

Phuket Hotels Sustainability by the Numbers

Hotel sustainability is often presented through individual projects.

This report focuses on the operating data, drawing on anonymised figures from Phuket hotels and resorts across energy, water, waste, food waste and staff training.

Progress inside the hotel. Pressure beyond its gates.

Hotel sustainability is usually presented one project at a time: a solar installation, a recycling drive, a new water-saving system. That can make it difficult to tell how Phuket's hotel industry is performing as a whole.

The figures come from records that Phuket hotels entered into the Tuu Performance Hub in 2026. Hotel names have been removed. Rather than create a league table, the analysis compares seven measures covering energy, water, waste, food waste and training.

Some results are noticeably stronger than others. Most of the group performs reasonably well on energy use and reports substantial staff training, but renewable power remains marginal. More than half of the hotels reuse no water at all. Waste diversion has the broadest spread, from almost zero to above 75%.

There is a practical reason for this divide. Hotel teams can often reduce consumption through closer monitoring, better maintenance and changes to everyday routines. Solar installations, wastewater systems and dependable recycling routes take more: capital, suitable space, owner approval and contractors able to handle the material once it leaves the property.

The following pages examine where Phuket's hotels are making progress, where results vary most and how pressures across the island affect what individual properties can achieve.

The data therefore records real progress, but it also shows where the next stage becomes harder. Phuket's hotels have learned how to use some resources more carefully. They now face the more difficult task of changing the systems around them.

THE CENTRAL PATTERN

Operational efficiency has moved faster than renewable supply, water reuse and material recovery.

A clear split in the data

The strongest results are concentrated in areas that hotels can manage directly through routine operations. The weakest tend to depend on infrastructure, investment or services beyond the property boundary.

171

KWH/M²/YEAR MEDIAN ENERGY INTENSITY

56% were at or below the 180 reference level.

3.3%

MEDIAN RENEWABLE-ENERGY SHARE

Almost 44% recorded no renewable energy.

2,802

L/M²/YEAR MEDIAN WATER INTENSITY

Just under half were at or below the 2,400 reference level.

0%

MEDIAN RECYCLED OR REUSED WATER

More than half recorded no water reuse.

21.9%

MEDIAN WASTE-DIVERSION RATE

Results ranged from almost none to more than three-quarters.

16–17%

MEDIAN FOOD-WASTE RATIO

One-third kept the ratio at or below 10%.

38.9

HOURS/FTE/YEAR MEDIAN TRAINING

Around 92% met or exceeded the 18-hour reference.

Hotels are becoming better at managing consumption. Progress is slower where change depends on capital, infrastructure or services outside the property.

Energy efficiency is ahead of renewable supply

171

kWh/m²/year median energy intensity

56% were at or below the 180 reference level

ENERGY INTENSITY AGAINST THE REFERENCE



Energy is one of the more encouraging parts of the dataset. The median property recorded annualised energy use of 171 kWh per square metre, while 56% were at or below the 180 kWh reference level.

That does not mean every hotel is efficient, or that differences in property type have disappeared. A large full-service resort, a compact urban hotel and a villa property do not have identical operating demands. Even so, the middle of the group sits in a credible range. The result suggests that familiar measures—plant maintenance, lighting controls, temperature settings, equipment replacement and closer monitoring—are becoming part of ordinary hotel management.

Renewable energy remains a small part of the mix. The median share was 3.3%, while almost 44% of the hotels reported none at all. Not one reached 50%.

3.3%

median renewable-energy share

Almost 44% recorded none; no hotel reached 50%

RENEWABLE ENERGY RECORDED



This leaves hotels drawing most of their electricity from a system still heavily reliant on fossil fuels. EGAT's figures for August 2026 put natural gas at 63.5% of the generation mix and lignite at 15.1%, compared with 20.2% from renewable sources.[1]

Many energy-saving measures sit within the engineering team's day-to-day control. Operating schedules can be tightened, equipment maintained more closely and inefficient plant replaced. Changing the source of the energy is usually a larger decision. Roof space may be limited, owners must approve capital spending, and solar installations or long-term supply agreements need a clear investment case.

Phuket's hotels have generally gone further on managing energy use than on securing renewable supply. Each property now needs to establish which options are workable—whether on-site generation, purchased renewable electricity or another supply arrangement—and put a cost, target and timetable against them.

Water rarely gets a second use

0%

median recycled or reused water

More than half of the properties reported no reuse at all

SHARE OF RECYCLED OR REUSED WATER



PHUKET'S WATER PRESSURE

40,457

m³/day estimated high-season hotel demand

149,917

m³/day wastewater generated

94,961

m³/day treatment capacity

The median water intensity was 2,802 litres per square metre a year. Just under half of the properties were at or below the 2,400-litre reference level, suggesting that efficient fixtures, maintenance and operating controls are delivering results in part of the market.

The more important weakness appears after the water has been used. The median share of recycled or reused water was zero. More than half of the properties reported no reuse at all, while only 7% reused more than 35% of their water.

In practical terms, most hotels still operate a largely one-way system: water is purchased or extracted, used once and then discharged. Where treatment and reuse are in place, the same water can irrigate gardens, support cooling systems or serve other non-potable needs. That reduces demand at the beginning of the chain and the volume requiring treatment at the end.

The best-performing hotels show that substantial reuse is possible. The wider figures show that it has not yet become normal practice.

Phuket's water pressure is seasonal as well as structural. A 2024 Mahidol University study of 178 larger hotels estimated that their daily demand rises from 24,275 cubic metres in the low season to 40,457 cubic metres in the high season—an increase of roughly two-thirds. Under the study's assumptions, the water available to the province could support no more than 8.99 million tourists a year, even after including water stored or produced by the hotels themselves.[2]

The constraint continues at the other end of the system. The GSTC Destination Assessment estimated that Phuket generates 149,917 cubic metres of wastewater each day but has combined treatment capacity of 94,961 cubic metres. That leaves a daily gap of almost 55,000 cubic metres.[3]

For Phuket, water reuse is as much a capacity issue as an environmental one. It reduces demand for fresh water during the busiest months and lowers the volume entering an already stretched treatment system.

Waste reveals the widest divide

21.9%

median waste-diversion rate

Results run from almost none to more than three-quarters

700

tonnes/day
incineration
capacity

1,200–1,300

tonnes/day
now received

WASTE DIVERSION ACROSS THE GROUP



No indicator separates the properties as sharply as waste diversion.

The median hotel diverted 21.9% of its recorded waste from disposal. Beneath that midpoint lies a much wider spread: 31% diverted no more than 15%, while 13% diverted more than 75%. Between those two ends, half of the properties recorded rates of 15–50%, and only 6% sat between 50% and 75%.

This is not a market moving together at roughly the same speed. A small group appears to have functioning recovery systems, with separation inside the property and a destination for the material afterwards. At the other end, recyclable and organic material is still leaving the hotel through the same route as residual waste.

Phuket's disposal infrastructure is already operating beyond its intended capacity. The GSTC assessment recorded 1,000–1,100 tonnes of waste being sent for disposal each day in 2024, compared with incineration capacity of 700 tonnes. A study published in 2026 estimates that the Phuket Integrated Waste Management Center now receives 1,200–1,300 tonnes a day, with volumes exceeding 1,400 tonnes during peak periods.[3][4]

Sorting waste inside a hotel does not guarantee that it will be recovered. The GSTC found that collection in Phuket remained largely focused on mixed waste, despite recycling policies and established colour codes.[3]

The hotel results need to be read in that context. Purchasing decisions, bin placement, accurate weighing and staff practice determine how well material is separated on site. What happens next depends on the contractor and whether a suitable recovery route exists. If the material is combined again during collection, careful separation inside the hotel achieves little.

The leading properties prove that high diversion is achievable in Phuket. The lower end of the range shows why it has not become the default. Hotels are working with different contractors, categories, records and levels of traceability inside a waste system that still favours mixed disposal.

The next step is therefore both individual and collective. Every hotel needs control over what happens on its premises. The industry also needs clearer standards for what happens after the truck leaves.

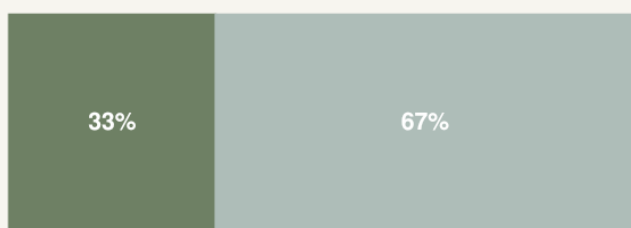
The hardest number in the kitchen

16–17%

median food-waste ratio

One in three hotels kept the ratio at 10% or below

FOOD-WASTE RATIO



9,800

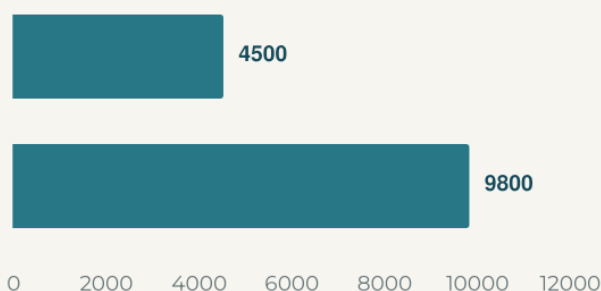
waste submissions

4,500

passed validation

Cornell's first waste index retained fewer than half of the submitted records

WASTE DATA SUBMITTED



Food waste is produced everywhere in a hotel's food operation: at the receiving dock, during storage and preparation, in buffet pans, on guests' plates and when prepared food cannot be served. Unlike electricity, it doesn't arrive as a single figure on a monthly bill.

That makes the food-waste ratio one of the report's most useful indicators, but also one of the most demanding to produce. It compares the weight of food discarded with the weight purchased over the same period. To make that calculation reliable, hotels must convert different purchasing units into kilograms, keep the same kitchen and outlet boundary, weigh waste consistently and avoid confusing food waste with the general waste stream.

The median food-waste ratio was around 16–17%, while one in three hotels kept it at 10% or below. Differences in service style, restaurant activity and the scale of banqueting make crude rankings unhelpful. Even so, the lower results provide a useful reference: ratios below 10% are already being achieved in Phuket.

Reliable comparison remains difficult across the hotel industry. Cornell's 2025 benchmarking index received waste data from 9,800 hotels, but only around 4,500 records passed validation. By comparison, its final energy, water and carbon dataset covered 27,219 hotels.[5] The drop-off shows how often waste records fail basic checks, even among hotels already reporting environmental data.

For an individual hotel, the ratio is a starting point for investigation. A high result could stem from poor ordering, spoiled stock, preparation losses, buffet surplus or food left on plates. Until those sources are recorded separately, the total tells a chef how much was lost but not where to intervene.

Prevention should come first, through changes to purchasing, storage, preparation and service. Edible surplus can then be redistributed, while material that cannot be consumed may be suitable for animal feed, composting or anaerobic treatment. A monthly total shows the scale of the problem; a breakdown by source makes the information useful.

Training is not the missing ingredient

38.9

hours per FTE/year

Median reported training; reference level: 18 hours

92%

met or exceeded the reference

Training is the strongest result in the report

TRAINING AGAINST THE 18-HOUR REFERENCE



Staff training is the strongest result in the report. The median was 38.9 hours per full-time-equivalent employee a year, and around 92% of properties met or exceeded the reference level of 18 hours.

The measure covers reported staff training overall, rather than sustainability training alone. It should not be treated as proof that every employee has been trained to manage energy, water or waste. What it does show is that the sector already invests in learning and has the organisational capacity to reach its workforce.

There is also an established local platform to build on. The Phuket Hotels Association's Environmental Committee runs education, practical workshops and collaborative initiatives, while the Association supports continuing sustainability training and the adoption of environmental practices across the hotel sector.[6]

Training hours are high, but that investment is not yet visible in every environmental measure. Renewable supply and water reuse remain limited, while waste diversion varies widely. Some of those gaps require capital or better contractors, rather than more instruction.

Even so, hotels could ask more of their training data than an attendance total. Engineering sessions should lead to better meter checks or faster responses to unusual consumption. Food-waste training should affect ordering and production, while waste training should reduce contamination. Recording those changes would show where training is influencing daily operations—and where staff still lack the equipment, budget or authority to act.

Those are operational outcomes, not attendance figures. They turn training from an activity into part of the control system.

Phuket's hotel sector does not appear short of training activity. Its opportunity is to direct more of that existing capacity towards the indicators where progress remains slow—and to give trained staff the tools and authority to act.

What would move the numbers

The results do not point to a need for another broad promise. They point to a short list of practical changes.

1

Set a renewable-energy plan for each property

Energy efficiency is already relatively strong. Hotels should now assess the renewable options available to them, including on-site generation and purchased electricity. The resulting plan should state what is feasible, what it would cost, whose approval is required and when the work could begin.

2

Find practical uses for treated water

Before investing in new treatment equipment, hotels should map their water use and identify regular non-potable demand. Irrigation, cooling and cleaning may provide dependable uses for treated water. Matching supply with an existing need will make the financial and operational case easier to establish.

3

Follow waste to its final destination

Hotels should use consistent categories and record how much material reaches each recovery or disposal route. Contractors should provide evidence of where it was taken and how it was handled. Shared requirements—and pooled collections where practical—would give hotels greater oversight once waste leaves the property.

From hotel action to collective action

4 Put food-waste information in the hands of kitchens

Separate preparation waste, spoilage, unserved surplus and plate waste. Review the results alongside covers, menus and purchasing while the information is still recent enough for chefs to respond. Prevention should come before disposal or treatment.

5 Connect training to a result

Keep investing in staff development, but define the operational change expected from each programme. Training should leave behind a new routine, control, target or area of responsibility—not only a record of attendance.

USE THE STRUCTURE THAT ALREADY EXISTS

Phuket does not need to create a new forum before collective work can begin. The Phuket Hotels Association already has structures for environmental training, workshops and collaboration. The next step is to use them for the less visible work that determines performance: common data definitions, minimum contractor evidence, pooled recovery routes, shared technical learning and coordinated discussions with utilities and public authorities.[6]

That would move collaboration beyond sharing examples and towards improving the conditions in which every hotel operates.

FINAL ASSESSMENT

Phuket's hotels have made genuine progress in the parts of sustainability they can manage through daily operations. The harder transition begins where those operations meet the island's physical limits: its electricity supply, water availability, treatment capacity and waste infrastructure.

The sector is not starting from zero. It has operational experience, a substantial training base and examples of strong performance in every indicator. The task now is to make those examples less exceptional—and to address collectively the problems that no property can solve alone.

About the data

The analysis uses 2026 operating figures recorded in the Tuu Performance Hub by Phuket hotels and resorts. Hotel names have been removed, and no individual property results are published.

- The most recent comparable result was used for each measure.
- Energy and water consumption were annualised and divided by the hotel's reported built-up area.
- Renewable energy, water reuse and waste diversion were calculated as shares of the corresponding totals.
- Food waste was compared with the reported weight of food purchased.
- Training hours were annualised per full-time-equivalent employee.
- The median represents the middle of the group and prevents unusually high or low figures from distorting the result.
- Each percentage includes only the hotels covered by that particular comparison.

The reference levels provide context for comparison; they are not certification or pass-or-fail thresholds. External research has been included to explain conditions in Phuket but was not used in the hotel calculations.

The results describe the group of hotels covered by the analysis. They should not be read as a census of Phuket's entire hotel industry.

Sources

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- 6 **PHUKET HOTELS ASSOCIATION**
About Us—Environmental Committee and sustainability programmes.
<https://www.phukethotelsassociation.com/about-us>

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