GREENVIEW

Horwath HTL™

Hotel, Tourism and Leisure *Celebrating 100 years*

Sustainability Data Trends Report 2014

Horwath HTL Asia Pacific
November 2015

Foreword by Horwath HTL and Greenview

Dear Industry Colleagues,

We are very happy to present this inaugural Asia Pacific Survey of Hotel Sustainability Trends.

The participation of over 1,400 hotels and serviced apartments across the region is encouraging. More and more hotels today are monitoring their utility consumption and identifying opportunities to reduce associated costs. Not only do they understand how this relates to the bottom line, they are aware of their opportunity to reduce impacts. We are pleased to see significant uptake in common best practices as well as innovations in sustainability for hotel design, development, and operations.

With the recent unveiling of the United Nations Sustainable Development Goals, the upcoming COP21 climate talks in Paris, and the call to action heard by several political and spiritual leaders, we will see significant progress in the availability of solutions to address our impacts on the planet and society. Furthermore, in such important times where climate change and resource scarcity hit home across the globe, a better understanding of a hotel's footprint and actions to reduce it becomes paramount.

Through this survey we hope to support these efforts to help the region's hotel industry identify and implement the opportunities available for true triple bottom line results: people, planet, and profit.

We would like to acknowledge and thank the Honorary Advisory Board for the Horwath HTL annual hotel industry surveys and the supporting country hotel associations for their participation and strong support.

Yours Sincerely,

Robert Hecker
Managing Director
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Eric Ricaurte
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Greenview

Overview

Sustainability increasingly translates to embedding aspects of design, equipment, and operations that reduce a hotel's footprint and enhance the guest experience. Hundreds, even thousands of best practices are available for hotels of all size and asset class. Several practices are commonplace and well understood by hoteliers. Others are emerging, while new innovations are arising and being tested throughout the industry.

To understand the region's status on implementing these types of practices, we included sustainability questions in the Horwath HTL hotel industry surveys involving 2014 calendar year utility data for energy and water usage. We then calculated the greenhouse gas (carbon) emissions using the energy data, producing the metrics according to the same methodology used in the Cornell Hotel Sustainability Benchmarking Study.

As an initial exercise, the sustainability questions were intended to gauge progress on hotel specifications across three categories of the adoption spectrum:

- Attributes that have become ubiquitous across all hotels (linen/towel reuse, low-flow fixtures);
- Emerging best practices with proven ROI and universal capacity for implementation (variable frequency drives, water reuse); and
- Nascent innovations forecasted to see uptake in the future, but which are not yet as common (use of renewable energy).

Next year, we will be able to compare year-over-year change in energy, water, and carbon, as well as uptake in best practices to increase energy and water efficiency, and reduce carbon emissions.

Survey Accuracy Notes

The benchmark data presented offers users, by and large, a baseline reference on the operational performance of hotels in each category. With great emphasis on presenting accurate benchmarks, the following fundamentals on the results should be noted.

Cost and Usage Variance: cost and usage metrics vary widely across properties and are determined by a number of factors as some figures reported from a utility invoice will include large facility components adjacent to, but separate from, the property's actual operations. Likewise, data may be underreported or allocated disproportionately. We used validity testing to remove outliers, however, we must acknowledge that certain outliers may always exist and be valid data under nuanced circumstances.

Requisite Sample Size: Each average benchmark figure will only be presented if the number of respondents is more than ten percent of the total respondents in the respective column group, or at least 5 respondents overall. Anything less than ten percent will be shown as Not Available (N/A).

Overall Respondents by Country

	AU	KH	CN	HK	ID	JP	KR
Total Responds	54	5	799	20	220	45	17
Full Service	51	5	N/A	N/A	206	45	13
Limited Service	1	N/A	N/A	N/A	14	N/A	4
	MY	MV	NZ	SG	TH	VN	Total
Total Responds	80	8	9	53	138	30	1482
Full Service	72	7	9	46	106	25	588
Limited Service	3	N/A	N/A	4	26	4	57

Countries are labeled by their 2-letter abbreviations supplied by the ISO (International Organization for Standardization).

Key Findings

Linen and Towel Reuse

For many hoteliers, a guestroom linen and towel reuse program is not only the most commonly identifiable sustainability program, it is also often the only program found within a hotel to gauge guests regarding sustainability or efficiency. Anecdotally, this type of program arguably existed since hotel operations began; it emerged as an industry trend in the 90's and has become commonplace today.

Findings

Linen and Towel Reuse by Country

	AU	KH	CN	HK	ID	JP	KR
% Participants	87%	60%	80%	75%	86%	80%	59%
Full Service	90%	60%	N/A	N/A	86%	80%	46%
Limited Service	N/A	N/A	N/A	N/A	79%	N/A	N/A
Opt-out Linen / Towel	34%	67%	N/A	N/A	16%	31%	30%
	MY	MV	NZ	SG	TH	VN	Total
% Participants	70%	75%	100%	75%	76%	83%	80%
Full Service	69%	86%	100%	80%	80%	88%	81%
Limited Service	N/A	N/A	N/A	N/A	77%	N/A	79%
Opt-out Linen / Towel	30%	17%	56%	43%	33%	48%	13%

- Linen and towel reuse programs are in place for the majority of hotels in all regions. With the exception of Korea (59%), at least three quarters of hotels surveyed have these programs in place. The question now emerges: why has the remaining quarter of hotels not implemented the program yet? Though the program itself has questionable merit for increasing a guest's positive perception of the hotel's concern for the environment, properties without the program in place may carry the risk of guests not perceiving any practice at all.

- Though the program is now common, much opportunity still exists to fine-tune its parameters. Hoteliers still have the opportunity to adjust the programs as an "opt-out" scenario where the bed linens are only changed upon request (instead of opt-in, requiring the guest to place the linen card on the bed to keep the same linens). Here, the trend is the reverse. With the exception of China (67%) and New Zealand (56%), less than half of the hotels that do have this program in place operate on an opt-out basis. By changing the program to change linens only upon request or every three days, the program's savings can be increased immensely. Regarding towel reuse, anecdotally it is common to hear guests complain that they hung their towels up, but the housekeeper changed them anyway. Increased training and awareness can also make the program more effective operationally and reduce the unintended guest perception of poor service.

Low-Flow Showerheads and Water Reuse

Water costs are rising, drought occurs and water scarcity is increasing in various places and at various times throughout the region. Efficient use of water resources is a common component of any hotel's green program. Installing low-flow fixtures in restrooms including showerheads, faucets, and toilets is often the largest opportunity for a hotel to reduce its water use. This also saves energy as it reduces water heating needs. In addition, an emerging practice of reusing water that was either captured rainwater, effluent graywater from laundry or other areas, is becoming a more practical way of coping with water scarcity and increased costs: using what is readily available.

Findings

Low-Flow Showerheads by Country

	AU	KH	CN	HK	ID	JP	KR
% Participants	78%	100%	47%	60%	72%	51%	76%
Full Service	80%	100%	N/A	N/A	74%	51%	77%
Limited Service	N/A	N/A	N/A	N/A	50%	N/A	N/A
Baseline Water Stress (0-5)	3.5	0.4	2.9	N/A	3.3	3.1	3.5
	MY	MV	NZ	SG	TH	VN	Total
% Participants	41%	75%	67%	64%	62%	63%	55%
Full Service	43%	86%	67%	70%	61%	64%	66%
Limited Service	N/A	N/A	N/A	N/A	77%	N/A	63%
Baseline Water Stress (0-5)	2.1	N/A	1.4	5	1.7	1	N/A

Water Reuse by Country

	AU	KH	CN	HK	ID	JP	KR
% Participants	0%	40%	62%	25%	1%	27%	18%
Full Service	0%	40%	N/A	N/A	1%	27%	23%
Limited Service	N/A	N/A	N/A	N/A	0%	N/A	N/A
	MY	MV	NZ	SG	TH	VN	Total
% Participants	4%	38%	0%	8%	38%	33%	40%
Full Service	4%	43%	0%	7%	45%	36%	14%
Limited Service	N/A	N/A	N/A	N/A	15%	N/A	11%

- The countries with the highest relative water stress are where the use of low-flow fixtures are present. Australia, Indonesia, Korea, and Singapore are the countries with an aggregate baseline water stress of 3.3 or higher, and had high prevalence of low-flow showerheads.

- Opportunity exists to increase low-flow fixtures in Singapore. Singapore is the country with the highest water stress, yet only 64% of the hotels surveyed have low-flow fixtures in place.
- Even without water scarcity, efficient use still makes a business case. Cambodia and New Zealand have relatively low water stress, but have high prevalence of low-flow showerheads. Use of low-flow showerheads and other fixtures are also present in the majority of the hotels, however, much opportunity exists to increase those figures as 45% of hotels that still do not have them.
- Reuse of graywater is emerging and prevalent in some countries. Reuse of graywater and rainwater capture is most prevalent in China, and present in about a quarter to a third of hotels in Cambodia, Japan, Maldives, Thailand, and Vietnam. In Malaysia and Indonesia however, water reuse is limited to only a handful of properties. Countries with high water stress have the opportunity to pursue water reuse, as there is a disconnect between them installing low-flow fixtures and reusing water for further conservation.

Variable Frequency Drives

One of the most prevalent component of hotel renovations, retrofits, and capital expenditures is outfitting of various parts of the HVAC or water systems with variable frequency drives (or VFDs, also known as variable speed drives). VFDs take the basic premise that air handling units or water circulation do not need to be operated at the same speed or capacity all the time, rather will have variable handling needs. They can be adjusted or set automatically to increase and decrease flows based on need. These may require relatively significant capital outlay to install, but the savings are now proven.

Variable Frequency Drives by Country

	AU	KH	CN	HK	ID	JP	KR
% Participants	72%	60%	53%	65%	85%	58%	82%
Full Service	75%	60%	N/A	N/A	85%	58%	85%
Limited Service	N/A	N/A	N/A	N/A	71%	N/A	N/A
Main Air-Handling Units	69%	67%	N/A	N/A	41%	85%	93%
Elevators	33%	67%	N/A	N/A	65%	62%	86%
Kitchen Hoods	31%	67%	N/A	N/A	30%	73%	71%
Water Pumps	74%	100%	N/A	N/A	67%	73%	86%
Refrigeration Units	21%	67%	N/A	N/A	41%	58%	57%
	MY	MV	NZ	SG	TH	VN	Total
% Participants	39%	38%	11%	81%	51%	67%	59%
Full Service	39%	43%	11%	87%	56%	72%	**69%**
Limited Service	N/A	N/A	N/A	N/A	42%	N/A	**53%**
Main Air-Handling Units	52%	67%	0%	81%	51%	65%	**28%**
Elevators	48%	0%	0%	35%	43%	60%	**27%**
Kitchen Hoods	42%	67%	0%	53%	34%	55%	**20%**
Water Pumps	94%	133%	100%	63%	79%	75%	**37%**
Refrigeration Units	35%	0%	0%	28%	21%	35%	**18%**

Findings

- The majority of hotels in the region now use Variable Frequency Drives. In all countries surveyed with a significant sample, over 50% of the hotels have them in place. However, the use of Variable Frequency Drives is more common in some countries than others. For example 85% of hotels in Indonesia are using some form of VFDs, while only 51% of hotels in Thailand have installed them.
- The most commonly used VFD is in water pumping and HVAC systems. Use of VFDs will depend on the hotel's characteristics (i.e. whether or not the hotel has a restaurant). Yet in general water pumps and air handling units may be good opportunities for the now "minority" of hotels that have not yet taken advantage of this energy saving opportunity.

Renewable Energy

Renewable energy is likely to be the primary topic of sustainability in hoteliers' discussions over the next ten years. As new technology emerges, options and cost structures for procurement become more diversified, unit costs decrease, and governments make commitments to reduce carbon emissions, renewable energy will overtake energy efficiency as the industry's primary form of reducing carbon emissions. In some places, renewable energy installation is now more cost-effective than purchasing from the grid, and in some cases also more reliable.

Onsite Renewable Energy by Country

	AU	KH	CN	HK	ID	JP	KR
% Participants	6%	0%	N/A	N/A	7%	4%	6%
Full Service	6%	0%	N/A	N/A	7%	4%	0%
Limited Service	N/A	N/A	N/A	N/A	0%	N/A	25%
Solar PV	67%	0%	N/A	N/A	13%	100%	0%
Solar Thermal	0%	0%	N/A	N/A	20%	0%	100%
Heat Pump	0%	0%	N/A	N/A	80%	0%	0%
Other	33%	0%	N/A	N/A	0%	0%	0%
	MY	MV	NZ	SG	TH	VN	Total
% Participants	4%	38%	11%	8%	9%	20%	3%
Full Service	4%	43%	11%	9%	10%	24%	8%
Limited Service	N/A	N/A	N/A	N/A	8%	N/A	N/A
Solar PV	0%	33%	0%	25%	15%	0%	20%
Solar Thermal	0%	0%	0%	25%	23%	50%	22%
Heat Pump	33%	0%	0%	25%	38%	50%	43%
Other	67%	67%	100%	100%	23%	0%	25%

Note: Solar PV, Solar Thermal, Heat Pump, and Other represent the type of renewables used by those hotels indicating use of renewable energy (represented in the % participants row). Some hotels will use more than one type of renewable energy, thus the prevalence may exceed 100%.

Offsite Renewable Energy by Country

	AU	KH	CN	HK	ID	JP	KR
% Participants	4%	N/A	N/A	N/A	6%	2%	6%
Full Service	4%	N/A	N/A	N/A	7%	2%	8%
Limited Service	N/A	N/A	N/A	N/A	0%	N/A	N/A
RECs	0%	N/A	N/A	N/A	0%	100%	0%
PPAs	100%	N/A	N/A	N/A	0%	0%	0%
Other	0%	N/A	N/A	N/A	0%	100%	100%
	MY	MV	NZ	SG	TH	VN	Total
% Participants	1%	0%	44%	4%	3%	7%	2%
Full Service	1%	0%	44%	4%	3%	8%	5%
Limited Service	N/A	N/A	N/A	N/A	4%	N/A	N/A
RECs	0%	N/A	0%	50%	0%	0%	6%
PPAs	0%	N/A	25%	100%	75%	100%	32%
Other	0%	N/A	75%	0%	50%	0%	26%

Note: Solar PV, Solar Thermal, Heat Pump, and Other represent the type of renewables used by those hotels indicating use of renewable energy (represented in the % participants row). Some hotels will use more than one type of renewable energy, thus the prevalence may exceed 100%.

Findings

- Onsite generation of renewable energy is still nascent in the region. As a percentage of the data set, the Maldives has the most uptake followed by Vietnam. However, in aggregate terms Indonesia boasts 15 hotels generating renewable energy onsite.
- The purchase of renewable energy is less prevalent overall. Purchase of renewable energy is often dependent on government mechanisms to enable its purchase and distribution through various forms. These mechanisms, such as Renewable Energy Certificates (RECs) and Purchase Power Agreements (PPAs) are less common in the region. Though nearly half the surveyed hotels in New Zealand (44%) are purchasing renewable energy.

Utility Consumption and Cost

Energy

Energy usage metrics vary widely in every region, as is commonly found in other studies. Numerous factors will determine why a hotel is on the high or low end of the spectrum. Hoteliers should seek to understand why a hotel is on the high or low end and whether the metrics are justified or the hotel is using energy or water inefficiently, or underreporting data.

Weather is often the primary driver of fluctuations in a hotel's energy usage year-over-year, in many cases more so than occupancy. In future years we will be able to compare performance across the region alongside weather variations.

Water

While water usage metrics are more consistent across regions, they also vary widely within countries and markets. Several properties will exhibit high water use, which may be due to landscaping, swimming pools, laundry use, and other factors. Similarly for energy, hoteliers should seek to understand whether the positioning within the spectrum of water usage could be improved.

Occupancy will be the primary driver of water fluctuations, including meeting attendees and restaurant covers for full service hotels. Sound operating practices and low-flow fixtures can help reduce this

Key Findings

- Despite having some of the highest cost per room and per square meter, Japan demonstrated some of the highest energy usage in the region. Though weather may affect Japan's results more negatively than regional peers, Japan's prevalence of VFD was relatively low across the region, and this may be an opportunity to reduce energy usage.
- New Zealand's water usage per room is significantly higher than others, despite having the most prevalent use of linen/towel reuse. Though a small sample and skewed with full service hotels, one third of the hotels do not have low-flow fixtures, which can be an opportunity to improve this performance.
- Several hotels have extremely high energy and water usage. Though outliers were removed from the results to mitigate potential errors in data validity, it is common to find hotels with significantly high metrics in energy and water usage, by a factor of 5 or more above the mean. If a hotel falls well above the range provided in this study, an onsite audit may be justified.
- While full service hotels generally use more energy on average than limited service hotels, the gap is closer in the case of water consumption.
- Convention hotels in Indonesia are more efficient than resorts or urban hotels in both energy and water. Though this may be intuitive when compared to resorts, opportunity may exist for improving efficiency of urban properties in Indonesia.

Carbon Emissions

The main drivers of carbon emissions in hotel operations are 1) the energy consumption of the property, particularly electricity usage, and 2) the type of fuel used onsite or to generate electricity from the power grid.

Electricity routinely represents the majority of a hotel's energy footprint, and the carbon emissions emitted per kilowatt-hour of purchased grid electricity will be much higher than from energy generated onsite (i.e. fuel burning, onsite electricity generation, geothermal or other energy sources). Properties located in countries or regions with high emission factors for electricity use such as China and Cambodia will inherently have higher footprints than counterpart properties in low-footprint countries such as New Zealand or Vietnam.

From a hotel's perspective, actions to lower a hotel's carbon footprint are:

- Reducing energy usage (particularly electricity);
- Switching to energy sources that emit less carbon emissions per kWh (i.e. natural gas instead of diesel or coal);
- Installing onsite renewable energy;
- Purchasing renewable energy from offsite sources;
- Purchasing carbon offsets (to reduce the footprint but not the hotel's actual emissions).

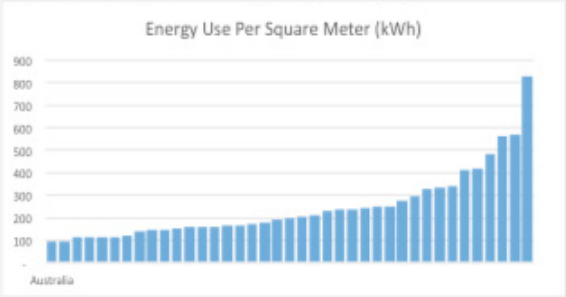
For an owner or manager of a portfolio, the relationship of carbon emissions per kWh of electricity can be analyzed to understand where the portfolio's largest sources of carbon emissions are found, and focus efforts on those larger emissions sources. This will be the most effective way to reduce the portfolio's overall carbon footprint.

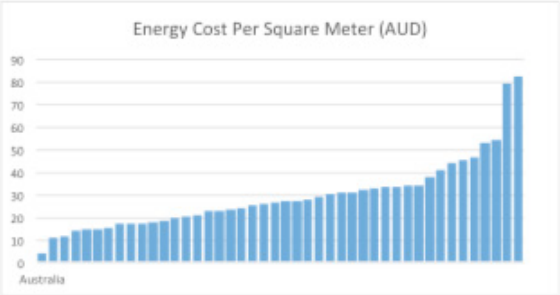
Utilities & Carbon Emissions Snapshot - Australia

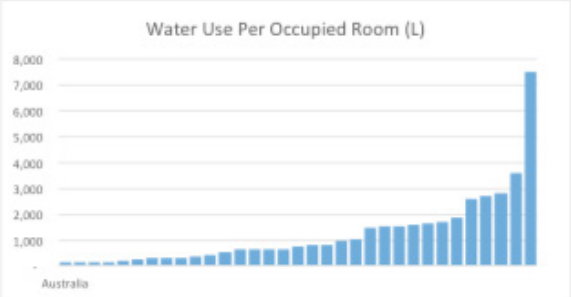
Overall Snapshot by Property Type - Australia

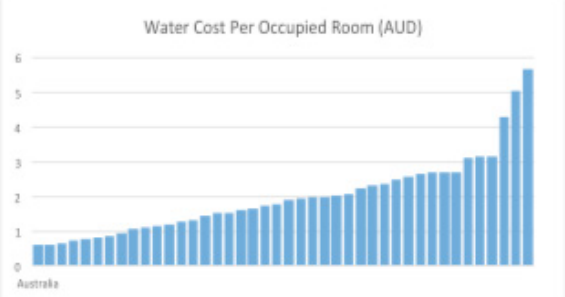
		Energy				Water				GHG Emissions	
		Usage PSM (kWh)	Usage POR (kWh)	Cost PSM (AUD)	Cost POR (AUD)	Usage PSM (L)	Usage POR (L)	Cost PSM (AUD)	Cost POR (AUD)	PSM (kgCO2e)	POR (kgCO2e)
Total	Count	39	43	44	47	28	33	40	42	43	41
	High	825.9	857.6	82.3	30.5	4,632.80	7,505.20	18.4	5.7	650.3	1,231.10
	Mean	246.6	115.4	29.4	9.2	1,459.80	1,230.70	6.6	2	67.4	190.8
	Median	198.9	67.6	26.9	7.5	1,179.10	754.5	5.9	1.8	42.8	149.6
	Low	91.9	25.6	4	2.1	189.9	115.3	1.6	0.6	16.6	64.8
Full Service	Count	38	42	43	46	26	31	39	41	42	40
	High	825.9	857.6	82.3	30.5	4,632.80	3,581.40	18.4	5.7	650.3	1,231.10
	Mean	249.1	117.4	29.5	9.3	1,457.20	978.1	6.7	2	68.5	193.2
	Median	201.7	68.6	27	7.5	1,179.10	641.7	6	1.9	44.9	150.9
	Low	91.9	25.6	4	2.1	270.5	115.3	1.6	0.6	16.6	64.8
Resort	Count	7	6	8	7	N/A	5	6	5	6	7
	High	568.6	344.7	82.3	24.4	N/A	2,570.00	11	5.7	183.4	282.4
	Mean	289.4	143.4	32.8	14.3	N/A	1,007.90	7.3	3.1	82.8	160.3
	Median	190.2	114	21.1	11.7	N/A	633.4	7.1	2.7	65.8	149
	Low	91.9	66.4	11.5	8.7	N/A	155.1	4.3	1.7	40.3	79.1
City / Urban	Count	29	34	34	38	22	26	32	35	34	31
	High	825.9	857.6	79.1	30.5	4,632.80	7,505.20	18.4	5	650.3	1,231.10
	Mean	225.3	115.4	29.2	8.6	1,519.70	1,267.40	6.5	1.9	66.8	192.3
	Median	198.9	60.2	27.5	7.1	1,267.50	698.1	5.9	1.7	41.6	148.6
	Low	96.2	25.6	4	2.1	189.9	115.3	1.6	0.6	16.6	64.8

Illustrative Graph of All Responses - Australia







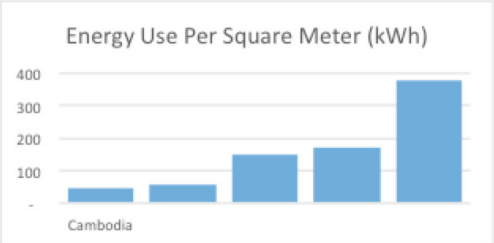


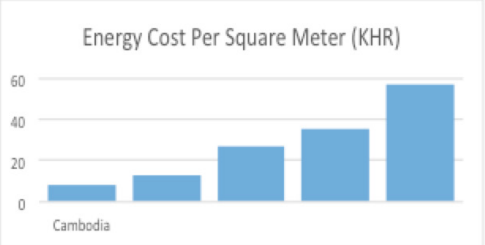
Utilities & Carbon Emissions Snapshot - Cambodia

Overall Snapshot by Property Type - Cambodia

		Energy				Water				GHG Emissions	
		Usage PSM (kWh)	Usage POR (kWh)	Cost PSM (KHR)	Cost POR (KHR)	Usage PSM (L)	Usage POR (L)	Cost PSM (KHR)	Cost POR (KHR)	PSM (kgCO2e)	POR (kgCO2e)
Total	Count	5	5	5	5	N/A	N/A	N/A	N/A	5	5
	High	379.5	235.7	57	35.4	N/A	N/A	N/A	N/A	151.9	244.7
	Mean	160.6	151.1	28	27.2	N/A	N/A	N/A	N/A	108.2	111.3
	Median	146.6	151.1	26.7	29.4	N/A	N/A	N/A	N/A	104.8	116.2
	Low	47.7	75.1	8.4	17.1	N/A	N/A	N/A	N/A	52.7	37.8
Full Service	Count	5	5	5	5	N/A	N/A	N/A	N/A	5	5
	High	379.5	235.7	57	35.4	N/A	N/A	N/A	N/A	151.9	244.7
	Mean	160.6	151.1	28	27.2	N/A	N/A	N/A	N/A	108.2	111.3
	Median	146.6	151.1	26.7	29.4	N/A	N/A	N/A	N/A	104.8	116.2
	Low	47.7	75.1	8.4	17.1	N/A	N/A	N/A	N/A	52.7	37.8

Illustrative Graph of All Responses - Cambodia



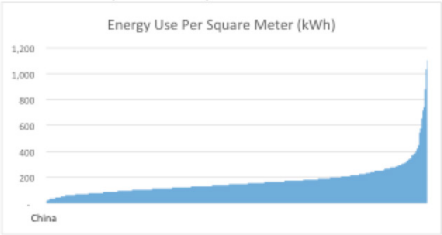


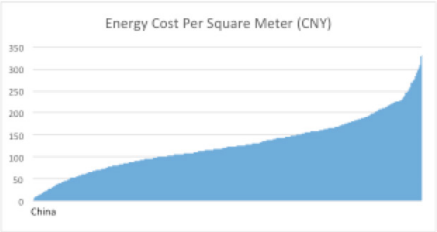
Utilities & Carbon Emissions Snapshot - China

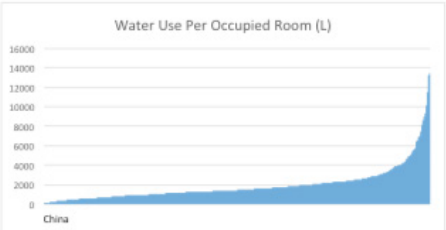
Overall Snapshot by Property Type - China

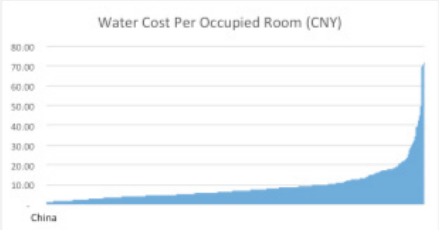
		Energy				Water				GHG Emissions	
		Usage PSM (kWh)	Usage POR (kWh)	Cost PSM (CNY)	Cost POR (CNY)	Usage PSM (L)	Usage POR (L)	Cost PSM (CNY)	Cost POR (CNY)	PSM (kgCO2e)	POR (kgCO2e)
Total	Count	695	674	719	716	516	559	525	529	674	695
	High	1,104.40	1,123.30	331.4	560.6	14,314.80	13,472.00	104.6	72	1,013.60	1,045.80
	Mean	166.5	146.5	127.5	110.5	2,657.90	1,930.90	11	9.1	94.3	107.1
	Median	146.5	114.7	122.1	89.5	2,062.10	1,443.90	9.3	6.7	71.5	95.2
	Low	20.2	24.9	1.1	3.3	77.7	91.5	1.2	1.1	5.5	4.2
Full Service	Count	6	6	7	7	N/A	N/A	N/A	N/A	6	6
	High	711.8	271.9	228.6	200.9	N/A	N/A	N/A	N/A	95.5	199.8
	Mean	232.8	112.7	150.9	103	N/A	N/A	N/A	N/A	60.1	111.5
	Median	160.2	93.4	157.9	87.3	N/A	N/A	N/A	N/A	61.2	116.6
	Low	77.6	38.6	59.1	37.7	N/A	N/A	N/A	N/A	23	42.7
Resort	Count	105	111	107	114	77	85	77	82	111	105
	High	591.4	1,123.30	278.7	560.6	14,314.80	13,389.50	78.8	72	794.5	677.4
	Mean	141.7	215.6	109.1	158.7	3,182.00	3,624.80	14.2	15.9	138.8	92.1
	Median	128.6	158.8	102.3	124.9	2,365.20	2,702.40	9.2	11.9	95.7	81.7
	Low	20.2	27	9.6	8.8	77.7	114.8	1.4	2	5.5	7
City / Urban	Count	466	441	473	471	352	379	362	360	441	466
	High	1,104.40	741.5	331.4	510.8	12,784.50	13,472.00	104.6	69.4	616.5	1,045.80
	Mean	175.4	129.7	134.9	100	2,576.60	1,613.70	10.9	7.7	83.5	113.9
	Median	150.2	103.1	127.9	85.5	2,066.30	1,339.00	9.5	6.2	66.2	100.5
	Low	22.9	24.9	1.1	3.3	83.4	91.5	1.2	1.1	5.9	7.3
Convention	Count	114	112	123	121	81	88	81	82	112	114
	High	762.6	1,091.50	296.7	438.4	11,616.60	10,096.30	27.1	70.7	1,013.60	255.7
	Mean	150.9	145.4	114.2	104.8	2,556.30	1,703.30	8.7	8.2	91.8	93
	Median	142.4	115.1	113.4	91.9	1,824.50	1,515.30	7	6.1	72.9	89.6
	Low	20.9	32.4	6	4.7	133	153.5	1.5	1.1	21.1	4.2

Illustrative Graph of All Responses - China







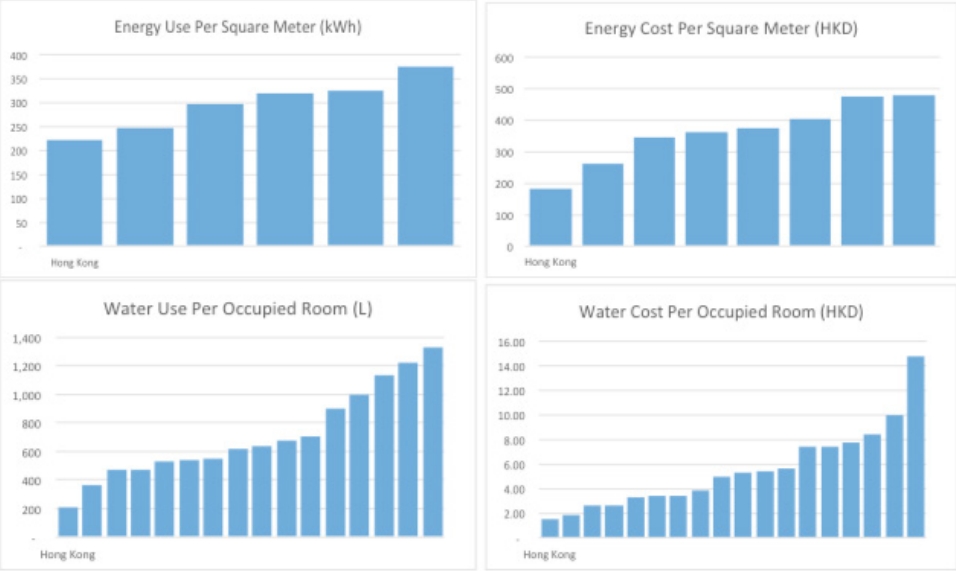


Utilities & Carbon Emissions Snapshot – Hong Kong

Overall Snapshot by Property Type – Hong Kong

		Energy				Water				GHG Emissions	
		Usage PSM (kWh)	Usage POR (kWh)	Cost PSM (HKD)	Cost POR (HKD)	Usage PSM (L)	Usage POR (L)	Cost PSM (HKD)	Cost POR (HKD)	PSM (kgCO2e)	POR (kgCO2e)
Total	Count	6	16	8	19	13	16	6	18	16	7
	High	373.4	296.3	479.3	140.2	4,656.00	1,326.70	39.7	14.7	107	594.3
	Mean	296.8	84	360.1	68.8	1,987.80	710.4	21.6	5.5	55	276.2
	Median	307.5	64.1	367.2	69.7	1,937.00	630.8	19.7	5.1	46.9	221.4
	Low	220.2	32.4	181.4	18.7	476.7	212.4	11.1	1.5	25.3	171.8
City / Urban	Count	7	16	8	19	13	16	6	18	16	7
	High	1,756.50	296.3	479.3	140.2	4,656.00	1,326.70	39.7	14.7	107	594.3
	Mean	505.4	84	360.1	68.8	1,987.80	710.4	21.6	5.5	55	276.2
	Median	318.3	64.1	367.2	69.7	1,937.00	630.8	19.7	5.1	46.9	221.4
	Low	220.2	32.4	181.4	18.7	476.7	212.4	11.1	1.5	25.3	171.8

Illustrative Graph of All Responses – Hong Kong

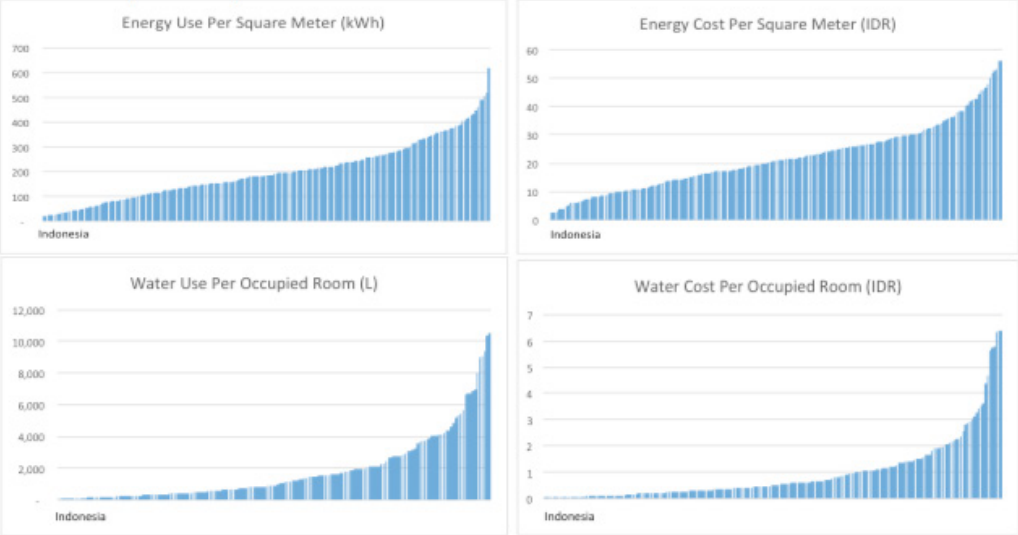


Utilities & Carbon Emissions Snapshot - Indonesia

Overall Snapshot by Property Type - Indonesia

		Energy				Water				GHG Emissions	
		Usage PSM (kWh)	Usage POR (kWh)	Cost PSM (IDR)	Cost POR (IDR)	Usage PSM (L)	Usage POR (L)	Cost PSM (IDR)	Cost POR (IDR)	PSM (kgCO2e)	POR (kgCO2e)
Total	Count	204	188	206	217	159	180	203	205	188	211
	High	616.7	716.7	56	73.8	12,487.50	10,505.10	47.1	6.4	538.7	1,345.90
	Mean	199	192.3	21.8	11.9	2,760.50	1,799.70	2.6	1	84	147.6
	Median	185	85.3	20.8	7.7	1,980.50	926.1	1.4	0.5	52.6	124.7
	Low	20.6	25.9	2.4	1	109.9	47.3	0.1	0.1	6.6	4.5
Full Service	Count	192	179	193	204	151	169	192	194	179	197
	High	616.7	716.7	56	73.8	12,487.50	10,505.10	47.1	6.4	538.7	1,345.90
	Mean	202.4	192.9	22.2	12.3	2,780.00	1,750.00	2.7	1	82.9	148.2
	Median	187.5	86.6	21.2	7.9	1,980.50	922.8	1.4	0.5	52.9	125.8
	Low	20.6	26.2	2.4	1	109.9	47.3	0.1	0.1	6.6	4.5
Limited Service	Count	13	9	13	13	8	11	11	12	9	14
	High	281.6	660.3	29.8	5.6	6,179.50	9,037.10	2.7	0.7	490.5	594.8
	Mean	148.4	120.6	15.6	4.5	2,353.50	2,564.30	1.2	0.3	87.5	135.7
	Median	146.3	53.2	15.5	3.5	1,711.80	1,014.20	0.8	0.2	35.9	115.3
	Low	36.1	25.9	7.4	1.6	153.3	87.7	0.1	0.1	15.4	25.9
Resort	Count	62	65	64	57	53	58	64	62	65	54
	High	504.6	716.7	52.8	73.8	12,487.50	10,340.00	47.1	6.4	538.7	1,345.90
	Mean	202.7	179.5	20.5	17.4	3,559.60	1,814.50	3	1.5	112.8	153.5
	Median	153.8	116.6	19.8	10.8	2,577.10	1,007.40	1.2	0.9	74.3	125.8
	Low	43.9	32.2	2.4	2.8	121.4	47.3	0.1	0.1	9.7	14.3
City / Urban	Count	106	91	106	112	76	88	104	107	91	110
	High	616.7	701.4	56	59.1	10,389.00	9,391.60	45.5	6.4	490.5	1,077.30
	Mean	198	117.2	22.1	10	2,294.90	1,485.80	2.6	0.7	75.6	149.4
	Median	181.9	69.6	21.3	6.7	1,671.10	787.3	1.5	0.4	49	127.3
	Low	30.6	27.6	2.4	1.3	109.9	57	0.1	0.1	11.7	5.4
Convention	Count	26	24	26	28	22	24	25	27	24	27
	High	462.4	204.3	46.7	20.6	9,020.60	10,505.10	4.8	2.2	111.3	431.3
	Mean	156.6	86.1	23.2	8.7	2,464.50	2,594.60	2.5	0.8	52.3	132.7
	Median	184.1	76.6	21	7.3	2,078.70	2,086.00	2.6	0.7	50.6	121.6
	Low	21.8	26.2	9.9	2.1	207.1	87.7	0.1	0.1	6.6	4.5

Illustrative Graph of All Responses - Indonesia

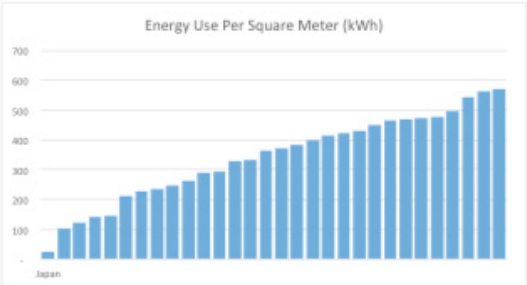


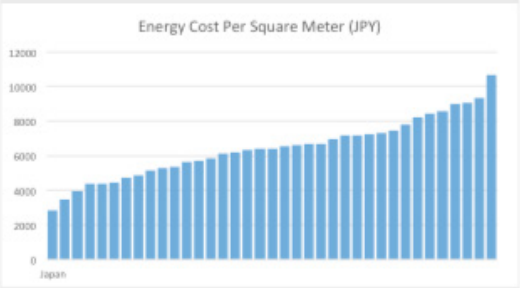
Utilities & Carbon Emissions Snapshot - Japan

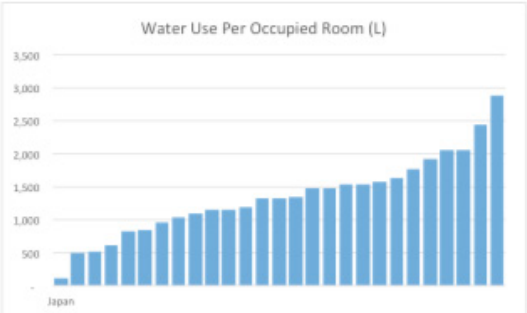
Overall Snapshot by Property Type - Japan

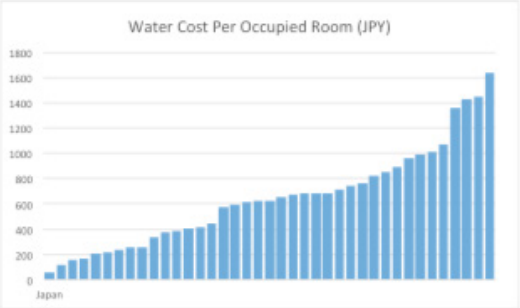
		Energy				Water				GHG Emissions	
		Usage PSM (kWh)	Usage POR (kWh)	Cost PSM (JPY)	Cost POR (JPY)	Usage PSM (L)	Usage POR (L)	Cost PSM (JPY)	Cost POR (JPY)	PSM (kgCO2e)	POR (kgCO2e)
Total	Count	30	32	37	41	26	27	37	39	32	32
	High	572.2	493.4	10,683.90	9,480.70	12,458.50	2,879.70	3,571.20	1,635.30	195.1	344.9
	Mean	342.4	173.7	6,438.40	2,862.10	3,079.20	1,344.00	1,543.70	645.4	68.8	142.5
	Median	369.4	153.1	6,418.30	2,078.40	1,957.20	1,323.10	1,512.20	627.9	59.8	140.1
	Low	25.8	31.6	2,840.90	667.9	498.8	111.1	177.3	60.8	14.6	12.8
Full Service	Count	30	32	37	41	26	27	37	39	32	32
	High	572.2	493.4	10,683.90	9,480.70	12,458.50	2,879.70	3,571.20	1,635.30	195.1	344.9
	Mean	342.4	173.7	6,438.40	2,862.10	3,079.20	1,344.00	1,543.70	645.4	68.8	142.5
	Median	369.4	153.1	6,418.30	2,078.40	1,957.20	1,323.10	1,512.20	627.9	59.8	140.1
	Low	25.8	31.6	2,840.90	667.9	498.8	111.1	177.3	60.8	14.6	12.8
Resort	Count	10	10	12	12	6	7	11	11	10	10
	High	572.2	392.3	8,569.20	9,480.70	7,305.90	2,056.60	3,571.20	1,433.00	195.1	189.2
	Mean	276.4	168.8	6,065.50	3,242.00	2,845.70	1,389.50	1,530.90	691.7	74.5	114.1
	Median	254.7	163.2	6,146.30	1,931.10	2,340.10	1,539.70	1,452.10	627.9	63.4	121.1
	Low	25.8	42	3,967.90	1,259.50	498.8	111.1	813	338.6	20.9	12.8
City / Urban	Count	19	21	24	28	19	19	25	27	21	21
	High	561.9	493.4	10,683.90	7,016.90	12,458.50	2,879.70	3,302.20	1,635.30	166.3	344.9
	Mean	377.5	180.5	6,711.30	2,764.90	3,222.60	1,335.60	1,584.90	644.7	68	157.2
	Median	422.8	153.7	6,799.00	2,427.60	1,952.20	1,323.10	1,604.20	651.4	62.8	157.8
	Low	102.9	31.6	2,840.90	667.9	616.3	501.3	177.3	60.8	14.6	51.2

Illustrative Graph of All Responses - Japan







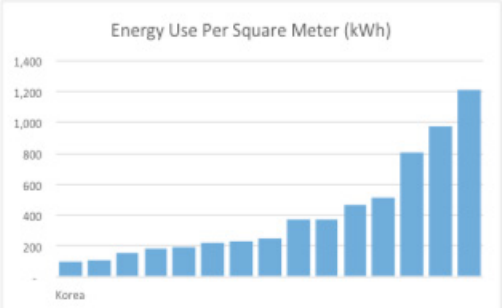


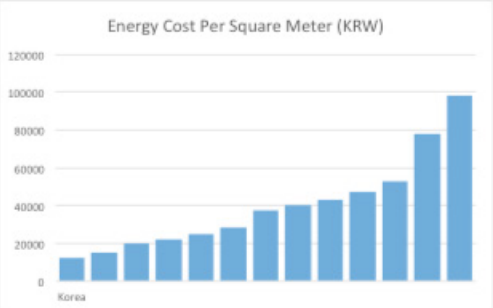
Utilities & Carbon Emissions Snapshot - Korea

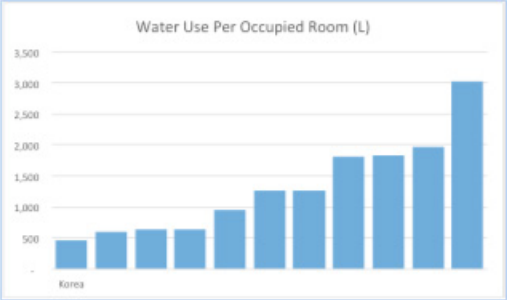
Overall Snapshot by Property Type - Korea

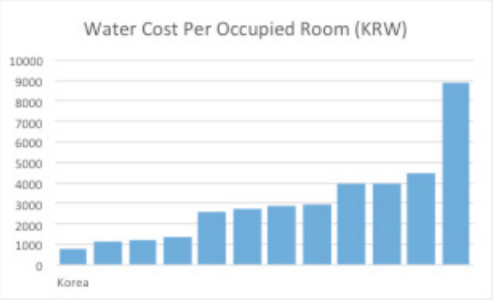
		Energy				Water				GHG Emissions	
		Usage PSM (kWh)	Usage POR (kWh)	Cost PSM (KRW)	Cost POR (KRW)	Usage PSM (L)	Usage POR (L)	Cost PSM (KRW)	Cost POR (KRW)	PSM (kgCO2e)	POR (kgCO2e)
Total	Count	15	16	13	14	15	11	13	12	16	16
	High	1,208.80	1,097.20	97,997.00	32,579.10	10,957.00	3,018.80	36,859.90	8,911.50	424.5	747
	Mean	409.3	248.5	40,033.80	15,199.40	2,933.20	1,315.60	13,349.20	3,078.30	105.6	210.6
	Median	248.8	149.3	37,228.50	12,970.00	2,852.10	1,257.90	8,080.30	2,805.70	64.1	122.7
	Low	96	29.4	12,325.60	2,513.10	172.3	473.7	2,331.50	806.1	15.6	46
Full Service	Count	11	13	10	10	12	9	9	8	13	12
	High	802.1	1,097.20	77,849.40	32,579.10	10,957.00	1,977.00	35,413.80	8,911.50	424.5	747
	Mean	336.2	295.5	38,986.00	19,615.60	3,003.90	1,206.30	11,385.40	4,055.30	124.9	189.3
	Median	248.8	259.7	38,740.90	19,576.60	2,445.00	1,257.90	6,733.80	3,444.00	98	122.7
	Low	96	61.5	15,480.70	9,330.80	283.4	473.7	2,974.50	2,557.10	30.5	46
City / Urban	Count	13	14	11	12	13	9	11	10	14	14
	High	1,208.80	1,097.20	97,997.00	32,579.10	10,957.00	3,018.80	36,859.90	4,496.60	424.5	747
	Mean	450.2	272.4	43,869.20	15,846.10	3,133.80	1,317.80	13,561.30	2,547.10	114.9	230.4
	Median	372.6	205.9	40,253.30	15,351.50	3,011.00	1,257.90	8,080.30	2,805.70	86.4	132.5
	Low	104.5	29.4	12,325.60	2,513.10	172.3	473.7	2,331.50	806.1	15.6	57

Illustrative Graph of All Responses – Korea







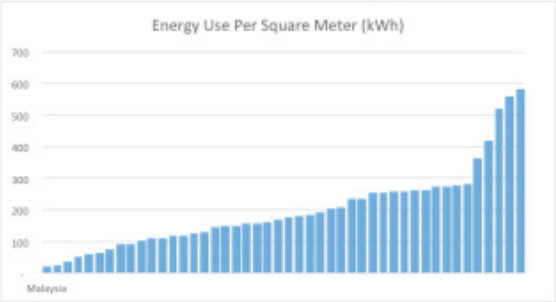


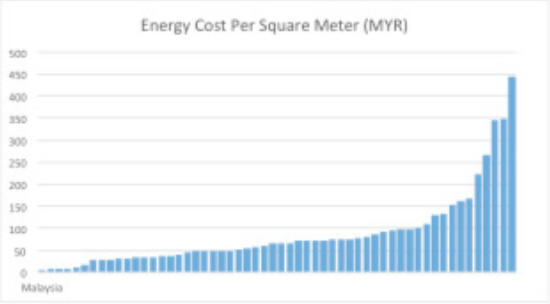
Utilities & Carbon Emissions Snapshot - Malaysia

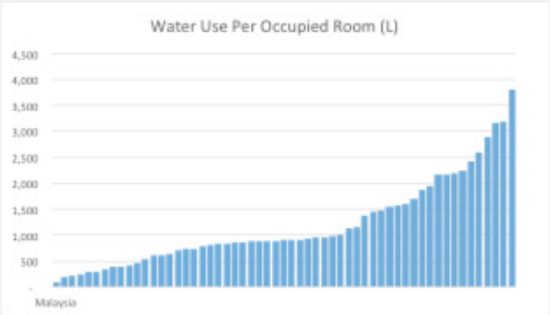
Overall Snapshot by Property Type - Malaysia

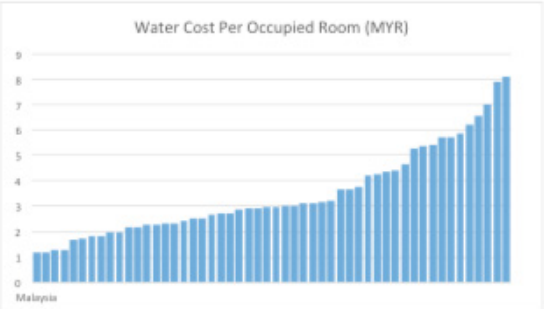
		Energy				Water				GHG Emissions	
		Usage PSM (kWh)	Usage POR (kWh)	Cost PSM (MYR)	Cost POR (MYR)	Usage PSM (L)	Usage POR (L)	Cost PSM (MYR)	Cost POR (MYR)	PSM (kgCO2e)	POR (kgCO2e)
Total	Count	46	56	56	73	57	57	40	52	56	49
	High	580.4	557.1	443.8	456.8	14,853.80	3,812.30	184.2	8.1	383.2	496.6
	Mean	199.2	127.6	86.7	52.6	3,111.50	1,185.70	15.8	3.5	83.4	149.7
	Median	173.3	101.4	65.3	40.2	2,305.70	903.4	6.5	3	69.2	125.4
	Low	23.1	38	5.4	1.4	186.9	100.4	2.9	1.2	19	15.9
Full Service	Count	43	52	53	66	52	54	39	50	52	46
	High	580.4	557.1	443.8	371.6	14,853.80	3,812.30	184.2	8.1	383.2	496.6
	Mean	198.3	129.5	87.9	47.7	3,199.40	1,207.90	16.1	3.4	84.7	150.2
	Median	168.6	100.6	64.8	40.3	2,408.00	905.5	6.9	3	69.2	123.9
	Low	23.1	38	5.4	2.2	186.9	187	2.9	1.2	25.7	15.9
Resort	Count	11	15	16	22	19	18	10	13	15	11
	High	256.9	557.1	160.7	138.4	5,209.40	3,812.30	7.6	7	383.2	176.7
	Mean	119.7	159.8	61.2	49.5	2,459.60	1,373.00	5.5	3.9	107.1	80.3
	Median	117.7	111.8	52.7	40.8	2,261.20	995	5.7	4.2	72.8	76.7
	Low	23.1	44.1	9.2	2.2	228.2	100.4	3	1.2	19	15.9
City / Urban	Count	35	41	40	51	38	39	30	39	41	38
	High	580.4	265.2	443.8	456.8	14,853.80	3,195.30	184.2	8.1	172.8	496.6
	Mean	224.2	115.8	96.9	53.9	3,437.40	1,099.30	19.2	3.3	74.7	169.7
	Median	193.5	101.3	68.6	37.2	2,429.10	872.4	7.5	2.9	68.1	136.4
	Low	53.8	38	5.4	1.4	186.9	209.3	2.9	1.2	25.7	35.6

Illustrative Graph of All Responses – Malaysia









Utilities & Carbon Emissions Snapshot - Maldives

Overall Snapshot by Property Type - Maldives

		Energy				Water				GHG Emissions	
		Usage PSM (kWh)	Usage POR (kWh)	Cost PSM (MVR)	Cost POR (MVR)	Usage PSM (L)	Usage POR (L)	Cost PSM (MVR)	Cost POR (MVR)	PSM (kgCO2e)	POR (kgCO2e)
Total	Count	N/A	6	N/A	5	N/A	N/A	N/A	N/A	6	N/A
	High	N/A	1,231.50	N/A	171.1	N/A	N/A	N/A	N/A	373.3	N/A
	Mean	N/A	441.2	N/A	107.6	N/A	N/A	N/A	N/A	159.9	N/A
	Median	N/A	262.8	N/A	88.5	N/A	N/A	N/A	N/A	138.5	N/A
	Low	N/A	78.3	N/A	61.6	N/A	N/A	N/A	N/A	41.3	N/A
Full Service	Count	N/A	6	N/A	5	N/A	N/A	N/A	N/A	6	N/A
	High	N/A	1,231.50	N/A	171.1	N/A	N/A	N/A	N/A	373.3	N/A
	Mean	N/A	441.2	N/A	107.6	N/A	N/A	N/A	N/A	159.9	N/A
	Median	N/A	262.8	N/A	88.5	N/A	N/A	N/A	N/A	138.5	N/A
	Low	N/A	78.3	N/A	61.6	N/A	N/A	N/A	N/A	41.3	N/A
Resort	Count	N/A	6	N/A	5	N/A	N/A	N/A	N/A	6	N/A
	High	N/A	1,231.50	N/A	171.1	N/A	N/A	N/A	N/A	373.3	N/A
	Mean	N/A	441.2	N/A	107.6	N/A	N/A	N/A	N/A	159.9	N/A
	Median	N/A	262.8	N/A	88.5	N/A	N/A	N/A	N/A	138.5	N/A
	Low	N/A	78.3	N/A	61.6	N/A	N/A	N/A	N/A	41.3	N/A

Utilities & Carbon Emissions Snapshot – New Zealand

Overall Snapshot by Property Type – New Zealand

		Energy				Water				GHG Emissions	
		Usage PSM (kWh)	Usage POR (kWh)	Cost PSM (NZD)	Cost POR (NZD)	Usage PSM (L)	Usage POR (L)	Cost PSM (NZD)	Cost POR (NZD)	PSM (kgCO2e)	POR (kgCO2e)
Total	Count	7	9	7	9	6	7	N/A	6	9	7
	High	737.2	313.8	45.4	12.8	10,466.30	3,282.50	N/A	2.5	60.6	142.4
	Mean	331.4	109	21.8	6.7	3,374.00	2,239.80	N/A	1.3	19	59.2
	Median	224	78.8	16.1	5	1,808.60	2,991.60	N/A	1.3	11.1	32.3
	Low	106.9	30.4	9.1	3.5	1,369.90	393.2	N/A	0.2	4.3	15
Full Service	Count	7	9	7	9	6	7	N/A	6	9	7
	High	737.2	313.8	45.4	12.8	10,466.30	3,282.50	N/A	2.5	60.6	142.4
	Mean	331.4	109	21.8	6.7	3,374.00	2,239.80	N/A	1.3	19	59.2
	Median	224	78.8	16.1	5	1,808.60	2,991.60	N/A	1.3	11.1	32.3
	Low	106.9	30.4	9.1	3.5	1,369.90	393.2	N/A	0.2	4.3	15
City / Urban	Count	N/A	6	N/A	6	N/A	5	N/A	5	6	N/A
	High	N/A	313.8	N/A	12.8	N/A	3,282.50	N/A	2.5	60.6	N/A
	Mean	N/A	103.6	N/A	7.3	N/A	1,924.80	N/A	1.3	17.7	N/A
	Median	N/A	69.7	N/A	6.7	N/A	2,156.50	N/A	1.4	9.3	N/A
	Low	N/A	35.3	N/A	4.3	N/A	393.2	N/A	0.2	5	N/A

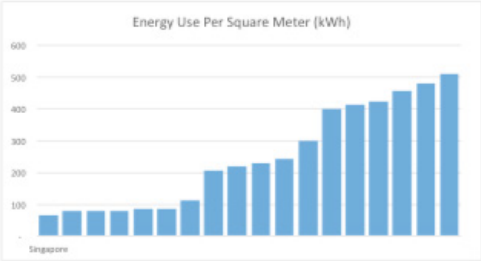
Illustrative Graph of All Responses – New Zealand

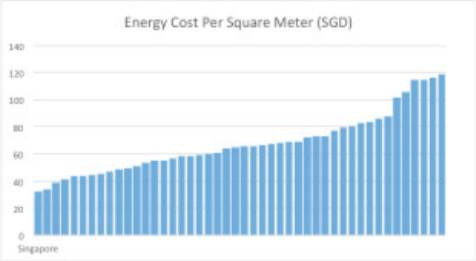
Utilities & Carbon Emissions Snapshot – Singapore

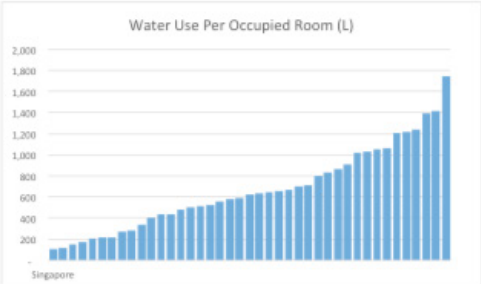
Overall Snapshot by Property Type – Singapore

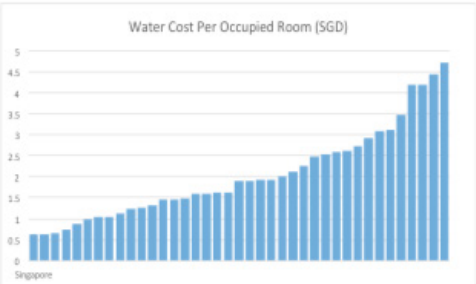
		Energy				Water				GHG Emissions	
		Usage PSM (kWh)	Usage POR (kWh)	Cost PSM (SGD)	Cost POR (SGD)	Usage PSM (L)	Usage POR (L)	Cost PSM (SGD)	Cost POR (SGD)	PSM (kgCO2e)	POR (kgCO2e)
Total	Count	18	15	46	51	38	41	42	39	15	20
	High	508.2	356.6	118.4	98.5	9,960.20	1,741.20	23.5	4.7	72.4	239.5
	Mean	247.4	104.3	67.4	21.9	2,458.10	672.1	7.7	2	33.6	76.5
	Median	223.4	74.7	65.2	16.5	1,914.40	622.9	7.1	1.9	31	46.6
	Low	66.4	29.8	32	4.5	146.7	103.5	0.8	0.6	6	4.7
Full Service	Count	16	14	42	45	32	35	37	35	14	18
	High	508.2	180.3	118.4	50.3	9,960.20	1,393.50	23.5	4.7	72.4	239.5
	Mean	249.5	86.3	67	19.2	2,476.30	592.1	7.6	2.1	30.8	79.8
	Median	216.9	70.2	64.3	16.4	1,885.90	560.8	7	1.9	28.4	47.8
	Low	66.4	29.8	32	5.2	146.7	103.5	0.8	0.7	6	4.7
City / Urban	Count	16	13	41	46	34	39	37	35	13	18
	High	508.2	356.6	118.4	98.5	9,960.20	1,413.70	23.5	4.7	72.2	239.5
	Mean	245	104.7	68.8	19.9	2,543.60	645.3	7.9	2	32.3	72
	Median	223.4	74.7	65.6	16.2	1,953.60	590.3	7.4	1.6	31	46.6
	Low	66.4	29.8	34.1	4.5	614.7	103.5	0.8	0.6	6	4.7

Illustrative Graph of All Responses – Singapore







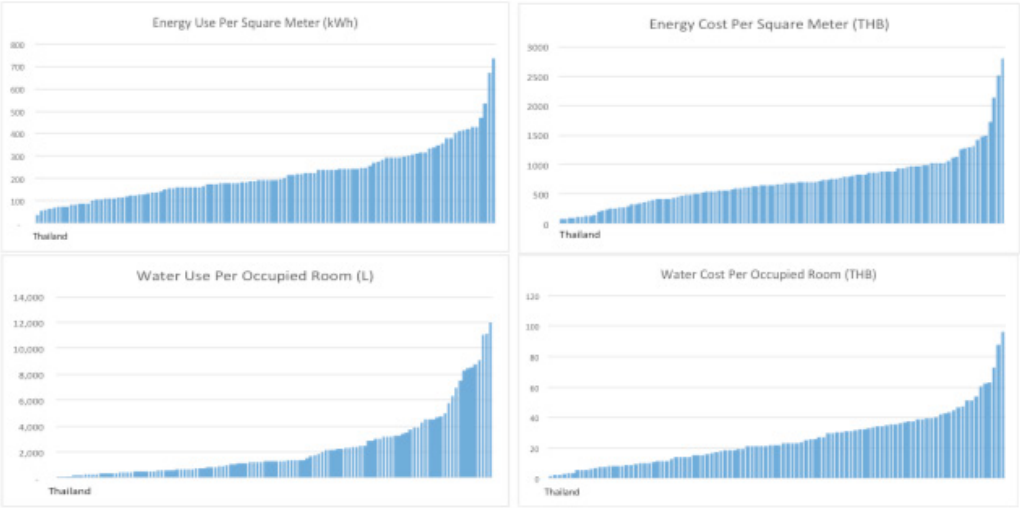


Utilities & Carbon Emissions Snapshot – Thailand

Overall Snapshot by Property Type – Thailand

		Energy				Water				GHG Emissions	
		Usage PSM (kWh)	Usage POR (kWh)	Cost PSM (THB)	Cost POR (THB)	Usage PSM (L)	Usage POR (L)	Cost PSM (THB)	Cost POR (THB)	PSM (kgCO2e)	POR (kgCO2e)
Total	Count	108	117	107	105	104	114	113	102	117	116
	High	736.6	501.1	2,797.30	951.6	14,972.20	12,040.70	393.5	96.1	251.5	747
	Mean	218.9	118.4	719	326.7	2,418.00	2,336.30	59.6	25.5	54	114.5
	Median	192.6	85	670.8	285.7	1,714.10	1,286.90	44.2	22	40.8	93.3
	Low	37.6	25.7	58.3	61.1	157.9	111.5	0.1	1.5	13.3	10.2
Full Service	Count	86	96	86	83	81	89	92	81	96	94
	High	736.6	501.1	2,797.30	951.6	14,972.20	12,040.70	393.5	96.1	251.5	747
	Mean	230.6	131.9	741.5	362.8	2,576.10	2,778.90	61	27.9	55.5	120.6
	Median	206.2	99.3	690.7	323.5	1,735.00	1,233.50	44.9	25	47.1	93.5
	Low	56.2	31.5	58.3	61.1	157.9	129	0.1	2.1	14.9	10.2
Limited Service	Count	21	20	21	22	17	19	21	21	20	21
	High	535.7	102.4	2,145.40	451.4	5,848.20	8,751.60	150.4	45.5	41.4	276.8
	Mean	169.9	53.3	677.9	150.7	1,930.80	2,751.80	53.3	16.7	26.7	85.7
	Median	157.1	47.5	559.4	169.3	1,304.50	1,975.70	42.8	13.7	24.8	78.9
	Low	37.6	25.7	140	79.3	172	278.8	0.9	1.5	13.3	17.1
Resort	Count	58	57	55	48	53	58	58	46	57	57
	High	736.6	501.1	2,797.30	951.6	14,972.20	12,040.70	380.5	96.1	251.5	377.1
	Mean	201.9	129.9	641.5	318.6	2,924.80	2,622.80	56.6	39.5	60	90.2
	Median	177.5	90.8	559.9	288.9	1,829.00	1,291.00	35.7	28.2	44.4	82.3
	Low	56.2	26.4	77.6	61.1	157.9	129	0.1	1.5	13.3	10.2
City / Urban	Count	44	53	46	51	48	51	48	50	53	47
	High	672.8	394.2	2,516.80	880.9	7,187.50	11,104.60	393.5	67.5	133.3	747
	Mean	246.6	102	809.5	328.7	1,925.80	1,987.80	53.8	21.5	46.9	145.8
	Median	235.7	74.8	792.4	271.9	1,672.40	1,219.90	46.3	18.9	36.6	113.4
	Low	74.8	25.7	58.3	85.9	235.2	111.5	0.8	5.1	13.4	34
Convention	Count	5	6	5	5	N/A	N/A	6	5	6	6
	High	306.9	315.8	1,308.80	458.1	N/A	N/A	182.4	53.9	97.5	356.1
	Mean	178.1	151.7	709.2	360.2	N/A	N/A	58	32.4	62.5	125.1
	Median	220.1	139.5	762.5	427	N/A	N/A	36.4	29.9	62.7	106.5
	Low	37.6	57	140	212.1	N/A	N/A	1.5	11.2	25.9	17.1

Illustrative Graph of All Responses – Thailand

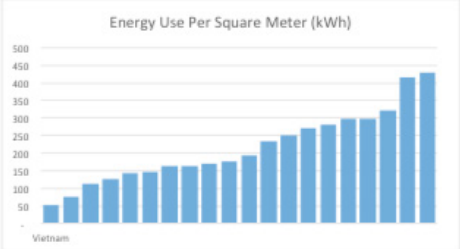


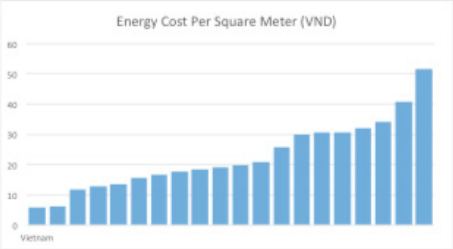
Utilities & Carbon Emissions Snapshot – Vietnam

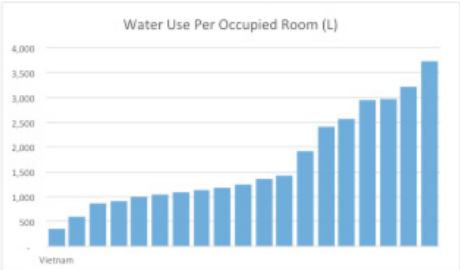
Overall Snapshot by Property Type – Vietnam

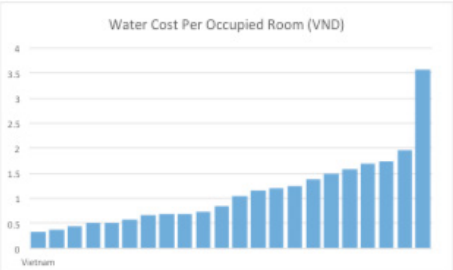
		Energy				Water				GHG Emissions	
		Usage PSM (kWh)	Usage POR (kWh)	Cost PSM (VND)	Cost POR (VND)	Usage PSM (L)	Usage POR (L)	Cost PSM (VND)	Cost POR (VND)	PSM (kgCO2e)	POR (kgCO2e)
Total	Count	20	29	20	25	22	19	23	22	29	25
	High	429.1	969.7	51.5	31.9	12,465.00	3,731.20	6	3.6	389.3	477.8
	Mean	216	161.2	22.6	12.2	3,039.00	1,683.20	2	1.1	65	107.9
	Median	184.6	113.2	19.5	11.7	2,497.20	1,247.40	1.6	0.9	45.9	72.6
	Low	51.2	33.6	5.7	3	491.6	354.3	0.1	0.3	14.3	10.5
Full Service	Count	18	25	18	21	19	16	21	20	25	21
	High	429.1	969.7	51.5	31.9	11,759.20	3,731.20	6	3.6	389.3	477.8
	Mean	222.9	174.9	23.3	12.8	2,785.90	1,681.10	2.1	1.1	70.3	100.5
	Median	213.8	114.1	20	11.7	2,537.60	1,304.80	1.7	0.9	46.5	78.4
	Low	51.2	55.2	5.7	5.7	639.4	354.3	0.1	0.4	22.8	10.5
Resort	Count	5	12	5	8	8	7	7	6	12	9
	High	163.8	969.7	16.5	31.9	12,465.00	3,221.40	2.6	3.6	389.3	443.4
	Mean	113	251.2	11.5	16.1	3,682.90	1,873.00	0.9	1.6	100.8	78.1
	Median	127.6	200	13.4	14	2,636.80	1,421.90	0.6	1.5	77.9	29
	Low	51.2	56.2	5.7	6.4	639.4	1,084.30	0.1	0.5	23	10.5
City / Urban	Count	14	16	14	16	13	12	15	15	16	15
	High	429.1	204.2	51.5	24.5	11,759.20	3,731.20	5.2	1.7	87.5	477.8
	Mean	246.8	97.6	26	10.4	2,673.80	1,572.50	2.3	0.8	39.7	125
	Median	242.1	94	23.3	11	1,603.50	1,115.40	1.8	0.7	37.7	102.6
	Low	113.4	33.6	11.7	3	491.6	354.3	0.9	0.3	14.3	45.4

Illustrative Graph of All Responses – Vietnam









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Damien Little is a Director of Horwath HTL in Asia and is based in the Singapore office. He has previously been based in both the Beijing and Hong Kong offices of Horwath HTL, having worked for the company for the last 14 years. Damien has 16 years of consulting experience and has significant experience in financial modeling. During this time he has undertaken hotel related projects in 17 countries across the Asia Pacific region, being involved in more than 400 projects.

Damien has been involved in projects across all industry segments including 5 star city hotels, golf resort properties, mid-scale regional hotels, budget hotels, backpacker accommodation, restaurants and clubs. He has significant experience in the China market having traveled to more than 70 cities across the country. Prior to joining Horwath HTL in 2001, Damien worked for both Arthur Andersen and PricewaterhouseCoopers in Sydney.

He is also a frequent speaker at industry related conferences around the region and has published numerous research articles in regional industry publications.

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Since founding Greenview in 2008, Eric has helped several global hospitality organizations measure and report on sustainability and ESG, in addition to his 10 years of experience in operations and consulting in diverse nature and cultural tourism projects globally. At Greenview Eric's clients include hotel companies, lodging REITs, citywide event organizers, cruise lines, DMOs, and industry organizations including the WTTC and UNWTO.

Eric is a frequent speaker, convener, and author in the topic of sustainability measurement. Eric's notable industry work includes serving as technical consultant for the Hotel Carbon Measurement Initiative, authoring the study "Developing a Sustainability Measurement Framework for Hotels: Toward an Industry-wide Reporting Structure" and launching both the Cornell Hotel Sustainability Benchmarking study and Green Venue Report.

Eric earned a Bachelor of Science degree from the Cornell University School of Hotel Administration and a Master of Science degree in Tourism & Travel Management from New York University. He is an adjunct instructor at the New York University Tisch Center for Hospitality and Tourism, and a member of the International Standards Working Group of the Global Sustainable Tourism Council, the Sustainability and Social Responsibility of PATA and the UFI Committee on Sustainable Development. Eric has served on the Sustainability Accounting Standards Board Hotels & Lodging Industry Working Group and held a research fellowship at the Cornell University Center for Hospitality Research.

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