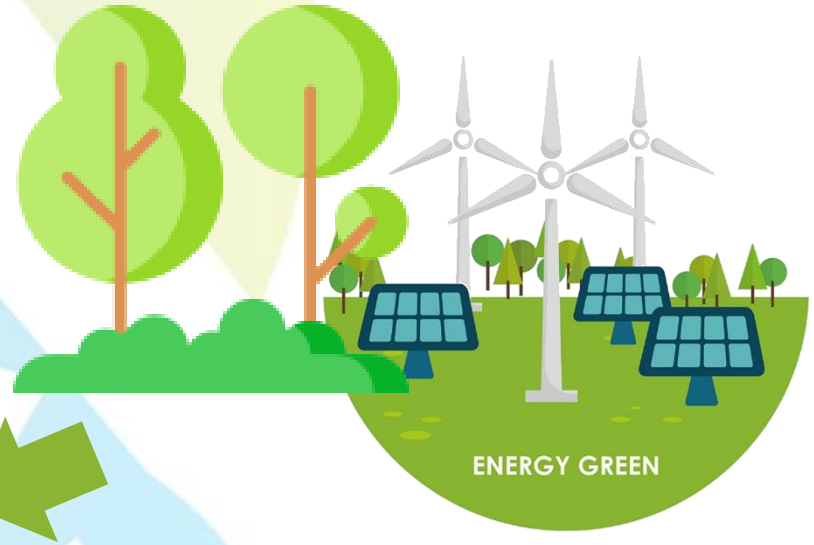
History of Carbon Offsets

- Concept starts in late 1980s
- 1997 Kyoto Protocol: Clean Development Mechanism
- 2005: European Union: Emission Trading Scheme
- Development of voluntary carbon offset scheme

Carbon Offset Mechanism

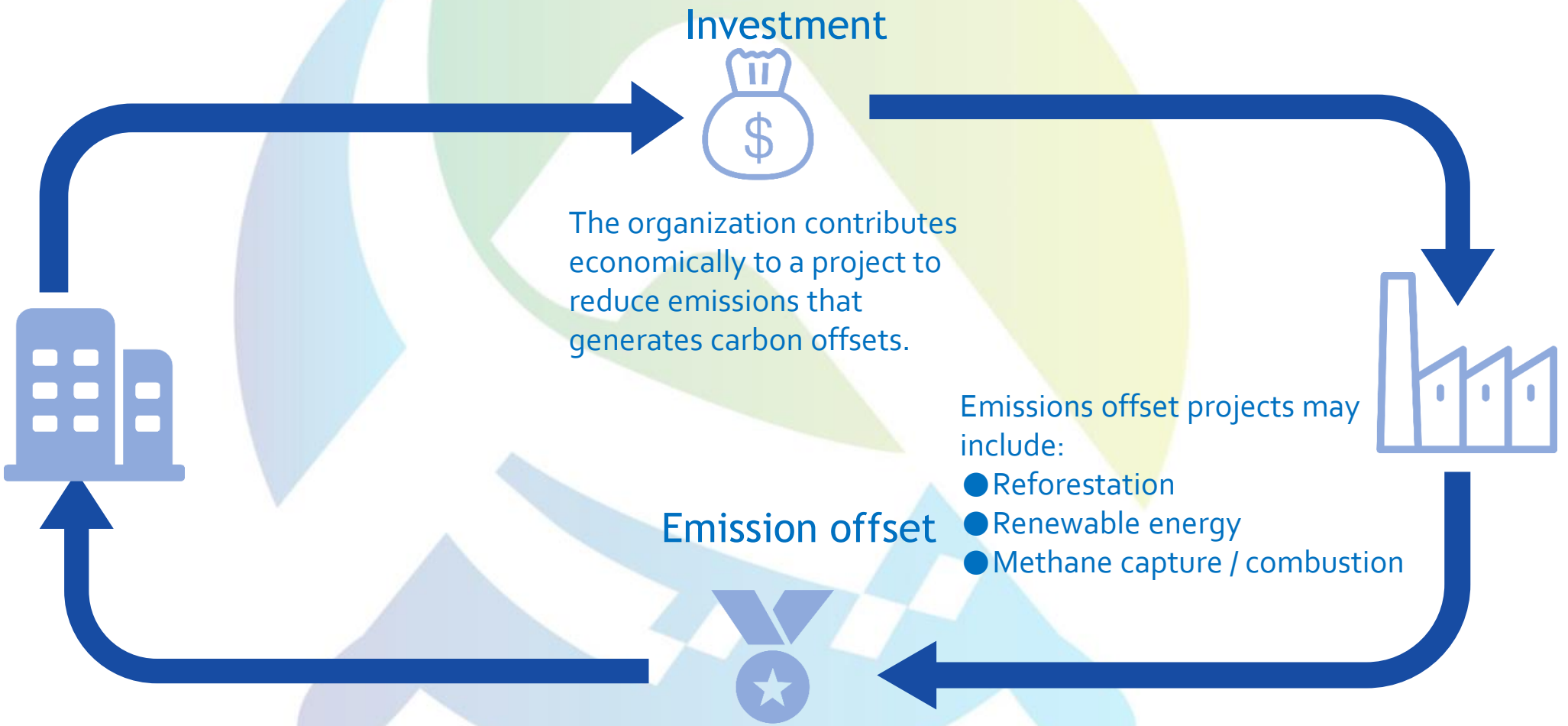
CO_2 ↑

CO_2 ↓



Carbon Credit

Carbon Offset Mechanism



Carbon Offset Market

Compliance Market

- Buyer: Government, cooperation or organization
- Offset amount:
  - Comply with total amount of carbon emission agreed/set by international agreement/pledge
- Price:
  - Typically have certain price for 1 ton CO_2 equivalent (CO_2e) offset

Voluntary Market

- Buyer:
  - Government, cooperation, organization or individual
- Offset amount:
  - Buy carbon offset for own emission
- Price:
  - Have different price, depend on bilateral transaction

Criteria for High Quality Carbon Offsets

Leakage

- Reduction in one region result a rise in emissions somewhere else
- Minimize the leakage at project design stage

- Additional to business as usual
- Reduce Co2 emissions below the baseline

Additionality

Auditing

- Validation and verification
- To confirm the CO_2 emissions reductions are true and accurate

Co-Benefits

- Social, economic benefits from the emission reduction projects
- E.g. GHGs emission reduction of transportation improves air quality and the health of the public

Permanence

- Emission reductions should be able to permanently removed from the atmosphere.
- Durability of emission reductions from an offset project varies on the project types
- E.g. planting trees vs renewable energy

Carbon Offset Standards

Certified Emission Reduction (CER)

Certified by official UN-backed offsetting schemes - Carbon emission projects certified by the United Nations under the Clean Development Mechanism (CDM) in Kyoto Protocol. Annex 1 countries (eg. EU and Canada) classified in the CDM are required to comply with a Cap-and-Trade agreement to limit emission through purchasing CER to an acceptable level.

Verified/voluntary Emission Reduction (VER)

Not certified by official UN-backed offsetting schemes -

Carbon reduction by emissions reducing project, it includes renewable energy project such as solar farm, wind farm and hydro plants projects. The project is validated independently by third parties based on international standards. Organizations which are not restricted by the Cap-and-Trade agreement under Kyoto Protocol may offset their carbon emission through VER.

Voluntary carbon crediting schemes

The Gold Standard

- Founded in 2003 by WWF
- Focusing on environmental and social benefits
- More than 550 registered projects

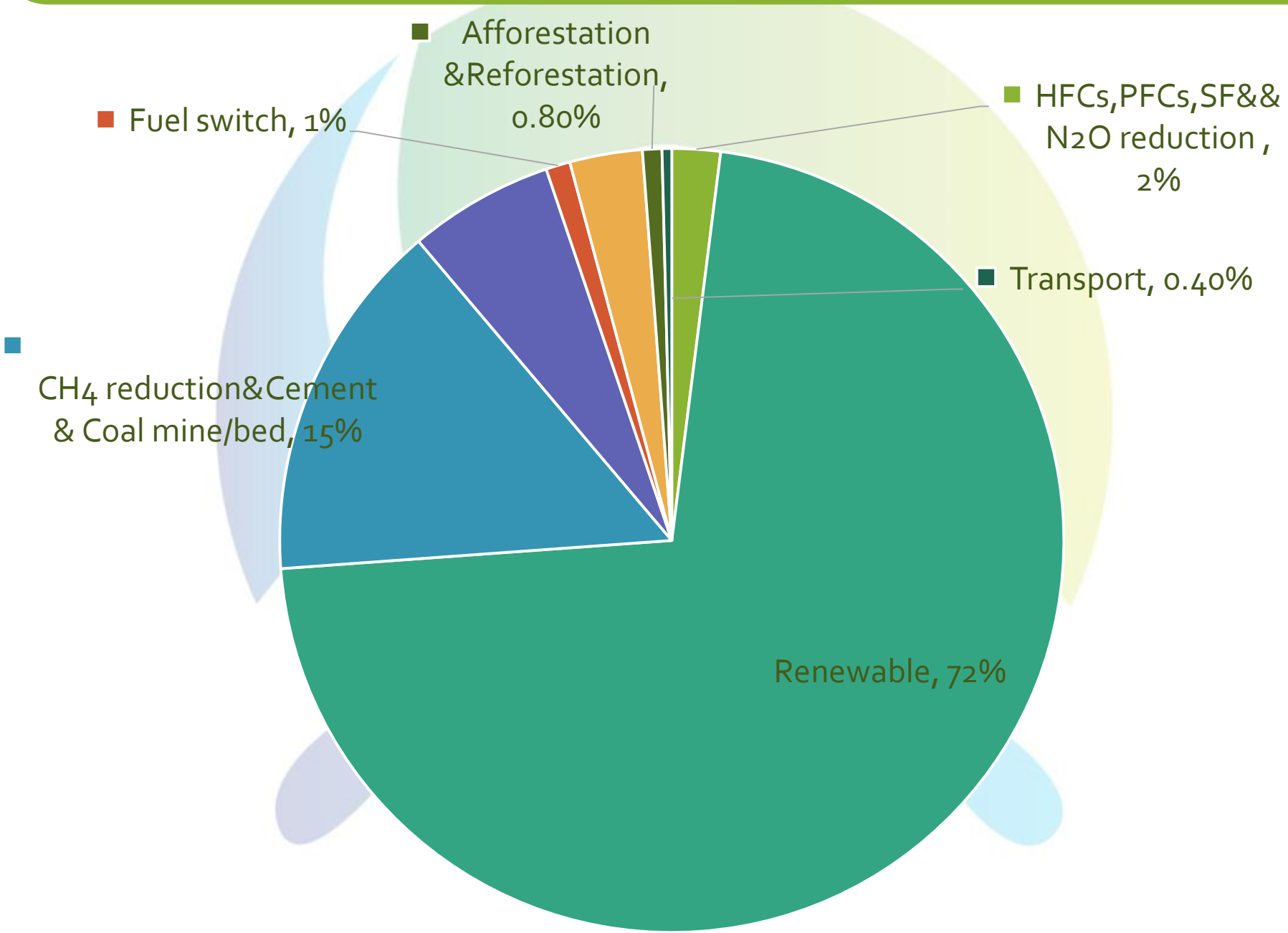
Gold Standard®
Climate Security & Sustainable Development

VCS (Verified carbon standard)

- Non-profit organization founded in 2005
- Largest voluntary standard with over 1300 projects

Verified Carbon Standard
A VERRA STANDARD

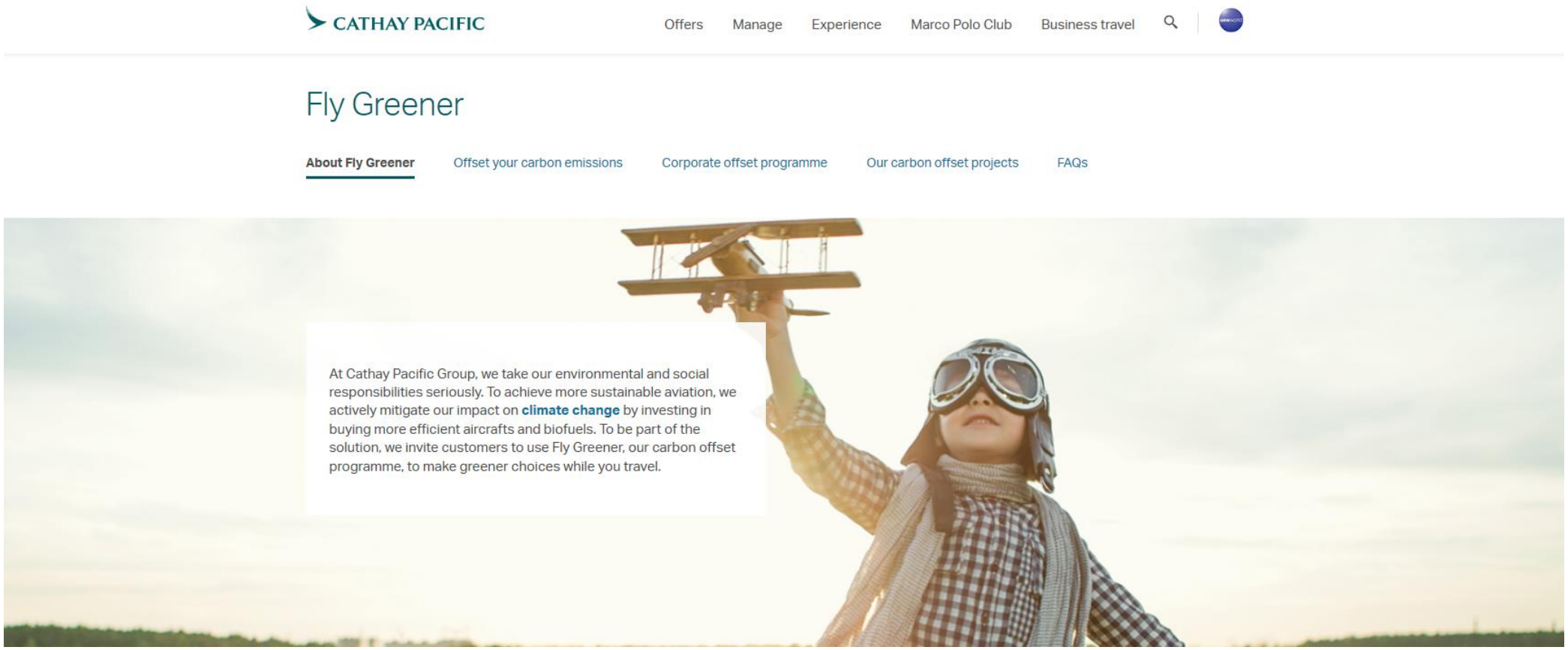
Projects for Carbon Offsets



(CDM, 2019)

Example of Applications

- Cathay Pacific offered carbon offsetting since 2007. Offset over 160,000 tons CO_2 from 2007 to 2019



Offset your carbon emissions

About Fly Greener | **Offset your carbon emissions** | Corporate offset programme | Our carbon offset projects | FAQs

If you're looking to offset your flights, you can use our online calculator to work out your share of the carbon emissions. This number is calculated by dividing the total fuel used on a journey by the number of passengers. To learn more about our calculation method, please visit on our **Fly Greener FAQs page**.

You can also choose to make a one-off contribution, using either cash or your Asia Miles. To do so, simply select 'Lump sum contribution' below.

- (●) **Trip-based contribution**
- ( ) Lump sum contribution

Calculate your carbon emissions

- (●) **Return** ( ) One way

Leaving from

Going to

NO. OF PASSENGER(S) 1 Passenger(s)

CABIN CLASS Economy

Reset | Add flight

Calculation results

Your total	CO2 emissions	Equivalent cash	Asia Miles	
	1.66 tonnes	HKD 32.05	₳ 790	
HKG ✈ LHR Return, 1 Passenger(s) Economy	1.66 tonnes	HKD 32.05	₳ 790	Remove

Offset your carbon emissions

A contribution can be made either by credit card (Hong Kong dollars) or by redeeming Asia Miles.

improving cooking methods in Bangladesh and generating clean energy in India.

climatecare Gold Standard

Bondhu Chula Cookstoves in Bangladesh

90% of the 160 million Bangladeshis cook on "three-stone" open fires in their homes, which wastes energy and produces smoke that causes more than 45,000 premature deaths a year.

The Bondhu Chula, or the 'friendly stove', is designed to ensure a more efficient burn reducing fuel use and the chimney takes the harmful pollutants out of the house. The project employs local entrepreneurs to produce and distribute the stoves. Fuel consumption can be reduced by approximately 50%, leaving families with more disposable income and better health.

firstclimate Gold Standard

Generating clean energy from organic food waste in India

An estimated 240million people in India are without electricity. Those who are connected suffer from poor output and regular power shortages. This causes residents to turn to natural resources for fuel, which can be harmful to health but also the local environment.

The project will distribute over 15,000 biodigestors across India to replace fuelwood grid electricity and other fossil fuels. These units can be used to produce cooking gas, heat or even electricity on the larger scale units. Poor households benefit from saving on fuel costs and cleaner air. The slurry generated by the units can also be used as an organic fertilizer, reducing the use of chemical fertilizer.

Offsetting Emissions from Events

Offsets as a Gift?

TCOP-16-O-021

Sample

Carbon Offset Certificate

presented to

Sophia Lau

for offsetting

1 tons of CO_2 Emissions

By participating in this carbon offsetting program, you are contributing to the fight against global warming and supporting greenhouse gases reduction projects in Thailand and enable Thailand's transition to a low-carbon future.

Thail

March 23, 2016

End of Session 4

Carbon Offsetting

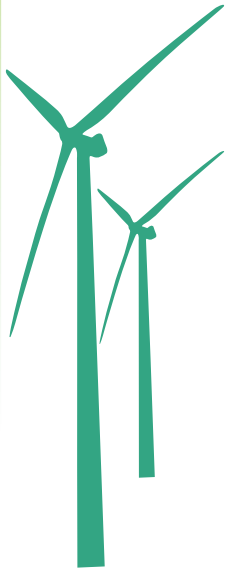
ASEL Consulting Company

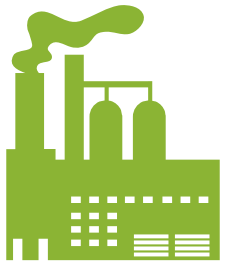
20th anniversary 2020
GREEN COUNCIL
環保促進會

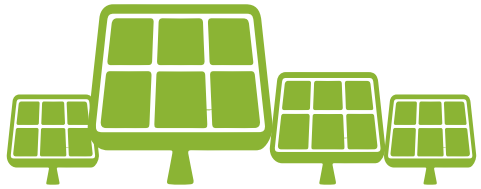
Course Summary
16:30 – 16:45

29th June, 2020

By Ir Sophia Lau







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Verification and Reporting

Carbon Audit

Summary

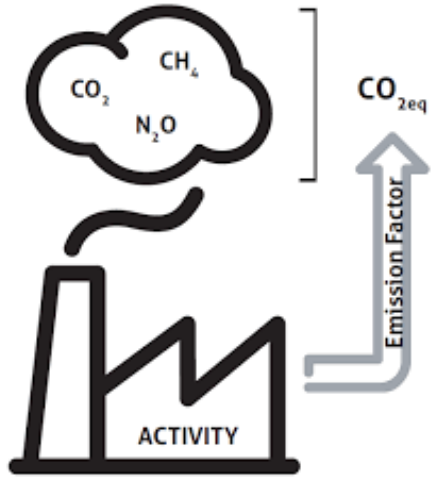
Target Setting

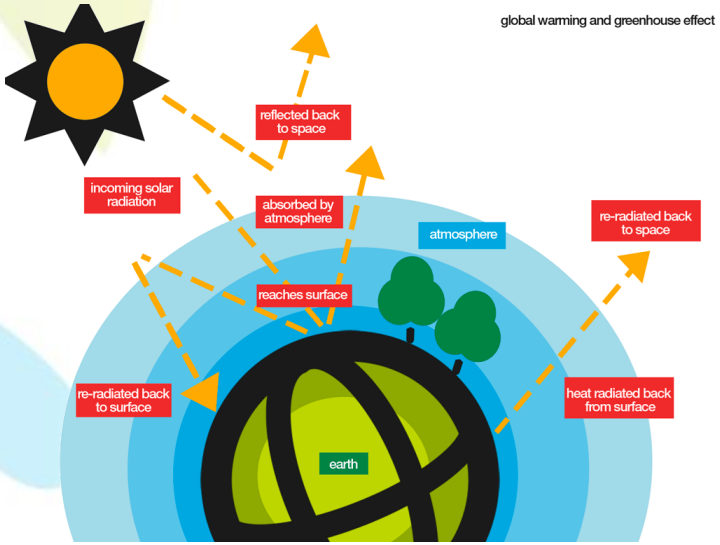
Carbon offset

Reduction

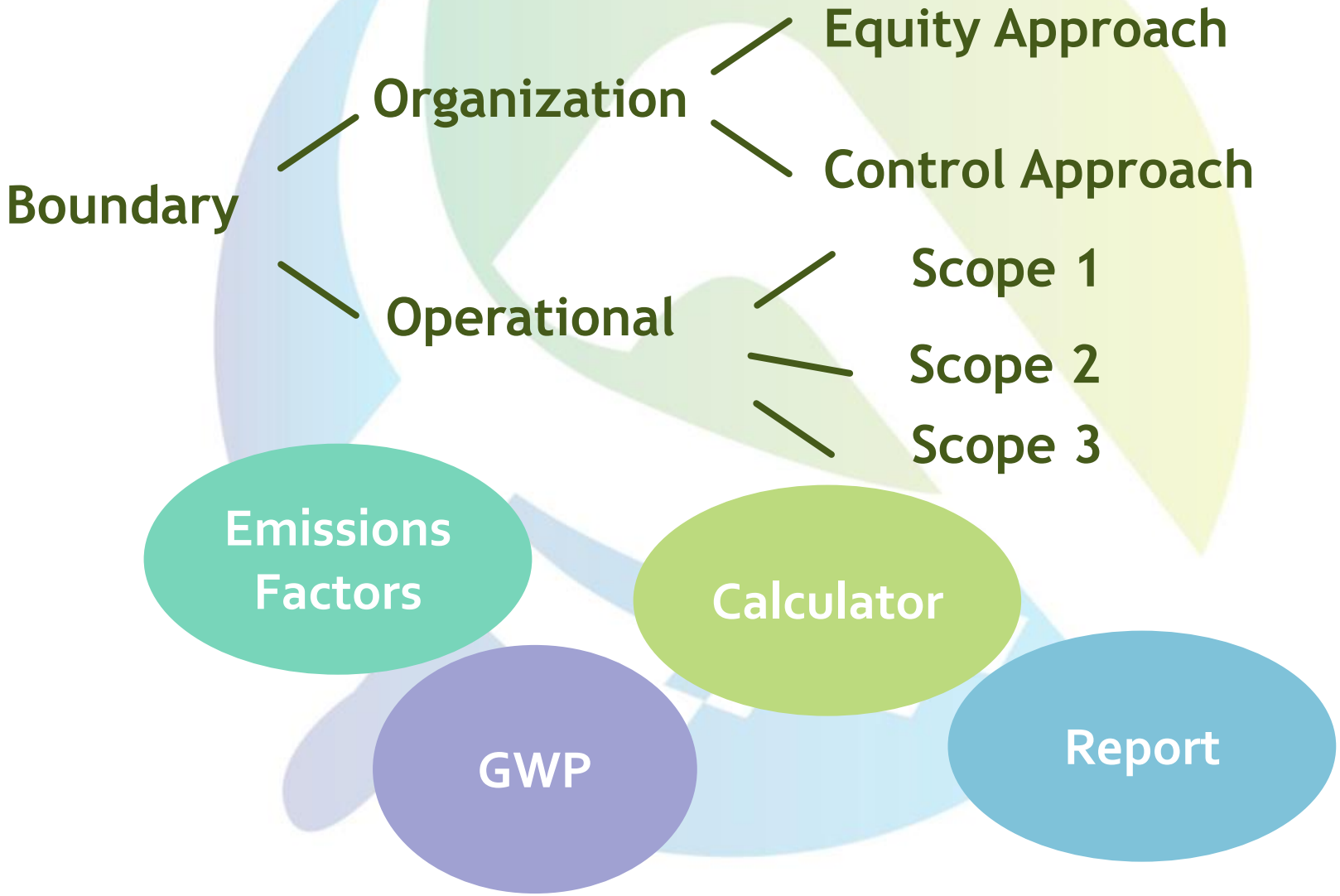
Carbon Audit

- What is scope 1, scope 2, scope 3
- What is Emission Factors
- What is Global Warming Potentials





Carbon Audit



Means of Carbon Reporting

- Sustainability reporting, ESG reporting
- Environmental report
- Annual report
- Company website
- Hong Kong Carbon Footprint Repository
- Carbon Disclosure Project
- Task Force on Climate-related Financial Disclosure(TCFD)

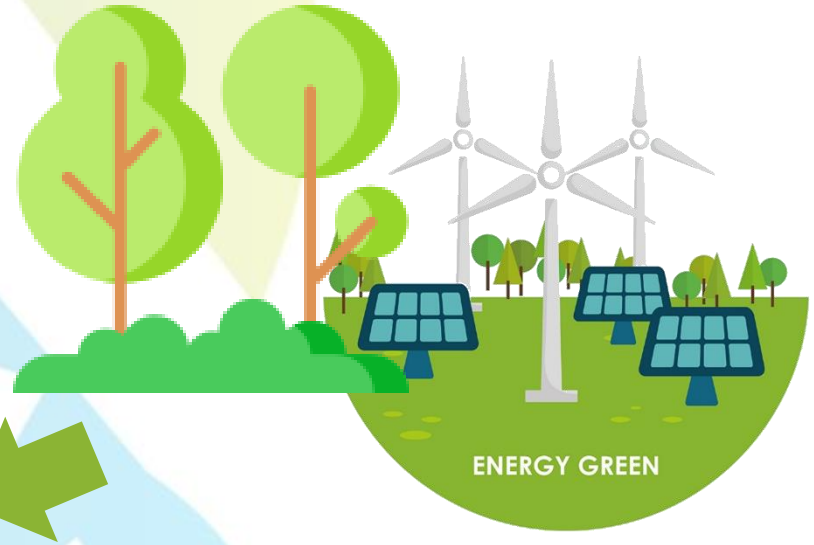
Context Of Carbon Offset

Key Components of a Target

Carbon Offset Mechanism

CO_2 ↑

CO_2 ↓



Carbon Credit

~. THANK YOU ~