Hong Kong Taxonomy for Sustainable Finance

Supported by



HONG KONG MONETARY AUTHORITY
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Climate Bonds INITIATIVE

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1. Introduction

1.1. The need for developing a taxonomy for Hong Kong

Climate change is one of the most pressing global issues. Its impact on the planet can be felt in the form of rising temperatures, melting glaciers, rising sea levels, and more frequent natural disasters. The continued burning of fossil fuels and other human activities are causing greenhouse gas (GHG) emissions, trapping heat in the atmosphere and aggravating the issue. Asia is one of the places most vulnerable to climate change as the region is experiencing changes in rainfall patterns, rising sea levels, and more frequent extreme weather events, such as typhoons and floods. These events can lead to crop failures, water scarcity, and infrastructure damage, which can have a significant impact on the region's economies. Moreover, the low-lying landscape makes this region particularly vulnerable to rising sea levels.

Hong Kong is no exception. According to the Hong Kong Observatory, temperature increased at a rate of 0.28℃ per decade during 1993-2022[1] whilst, on average, the mean sea level at Victoria Harbour rose at a rate of 32 millimetres per decade during 1954-2022[2]. In addition, in recent years Hong Kong is experiencing more frequent and intense weather events, such as typhoons and heavy rainfalls. These events disrupt the city's transportation and cause damages to infrastructure, affecting business operation and daily lives of peoples.

In an effort to combat climate change, 196 Parties at the United Nations (UN) Climate Change Conference adopted the Paris Agreement in 2015[3]. As part of China, the Hong Kong Special Administrative Region has the duty to make its contribution in order to achieve the goals of the Paris Agreement. In 2021, the Government announced the "*Hong Kong's Climate Action Plan 2050*", which set out four major decarbonisation strategies to allow it to achieve carbon neutrality before 2050: the "*net-zero electricity generation*", "*energy saving and green buildings*", "*green transport*" and "*waste reduction*". To support the global action on climate change, the financial sector has a key role to play. It can green the world by directing capital flows towards sustainable investments and away from high-emitting industries, hence driving the transition to a sustainable future.

In this regard, a sustainable finance taxonomy is an important tool as it provides a standardised framework for classifying and labelling financial products and investments based on their environmental sustainability. This classification system allows investors to identify and invest in activities that are making a positive impact on the environment while avoiding those that have a negative impact. It helps to align investment decisions with climate goals and reduce the risk of investing in assets that are not aligned with a low-carbon future. It can also help unlock new investment opportunities for green technologies and sustainable projects and increase transparency and accountability in the financial sector.

Given the critical role a sustainable finance taxonomy can play in shaping green financial markets, the Hong Kong Monetary Authority (HKMA) has commissioned Climate Bonds Initiative (Climate Bonds) to work on a green classification framework for adoption in the local market. This will help underpin Hong Kong's instrumental role in bridging green financial flows between Mainland China and the rest of the world, and hence strengthen Hong Kong's status as an international green finance hub.

[1] https://www.hko.gov.hk/en/climate_change/obs_hk_temp.htm

[2] https://www.hko.gov.hk/en/climate_change/obs_hk_sea_level.htm

[3] https://unfccc.int/process-and-meetings/the-paris-agreement

1.2. Core principles

The Hong Kong Taxonomy is intended to provide financial sectors professionals with consistent and internationally recognised definition of "green" and "environmentally sustainable" (collectively referred to as "green" hereafter) economic activities. It will be guided by scientific principles and be interoperable, comparable and inclusive of other green definitions globally. More specifically, it will be based on the following core principles that ensure its credibility, scientific approach, and alignment with all important benchmarks:

1) **Alignment with the Paris Agreement**. The Hong Kong Taxonomy is primarily focused on providing clear definitions regarding the emissions intensity performance required of economic activities in order to keep global warming well below 2℃, ideally aiming for 1.5℃. The criteria represent the maximum GHG-emissions intensity an economic activity can have to avoid breaching the remaining carbon budget. At this stage, climate change mitigation is the central environmental objective of the Taxonomy. The Hong Kong Taxonomy shall thus be objective in nature, supported by clearly defined metrics and thresholds aligned to the Paris Agreement, and science-based targets.

2) **A proof from greenwashing**. By synthesising existing taxonomies' best practices into an easy-to-use set of criteria, the Hong Kong Taxonomy's goal is to provide more clarity about what can be considered 'green', and to ensure that claims of meeting this definition can be verified accordingly.

3) **Interoperability with other taxonomies**. The Hong Kong Taxonomy considers significant sustainable finance taxonomy developments that have occurred in other jurisdictions, particularly the Mainland China, the EU and the ASEAN. The key taxonomies referenced are the Common Ground Taxonomy (CGT), the European Union (EU) Taxonomy, the Green Bond Endorsed Projects Catalogue, ASEAN Taxonomy and the Climate Bonds Taxonomy (CBT). This was accomplished by categorising activities in accordance with the International Standard Industrial Classification of All Economic Activities (ISIC) and Hong Kong Standard Industrial Classification (HSIC) codes, and as far as possible, using universally applicable metrics.

4) **Science-based criteria and thresholds**. The thresholds reflect the ambition required to meet global decarbonisation objectives. In many instances, the thresholds follow a trajectory that aligns with the overall need to transition the global economy to net-zero emissions by 2050.

5) **Foundations of Do No Significant Harm (DNSH) and Minimum Social Safeguards (MSS)**. While the Hong Kong Taxonomy primarily focuses on climate change mitigation, it acknowledges the interconnectedness of sustainability issues. The importance of DNSH and MSS is recognized and will be explored in future development.

1.3. Alignment of the Hong Kong Taxonomy

The Hong Kong Taxonomy aims to achieve interoperability with other reference taxonomies. The table below presents whether and how reference taxonomies are adopted/adapted.

Figure 1: Taxonomy compatibility table

Sectors in Hong Kong Taxonomy	Common Ground Taxonomy	EU Taxonomy	Mainland China Taxonomy	ASEAN Taxonomy (V2)	Climate Bonds Taxonomy
Electricity generation using concentrated solar power technology				Tier 1 Green	
Electricity generation using solar photovoltaic technology				Tier 1 Green	
Electricity generation from wind power				Tier 1 Green	
Construction and operation of public transportation system in urban and rural areas					
Construction and operation of personal mobility devices, cycle logistics					
Water Transport (freight and passenger)					
Collection and transport of non-hazardous waste in source segregated fractions					
Utilisation/ treatment of domestic waste – anaerobic digestion					
Sewage sludge treatment – anaerobic digestion					
Construction of new buildings					
Renovation of buildings					

Colour Coding

Level of ambition is aligned	Adapted	Criteria not yet developed/ Comparison not yet conducted

2. Taxonomy spreadsheet

The Taxonomy spreadsheet in Section 2.1. provides an overview of all the activities that have been included for each sector in the Taxonomy. The activities have been listed in the spreadsheet along with the activity description and key metrics. The substantial contribution criteria for each activity that defines the thresholds to classify the activity as green can be further referenced at the granular level by clicking on the link to the corresponding activity cards. Additionally, the activities have been mapped to HSIC codes and the closest taxonomy reference, to support interoperability and local applicability.

The Taxonomy spreadsheet thus provides an initial reference list to users to identify all the activities included in the Taxonomy for each sector, and they can further reference to the linked activity cards (Section 3) for detailed information regarding the sector, metrics and criteria to classify the activity as green.

Structurally, the prototype spreadsheet is divided into three layers:

- **Layer 1**: **Taxonomy activities and mapping**
  Layer 1 columns of the Spreadsheet represent the mapping of HSIC codes for each activity, including the activity name and description. More details are provided below:
  - To support interoperability and ease of comparison to other taxonomies, the HSIC Industry class for each activity is also mapped against its corresponding ISIC and NACE codes
  - It is noted that a prototype activity can be mapped against one or more HSIC Industry subclasses based on the specific activity description as the HSIC and ISIC classification systems do not perfectly align.

- **Layer 2: Key Metrics**
  The corresponding Layer 2 columns of the Spreadsheet represent the key metrics for the prototype activity that has been adopted/adapted from a specific reference taxonomy. In most cases, prototype activities align and adopt/adapt CGT activity metrics and criteria.

- **Layer 3**: **Substantial contribution criteria**

  The layer 3 column of the Spreadsheet defines the substantial contribution criteria of the prototype activity. For ease of review, this column references the activity cards, which contain a more granular description of the prototype activity's technical screening criteria.

2.1. Prototype spreadsheet

1. Taxonomy Activities and Mapping								2. Key Metrics	3. Substantial Contribution Criteria
HSIC Industry Section	**HSIC Industry Division (2 Digit)**	**HSIC Industry Group (3 Digit)**	**HSIC Industry Class (4 digit) (Corresponding ISIC / NACE)**	**HSIC Industry Sub-class (6 Digit)**	**Taxonomy-level activity**	**Description**	**Closest Taxonomy Alignment**		
F-Construction	**41 - Construction of buildings**	411: Erection of architectural superstructures, building construction	4110: Erection of architectural superstructures, building construction (ISIC: 4100 - Construction of Buildings) (NACE: 41.10 - Development of building projects; 41.20 - Construction of residential and non-residential buildings)	411000: Erection of architectural superstructures, building construction	**Construction of new buildings**	**Construction of new buildings**	**CGT F1.1 Construction of new buildings**	1) **Operational emissions:** a. Primary Energy Demand b. Energy Consumption c. Direct emissions of building d. Reference to PCAF technical guidance on operational emissions assessment. 2) **Energy savings:** The share of total or relative energy consumption that can be saved because of the implemented measures. 3) **Energy consumption of buildings compared to peers** 4) **Buildings Certification Schemes**: **BEAM Plus** is commonly used in Hong Kong. 5) **Zero-Carbon-Ready Building Certification & (Upcoming) Net Zero Building Certification**: HKGBC is in the process of developing a new building certification scheme which is primarily focused on the emissions performance of buildings in Hong Kong. **Note: Items 1 to 3 in the above list of Metrics are the most ideal, however, this data may not be adequately available across the sector. As such, it is recommended that item 4 (BEAM Plus) should be the main criterion for Hong Kong while item 5 (Zero-Carbon-Ready Building Certification & Net Zero Building Certification) should be a supplementary criterion to provide flexibility for compliance.**	Please refer to the activity card for the full set of criteria
		412: Structural steel framework erection	4120: Structural steel framework erection (ISIC: 4100 - Construction of Buildings) (NACE: 41.10 - Development of building projects; 41.20 - Construction of residential and non-residential buildings)	412000: Structural steel framework erection					
		419: Other new building construction works	4191: Structural alteration and addition works (ISIC: 4100 - Construction of Buildings) (NACE: 41.10 - Development of building projects; 41.20 - Construction of residential and non-residential buildings)	419100: Structural alteration and addition works					
	43 - Specialised construction activities	432-Building services installation and maintenance activities	4321-Electrical equipment installation and maintenance (ISIC: 4321 - Electrical Installation) (NACE: 43.21 - Electrical installation)	4321XX: Electrical equipment installation and maintenance					
			4322-Ventilation, gas and water fitting installation and maintenance activities (ISIC: 4322 - Plumbing, Heat and Air-Conditioning Installation) (NACE: 43.22 - Plumbing, heat and air-conditioning installation)	4322XX: Ventilation, gas and water fitting installation and maintenance activities					
			4329-Other construction installation and maintenance (ISIC: 4329 - Other Construction Installation) (NACE: 43.29 - Other construction installation)	4329XX: Other construction installation and maintenance					
		439 - Building finishing and other specialised construction activities	4391-Decoration, repair and maintenance for buildings (ISIC: 4330 - Building Completion and Finishing) (NACE: 43.3 - Building completion and finishing)	439101: Interior fitting, decoration and repairs for buildings					
			4399-Other general finishing and specialised construction works (ISIC:4390 - Other Specialized Construction Activities) (NACE: 43.9 - Other specialised construction activities)	4399XX: Other general finishing and specialised construction works					

1. Taxonomy Activities and Mapping								2. Key Metrics	3. Substantial Contribution Criteria
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F-Construction	**41 - Construction of buildings**	419: Other new building construction works	4191: Structural alteration and addition works (ISIC: 4100 - Construction of Buildings) (NACE: 41.10 - Development of building projects; 41.20 - Construction of residential and non-residential buildings)	419100: Structural alteration and addition works	**Renovation of existing buildings**	**Renovation of existing buildings**	**CGT F1.2 Renovation of existing buildings**	1) Primary Energy Demand: Amount of energy that must be generated originally in order to meet the total energy demand of a building (**kWh/m2**) 2) Energy Consumption: Total amount of electricity or equivalent electricity, and gas consumed by the building per annum (**kWh/m2/year**) 3) Direct emissions of building: Greenhouse gases emitted from activities under the tenant or landlords' control - (**KgCO2/m2/year**)	Please refer to activity card for the full criteria
	43 - Specialised construction activities	432-Building services installation and maintenance activities	4321-Electrical equipment installation and maintenance (ISIC: 4321 - Electrical Installation) (NACE: 43.21 - Electrical installation)	4321XX: Electrical equipment installation and maintenance					
			4322-Ventilation, gas and water fitting installation and maintenance activities (ISIC: 4322 - Plumbing, Heat and Air-Conditioning Installation) (NACE: 43.22 - Plumbing, heat and air-conditioning installation)	4322XX: Ventilation, gas and water fitting installation and maintenance activities					
			4329-Other construction installation and maintenance (ISIC: 4329 - Other Construction Installation) (NACE: 43.29 - Other construction installation)	4329XX: Other construction installation and maintenance					
		439 - Building finishing and other specialised construction activities	4391-Decoration, repair and maintenance for buildings (ISIC: 4330 - Building Completion and Finishing) (NACE: 43.3 - Building completion and finishing)	4391XX: Decoration, repair and maintenance for buildings					
			4399-Other general finishing and specialised construction works (ISIC:4390 - Other Specialized Construction Activities) (NACE: 43.9 - Other specialised construction activities)	439101: Interior fitting, decoration and repairs for buildings					

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HSIC Industry Section	**HSIC Industry Division (2 Digit)**	**HSIC Industry Group (3 Digit)**	**HSIC Industry Class (4 digit) (Corresponding ISIC / NACE)**	**HSIC Industry Sub-class (6 Digit)**	**Taxonomy-level activity**	**Description**	**Closest Taxonomy Alignment**		
D - Electricity and gas supply	**35- Electric and gas supply**	351- Electric power generation, transmission and distribution	3510 - Electric power generation, transmission and distribution (ISIC: 3510 - Electric power generation, transmission and distribution) (NACE:35.11 - Production of electricity)	35100- Electric power generation, transmission and distribution	**Electricity generation using concentrated solar power**	**Electricity generation using concentrated solar power (CSP) technology. Construction and operation of facilities using solar thermal power to generate electricity.**	**CGT D1.2 Electricity generation using concentrated solar power (CSP) technology**	**gCO_2/kWh:** Reflects the emissions intensity for electricity generation, and is based on life cycle emissions to account for GHG emissions throughout the value chain of energy production processes	Please refer to activity card for the full criteria. Automatically eligible if Use of Proceeds comply with activity description.
					Electricity generation using solar photovoltaic technology	**Electricity generation using solar photovoltaic (solar PV) technology. Construction and operation of facilities using concentrated solar photovoltaic power to generate electricity.**	**CGT D1.1 Electricity generation using solar photovoltaic technology**		Please refer to activity card for the full criteria.
					Electricity generation from wind power	**Construction or operation of electricity generation facilities that produce electricity from wind power.**	**CGT D1.3 Electricity generation from wind power**		Please refer to activity card for the full criteria. Automatically eligible if Use of Proceeds comply with activity description.

1. Taxonomy Activities and Mapping								2. Key Metrics	3. Substantial Contribution Criteria
HSIC Industry Section	**HSIC Industry Division (2 Digit)**	**HSIC Industry Group (3 Digit)**	**HSIC Industry Class (4 digit) (Corresponding ISIC / NACE)**	**HSIC Industry Sub-class (6 Digit)**	**Taxonomy-level activity**	**Description**	**Closest Taxonomy Alignment**		
H-Transportation, storage, postal and courier services	**49 - Land Transport**	491- Railway and cable transport	4910-Railway and cable transport (ISIC: 4921 - Urban and Suburban Passenger Land Transport) (NACE: 49.31 - Urban and suburban passenger land transport)	491000- Railway and cable transport	**Construction and operation of public transportation system in urban and rural areas**	**Purchase, financing, leasing, rental and operation of urban and suburban transport vehicles for passengers and road passenger transport. This includes construction and operation of subways, light railways, tram, and other urban rail transportation facilities; construction and operation of high-capacity public transportation facilities, such as BRT bus stations, lines and other facilities construction and operation; purchase of public transportation vehicles, etc.**	**CGT H1.1. Construction and operation of public transportation system in urban and rural areas**	The transport sector criteria require that operated fleets to become more efficient over time by linking eligibility to emissions performance below a certain threshold set to ensure substantially reduced emissions. Emission reduction thresholds are based on performance metrics: • CO2e emissions per passenger kilometre (**gCO2e/pkm**); • CO2e emissions per vehicle kilometre (**gCO2e/vkm**); • CO2e emissions per tonne kilometre (**gCO2e/tkm**).	Please refer to activity card for the full criteria. The trains and passenger coaches that have zero direct (tailpipe) CO_2 emissions Specific criteria for projects in the EU to align with EU Taxonomy
		492 - Land Transport by road	4921 - Public bus services (ISIC: 4921 - Urban and Suburban Passenger Land Transport) (NACE: 49.31 - Urban and suburban passenger land transport)	492100 - Public bus services					
			4923 - Non-scheduled public light bus services (ISIC: 4922 - Other Passenger Land Transport) (NACE: 49.39 - Other passenger land transport n.e.c.)	492300 - Non-scheduled public light bus services					
			4924- Scheduled public light bus services (ISIC: 4922 - Other Passenger Land Transport) (NACE: 49.39 - Other passenger land transport n.e.c.)	492400 - Scheduled public light bus services					
			4925 - School bus services (ISIC: 4922 - Other Passenger Land Transport) (NACE: 49.39 - Other passenger land transport n.e.c.)	492500 - School bus services					

1. Taxonomy Activities and Mapping								2. Key Metrics	3. Substantial Contribution Criteria
HSIC Industry Section	**HSIC Industry Division (2 Digit)**	**HSIC Industry Group (3 Digit)**	**HSIC Industry Class (4 digit) (Corresponding ISIC / NACE)**	**HSIC Industry Sub-class (6 Digit)**	**Taxonomy-level activity**	**Description**	**Closest Taxonomy Alignment**		
H-Transportation, storage, postal and courier services	**49 - Land Transport**	499 - Other land transport services	4990 - Other land transport services (ISIC: 4922 - Other Passenger Land Transport) (NACE: 49.39 - Other passenger land transport n.e.c.)	499000 - Other land transport services	**Construction and operation of personal mobility devices, cycle logistics**	**Selling, purchasing, financing, leasing, renting and operation of personal mobility or transport devices where the propulsion comes from the physical activity of the user, from a zero emissions motor, or a mix of zero-emissions motor and physical activity. This specifically also includes:** **- Construction of urban walking and cycling transportation systems, including public bicycle rental sites, non-motorized vehicle parking facilities, road crossing facilities and other slow-moving urban systems.** **- Construction and operation of shared transportation infrastructure, such as systems for public rental bicycles, online bicycle rental, online electric bicycle rental, online car rental, car sharing, parking facilities and equipment, and bicycle parking facilities.** **- The provision of freight transport services by (cargo) bicycles.** **- Selling, purchasing, financing, leasing, renting and operation of private electric or hydrogen vehicles**	**CGT H1.5. Construction and operation of personal mobility devices, cycle logistics**		Please refer to activity card for the full criteria. 1) Automatically eligible if the propulsion of personal mobility devices comes from the physical activity of the user, from a zero-emissions motor, or a mix of zero-emissions motor and physical activity. 2) Personal mobility devices are allowed to be operated on the same public infrastructure as bikes or pedestrians.

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HSIC Industry Section	**HSIC Industry Division (2 Digit)**	**HSIC Industry Group (3 Digit)**	**HSIC Industry Class (4 digit) (Corresponding ISIC / NACE)**	**HSIC Industry Sub-class (6 Digit)**	**Taxonomy-level activity**	**Description**	**Closest Taxonomy Alignment**		
H-Transportation, storage, postal and courier services	**50-Water transport**	501-Cross-border water transport	5013-Ship owners of sea-going vessels (ISIC: 5011 - Sea and Coastal Passenger Water Transport; 5012 - Sea and Coastal Freight Water Transport) (NACE: 50.10 - Sea and coastal passenger water transport; 50.20 - Sea and coastal freight water transport)	501301: Ship owners of sea-going vessels for passenger transport	**Transportation of passengers by sea**	**Transportation of passengers by sea**	**Climate Bonds Criteria**	• **Annual Efficiency Ratio (AER):** The ratio of a ship's carbon emissions per actual capacity-distance (e.g., deadweight tonnage per nautical mile (dwt-nm), which is a measure of a ship's weight carrying capacity (not including the empty weight of the ship) x distance. • **Energy Efficiency Operational Indicator (EEOI):** The total operational emissions to satisfy transport work demanded, this is usually quantified over a period of time which encompasses multiple voyages (e.g. a year). The ratio of a ship's carbon emissions per unit of transport work (e.g., Tonne-nm (t-nm) is a measure of useful work done and is calculated as deadweight carried X distance). • **Dry bulk by tonnes**	Please refer to activity card for the full criteria. 1) The ship must report an operational emissions intensity (using AER or EEOI) according to the criteria table below. Compliance can be reported by either AER or EEOI for a specific timeframe. For passenger vessels the denominator is GT-nm (gross tonne- nautical mile).
			5014-Operators of sea-going vessels (ISIC: 5011 - Sea and Coastal Passenger Water Transport; 5012 - Sea and Coastal Freight Water Transport) (NACE: 50.10 - Sea and coastal passenger water transport; 50.20 - Sea and coastal freight water transport)	501401: Operators of sea-going vessels for passenger transport					
			5013-Ship owners of sea-going vessels (ISIC: 5011 - Sea and Coastal Passenger Water Transport; 5012 - Sea and Coastal Freight Water Transport) (NACE: 50.10 - Sea and coastal passenger water transport; 50.20 - Sea and coastal freight water transport)	501302: Ship owners of sea-going vessels for freight transport	**Transportation of freight by sea**	**Transportation of freight by sea**	**Climate Bonds Criteria**		Please refer to activity card for the full criteria. 1) The ship must report an operational emissions intensity (using AER or EEOI) according to the criteria table below. Compliance can be reported by either AER or EEOI. For freight, the denominator is tnm (tonne-nautical mile) 2) Excluded assets:

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HSIC Industry Section	**HSIC Industry Division (2 Digit)**	**HSIC Industry Group (3 Digit)**	**HSIC Industry Class (4 digit) (Corresponding ISIC / NACE)**	**HSIC Industry Sub-class (6 Digit)**	**Taxonomy-level activity**	**Description**	**Closest Taxonomy Alignment**		
			5014-Operators of sea-going vessels (ISIC: 5011 - Sea and Coastal Passenger Water Transport; 5012 - Sea and Coastal Freight Water Transport) (NACE: 50.10 - Sea and coastal passenger water transport; 50.20 - Sea and coastal freight water transport)	501402: Operators of sea-going vessels for freight transport				**carried (Tonnes)** **• Volume of coal transported (Tonnes)**	• Crude oil tankers and liquefied gas tankers • Dry bulk carriers IF transporting more than 20% of fossil fuels annually • Assets used for the exploration or production of fossil fuels (floating production, supply and offloading (FPSO) vessels; subsea, umbilicals, risers, flowlines (SURF) vessels; drilling units; platform supply vessels; well intervention vessels.
E - Water Supply; Sewerage, Waste Management And Remediation Activities	**37 - Sewerage**	370 - Sewerage	3700 – Sewerage (ISIC: 3700 - Sewerage) (NACE: 37.00 - Sewerage)	370000 Sewerage	**Sewage sludge treatment – anaerobic digestion or co-digestion**	**Construction and operation of facilities for the treatment of sewage sludge by anaerobic digestion or co-digestion with the resulting production and utilization of biogas or chemicals.**	**CGT E1.1 Sewage sludge treatment – anaerobic digestion**	No specific quantifiable metrics	Please refer to activity card for the full criteria. 1) A monitoring and contingency plan is in place in order to minimise methane leakage at the facility. 2) The majority of the produced biogas is used directly for the generation of electricity or heat, or injection into the city gas network, or used as vehicle fuel or as fuel/ feedstock in city gas production. In the unlikely event of equipment breakdown, unconsumed biogas will be safely flared.

1. Taxonomy Activities and Mapping								2. Key Metrics	3. Substantial Contribution Criteria
HSIC Industry Section	**HSIC Industry Division (2 Digit)**	**HSIC Industry Group (3 Digit)**	**HSIC Industry Class (4 digit) (Corresponding ISIC / NACE)**	**HSIC Industry Sub-class (6 Digit)**	**Taxonomy-level activity**	**Description**	**Closest Taxonomy Alignment**		
	38-Waste collection, treatment and disposal activities; materials recovery	381-Waste collection	3811-Collection of non-hazardous waste (ISIC: 3811 - Collection of Non-Hazardous Waste) (NACE: 38.11 - Collection of non-hazardous waste)	381100 Collection of non-hazardous waste	**Collection and transport of non-hazardous waste in source segregated fractions**	**Collection and transport of non-hazardous waste in source segregated fractions**	**CGT E2.1Collection and transport of non-hazardous waste in source segregated fractions**	No specific quantifiable metrics	Please refer to activity card for the full criteria. 1) All separately collected and transported non-hazardous waste that is segregated at source is intended for preparation for reuse or recycling operations.

1. Taxonomy Activities and Mapping								2. Key Metrics	3. Substantial Contribution Criteria
HSIC Industry Section	**HSIC Industry Division (2 Digit)**	**HSIC Industry Group (3 Digit)**	**HSIC Industry Class (4 digit) (Corresponding ISIC / NACE)**	**HSIC Industry Sub-class (6 Digit)**	**Taxonomy-level activity**	**Description**	**Closest Taxonomy Alignment**		
E - Water Supply; Sewerage, Waste Management And Remediation Activities	**38- Waste collection, treatment and disposal activities; materials recovery**	382-Waste treatment and disposal	3821-Treatment and disposal of non-hazardous waste (ISIC: 3821 - Treatment and Disposal Of Non-Hazardous Waste) (NACE: 38.21 - Treatment and disposal of non-hazardous waste)	382100 Treatment and disposal of non-hazardous waste	**Utilization/ treatment of domestic waste – anaerobic digestion or co-digestion**	**Construction and operation of dedicated facilities for the treatment of separately collected bio-waste through anaerobic digestion or co-digestion with the resulting production and utilisation of biogas and digestate and/or chemicals.**	**CGT E2.4 Utilization/ treatment of domestic waste – anaerobic digestion**	**• % of food and feed crops used as feedstock**	Please refer to activity card for the full criteria. 1) A monitoring and contingency plan is in place in order to minimise methane leakage at the facility. 2) The majority of the produced biogas is used directly for the generation of electricity or heat, or injection into the city gas network, or used as vehicle fuel or as fuel/ feedstock in city gas production. In the unlikely event of equipment breakdown, unconsumed biogas will be safely flared. 3) The bio-waste that is used for anaerobic digestion or co-digestion is source segregated and collected separately 4) The produced digestate is used as fertiliser or soil improver. 5) Food and feed crops used as input feedstock, measured in weight, as an annual average, is less than or equal to 10% of the input feedstock.

3. Sectors in the Hong Kong Taxonomy

This section sets out the "activity cards" for activities covered in the Hong Kong Taxonomy. They facilitate the use of the Hong Kong Taxonomy and its regular updates due to developments in climate science. Each card contains a detailed description of one or more activities depending on whether metrics, criteria and thresholds for these activities are similar in nature (e.g. different kinds of renewable energy) or must be viewed together because they are interconnected in the real economy. In most cases, one activity card covers several activities with identical sectoral affiliation (e.g. sewage sludge treatment (1 activity), waste collection, treatment and recycling (2 activities), water transport (2 activities) etc).

Structurally, this section consists of the following subsections:

- **Sector overview.** This subsection describes how the sector operates in Hong Kong, its share of emissions, what technology is used, what kind of economic agents are involved in the sector (municipality or private companies), what the most pressing problems present in the sector are, and how this sector can be broken down for the purpose of its taxonomical classification.

- **Metrics.** This subsection describes in detail what kind of metrics are going to be used to define criteria and thresholds and why, including the units of measurement and justification for their use.

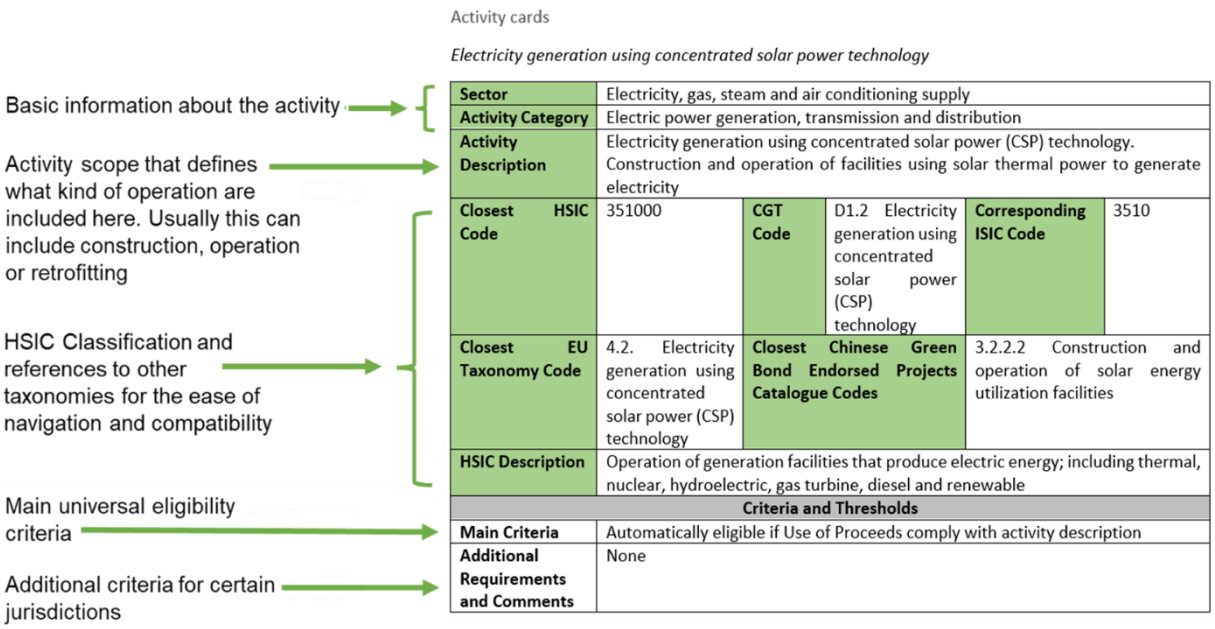
- **Criteria and thresholds.** This subsection identifies the specific criteria and thresholds for each activity and provides a justification in terms of scientific rigour, applicability in the local context, and consistency with other taxonomies.
    - **Main criteria** are the criteria taken from the CGT to the extent practicable. In most cases, the same criteria exist in both EU and Mainland China taxonomies and use universal metrics that do not require further adjustment. Hence, they should be applied regardless of the jurisdiction where the project is executed.

    - **Additional criteria** are primarily those considered more stringent and/or detailed for specific markets by the CGT. These criteria are only relevant when the project is executed in the jurisdiction mentioned in the criterion.

- **Activity card.** This subsection contains the final product that constitutes the "body" of the taxonomy as seen by the end user. In most cases, it contains all information needed to use the Taxonomy in practice.

- **Additional information (where applicable).** This subsection provides more detailed information about the selection and formulation of metrics and technical screening criteria.

Figure 1. Activity card parts and description



Activity cards

Electricity generation using concentrated solar power technology

Sector	Electricity, gas, steam and air conditioning supply				
Activity Category	Electric power generation, transmission and distribution				
Activity Description	Electricity generation using concentrated solar power (CSP) technology. Construction and operation of facilities using solar thermal power to generate electricity				
Closest HSIC Code	351000	**CGT Code**	D1.2 Electricity generation using concentrated solar power (CSP) technology	**Corresponding ISIC Code**	3510
Closest EU Taxonomy Code	4.2. Electricity generation using concentrated solar power (CSP) technology	**Closest Chinese Green Bond Endorsed Projects Catalogue Codes**		3.2.2.2 Construction and operation of solar energy utilization facilities	
HSIC Description	Operation of generation facilities that produce electric energy; including thermal, nuclear, hydroelectric, gas turbine, diesel and renewable				
Criteria and Thresholds					
Main Criteria	Automatically eligible if Use of Proceeds comply with activity description				
Additional Requirements and Comments	None				

3.1. Sector: Electricity, Gas, Steam and Air Conditioning Supply

3.1.1. Electric power generation, transmission and distribution

Overview

Hong Kong is determined to achieve carbon neutrality before 2050.

In the 2021 policy address, the Chief Executive, called on the power companies to phase down coal-fired generation units and replace the use of coal with other alternatives such as natural gas and renewable energy for electricity generation. She reaffirmed the government's efforts to grapple with Hong Kong's geographical and environmental constraints in driving the development of renewable energy and strive to increase its share in the fuel mix for electricity generation through facilitating local projects, regional collaboration and joint ventures[4].

Hong Kong's power sector accounted for approximately 63%, or 21.0 $MtCO_2e$ of Hong Kong's total GHG emissions in 2022[5]. Hong Kong's electricity consumption was 44.1TWh in 2020, a slight decrease from 2019 levels due to the COVID-19 pandemic. In the past 20 years, growth in electricity demand has slowed. Per capita electricity consumption peaked in 2014, the same year that total GHG emissions peaked.

In order to reach net-zero electricity generation, Hong Kong's Climate Action Plan 2050 aims to cease the use of coal for daily electricity generation; increase the share of renewable energy in the fuel mix for electricity generation to 7.5% to 10% by 2035, and to 15% subsequently; and to trial the use of new energy and strengthen co-operation with neighbouring regions to achieve the long-term target of net-zero electricity generation before 2050[6].

The objective of the following energy sector criteria is to provide clear guidance on certain technologies, assets and investments that will provide a substantial contribution to climate change mitigation in the context of Hong Kong's decarbonisation objectives. The criteria will potentially expand to include more technologies (such as ocean tidal, geothermal, hydropower and bioenergy) taking into account whether they could meet the overarching emissions intensity threshold, and other critical factors throughout the construction and operation of these energy systems which may increase the level of uncertainty regarding their emissions intensities.

Metrics

- **gCO_2/kWh**

To be consistent with other global taxonomies including the EU Taxonomy, the primary metric for measuring emissions in the energy sector is **gCO_2/kWh** as this directly reflects the emissions intensity for electricity generation, which is the major source of emissions from the energy sector**.** The metric is based on life cycle emissions to account for GHG emissions throughout the value chain of energy production processes (e.g., electricity generation from natural gas can have significantly large emissions due to methane leakage during extraction, transportation and distribution in addition to

[4] https://www.policyaddress.gov.hk/2021/eng/p95.html

[5] https://cnsd.gov.hk/en/climate-ready/ghg-emissions-and-trends/

[6] https://www.info.gov.hk/gia/general/202110/08/P2021100800588.htm

combustion. Hence, a lifecycle-based threshold is useful to assess the level of GHG emissions during the entire supply chain and not just during combustion).

Criteria and thresholds

- **Lifecycle emissions from generation must not exceed 100gCo_2e/kWh**

A 100gCo_2e/kWh threshold applies across all technology types within the electricity generation sector, declining to net zero by 2050. This reflects international best practice and is aligned with the EU Taxonomy criteria.

Automatic eligibility is available for renewable energy technologies which are well recognised to have emissions intensities below this threshold and this helps to ease the process of operationalising the present Hong Kong Taxonomy by allowing activities conducted by technologies which are indisputably "green" to be considered eligible – for example, there is unanimous consent that renewable energy technologies such as solar photovoltaic or wind power are technologies which perform well below the 100gCo2e/kWh threshold and, therefore, can be considered to provide a substantial contribution to climate change mitigation.

Consequently, to facilitate the use of the Hong Kong Taxonomy, issuers who are committed to using the proceeds of a bond to finance such technologies need not conduct a lifecycle assessment of their solar or wind asset. However, it is noted that in the CGT there are instances where additional technology-specific criteria apply. For example, although solar photovoltaic technologies are well recognised to have lifecycle emissions well below the 100gCo_2e/kWh threshold, they are also subject to additional requirements regarding factors such as conversion efficiency. These are aligned with the PBOC Green Bond Endorsed Project Catalogue and are designed to help encourage innovation across the technology segment.

It is noted that the Hong Kong Taxonomy should be a "living" document. The threshold and respective eligibility mentioned above should be reviewed and updated as the 100gCo2e/kWh threshold declines to 0gCo2e/kWh by 2050. Similarly, there may be opportunities to introduce additional criteria to promote the continued improvement of renewable energy technologies. For example, the Guobiao and the International Electrotechnical Commission Standards for Certification of Crystalline Photovoltaic (PV) Modules could be considered in future iterations of the Taxonomy.

Unless otherwise stated, the Lifecycle analysis of GHG emissions should be calculated based on project-specific data, where available, using ISO 14067:2018 or ISO 14064-1:2018, or by using the European Commission Recommendation 2013/179/EU, and verified by an independent third party.

Electricity generation using concentrated solar power technology

Sector	Electricity, gas, steam and air conditioning supply				
Activity Category	Electric power generation, transmission and distribution				
Activity Description	Electricity generation using concentrated solar power (CSP) technology. Construction and operation of facilities using solar thermal power to generate electricity				
Closest HSIC Code	351000	**CGT Code**	D1.2 Electricity generation using concentrated solar power (CSP) technology	**Corresponding ISIC Code**	3510
Closest EU Taxonomy Code	4.2 Electricity generation using concentrated solar power (CSP) technology	**Closest Chinese Green Bond Endorsed Projects Catalogue Codes**		3.2.2.2 Construction and operation of solar energy utilisation facilities	
HSIC Description	Operation of generation facilities that produce electric energy; including thermal, nuclear, hydroelectric, gas turbine, diesel and renewable				
Criteria and Thresholds					
Main Criteria	Automatically eligible if Use of Proceeds comply with activity description				
Additional Requirements and Comments	None				

Electricity generation using solar photovoltaic technology

Sector	Electricity, gas, steam and air conditioning supply				
Activity Category	Electric power generation, transmission and distribution				
Activity Description	Construction or operation of electricity generation facilities that produce electricity using solar photovoltaic (PV) technology				
Closest HSIC Code	351000	**CGT Code**	D1.1 Electricity generation using solar photovoltaic technology	**Corresponding ISIC Code**	3510
Closest EU Taxonomy Code	4.1 Electricity generation using solar photovoltaic technology	**Closest Chinese Green Bond Endorsed Projects Catalogue Codes**		3.2.2.2 Construction and Operation of Solar Energy Utilisation Facilities	
HSIC Description	Operation of generation facilities that produce electric energy; including thermal, nuclear, hydroelectric, gas turbine, diesel and renewable				
Criteria and Thresholds					
Main Criteria	1. The minimum photoelectric conversion efficiency of polycrystalline silicon cells and monocrystalline silicon cells shall not be less than 19% and 21% respectively;				

	2. The minimum photoelectric conversion efficiency of polycrystalline silicon cell modules and single crystal silicon battery modules shall not be less than 17% and 17.8% respectively; 3. The minimum photoelectric conversion efficiency of silicon-based, CIGS, CdTe and other thin-film battery modules shall not be less than 12%, 14%, 14%, 12%; 4. The decay rates of polycrystalline silicon battery modules and monocrystalline silicon battery modules shall not be higher than 2.5% and 3% in the first year, and not higher than 0.7% per year, and not higher than 20% within the period of 25 years; the attenuation rate of thin-film battery module shall not be more than 5% in the first year, no more than 0.4% per year in the following year, no more than 15% within the period of 25 years.
Additional Requirements and Comments	None

Electricity generation from wind power

Sector	Electricity, gas, steam and air conditioning supply				
Activity Category	Electric power generation, transmission and distribution				
Activity Description	Construction or operation of electricity generation facilities that produce electricity from wind power				
Closest HSIC Code	351000	**CGT Code**	D1.3 Electricity generation from wind power	**Corresponding ISIC Code**	3510
Closest EU Taxonomy Code	4.3 Electricity generation from wind power	**Closest Chinese Green Bond Endorsed Projects Catalogue Codes**		3.2.2.1 Construction and Operation of Wind Generators	
HSIC Description	Operation of generation facilities that produce electric energy; including thermal, nuclear, hydroelectric, gas turbine, diesel and renewable				
Criteria and Thresholds					
Main Criteria	Automatically eligible if Use of Proceeds comply with activity description				
Additional Requirements and Comments	None				

3.2. Sector: Transportation and Storage

3.2.1. Land transport including railways

Overview

To ensure sustainable development and effective utilisation of limited road resources, Hong Kong has adhered to a public transport-oriented policy whilst upgrading its transport infrastructure and services for private mobility. Hong Kong has a diverse and highly efficient multi-modal public transport system with railways acting as the backbone, complemented by other services including franchised buses, public light buses, taxis, non-franchised buses, tram, and ferry services. Over 11 million passenger trips are made through Hong Kong's public transport every day, which is estimated to account for 90% of daily trips in the city, a proportion that is amongst the highest in the world.

Hong Kong's transport sector accounted for approximately 19 %, or 6.4 $MtCO_2e$ of Hong Kong's total GHG emissions in 2022.[7] Road transport (motor vehicles) is the largest source accounting for 87% of GHG emissions within the transport sector. As of 2019[8], private cars account for the highest share of the motor vehicle fleet, but freight vehicles represented the largest share of emissions, contributing 6% of Hong Kong's total GHG emissions, followed by private cars (4.5%), buses (3.6%), and taxis (1.9%).[9]

As per Hong Kong's Climate Action Plan 2050, the goal for the transport sector is to achieve zero vehicular emissions before 2050. This would require strengthening the public transport system and specifically promoting vehicle (and ferry) electrification. Seeing this as their primary goal, the Hong Kong government aims to cease registration of new internal combustion engine-based and hybrid private cars (including plug-in hybrid electric vehicles) by 2035 or earlier. It actively promotes electric vehicles at a large scale for commercial purposes and testing out hydrogen fuel cell bus and heavy vehicles.[10]

In this context and driven by various government policies, the proportion of electric private cars has increased rapidly in recent years. In 2023, the number of newly registered electric private cars was 28,500, accounting for 65% of all newly registered private cars. The government will announce a roadmap for the promotion of new energy public transport and commercial vehicles in 2025. The government also targets to introduce about 700 electric buses and 3,000 electric taxis by end-2027.

Metrics

- **CO_2e emissions per passenger kilometre (gCO_2e/pkm);**
- **CO_2e emissions per vehicle kilometre (gCO_2e/vkm);**
- **CO_2e emissions per tonne kilometre (gCO_2e/tkm).**

[7] https://cnsd.gov.hk/en/climate-ready/ghg-emissions-and-trends/

[8] The data and figures refer to years before the COVID-19 pandemic because the years 2020, 2021 and 2022 are not representative of the status of the transport sector as economic activity decreased markedly.

[9] https://www.legco.gov.hk/research-publications/english/2022issh03-decarbonization-strategy-in-hong-kong-20220210-e.pdf

[10] https://civic-exchange.org/wp-content/uploads/2022/10/HK-transport-report_-Final.pdf

As in other international taxonomies, the transport sector criteria require that operated fleets to become more efficient over time by linking eligibility to emissions performance below a certain threshold set to ensure substantially reduced emissions. Emission reduction thresholds are based on performance metrics (vehicle km, passenger km or tonne km).

Criteria and thresholds

Construction and operation of public transportation system in urban and rural areas

The type of infrastructure available in a specific country or jurisdiction is a crucial element of transport behaviour and choice. Transport investments decided by governments can therefore lock in a high-carbon transport future when the projects and assets invested in are not aligned with a low-carbon future. In this context, the setting of the criteria for this activity was inspired by long term strategic vision of decarbonisation of the transport sector, as per Hong Kong's Climate Action Plan 2050 wherein the goal for the transport sector is to achieve zero vehicular emissions before 2050.

In line with other taxonomies at the international level (such as the EU, Thailand, Colombia, and South Africa), certain transport modes, such as electrified rail transport, are already associated with relatively low-carbon emissions whilst electric vehicles and hydrogen vehicles are singled out as eligible assets as they are a clear part of the low carbon transport sector in 2050. The purpose of the rationale is to provide a clear signal to the market and ease for issuers that are keen to finance such projects both in Hong Kong and other jurisdictions.

Description and scope:

Purchase, financing, leasing, rental and operation of urban and suburban transport vehicles for passengers and road passenger transport. This includes construction and operation of subways, light railways, tram, and other urban rail transportation facilities; construction and operation of high-capacity public transportation facilities, such as BRT bus stations, lines and other facilities construction and operation; purchase of public transportation vehicles, etc.

- **The trains and passenger coaches have zero direct (tailpipe) CO_2 emissions**

The criteria ensure substantial GHG emission reduction by increasing the number of zero-emission vehicles, improving the efficiency of the transport system in general.

Construction and operation of personal mobility devices, cycle logistics

The promotion of electric vehicles for personal mobility devices, transport devices and improving cycle logistic is pivotal to achieve Hong Kong's zero emission plan for the transport sector by 2050. Considering this activity defines that the propulsion of personal mobility devices should come from the physical activity of the user, from a zero-emissions motor, or a mix of zero-emissions motor and physical activity, the activity is automatically eligible. This aligns with other international taxonomies wherein the operation of vehicles with zero tailpipe emissions, or close to zero tailpipe emissions, is automatically eligible as it supports the decarbonisation of the transport sector. Furthermore, this activity also includes the promotion and use of hydrogen fuel cell vehicles.

Description and scope:

Selling, purchasing, financing, leasing, renting and operation of personal mobility or transport devices where the propulsion comes from the physical activity of the user, from a zero emissions motor, or a mix of zero-emissions motor and physical activity. This specifically also includes:

- Construction of urban walking and cycling transportation systems, including public bicycle rental sites, non-motorised vehicle parking facilities, road crossing facilities and other slow-moving urban systems
- Construction and operation of shared transportation infrastructure, such as systems for public rental bicycles, online bicycle rental, online electric bicycle rental, online car rental, car sharing, parking facilities and equipment, and bicycle parking facilities
- The provision of freight transport services by (cargo) bicycles
- Selling, purchasing, financing, leasing, renting and operation of private electric or hydrogen vehicles

- **The propulsion of personal mobility devices comes from the physical activity of the user, from a zero-emissions motor, or a mix of zero-emissions motor and physical activity**

The criteria specify the propulsion methods of personal mobility device to ensure zero GHG emission.

- **The personal mobility devices are allowed to be operated on the same public infrastructure as bikes or pedestrians**

The criteria promote green transportation by allowing zero-emission personal mobility devices to share public infrastructure with bikes and pedestrians.

Activity cards

Construction and operation of public transportation system in urban and rural areas

<table>
<tr><td>Sector</td><td colspan="5">Transportation and Storage</td></tr>
<tr><td>Activity Category</td><td colspan="5">Land transport including railways</td></tr>
<tr><td>Activity Description</td><td colspan="5">Purchase, financing, leasing, rental and operation of urban and suburban transport vehicles for passengers and road passenger transport. This includes construction and operation of subways, light railways, tram, and other urban rail transportation facilities; construction and operation of high-capacity public transportation facilities, such as BRT bus stations, lines and other facilities construction and operation; purchase of public transportation vehicles, etc.</td></tr>
<tr><td>Closest HSIC Code</td><td>491000
492100
492300
492400
492500</td><td>CGT Code</td><td>H1.1. Construction and operation of public transportation system in urban and rural areas</td><td>Corresponding ISIC Code</td><td>4921
4922</td></tr>
<tr><td>Closest EU Taxonomy Code</td><td>6.3 Urban and suburban transport, road passenger transport</td><td colspan="2">Closest Chinese Green Bond Endorsed Projects Catalogue Codes</td><td colspan="2">5.5.1.5 Construction and operation of public transportation system in urban and rural areas</td></tr>
<tr><td>HSIC Description</td><td colspan="5">491000: Railway and cable transport
492100: Public bus services
492300: Non-scheduled public light bus services
492400: Scheduled public light bus services
492500: School bus services</td></tr>
</table>

Criteria and Thresholds	
Main Criteria	The trains and passenger coaches have zero direct (tailpipe) CO_2 emissions
Additional Requirements and Comments	**Specific criteria for projects in the EU to align with EU Taxonomy:** Other fleets/trains are eligible if direct emissions are below 50 gCO_2e/pkm until 2025 (non-eligible thereafter). The threshold of 50 gCO_2e/pkm until 2025 ensures that the carbon intensity remains similar to criteria for eligible road vehicles with low occupation factor (50 gCO_2/vkm) and significantly lower than emissions for an average car.

Construction and operation of personal mobility devices, cycle logistics

Sector	Transportation and Storage				
Activity Category	Land transport including railways				
Activity Description	Selling, purchasing, financing, leasing, renting and operation of personal mobility or transport devices where the propulsion comes from the physical activity of the user, from a zero emissions motor, or a mix of zero-emissions motor and physical activity. This specifically also includes: - Construction of urban walking and cycling transportation systems, including public bicycle rental sites, non-motorised vehicle parking facilities, road crossing facilities and other slow-moving urban systems - Construction and operation of shared transportation infrastructure, such as systems for public rental bicycles, online bicycle rental, online electric bicycle rental, online car rental, car sharing, parking facilities and equipment, and bicycle parking facilities - The provision of freight transport services by (cargo) bicycles - Selling, purchasing, financing, leasing, renting and operation of private electric or hydrogen vehicles				
Closest HSIC Code	499000	**CGT Code**	H1.5. Construction and operation of personal mobility devices, cycle logistics	**Corresponding ISIC Code**	4922
Closest EU Taxonomy Code	6.4 Operation of personal mobility devices, cycle logistics	**Closest Chinese Green Bond Endorsed Projects Catalogue Codes**		5.5.1.6 Construction and operation of facilities for shared transport 5.5.1.4 Construction and operation of slow mode transportation system	
HSIC Description	499000: Other land transport services				
Criteria and Thresholds					
Main Criteria	• The propulsion of personal mobility devices comes from the physical activity of the user, from a zero-emissions motor, or a mix of zero-emissions motor and physical activity • The personal mobility devices are allowed to be operated on the same public infrastructure as bikes or pedestrians				
Additional Requirements and Comments	None				

3.2.2. Water Transport

Overview

Maritime transport currently accounts for over 80% of global trade by volume whilst in 2022, international seaborne trade volume reached 12.0 billion tonnes. The UN Conference on Trade and Development is forecasting an average growth rate of 2.1% for seaborne trade during the period of 2024-2028. Hong Kong is one of the major ports in Asia and has a unique opportunity to facilitate the financing of transport operations and infrastructure.

While CO_2 represented almost all of the industry's GHG emissions (98%), methane (CH_4) emissions from ships have recently increased due to the methane slip associated with increased use and transport of liquefied natural gas (LNG) in LNG carriers and other LNG-propelled ships. There is potential for this trend to continue in the future if there is an increased uptake of LNG-powered ships. However, there is potential for the sector to make significant GHG reductions. These can be achieved through a combination of increasing the energy efficiency of shipping and reducing the GHG intensity of the energy used by ships.

According to the International Maritime Organisation (IMO), the shipping industry's governing body, the sector currently accounts for 2.2% of global emissions. If left unchecked, shipping emissions are expected to grow by 50-250% by 2050.

Metrics

The shipping criteria are designed to apply to a wide range of ships, provided that issuers are able to provide either the Energy Efficiency Operation Index (EEOI) or Annual Efficiency Ratio (AER) data of the vessels. Specifically, issuers are required to submit information reported on an annual basis of their achieved EEOI or AER, alongside documentation that the data has been submitted to the IMO Ship Fuel Oil Consumption Database and verified under the mandatory reporting framework using the IMO Data Collection System. The use of such pre-existing systems also ensures that no additional data collection burden should be required.

- **AER:**

- The ratio of a ship's carbon emissions per actual capacity-distance (e.g., dwt x nm sailed).
- Assumes ships are fully loaded on all miles travelled during the year. In practice, ships are not always fully loaded and many ships (e.g., tankers and bulkers) operate with ballast voyages where for several voyages a year they have no cargo.

- **EEOI:**

- The total operational emissions to satisfy transport work demanded, usually quantified over a period which encompasses multiple voyages (e.g. a year). The ratio of a ship's carbon emissions per unit of transport work (e.g. cargo x nm sailed).
- Considered the ultimate measurement of a ship's estimated "real-world" efficiency in that it incorporates all of the components listed above, emissions when the ship is in port/anchor, etc. This also requires that operators and owners provide a vessel's bills of lading, to increase transparency regarding the precise emissions-intensity/per unit of cargo transported.

Criteria and thresholds

The utilisation of EEOI and AER metrics and a 2020-2050 declining threshold are derived from the Climate Bonds Shipping Criteria which are in turn based on IMO Secretariat's Third IMO GHG Study, published in 2014. The Third IMO GHG Study contains a dataset estimating the average operational emissions intensities of different ship types and sizes between 2010 and 2012. From this data, the criteria calculate the decarbonisation trajectories for each size and class of ship, adopting a linear threshold to net zero by 2050. These thresholds will be updated regularly.

For example, in any given year the AER emissions intensity is =

$$\text{AER in 2020} - \text{Years since 2020} \times \frac{\text{AER in 2020}}{30 \text{ years}}$$

At any given year, a ship must be operating at the corresponding emissions intensity for that year. Ships remain compliant provided they are able to operate below the threshold.

While the Fourth IMO GHG Study was published in July 2020, the criteria below still reference the Third IMO GHG Study, in line with Climate Bonds. With that in mind, these estimated emissions intensities can be continuously updated as the average emissions of the global fleet changes over time.

Activity cards

Transportation of freight by sea

<table>
<tr><td>Sector</td><td colspan="5">Transportation and Storage</td></tr>
<tr><td>Activity Category</td><td colspan="5">Water transport</td></tr>
<tr><td>Activity Description</td><td colspan="5">Transportation of freight by sea</td></tr>
<tr><td>Closest HSIC Code</td><td>501302
501402</td><td>CGT Code</td><td>None</td><td>Corresponding ISIC Code</td><td>5012
5022</td></tr>
<tr><td>Closest EU Taxonomy Code</td><td>6.10 Sea and coastal freight water transport, vessels for port operations and auxiliary activities</td><td colspan="2">Closest Chinese Green Bond Endorsed Projects Catalogue Codes</td><td colspan="2">None</td></tr>
<tr><td>HSIC Description</td><td colspan="5">501302:
Freight transport by own sea-going vessels
Chartering of own sea-going vessels with crews (i.e. on a full basis) to other operators for freight transport
Renting of own sea-going vessels without crews (i.e. on a bare vessel basis) to other operators for freight transport
501402:
Operation of sea-going freight vessels rented or chartered from others.
Re-renting out sea-going freight vessels, which are rented or charted from others to third party operators.</td></tr>
<tr><td colspan="6">Criteria and Thresholds</td></tr>
</table>

Main Criteria

In order to be compliant with the criteria the ship must report an operational emissions intensity (using AER or EEOI) according to the criteria table below.

Compliance can be reported by either AER or EEOI. For freight the denominator is tnm (tonne-nautical mile)

Type	Size (GT)	2020 AER/EEOI	2030 AER/EEOI	2040 AER/EEOI	2050 AER/EEOI
Bulk carrier	0-9999	35.1 / 24.6	23.4 / 16.4	11.7 / 8.2	0
	10000-34999	12.2 / 6.6	8.1 / 4.4	4.1 / 2.2	0
	35000-59999	9.2 / 4.6	6.2 / 3.1	3.1 / 1.5	0
	60000-99999	8.4 / 3.6	5.6 / 2.4	2.8 / 1.2	0
	100000-199999	4.6 / 2.4	3.1 / 1.6	1.5 / 0.8	0
	200000-+	4.1 / 2.3	2.7 / 1.5	1.4 / 0.8	0
Chemical tanker	0-4999	40.3 / 35.4	26.8 / 23.6	13.4 / 11.8	0
	5000-9999	26.6 / 19	17.7 / 12.7	8.9 / 6.3	0
	10000-19999	18.7 / 11.9	12.5 / 7.9	6.2 / 4	0
	20000-+	12.3 / 6.5	8.2 / 4.3	4.1 / 2.2	0
Container	0-999	27.3 / 16.9	18.2 / 11.3	9.1 / 5.6	0
	1000-1999	24.9 / 14.8	16.6 / 9.9	8.3 / 4.9	0
	2000-2999	19.5 / 10	13 / 6.7	6.5 / 3.3	0
	3000-4999	16.8 / 8.3	11.2 / 5.5	5.6 / 2.8	0
	5000-7999	16.2 / 7.8	10.8 / 5.2	5.4 / 2.6	0
	8000-11999	14.1 / 6.7	9.4 / 4.5	4.7 / 2.2	0
	12000-14500	10.4 / 4.6	6.9 / 3.1	3.5 / 1.5	0
	14500-+	10.4 / 4.6	6.9 / 3.1	3.5 / 1.5	0
General cargo	0-4999	30.2 / 24.2	20.1 / 16.1	10.1 / 8.1	0
	5000-9999	27.2 / 16.7	18.2 / 11.1	9.1 / 5.6	0
	10000-+	24.2 / 13.1	16.2 / 8.8	8.1 / 4.4	0
Other liquid tanker	0-+	106.6/ 97.6	71.1 / 65.1	35.5 / 32.5	0
Refrigerated bulk	0-1999	72.8 / 48.7	48.5 / 32.5	24.3 / 16.2	0
Ro-Ro	0-4999	258.2 / 212.4	172.1 / 141.6	86.1 / 70.8	0
	5000-+	63.9 / 45.9	42.6 / 30.6	21.3 / 15.3	0
Vehicle	0-3999	124.7 / 46	83.2 / 30.7	41.6 / 15.3	0
	4000-+	58.1 / 13.8	38.7 / 9.2	19.4 / 4.6	0

Additional Requirements and Comments

Excluded assets:

- Crude oil tankers, liquefied gas tankers and any other vessels that are dedicated to the transport or production of fossil fuels, including:
  - Dry bulk carriers IF transporting more than 20% of fossil fuels annually
  - Assets used for the exploration or production of fossil fuels (floating production, supply and offloading (FPSO) vessels; subsea, umbilicals, risers, flowlines (SURF) vessels; drilling units; platform supply vessels; well intervention vessels.

Transportation of passengers by sea

<table>
<tr><td>Sector</td><td colspan="5">Transportation and Storage</td></tr>
<tr><td>Activity Category</td><td colspan="5">Water transport</td></tr>
<tr><td>Activity Description</td><td colspan="5">Transportation of passengers by sea</td></tr>
<tr><td>HSIC Code</td><td>501301
501401</td><td>CGT Code</td><td>None</td><td>Corresponding ISIC Code</td><td>5011
5011</td></tr>
<tr><td>Closest EU Taxonomy Code</td><td>6.11 Sea and coastal passenger water transport</td><td colspan="2">Closest Chinese Green Bond Endorsed Projects Catalogue Codes</td><td colspan="2">None</td></tr>
<tr><td>HSIC Description</td><td colspan="5">501301:
Passenger transport by own sea-going vessels
Chartering of own sea-going vessels with crews (i.e., on a full basis) to other operators for passenger transport
Renting of own sea-going vessels without crews (i.e., on a bare vessel basis) to other operators for passenger transport
501401:
Operators of sea-going passenger vessels, rented or chartered from others
Re-renting out sea-going passenger vessels, which are rented or charted from others to third party operators</td></tr>
<tr><td colspan="6">Criteria and Thresholds</td></tr>
<tr><td>Main Criteria</td><td colspan="5">In order to be compliant with criteria, the ship must report an operational emissions intensity (using AER or EEOI) according to the criteria table below. Compliance can be reported by either AER or EEOI for a specific timeframe. For passenger vessels the denominator is GT-nm (gross tonne- nautical mile).
<table>
<tr><th>Type</th><th>Size (GT)</th><th>2020
AER / EEOI</th><th>2030
AER / EEOI</th><th>2040
AER / EEOI</th><th>2050
AER / EEOI</th></tr>
<tr><td rowspan="2">Ferry-pax only*</td><td>0-1999</td><td>1272135.8</td><td>848090.5</td><td>424045.3</td><td>0</td></tr>
<tr><td>2000-+</td><td>1740606.6</td><td>1160404.4</td><td>580202.2</td><td>0</td></tr>
<tr><td rowspan="5">Cruise*</td><td>0-1999</td><td>2044403.4</td><td>1362935.6</td><td>681467.8</td><td>0</td></tr>
<tr><td>2000-9999</td><td>1286641.3</td><td>857760.8</td><td>428880.4</td><td>0</td></tr>
<tr><td>10000-59999</td><td>1495064.7</td><td>996709.8</td><td>498354.9</td><td>0</td></tr>
<tr><td>60000-99999</td><td>1738613.6</td><td>1159075.7</td><td>579537.9</td><td>0</td></tr>
<tr><td>100000-+</td><td>1337274.9</td><td>891516.6</td><td>445758.3</td><td>0</td></tr>
<tr><td rowspan="2">Ferry-RoPax*</td><td>0-1999</td><td>822123.9</td><td>548082.6</td><td>274041.3</td><td>0</td></tr>
<tr><td>2000-+</td><td>1137003.8</td><td>758002.5</td><td>379001.3</td><td>0</td></tr>
</table></td></tr>
<tr><td>Additional Requirements</td><td colspan="5">Excluded assets:</td></tr>
</table>

and Comments	Vessels built or operated for the sole purpose of transporting passengers to-and-from assets or infrastructure that are dedicated to the production or transport of fossil fuels.

Additional Information

The criteria presented leverage the CBT criteria, whereby vessels must be compliant with the declining emissions intensity threshold in each year of operation. This can be proven through annual reporting. It should also be noted that:

- The criteria for a low-carbon vessel are categorised according to the size and class of ship, taking the average emissions for that segment and providing a linear threshold to zero by 2050.

The AER measures carbon emissions associated with transport work, but it uses a ship's size (deadweight) as a proxy for cargo carried. This does not provide an apple-to-apple comparison between two ships which carry different cargo amounts. Cargo influences the numerator (carbon emissions) because a ship which carries a larger cargo requires more energy for propulsion and the denominator (transport work is a function of cargo carried and distance). Because ships are not typically fully utilised, the AER would overestimate the efficiency of the ship. The IMO's Data Collection System will require data to be collected (e.g. fuel consumption, distance sailed and DWT) for all ships 5000 DWT and will enable the calculation of AER.

Efficiency metrics (gCO_2/tonne-nm) allow for an apple-to-apple comparison between two vessels which cargo movements produce different levels of transport work. They also enable the tracking of progress over time and comparison across different shipping fleets, companies, and different modes of transport. The carbon intensity of a ship in real operating conditions is known as the EEOI. It is the metric adopted by the IMO and represents the CO_2 emitted per tonne nautical mile for a voyage or specific time period. It can either be calculated from fuel consumption measurements and information on cargo carried and distance travelled or estimated using satellite tracking data and fleet technical specifications.

EEOI therefore accounts for the real operating conditions of the vessel and their impact on fuel consumption (e.g. speed, weather, draught) and is therefore a more accurate representation of the CO_2 efficiency than if the efficiency were estimated in the vessel's designed (or optimal operating) condition as is done by the EEDI or Existing Vessel Design Index (EVDI). The as-designed efficiency assumes that a ship operates in its designed speed (often above the actual ship speed) in ideal weather conditions and is fully loaded.

The EEOI is influenced by speed, utilisation and a ship's technical efficiency. Increasing the energy efficiency of a ship lowers the EEOI, controlling for all other factors. In practice however, there could be rebound effects as a result of the lower marginal operating cost from the technical efficiency improvement. If the ship is operating on zero emissions fuels, this rebound effect is no longer an issue.

3.3. Sector: Water Supply; Sewerage, Waste Management and Remediation Activities

3.3.1. Sewage sludge treatment

Overview

In Hong Kong, more than 94% of the population is served by the public sewerage system, with its sewerage network of about 2,000 kilometres and around 330 sewage pumping stations and sewage treatment plants collecting and treating 2.8 million cubic metres of sewage per day. On average, the system treats a little over 1 billion cubic metres of sewage per year, of which 80.3% undergo chemically enhanced primary treatment (CEPT), and 19.3% secondary treatment. The remaining 0.4% undergo preliminary, primary or tertiary treatment.

For the purpose of the current phase of development of the Hong Kong Taxonomy, the following activities will be assessed:

- Sewage sludge treatment – anaerobic digestion including co-digestion

During anaerobic digestion and co-digestion, a by-product generated is biogas, which consists mainly of methane and carbon dioxide (CO_2). Methane is a much stronger absorber of the emitted thermal infrared radiation in Earth's atmosphere than CO_2 and, therefore, in practice, this means that methane is a much more powerful GHG with a warming potential 84-87 times higher than CO_2 over the first 20 years after it reaches the atmosphere[11].

As a consequence, even though CO_2 has a longer-lasting effect, methane sets the pace for warming in the near term and its current level of estimated anthropogenic emissions corresponds to a global temperature increase of over 3 degrees by 2100[12]. Crucially, methane emissions have increased drastically since 2007 and, in the longer term, their constant increase may be the biggest threat to keeping temperatures below the 2-degree scenario envisioned by the Paris Agreement and to avoid the tipping point towards catastrophic climate change[13] [14].

Criteria and thresholds

Sewage sludge treatment – anaerobic digestion or co-digestion

- **A monitoring and contingency plan is in place in order to minimise methane leakage at the facility**

The anaerobic digestion or co-digestion unit converts a certain class of waste into methane, a dangerous greenhouse gas, with a much higher global warming potential than CO_2. It is essential that the plant has all the necessary safety measures in place to prevent the possibility of any leakages.

[11] https://www.iea.org/reports/methane-tracker-2021/methane-and-climate-change
[12] https://essd.copernicus.org/articles/12/1561/2020/
[13] https://esd.copernicus.org/articles/12/601/2021/
[14] https://www.ipcc.ch/sr15/chapter/chapter-3/

- **The majority of the produced biogas is used directly for the generation of electricity or heat, or injection into the city gas network, or used as vehicle fuel or as fuel/ feedstock in city gas production. In the unlikely event of equipment breakdown, unconsumed biogas should be safely flared**

Biogas that is produced as a result of anaerobic digestion or co-digestion is a renewable energy source but has potential negative effects on climate and human health. Leakage risks also include explosion, asphyxiation, and poisoning. Therefore, it is crucial to store and utilise it in the correct manner.

Activity cards

Sewage sludge treatment – anaerobic digestion or co-digestion

<table>
<tr><td>Sector</td><td colspan="5">Water supply; sewerage, waste management and remediation activities</td></tr>
<tr><td>Activity Category</td><td colspan="5">Sewage sludge treatment</td></tr>
<tr><td>Activity Description</td><td colspan="5">Construction and operation of facilities for the treatment of sewage sludge by anaerobic digestion or co-digestion with the resulting production and utilisation of biogas or chemicals.</td></tr>
<tr><td>Activity Scope</td><td colspan="5">Construction and operation</td></tr>
<tr><td>Closest HSIC Code</td><td>370000</td><td>CGT Code</td><td>E1.1 Sewage sludge treatment – anaerobic digestion</td><td>Corresponding ISIC Code</td><td>3700</td></tr>
<tr><td>Closest EU Taxonomy Code</td><td>5.6 Anaerobic digestion of sewage sludge</td><td colspan="2">Closest Chinese Green Bond Endorsed Projects Catalogue Codes</td><td colspan="2">1.5.3.3 Comprehensive utilisation of sludge from urban sewage treatment plants</td></tr>
<tr><td>HSIC Description</td><td colspan="5">Sewage treatment</td></tr>
<tr><td colspan="6">Criteria and Thresholds</td></tr>
<tr><td>Main Criteria</td><td colspan="5">● A monitoring and contingency plan is in place in order to minimise methane leakage at the facility
● The majority of the produced biogas is used directly for the generation of electricity or heat, or injection into the city gas network, or used as vehicle fuel or as fuel/feedstock in city gas production. In the unlikely event of equipment breakdown, unconsumed biogas will be safely flared.</td></tr>
<tr><td>Additional Requirements and Comments</td><td colspan="5">None</td></tr>
</table>

3.3.2. Waste Collection, Treatment and Recycling

Overview

Hong Kong is a densely populated area, so the issue of waste management is key to its sustainable development. About 5.7 million tonnes of waste are disposed of at landfills each year, including municipal solid waste (MSW), construction and demolition waste, chemical waste, and other special waste (clinical waste, animal carcasses, livestock waste, waste tyres, and waterworks/sewage sludge). Municipal solid waste accounts for 7% of the city's GHG emissions[15], with the major source being organic waste decomposition in landfills.

In 2022, the total quantity of MSW disposed to the landfills was 4.06 million tonnes (68% of the total), which represented a decrease of 2.0% as compared to 2021. Discounting the factor of population growth, the disposal rate of MSW was 1.51 kg/person/day, as compared to 1.53 kg/person/day in 2021[16]. The major component of MSW is domestic waste. Its quantity of disposal was 2.48 million tonnes in 2022, which has decreased by 2.8% as compared to 2021. On the other hand, the quantity of commercial and industrial (C&I) waste disposed of was 1.58 million tonnes in 2022, which has decreased by 0.8% when compared to 2021. The overall MSW recovery rate in 2022 was 32% (1.91 million tonnes), which has increased from 31% in 2021.

Of the 11,128 tonnes of MSW landfilled daily in 2022, some 3,302 tonnes (30% of MSW) were food waste, which decreased by 3.9% as compared to 2021, whilst the second largest constituent of MSW was waste plastics. Some 2,369 tonnes per day (tpd) (21% of MSW) were disposed in landfills in 2022, which increased by 1.6% as compared to 2021. The third largest constituent of MSW was wastepaper, with a disposed quantity of 2,244 tpd (20% of MSW) in 2022, which has increased marginally by 0.4% as compared to 2021.

Regarding construction waste, the quantity of waste generation dropped by about 3,100 tpd (6%) as compared with 2021 to 49,865 tpd, among which 45,736 tpd of construction waste (92% of total) were recovered either through transferring to projects for direct reuse or storing at public fill reception facilities for reuse in the future. The remaining 4,128 tpd of construction waste (8% of total) was disposed of at landfills, which was 483 tonnes more than that in 2021 and was on par with the level before COVID-19. In the past decade, the recovery rate of construction materials has remained at above 90% and was 92% in 2022.

Currently, most of the municipal solid waste in Hong Kong is disposed of in the following landfills:

- West-New Territories (WENT)
- North-East New Territories (NENT)

[15] https://www.scmp.com/comment/letters/article/3167424/why-hong-kongs-landfill-problem-wont-be-solved-waste-energy-plants

[16] https://www.wastereduction.gov.hk/sites/default/files/resources_centre/waste_statistics/msw2022_eng.pdf

There are 13 closed landfills in Hong Kong and their restoration works were completed between 1997 and 2006 to minimise their potential adverse impacts to the environment and to render them safe for beneficial use[17]. There are also nine recycling plants in Hong Kong working with different types of waste.

In February 2021, the Hong Kong government adopted a plan called Waste Blueprint for Hong Kong 2035[18], which indicates priorities for the upcoming decades. According to the plan, per capita MSW disposal needs go down to 40-45% of the total, while recovery rate must go up to 55% in the medium term. In the long term, the government plans to abandon landfills altogether.

For the purpose of the current phase of the Hong Kong Taxonomy development, two activities within this sector will be addressed:

- Collection and transport of non-hazardous waste in source segregated fractions
- Utilisation/treatment of domestic waste – anaerobic digestion or co-digestion

During anaerobic digestion and co-digestion, a by-product generated is biogas, which consists mainly of methane and CO_2. Methane is a much stronger absorber of the emitted thermal infrared radiation in Earth's atmosphere than CO_2 and, therefore, in practice, this means that methane is a much more powerful GHG with a warming potential 84-87 times higher than CO_2 over the first 20 years after it reaches the atmosphere[19].

As a consequence, even though CO_2 has a longer-lasting effect, methane sets the pace for warming in the near term and its current level of estimated anthropogenic emissions corresponds to a global temperature increase of over 3 degrees by 2100[20].

Metrics

- **% of food and feed crops used as feedstock**

Excessive utilisation of edible crops and food as a feedstock for producing bioenergy may lead to price distortion and negatively affect vulnerable population. Therefore, it is important to limit these kinds of feedstock and give preferences to non-edible types.

Criteria and thresholds

Collection and transport of non-hazardous waste in source segregated fractions

Description and scope:

Separate collection and transport of non-hazardous waste in single or comingled fractions aimed at preparing for reuse or recycling.

[17] https://www.gov.hk/en/residents/environment/waste/treatment/msw.htm
[18] https://www.eeb.gov.hk/sites/default/files/pdf/waste_blueprint_2035_eng.pdf
[19] https://www.iea.org/reports/methane-tracker-2021/methane-and-climate-change
[20] https://essd.copernicus.org/articles/12/1561/2020/

- **All separately collected and transported non-hazardous waste that is segregated at source is intended for preparation for reuse or recycling operations**

Waste that is destined for recycling plants should be collected from segregated sources in order to avoid contamination with non-recyclable waste. More specifically, if contaminated with non-recyclable materials and biowaste, the feedstock might not be able to be used in the recycling plant and, hence, it might need to be landfilled or incinerated.

Utilisation/ treatment of domestic waste – anaerobic digestion or co-digestion

Description and scope:

Construction and operation of dedicated facilities for the treatment of separately collected bio-waste through anaerobic digestion or co-digestion with the resulting production and utilisation of biogas and digestate and/or chemicals.

- **A monitoring and contingency plan is in place in order to minimise methane leakage at the facility**

The anaerobic digestion or co-digestion unit converts a certain class of waste into methane, a dangerous greenhouse gas, with a much higher global warming potential than CO_2. It is essential that the plant has all the necessary safety measures in place to prevent the possibility of any leakages.

- **The majority of the produced biogas is used directly for the generation of electricity or heat, or injection into the city gas network, or used as vehicle fuel or as fuel/ feedstock in city gas production. In the unlikely event of equipment breakdown, unconsumed biogas will be safely flared**

Biogas that is produced as a result of anaerobic digestion or co-digestion is a renewable energy source but has potential negative effects on climate and human health. Leakage risks also include explosion, asphyxiation, and poisoning. Therefore, it is crucial to store and utilise it in the correct manner.

- **The bio-waste that is used for anaerobic digestion or co-digestion is source segregated and collected separately**

Bio-waste that is used for anaerobic digestion or co-digestion should be collected from segregated sources in order to avoid contamination of the feedstock. More specifically, if contaminated with plastics, metals and other non-biodegradable materials, the feedstock might not be able to be used in the anaerobic plant and, hence, it might need to be landfilled.

- **The produced digestate is used as fertiliser or soil improver, either directly or after composting or any other treatment**

The material that is left after anaerobic digestion or co-digestion is called digestate. It is a wet mixture that is usually separated into a solid and a liquid. Digestate is rich in nutrients and can be used as fertiliser for crops.

- **In the dedicated bio-waste treatment plants, the share of food and feed crops used as input feedstock, measured in weight, as an annual average, is less than or equal to 10% of the input feedstock**

It is very important that the production of biomethane affects as little as possible the food supply chain as the use of food-quality feedstocks may lead to an increase of food prices in the market.

Activity cards

Collection and transport of non-hazardous waste in source segregated fractions

<table>
<tr><td>Sector</td><td colspan="5">Water supply; sewerage, waste management and remediation activities</td></tr>
<tr><td>Activity Category</td><td colspan="5">Waste collection, treatment and recycling</td></tr>
<tr><td>Activity Description</td><td colspan="5">Separate collection and transport of non-hazardous waste in single or comingled fractions aimed at preparing for reuse or recycling</td></tr>
<tr><td>Closest HSIC Code</td><td>381100</td><td>CGT Code</td><td>E2.1 Collection and transport of non-hazardous waste in source segregated fractions</td><td>Corresponding ISIC Code</td><td>3811</td></tr>
<tr><td>Closest EU Taxonomy Code</td><td>5.5 Collection and transport of non-hazardous waste in source segregated fractions</td><td colspan="2">Closest Chinese Green Bond Endorsed Projects Catalogue Codes</td><td colspan="2">5.3.1.2 Construction and operation of garbage treatment facilities</td></tr>
<tr><td>HSIC Description</td><td colspan="5">Collection of non-hazardous waste</td></tr>
<tr><td colspan="6">Criteria and Thresholds</td></tr>
<tr><td>Main Criteria</td><td colspan="5">● All separately collected and transported non-hazardous waste that is segregated at source is intended for preparation for reuse or recycling operations</td></tr>
<tr><td>Additional Requirements and Comments</td><td colspan="5">None</td></tr>
</table>

Utilisation/ treatment of domestic waste – anaerobic digestion or co-digestion

<table>
<tr><td>Sector</td><td colspan="5">Water supply; sewerage, waste management and remediation activities</td></tr>
<tr><td>Activity Category</td><td colspan="5">Waste collection, treatment and recycling</td></tr>
<tr><td>Activity Description</td><td colspan="5">Construction and operation of dedicated facilities for the treatment of separately collected bio-waste through anaerobic digestion or co-digestion with the resulting production and utilisation of biogas and digestate and/or chemicals.</td></tr>
<tr><td>Closest HSIC Code</td><td>382100</td><td>CGT Code</td><td>E2.4 Utilisation/ treatment of domestic waste – anaerobic digestion</td><td>Corresponding ISIC Code</td><td>3821</td></tr>
<tr><td>Closest EU Taxonomy Code</td><td>5.7 Anaerobic digestion of bio-waste</td><td colspan="2">Closest Chinese Green Bond Endorsed Projects Catalogue Codes</td><td colspan="2">1.5.3.1 Comprehensive utilisation of urban and rural household waste</td></tr>
<tr><td>HSIC Description</td><td colspan="5">Treatment and disposal of non-hazardous waste</td></tr>
<tr><td colspan="6">Criteria and Thresholds</td></tr>
<tr><td>Main Criteria</td><td colspan="5">● A monitoring and contingency plan is in place in order to minimise methane leakage at the facility
● The majority of the produced biogas is used directly for the generation of electricity or heat, or injection into the city gas network, or used as vehicle fuel or as fuel/ feedstock in city gas production. In the unlikely event of equipment breakdown, unconsumed biogas will be safely flared
● The bio-waste that is used for anaerobic digestion or co-digestion is source segregated and collected separately
● The produced digestate is used as fertiliser or soil improver, either directly or after composting or any other treatment
● In the dedicated bio-waste treatment plants, the share of food and feed crops used as input feedstock, measured in weight, as an annual average, is less than or equal to 10% of the input feedstock</td></tr>
<tr><td>Additional Requirements and Comments</td><td colspan="5">None</td></tr>
</table>

3.4. Sector: Construction

3.4.1. Construction and renovation of buildings

Overview

Hong Kong's Climate Action Plan 2050 sets out the vision of "Zero-carbon Emissions Liveable City Sustainable Development", and outlines strategies and targets for combating climate change and achieving carbon neutrality[21]. As part of the Action Plan, the Hong Kong government has set out to reduce the overall electricity consumption of buildings through promoting green buildings, improving buildings' energy efficiency, and promoting a low-carbon lifestyle. The goal is to reduce the electricity consumption of commercial buildings by 30% to 40% and that of residential buildings by 20% to 30% from the 2015 level by 2050, and to achieve half of the above targets by 2035.[22]

The criteria below are to help building developers, owners, operators and investors to determine whether a building can be considered to be contributing to climate change mitigation. This is done by referencing locally and internationally available building certification schemes that can serve as proxies which denote whether a building is "green".

The criteria presented here are primarily focused on the operational emissions of buildings, and do not include the emissions associated with the construction of buildings. As will be explained in the following section, a major challenge for standardising the comparison of buildings' operational emissions at both the local and international level is the uptake of globally applicable green building certification schemes.

Metrics

Currently, Hong Kong's building market typically references BEAM Plus to determine whether a building can be considered "green". BEAM Plus is a green building rating system to assess and recognise buildings which meet certain green requirements or standards. Recognised and certified by the Hong Kong Green Building Council (HKGBC)[23] and in line with other green building rating tools, BEAM Plus has a broad coverage, which includes not only energy performance but also water use, material embodied carbon, waste management, climate change adaptation, etc. It provides a comprehensive set of performance standards that can be pursued by developers and owners across the whole life-cycle of buildings and projects.

A problem that is typically encountered when assessing the climate impact of buildings is the availability of universally comparable data. Ideally, information about energy consumption such as energy intensity per square metre, (including both electricity and gas) of a building would be made available for use. This could be in the form of Primary Energy Demand and Energy Use Intensity (EUI). However, it is often the case, particularly in buildings with multiple tenants, that building owners and operators cannot provide this information without the tenant's consent. While acknowledging that efforts to generate this data should be made in the future, this goes beyond the scope of the present Taxonomy.

[21] https://www.info.gov.hk/gia/general/202110/08/P2021100800588.htm
[22] https://www.info.gov.hk/gia/general/202110/08/P2021100800588.htm
[23] https://www.hkgbc.org.hk/eng/about-us/index.jsp

Therefore, in lieu of the data unavailability, the criteria reference the BEAM Plus certification scheme that is widely used in Hong Kong, with an additional focus on the energy use component *within* the BEAM Plus certification scheme. Applicants under the Hong Kong Taxonomy would be required to provide both their overall BEAM Plus rating (which should be at either Gold or Platinum) and show that they meet a minimum energy use threshold, using the BEAM Plus energy use scoring methodology. Certification should be provided or verified by an independent third party.

Furthermore, the Hong Kong Taxonomy also incorporates the use of HKGBC's Zero-Carbon-Ready Building Certification Scheme. It is recognised that at these early stages, many buildings will not have received such certification yet, thus using it to meet the Taxonomy is an option, but not a requirement.

Metrics for New Buildings

Design and operational data are required. Design-level and simulation data should be provided for new construction with a commitment to monitor and report emissions following construction.

1) **Operational emissions:** Operational emissions encompass all activities related to the use of buildings, over their life span. This can be further disaggregated into the following measures:
    a. **Primary energy demand:** Primary energy is the amount of energy that must be generated originally in order to meet the total energy demand of a building. A decrease of this parameter as well as the source of energy may influence carbon footprints of buildings.
    b. **Energy consumption:** Total energy consumption is defined as the total amount of electricity or equivalent electricity, and gas consumed by the building per annum. A decrease of this parameter as well as the source of energy may influence carbon footprints of buildings.
    c. **Direct emissions of building:** Greenhouse gases emitted from activities under the industry's control such as from burning fuel for cement production are direct emissions; those from sources outside of its control including from the electricity it purchases are indirect emissions. This may also include the use of LPG or Towngas (for example use of Towngas in gas boilers).
    d. Reference can be made to the Product Carbon Accounting Footprint (PCAF) technical guidance for "Accounting and Reporting of GHG Emissions from Real Estate Operations", for further details on the process for conducting an operational emissions assessment.
2) **Energy savings:** The share of total or relative energy consumption that can be saved because of the implemented measures.
3) **Energy consumption of buildings compared to peers:** Energy consumption compared to best-in-class peers. The Electrical and Mechanical Services Department of the Hong Kong government provides an online building-based electricity EUI Benchmarking Tool[24] and HKGBC also has a Benchmarking and Energy Saving Tool[25] which building owners could use to compare their energy consumption to peers.
4) **Buildings Certification Schemes:** Many jurisdictions have their own building certification schemes. For example, BEAM Plus is commonly used in Hong Kong. Other building certification schemes used globally include the US Green Buildings Council Leadership in Energy Efficiency and Design (LEED)[26], and the National Australian Built Environment Rating System (NABERS)[27]. The International Finance Corporation (IFC) has also developed a buildings rating system

[24] https://eui.emsd.gov.hk/en/EUI_Introduction.html
[25] https://hkbest.hkgbc.org.hk/
[26] https://www.usgbc.org/leed
[27] https://www.nabers.gov.au/

Excellence in Design for Greater Efficiencies (EDGE)[28], that can be easily applied to emerging market contexts. The CGT also outlines the minimum requirements for buildings to be considered green under the EU and Mainland China's respective building certification schemes (i.e. the Nearly Zero-Energy Building (NZEB) and Mainland China's three-star rating system). Given Hong Kong's role as a global financial centre, the building criteria are designed to facilitate the mobilisation of capital for green buildings in Hong Kong and internationally. Therefore, the criteria are designed to recognise certifications of buildings outside of Hong Kong, provided that they meet certain thresholds under those international building certification schemes.

5) **Zero-Carbon-Ready Building Certification & (Upcoming) Net Zero Building Certification[29]:** The HKGBC has recently launched its Zero-Carbon-Ready Building Certification Scheme which is a positive step towards measuring the emissions performance of buildings in Hong Kong. We anticipate this scheme will help to enrich Hong Kong's certification systems and have incorporated this into the Taxonomy, which may be used instead of the other options that are laid out in the activity card.
    a. The Zero-Carbon-Ready Building Certification Scheme is an energy performance certification whereby buildings will be certified according to their rating of building energy efficiency. It includes a Target Setting Certification, whereby buildings are awarded a certification if a target to zero-carbon-ready building requirements is set, and a Progress Certification rewarded when the reduction target is achieved.
    b. The anticipated Net Zero Building Certification is awarded if the annual on-site renewable energy generation is equal, or more than the annual energy consumption of the building.

Note: Items 1 to 3 in the above list of Metrics for New Buildings are the most ideal metrics, however, this data may not be adequately available across the buildings sector. As such, it is recommended that item 4 (BEAM Plus) should be the main criterion for Hong Kong while item 5 (Zero-Carbon-Ready Building Certification & Net Zero Building Certification) should be a supplementary criterion to provide flexibility for compliance.

Metrics for Renovations

1) **Primary energy demand:** Primary energy is the amount of energy that must be generated originally in order to meet the total energy demand of a building. A decrease of this parameter as well as the source of energy may influence carbon footprints of buildings.
2) **Energy consumption:** Total energy consumption is defined as the total amount of electricity or equivalent electricity and the total amount of gas consumed by the building per annum. A decrease of this parameter as well as the source of energy may influence carbon footprints of buildings.
3) **Direct emissions of building:** Greenhouse gases emitted from activities under the industry's control such as from burning fuel for cement production are direct emissions; those from sources outside of its control including from the electricity it purchases are indirect emissions.

[28] https://edgebuildings.com/
[29] https://zcrbc.hkgbc.org.hk/

Criteria and alignment

The Hong Kong Taxonomy for certification of buildings currently cover four separate economic activities, namely construction of new commercial buildings, construction of new residential buildings, renovation of commercial buildings, and renovation of residential buildings. In line with BEAM Plus, commercial buildings are those intended to be used for business, trade or entertainment, for example office, clubhouse and retail.

The criteria for construction of new commercial buildings and construction of new residential buildings cover buildings that are constructed in Hong Kong, but also buildings that are constructed outside of Hong Kong.

It is important to note that the criteria for construction of new commercial and residential buildings in Hong Kong references the existing BEAM Plus, as well as the Zero-Carbon-Ready Building Certification Scheme developed by the HKGBC. Furthermore, it is important to clarify that at this current stage, we only require that buildings meet the specified criteria under *either* BEAM Plus *or* the Zero-Carbon-Ready Building Certification Scheme. This optionality is to accommodate for the fact that the Zero-Carbon-Ready Building Certification Scheme is not yet commonplace within the Hong Kong buildings market.

The present criteria are designed to be usable and supportive of the local buildings market in Hong Kong while also ensuring that the criteria are aligned with international best practice and help to position Hong Kong as a conduit for inbound and outbound investments in green buildings worldwide, irrespective of their location. The present criteria seek to be consistent with the Mainland China and the EU taxonomies by directly referencing the criteria outlined in the International Platform on Sustainable Finance's CGT, while at the same time, establish a common level of stringency across different building labelling systems.

While recognising that many different labelling schemes that exist worldwide vary in their approach to assessing a building's impact on climate change, we have sought – through engagement with industry experts in particular from the HKGBC - to address the broader systematic challenge facing the comparability of low-carbon buildings labelling systems between markets. This has been done with a focus on the climate impacts of a building's operations. However, we expect that as the Hong Kong Taxonomy is developed further, other environmental objectives can be introduced into the criteria.

Furthermore, there is flexibility to update the different criteria in the Hong Kong Taxonomy from time to time to reflect the latest progress in the industry and developments in the green building certification schemes developed by the HKGBC.

Activity cards

Renovation of existing buildings

Sector	Construction				
Activity Scope	Construction and renovation of buildings				
Activity Description	Renovation of existing buildings				
Closest HSIC Code	419100 439101 439102 4321XX 4322XX 4329XX 4399XX	**CGT Code**	F1.2 Renovation of existing buildings	**Corresponding ISIC Code**	4100 4321 4322 4329 4300 4390
Closest EU Taxonomy Code	7.2 Renovation of existing buildings	**Closest Chinese Green Bond Endorsed Projects Catalogue Codes**		5.2.1.5 Energy conservation and environmental-friendly renovation of existing buildings	
HSIC Description	419100 - Structural alteration at erected buildings and structures 439101 - Interior fitting, decoration and repairs for buildings 439102 - Exterior renovation and repairs for buildings 4321XX - Electrical equipment installation and maintenance 4322XX - Ventilation, gas and water fitting installation and maintenance activities 4329XX - Other construction installation and maintenance 4399XX: Other general finishing and specialised construction works				
Criteria and Thresholds					
Main Criteria	**For the renovation of existing <u>commercial</u> buildings:** 1) The building renovation leads to a reduction of primary energy demand, energy consumption, or direct GHG emissions of at least 30% against the building's historic average, or 2) Use HKGBC's Zero-Carbon-Ready Building: Must be at least Extra Low or **Level 2** improvement (i.e., 25% reduction) according to Zero-Carbon-ready building Certification Scheme. **For the renovation of existing <u>residential</u> buildings:** The building renovation leads to a reduction of primary energy demand, energy consumption, or direct GHG emissions of at least 30% against the building's historic average. This is proven with measured and verified data.				
Additional Requirements and Comments	None				

Construction of new buildings

Sector	Construction				
Activity Scope	Construction and renovation of buildings				
Activity Description	Construction of new buildings				
Closest HSIC Code	411000 412000 419100 439101 4321XX 4322XX 4329XX 4399XX	**CGT Code**	F1.1 Construction of new buildings	**Corresponding ISIC Code**	4100 4321 4322 4329 4330 4390
Closest EU Taxonomy Code	7.1 Construction of new buildings	**Closest Chinese Green Bond Endorsed Projects Catalogue Codes**		5.2.1.1 Construction of ultra-low energy consumption buildings 5.2.1.2 Green buildings	
HSIC Description	411000 - Erection of architectural superstructures 412000 - Structural steel framework erection 419100 - Structural alteration at erected buildings and structures 439101 - Interior fitting, decoration and repairs for buildings 4321XX - Electrical equipment installation and maintenance 4322XX - Ventilation, gas and water fitting installation and maintenance activities 4329XX - Other construction installation and maintenance 4399XX: Other general finishing and specialised construction works				
Criteria and Thresholds					
Main Criteria	**For the construction of new commercial buildings in Hong Kong:** 1) Buildings must be BEAM Plus certified (to either gold or above) or designed to certify as such, *and* the Energy Use component of applicant's BEAM Plus Certification must meet at least a minimum of 10 credits under EU2 (Reduction of CO_2 Emissions) *and* a minimum score of 70% in Energy Use category *and, either:* a. For projects certified under BEAM Plus 1.2: 30% energy saving against the BEC 2018 baseline, *or* b. For projects certified under BEAM Plus 2.0, 20% energy saving against BEC 2021 baseline. 2) Or buildings certified at least Extra Low in EUI or level 2 improvement (i.e. 25% reduction) in Energy Performance Certification under the Zero-Carbon-Ready Building Certification Scheme. **For the construction of new residential buildings in Hong Kong:** 1) Buildings must be BEAM Plus certified (to either gold or above) or designed to certify as such, *and* the Energy Use component of applicant's BEAM Plus Certification must meet at least a minimum of 10 credits under EU2 (Reduction of CO_2 Emissions) *and* a minimum score of 70% in Energy Use category *and, either:*				

	a. For projects certified under BEAM Plus 1.2: 30% energy saving against the BEC 2018 baseline, or b. For projects certified under BEAM Plus 2.0, 20% energy saving against BEC 2021 baseline. 2) Or buildings certified at least Extra Low in EUI or level 2 improvement (i.e. 25% reduction) in Energy Performance Certification under the Zero-Carbon-Ready Building Certification Scheme. **Construction of new <u>commercial and residential buildings</u> outside Hong Kong can also be eligible if the following conditions are met. Buildings that are situated in markets with existing taxonomies such as the EU or Mainland China would be required to meet the respective substantial contribution to climate change mitigation criteria in those markets:** 1) For projects in the European Union: a. Primary energy demand, defining the energy performance of the building resulting from the construction, is at least 10 % lower than the threshold set for the NZEB requirements in national measures implementing Directive 2010/31/EU of the European Parliament and of the Council. The energy performance is certified using an as built Energy Performance Certificate. b. For buildings larger than 5000m^2, upon completion, the building resulting from the construction undergoes testing for air-tightness and thermal integrity, and any deviation in the levels of performance set at the design stage or defects in the building envelope are disclosed to investors and clients. i. The testing should be carried out in accordance with EN13187 (Thermal Performance of Buildings - Qualitative Detection of Thermal Irregularities in Building Envelopes - Infrared Method) and EN 13829 (Thermal performance of buildings - Determination of air permeability of buildings - Fan pressurization method) or equivalent standards accepted by the respective building control body where the building is located. 2) For buildings in Mainland China: a. Projects should be rated to the third-level of Mainland China's Three Star System **For buildings in markets that are currently not covered under the CGT, they may refer to the following criteria. These criteria may also be used for buildings in Hong Kong where relevant.** 1) Certified under Leadership in Energy and Environmental Design (LEED) to Gold level *and* a. Minimum score of 9 points under Energy Assessment Credits *and*

	b. Optimise Energy Performance for 30% improvement above ASHRAE 90.1 in energy performance. 2) Certification under NABERS of at least five stars. 3) Certification under IFC EDGE is also acceptable. For buildings in Least Developed Countries (as classified by the UN), any level of IFC EDGE certification is sufficient to be considered green, otherwise, buildings that seek to use IFC EDGE certification in non-Least Developed Countries, must obtain at least an IFC EDGE Advanced certification or above.
Additional Requirements and Comments	**For the construction of new residential buildings:** The criteria for construction of new residential buildings outside of Hong Kong reference international best practices.

Additional Information

Hong Kong uses BEAM Plus, a green building rating system to assess and recognise buildings which meet certain green requirements or standards. BEAM Plus is recognised and certified by the HKGBC. As of end 2022, there were 3,769 buildings, mainly situated in Hong Kong, that had been certified by BEAM Plus or its predecessor HK-BEAM. BEAM Plus defines a comprehensive set of performance criteria covering a range of sustainability issues relating to the planning, design, construction, commissioning, management, operation and maintenance of buildings.

However, one characteristic of scoring-based rating systems is that they do not solely focus on the climate-performance of buildings. This is because this kind of rating system covers multiple aspects of a building (beyond climate change mitigation) including water, waste, material, site and transport, indoor environments, building management and more.

Therefore, as can be seen in the criteria above, in order to balance the accuracy of the taxonomy criteria with usability and practicality, not only do we use the overall BEAM Plus performance level, but also ask for an additional set of climate and energy-related criteria.

More information comparing the green building rating systems of different markets can be found here: Green-Building-Rating-Systems-Energy-Benchmarking-Study.pdf (hkgreenfinance.org)

The HKGBC anticipated launch of a Net Zero Building Certification. We will monitor its development and incorporate it into the Taxonomy when it becomes available.

Annex 1: List of Abbreviations

AER	Annual efficiency ratio
ASEAN	The Association of Southeast Asian Nations
ASHRAE	The American Society of Heating, Refrigerating and Air-Conditioning Engineers
BEAM	Building Environmental Assessment Method
BEC	Building Energy Code
BRT	Bus rapid transit
C&I	Commercial and industrial
Climate Bonds	Climate Bonds Initiative
CBT	Climate Bonds Taxonomy
CEPT	Chemically enhanced primary treatment
CGT	Common Ground Taxonomy
CH_4	Methane
CO_2	Carbon dioxide
COVID	Coronavirus Disease
CSP	Concentrated Solar Power
DNSH	Do no significant harm
DWT	Deadweight tonnage
EDGE	Excellence in Design for Greater Efficiencies
EEDI	Energy Efficiency Design Indicator
EEOI	Energy Efficiency Operational Indicator
EU	European Union
EUI	Energy use intensity
EVDI	Existing Vessel Design Index
FPSO	Floating production, supply and off-loading
GHG	Greenhouse gas
GT-nm	Gross tonne- Nautical mile
HKGBC	Hong Kong Green Building Council
HKMA	Hong Kong Monetary Authority
HSIC	Hong Kong Standard Industrial Classification
KWh	Kilowatts per hour
Hong Kong Taxonomy	Hong Kong Taxonomy for Sustainable Finance
ICMA	International Capital Market Association
IFC	International Finance Corporation
IMO	International Maritime Organisation
ISIC	International Standard Industrial Classification of All Economic Activities
ISO	International Organization for Standardization
LEED	Leadership in Energy Efficiency and Design
LNG	Liquefied natural gas
M^2	Square metre
MSS	Minimum Social Safeguards

MSW	Municipal solid waste
NABERS	National Australian Built Environment Rating System
NACE	Nomenclature of Economic Activities
NZEB	Nearly Zero-Energy Building
PCAF	Product Carbon Accounting Footprint
PKM	Passenger kilometre
PV	Photovoltaic
TKM	Tonne kilometre
SURF	Subsea, umbilicals, risers, flowlines
UN	United Nations
VKM	Vehicle Kilometre