

BEE

2019

GHG INVENTORY

Greater China

2019 SUMMARY

77,431

KG CO₂-EQ

2019	kgCO ₂ -eq
Scope 1*	0
Scope 2*	18,979
Scope 3*	58,452
TOTAL	77,431

2019	Tonne CO ₂ -eq/FTE
Emissions per FTE**	4.3

* See definition in appendix 1

** 17.8 FTE in 2019 (Greater China)

REPORTING ORGANIZATION

BEE is an engineering consulting company focusing on sustainability for the built environment. BEE has a global presence and projects in many countries worldwide.

BOUNDARIES OF THE ASSESSMENT

This assessment includes all BEE activities in Greater China in 2019. In Greater China, BEE operates offices in Shanghai, Hong Kong, and Taipei. At the end of 2019, 18 employees are working in these offices.

SOURCES OF EMISSIONS

Source of emissions	Scope	Included	Reason for exclusion
Energy use	2	Y	N/A
T&D losses	3	Y	N/A
Commuting	3	Y	N/A
Business travel	3	Y	N/A
Hotel & conferences	3	Y	N/A

Waste	3	Y	N/A
Other (trip to Phuket)	3	Y	N/A
Stationeries	3	N	Small and difficult to assess accurately
Printing	3	N	
Courier	3	N	
Fugitive emissions from air-con	3	N	

ACTIVITY DATA

Activity data	Source of data
Commuting	Employee survey
Energy use – Shanghai	Actual energy bills
Energy use – Taiwan and HK	Based on office surface area and default EUI in EnergyStar Portfolio Manager. U.S. Energy Use Intensity per Property Type.
T&D losses – Shanghai	https://www.statista.com
T&D losses – Taiwan	https://en.wikipedia.org
T&D losses – HK	https://tradingeconomics.com
Business travel (BEE van)	Actual number of km
Business travel (other)	Employee survey
Hotel & Conferences	Employee survey
Waste	Default based on number of FTE
Trip to Phuket	Employee survey

EMISSION FACTORS

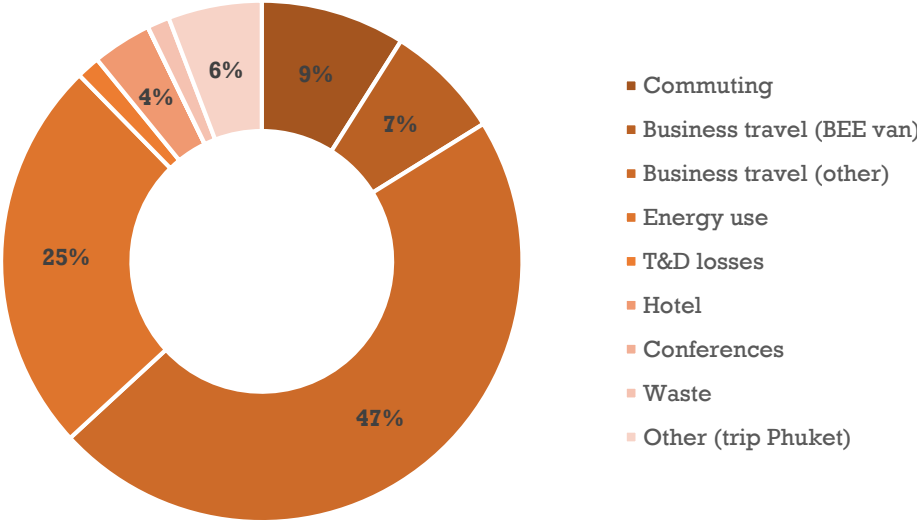
Emission factor	Source
Commuting	EPA. Optional Emission from Commuting, Business Travel, and Product Transport.
Energy use	Ecometrica. Electricity-Specific Emission Factors for Grid Electricity.
T&D losses	N/A. This is a percentage that we applied to energy use.
Business travel (BEE van)	DEFRA. 2019 Government GHG Conversion Factors for Company Reporting.
Business travel (other)	EPA. Optional Emission from Commuting, Business Travel, and Product Transport.
Hotel & Conferences	EPA. Indirect Emissions from Events and Conferences.
Waste	Cundall. CO2e Emissions Due to Office Waste.
Trip to Phuket	EPA. Optional Emission from Commuting, Business

TOTAL CARBON

77,431

KG CO2-EQ

Fig. 1 – Total carbon emissions (kgCO2-eq)



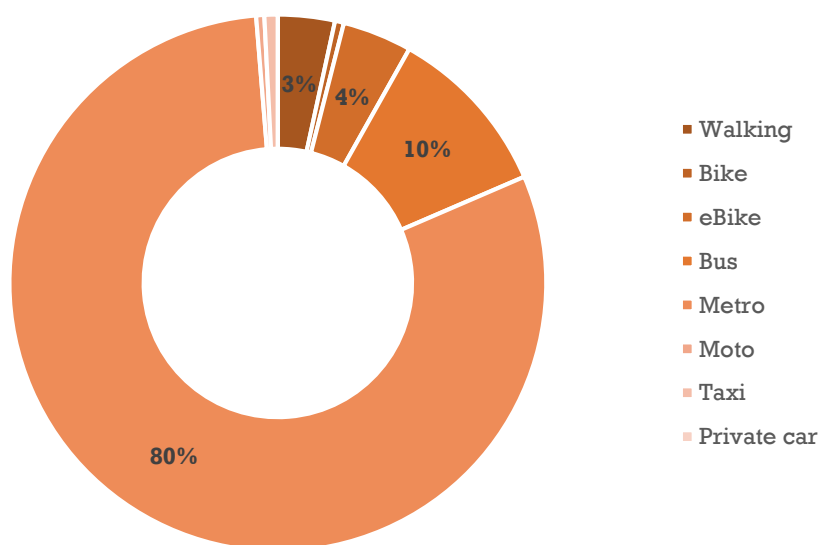
Source of emissions	kgCO2-eq	%
Commuting	6,943	9.0
Business travel (BEE van)	5,571	7.2
Business travel (other)	36,382	47.0
Energy	18,979	24.5
T&D losses	1,121	1.4
Hotel	2,852	3.7
Conferences	13	0.0
Waste	1,068	1.4
Other (trip to Phuket)	4,502	5.8
TOTAL	77,431	100

COMMUTING

6,943

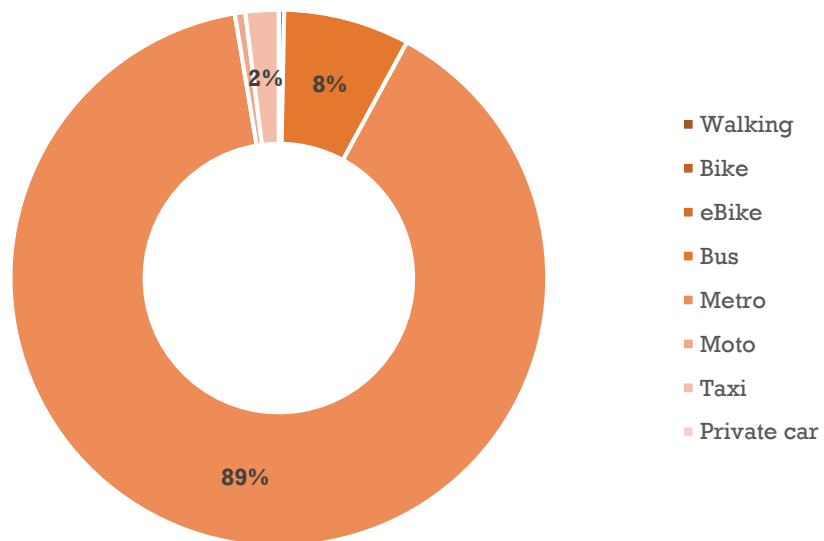
KG CO₂-EQ

Fig. 2 – Commuting (km)



Vehicle	km	%
Walking	2,601	3.4
Bike	409	0.5
eBike	3,180	4.2
Bus	7,876	10.4
Metro	60,884	80.2
Moto	372	0.5
Taxi	612	0.8
Private car	0	0.0
TOTAL	75,934	100

Fig. 3 – Commuting (kgCO2-eq)

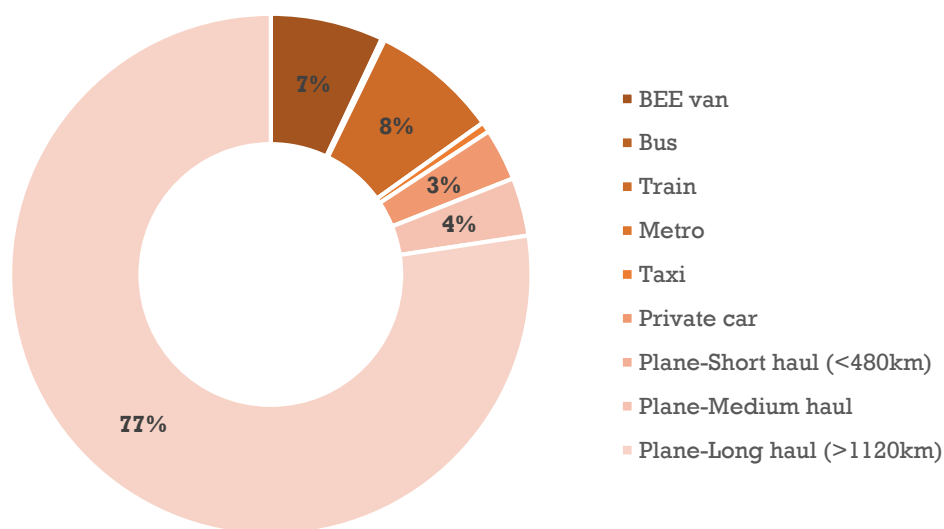


Vehicle	kgCO2-eq	%
Walking	0	0.0
Bike	0	0.0
eBike	22	0.3
Bus	528	7.6
Metro	6,210	89.4
Moto	44	0.6
Taxi	139	2.0
Private car	0	0.0
TOTAL	6,943	100

42,154

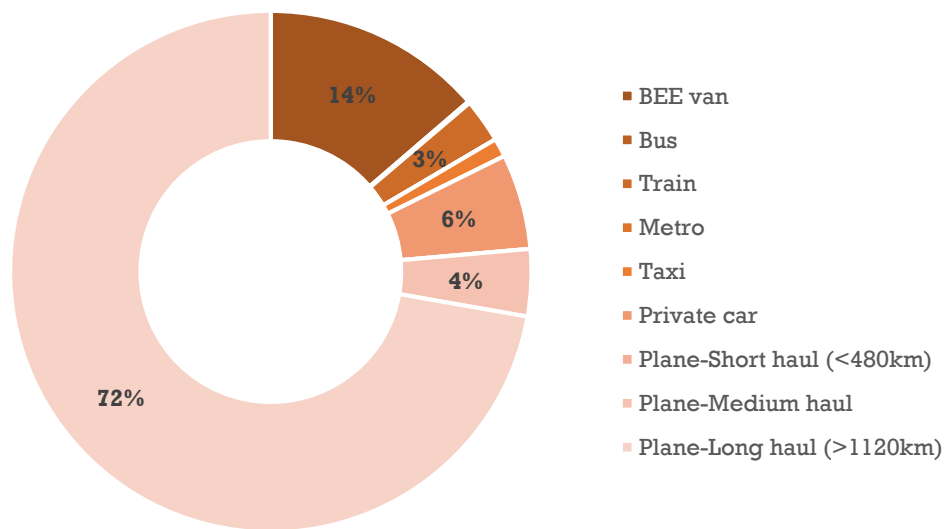
KG CO2-EQ

Fig. 4 – Business travel (km)



Vehicle	km	%
BEE van	23,750	7.0
Bus	690	0.2
Train	26,846	7.9
Metro	0	0.0
Taxi	2,140	0.6
Private car	11,000	3.2
Plane-Short haul (<480km)	0	0.0
Plane-Medium haul	12,250	3.6
Plane-Long haul (>1120km)	262,500	77.4
TOTAL	339,176	100

Fig. 5 – Business travel (kgCO2-eq)



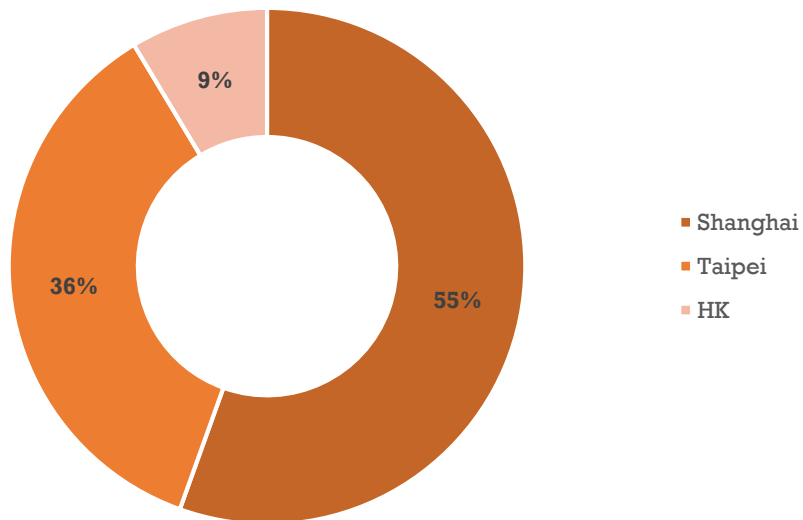
Vehicle	kgCO2-eq	%
BEE van	5,771	13.7
Bus	46	0.1
Train	1,152	2.7
Metro	0	0.0
Taxi	486	1.2
Private car	2,497	5.9
Plane-Short haul (<480km)	0	0.0
Plane-Medium haul	1,752	4.2
Plane-Long haul (>1120km)	30,450	72.2
TOTAL	42,154	100

ENERGY AND T&D LOSSES

20,100

KG CO₂-EQ

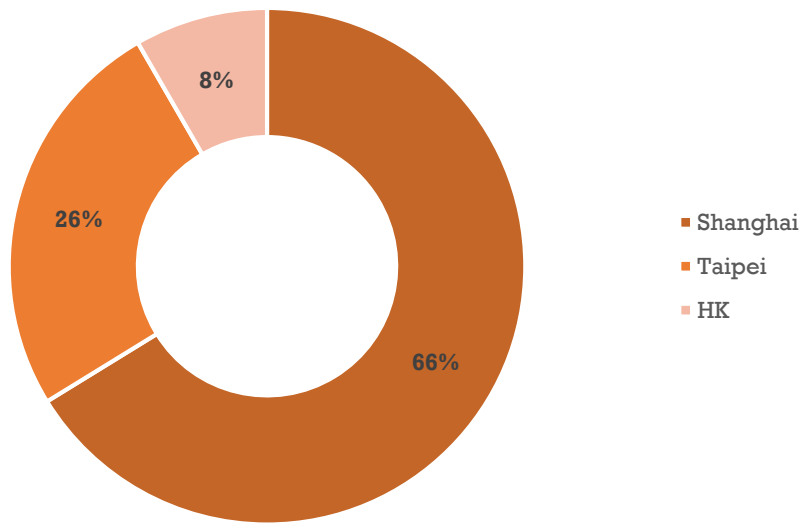
Fig. 6 – Energy use (kWh)



Office	kWh	%
Shanghai	12,905	55.5
Taipei	8,350	35.9
HK	2,004	8.6
TOTAL	23,259	100

T&D losses: Shanghai=6.21%; Taiwan=2.96%; HK=12.5%.

Fig. 7 – Energy use (kgCO2-eq)



Office	kgCO2-eq	%
Shanghai	12,569	66.2
Taipei	4,826	25.4
HK	1,583	8.3
TOTAL	18,979	100

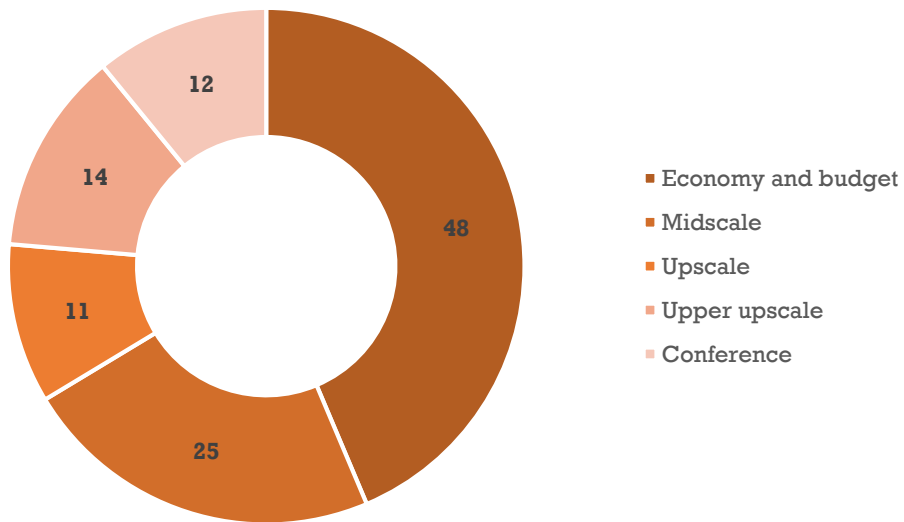
T&D losses: Shanghai=6.21%; Taiwan=2.96%; HK=12.5%.

HOTEL & CONFERENCES

2,865

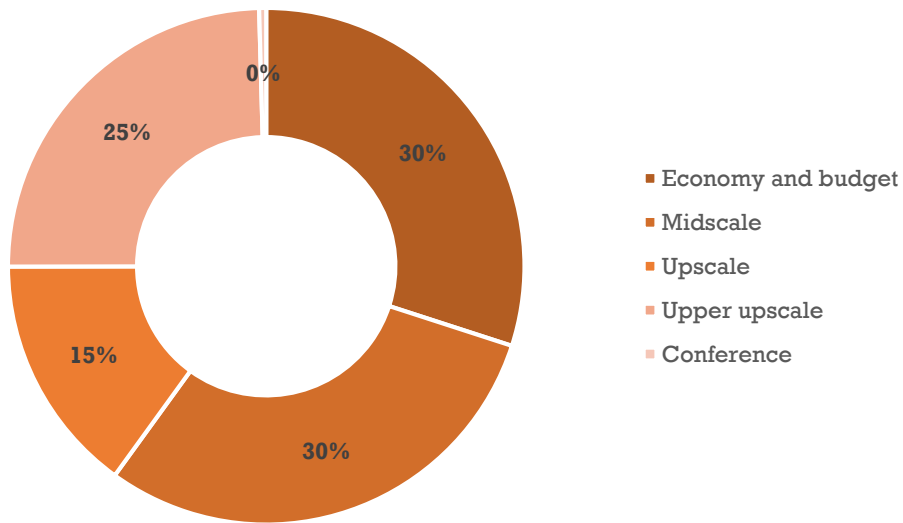
KG CO₂-EQ

Fig. 8 – Hotel & conferences (night stay and visitor.day)



Hotel	Unit	Activity data
Economy and budget	night stay	48
Midscale	night stay	25
Upscale	night stay	11
Upper upscale	night stay	14
Conference	visitor.day	12

Fig. 9 – Hotel & conferences (kgCO2-eq)



Hotel	kgCO2-eq	%
Economy and budget	859	30.0
Midscale	859	30.0
Upscale	430	15.0
Upper upscale	704	24.6
Conference	13	0.4
TOTAL	2,865	100

WASTE

1,068

KG CO2-EQ

OTHER (TRIP TO PHUKET)

4,502

KG CO2-EQ

APPENDIX

Appendix 1 – Definitions

Appendix 2 – GHG reduction measures

APPENDIX 1 – DEFINITIONS

FTE (full-time equivalent employee):

An FTE is a yardstick that measures the number of full-time hours being completed in a company. The number is tallied using part-time and full-time employee count. An FTE employee works 8 hours per day, 40 hours per week.

Scope 1 emissions:

Direct GHG emissions that occur from sources that are owned or controlled by the reporting organization.

Scope 2 emissions:

GHG emissions from electricity and energy purchased by the reporting organization.

Scope 3 emissions:

GHG emissions that are a consequence of the reporting organization's activities but that occur at sources not owned or controlled by the organization (e.g. plane travel).

APPENDIX 2 – GHG REDUCTION MEASURES

GHG Reduction Measures	Impact	Cost	Recommended	Approved	Rejected
General/Organization					
Designate a person in charge of the implementation of GHG emissions reduction measures in each office	●●●	-	Y		
Organize competition between offices to see which one has the lowest carbon footprint	●●●	-	Y		
Training					
Organize awareness campaigns about the impact of human activities on climate change and what can be done to mitigate carbon emissions at work	●●●	-	Y		
Energy					
Use fans instead of turning on air-con system (fans can reduce temperature by 3oC)	●●	●	Y		
Set office temperature to no less than 24oC in summer and no more than 20oC in winter (install thermometers in each room to control temperature)	●●●	-	Y		
Close windows before heating or cooling a room	●●●	-	Y		
Check that windows and doors seal correctly	●●●	-	Y		
Install reflective film on windows to reduce solar heat gain in summer	●●●	●●	N		
Install blinds to reduce solar heat gain in summer	●●●	●●	Done		
Post signs to remind employees to turn off air-con and lighting at the end of the day	●●●	-	Y		
Turn off lights in summer and when not needed to reduce cooling load	●●●	-	Y		
Have the air-con systems balanced so that the appropriate volume of air is supplied to each room	●●●	-	Y		
Clean filters on a regular basis to reduce pressure drop	●●	-	Y		
Purchase EnergyStar equipment (laptops, printers, coffee machine, refrigerator, etc.)	●●●	-	Y		
Set all computers to switch to “saving mode” when not in use	●●	-	Y		
Set the fridge temperature to 4oC (not less)	●	-	Y		
Check that the fridge door seals correctly	●	-	Y		

Use task lights and reduce ambient lighting	●●●	●●	Y		
Install occupancy sensors in all the rooms to turn off lights automatically when rooms are unoccupied	●●●	●●●	N		
Clean windows on a regular basis to enhance daylight	●●	-	Y		
Rearrange desks and partitions to maximize daylight access	●●	-	Y		
Commuting					
Allow telecommuting (like 1, 2 days per week)	●●	-	Y		
Participate in the purchase of public transport cards for employees	●●	●●●	N		
Business Travel					
Cancel meetings outside office when not absolutely necessary	●●●	-	Y		
Prefer teleconference rather than face to face meeting when possible	●●●	-	Y		
Invest in video-conferencing system	●●●	●●●	Done		
Travel in economy class rather than business or premium class (plane)	●●●	-	Y		
Centralize the approval and purchase of plane tickets (set a strict policy for the approval of plane tickets)	●●	-	Y		
Organize Company's events (trips, training events, etc.) close to the office	●●●	-	Y		
When renewing the company cars fleet, select car models that emit little CO2	●●●	-	Y		
Regularly check the pressure of the car tires	●	-	Y		
Install GPS navigation system in the company owned cars to identify the shortest way between 2 locations	●	-	Y		
Promote carpooling (if 2 or more employees go to the same meeting, have them travel in the same car)	●●	-	Y		
Hotel and Conferences					
Stay in economy hotel rather than upscale hotel	●●	-	Y		
Courier Service					
Use EMS courier only when really necessary	●	-	Y		
Ask suppliers to send brochures and documents via pdf	●	-	Y		
Waste					
Use mugs instead of paper/plastic cups	●	-	Done		
Use refillable toner cartridges instead of disposable cartridges	●	-	Y		
Sort wastes on-site and send to recycling (use different trash bins for recyclable and non-recyclable wastes)	●	-	Y		
Donate old electronic equipment that can still be used (computer, cell phones, etc.)	●	-	Y		

Collect used batteries and send to specialized recycling centers (cell phones, electric bikes, etc.)	●	-	Y		
Paper Consumption					
Use 0.70g paper instead of 0.80g paper sheets	●	-	Y		
Print on both side of paper	●	-	Y		
Use 100% recycled paper as printing paper	●	-	Y		
Use 100% recycled paper for business cards	●	-	Y		
Reuse waste paper to take notes	●	-	Y		
Buy FSC paper	●	-	Y		
Install personal access code to use printers	●	●	N		
Offsetting					
Offset plane travels	●●●	●●●	Y		
Buy renewable energy certificates to offset the energy consumption of the organization	●●●	●●●	N		
Offset the entire carbon footprint of the organization (e.g., buy carbon offsets, invest in trees planting projects, etc.)	●●●	●●●	N		