



Low Carbon Living Ratings System

Contents

Introduction	2
Data sources for scorecard	4
Weighting of categories.....	5
Scoring within categories.....	7
Bonus points	11
Continual improvement.....	11

Introduction

The ratings system for the Low Carbon Living program categorises participating businesses as either Gold, Silver or Bronze based on the actions that they have taken to reduce their greenhouse gas emissions from energy use, water use and waste management.

The ratings system is based on a points system out of 100, with 75 points required for a Gold rating, 50 for a Silver and 25 for a Bronze. Businesses that score less than 25 are classed as “Participant” and businesses that have joined but are yet to receive a rating are classed as “Not yet rated”.

The system has been based on community consultation with participating businesses and other stakeholders, including a stakeholder workshop in Katoomba in October 2014. The design also takes account of other existing schemes, such as the TripAdvisor GreenLeaders scheme, Earthcheck and the UK-based Green Tourism Business Scheme.

The categories and basic parameters employed in the ratings system are shown in Table 1 below. The subsequent sections of this document providing further details on the calculation of the scores and justification for the weightings assigned to each category.

Table 1: Ratings categories and parameters

Category	Sub-category	Maximum Score	How the score is calculated
Energy	Efficient lighting	20	Based on the proportion of lighting that is efficient (i.e. CFLs, LEDs, T5s/T8s battens). 2 points are awarded for every 15% of light fixtures that are efficient up to 75%, then beyond that 2 points are awarded for every additional 5% of fixtures that are efficient (i.e. 75-80%=12 points, 80-85%=14, 85-90%=16, 90-95%=18, 95-100%=20)
Energy	Heating and cooling	40	<ul style="list-style-type: none">• 10 points awarded for heating source (e.g. electricity = 0, gas = 5, no heating = 10)• 10 points for heating technology (e.g. electric resistance heaters = 0, gas central heating = 7, no heating = 10)• 10 points for cooling technology (e.g. A/C = 0, floor fans

Category	Sub-category	Maximum Score	How the score is calculated
			<p>= 4, ceiling fans = 6, natural ventilation = 10)</p> <ul style="list-style-type: none"> • 10 points for thermal performance (including insulation, curtains/pelmets, double-glazing, zoning)
Energy	Appliances	10	To what extent has the business attempted to employ the most efficient options for its major energy-using appliances?
<i>Energy bonus</i>	<i>Renewable energy bonus</i>	<i>70</i>	<i>7 bonus points awarded for every 10% of a business' energy that is sourced from renewable sources (e.g. solar panels, GreenPower). These bonus points are added to the other energy-related points up to a maximum cap of 70 points for the overall energy score.</i>
Water	Efficient water use	10	Based on the proportion of water fixtures that are efficient (e.g. taps <4.5 L/min, showerheads <9 L/min, toilets <4.5 L/flush or with dual flush). 1 point is awarded for every 15% of water fixtures that are efficient up to 75%, then beyond that 1 point is awarded for every additional 5% of fixtures that are efficient (i.e. 75-80%=6 points, 80-85%=7, 85-90%=8, 90-95%=9, 95-100%=10).
<i>Water bonus</i>	<i>Alternative water source bonus</i>	<i>10</i>	<i>1 bonus point awarded for every 10% of a business' water that is sourced from an alternative sustainable source (e.g. rainwater tanks, greywater, on-site dam). These bonus points are added to the other water-related points up to a maximum cap of 10 points for the overall water score.</i>
Waste	Composting and recycling	10	<ul style="list-style-type: none"> • 5 points awarded based on whether composting (or wormfarming) is practiced and the standard of the management practices employed. • 5 points awarded based on whether recycling of paper and cardboard is practiced and the standard of the management practices employed.

Category	Sub-category	Maximum Score	How the score is calculated
Waste	Relative waste emissions	10	Based on a business' waste-related emissions relative to others in the same category on a per-customer basis (accommodation, restaurants/cafes, activities and transport). For example, if they have the median emissions within their category they score 5, if their emissions are less than 10% of the median they score 10 points, if their emissions are ten times the median they score 0 points.
TOTAL		100	70 for energy, 10 for water, 20 for waste

Data sources for scorecard

The scores for each business are calculated using two main data sources:

- 1) Audit data obtained through an on-site environmental audit covering each business' energy use, water use and waste management; and
- 2) Self-reporting by each business of low carbon actions (with verification if required by auditors).

The audit data includes a spreadsheet of key energy and water-using fixtures and appliances. This spreadsheet makes note of the type of appliance or fixture (e.g. are lights LED, CFL, halogen or incandescent), the rate of consumption of energy or water (e.g. flow-rate of showers or taps) and the estimated level of usage (e.g. 5 hours per day, 7 days per week). The audit also includes a waste audit assessing the amounts of different waste types found in the business' general waste stream (e.g. food waste, paper/cardboard, garden/green etc.).

The self-reporting component of the scorecard is based on answers to a set of questions covering factors such as sources of heating and cooling, building thermal performance, efficiency of appliances, use of composting and recycling and alternative energy and water sources (e.g. solar panels, rainwater tanks). These questions can be found in Appendix 1 of this document. Answers to these questions are able to be verified through the on-site audit or follow-up visits.

Table 2 below indicates which sources of data are used to calculate each category of the scorecard.

Table 2: Data sources used to score each category

Category	Sub-category	Data source(s)
Energy	Efficient lighting	Audit data (primary data source) plus self-reporting (if changes have been made since initial audit)
Energy	Heating and cooling	Self-reporting (with on-site verification if needed)
Energy	Appliances	Combination of self-reporting and observations made during audit
<i>Energy bonus</i>	<i>Renewable energy bonus</i>	Self-reporting (with on-site verification if needed)
Water	Efficient water use	Audit data (primary data source) plus self-reporting (if changes have been made since initial audit)
<i>Water bonus</i>	<i>Alternative water source bonus</i>	Self-reporting (with on-site verification if needed)
Waste	Composting and recycling	<ul style="list-style-type: none"> • Self-reporting to assess whether composting and recycling are practiced • Audit data used to determine emissions from waste and to verify standard of composting and recycling

Weighting of categories

The weighting of each category in the ratings system has been based on a review of the initial batch of sixteen businesses that were audited under the Low Carbon Tourism program in the Blue Mountains. This review revealed that energy was the dominant contributor to the carbon footprint for a typical tourism business, followed by waste, then water.

Across the initial batch of businesses used for the development of the ratings system, energy-related emissions made up an average of 82% of each business' carbon footprint, with waste making up 16% and water 2%. For the final scorecard, the decision was made to assign 70% of the score to energy, 20% to waste and 10% to water. The justification for this breakdown is as follows:

- It closely follows the contribution that each activity makes to the carbon footprint of an average business, albeit with energy weighted slightly lower than its actual contribution to carbon footprint and waste and water weighted slightly higher
- Waste was set at 20% of the overall score rather than 16% based on the fact that waste-related actions were identified as some of the easily-adopted “low-hanging fruit” for businesses looking to reduce their carbon footprint. Our analysis showed that even though waste accounted for only 16% of emissions for an average business, waste-related recommendations made up almost half of the estimated emissions savings that were identified from simple, easy-to-adopt recommendations for the businesses.
- Water was boosted up to 10% rather than 2% to ensure that the ratings system provided an adequate incentive to improve water use efficiency, which can often bring with it an associated reduction in energy use (e.g. increasing the efficiency of showers and bathroom taps reduces not only the amount of water used but also the amount of energy used to heat the water).

The carbon footprinting methodology used to determine the relative emissions from energy, water and waste follows the guidance provided by the Australian Government’s National Carbon Offset Standard and the National Greenhouse and Energy Reporting system (NGERs) and includes all emissions falling within the boundaries marked by the black rectangle in Figure 1 below. Following the National Carbon Offset Standard, our calculations include all emissions classed as Scope 1 (direct on-site emissions) and Scope 2 (indirect off-site emissions that can be clearly attributed to the business such as emissions from electricity generation). Scope 3 emissions have been included where good data exists and reasonable assumptions can be made, such as the emissions resulting from disposal of waste in landfill or the emissions related to water supply (using carbon footprint data published by Sydney Water).

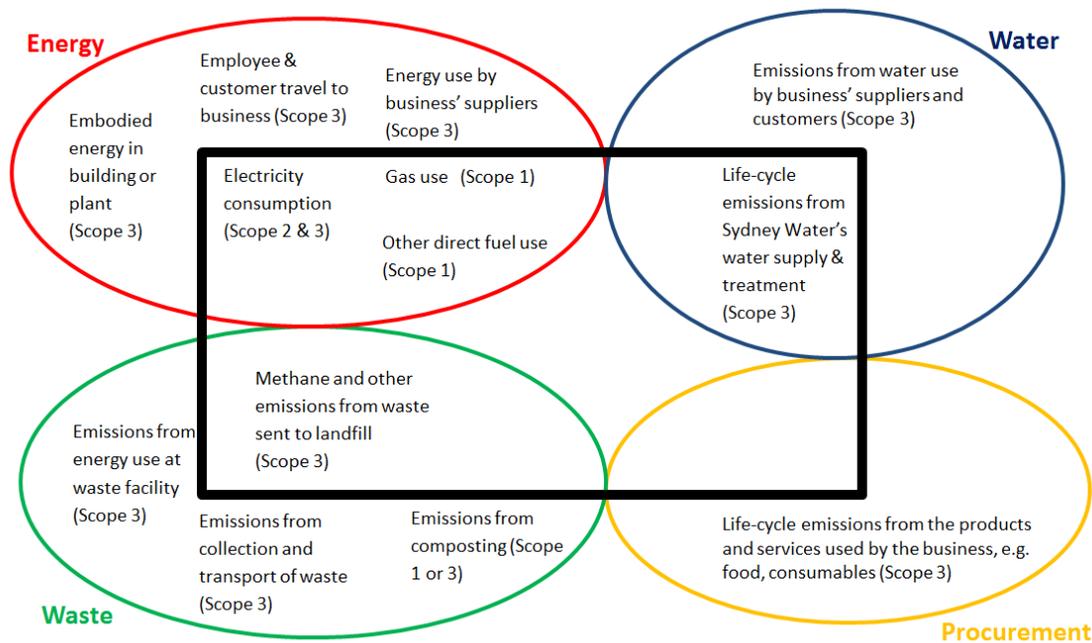


Figure 1: Emissions included in carbon footprint analysis of participating businesses

It is important to bear in mind that the weighting of the scorecard used in the Low Carbon Living program is based purely on the contribution that each category makes to greenhouse gas emissions rather than to environmental sustainability more broadly. Other programs and stakeholders may have a strong interest in other aspects of sustainability, such as reducing resource use, biodiversity conservation or social equity which would lead them to assign different weightings to energy use, water use and waste disposal, as well as introducing different categories and criteria to be measured. The Low Carbon Tourism program is committed to environmental sustainability and views carbon reduction as key part of that process, but recognises that this is only one issue amongst many that consumers may wish to consider when choosing a service provider.

Scoring within categories

In addition to the broader 70:20:10 breakdown of the scorecard between energy, waste and water, careful consideration has also been given to the breakdown of scoring within each of those categories.

The breakdown of scoring in the energy category is based on published data for the hotel sector in Australia, which is shown in Figure 2 below.

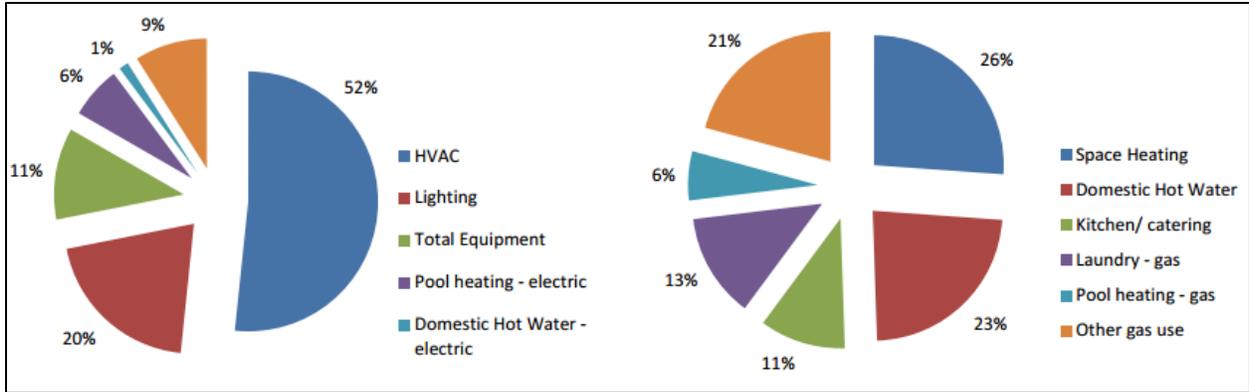


Figure 2: Average end-use shares for electricity (left) and gas (right) for Australian hotels 1990-2020.

Reproduced from: Department of Climate Change and Energy Efficiency 2012

Table 3 below combines the electricity and gas figures from Figure 2 and converts them into GHG emissions¹ to estimate the contribution that each activity makes to overall energy-related emissions.

Table 3: Energy-related emissions for hotels based on combined electricity and gas use

Emissions %	
Heating & cooling (electric HVAC + gas space heating)	49%
Lighting (electricity only)	18%
Equipment (electrical equipment + gas use in kitchen & laundry)	12%
Pool heating (electric + gas)	6%
Domestic hot water (electric + gas)	3%
Other	11%

Based on the breakdown of emissions shown in Table 3, the 70 points allocated to energy in our scorecard have been assigned as follows:

¹ This calculation assumes that overall energy use by hotels (in MJ) is 65% electricity and 35% gas (Department of Climate Change and Energy Efficiency 2012) and that the emissions intensity for electricity and gas are 0.292 and 0.0663 kg CO₂-e/MJ respectively.

- The largest component of the energy scorecard (40 out of 70 points) has been assigned to heating and cooling
- The second-largest component of the energy scorecard (20 out of 70 points) has been assigned to lighting
- The third-largest component of the energy scorecard (10 out of 70 points) has been assigned to appliances/equipment
- No points have been specifically allocated to the smaller categories shown in Table 3 (pool heating, domestic hot water and other) due to the impracticality of creating sub-categories worth very few points, the fact that pools are relatively rare amongst participating businesses in the Blue Mountains and the fact that hot water usage is already captured by the 10% of the scorecard that has been allocated to water use

With regards to waste, the breakdown of scores is based on evidence from the initial batch of businesses audited in the Blue Mountains. Figure 3 shows that food waste and paper/cardboard are the two main sources of emissions coming from the general waste streams of the initial batch of audited businesses. Food and paper can break down in landfill to form methane, a potent greenhouse gas. Composting and recycling are effective methods for dealing with food waste and paper waste respectively, so each have been assigned 5 points under our scoring system.

Metals, plastics and glass are classed as inert waste and do not break down to form methane or other greenhouse gases in landfill. Thus, the recycling of these materials does not feature directly in our scorecard. However, despite not featuring in the scorecard, the Low Carbon Living program does encourage participating businesses to recycle metals, plastics and glass due to the flow-on effects that can result (i.e. fewer new resources needing to be mined and processed to make cans, bottles and containers).

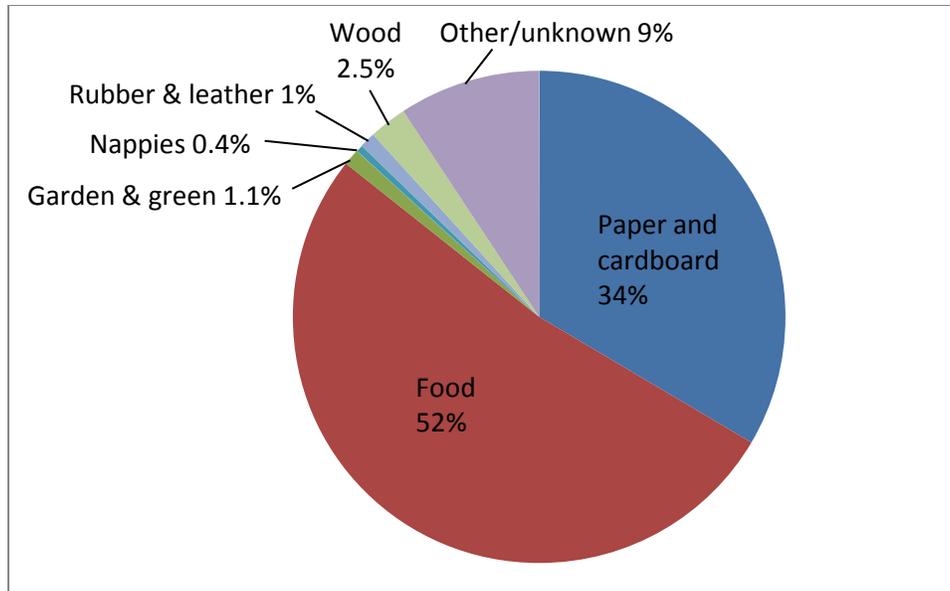


Figure 3: Average proportion of general waste emissions from each waste type across initial batch of audited businesses

While composting and recycling are important options for dealing with food and paper waste, it is important to remember that they should not be the starting point for waste management. Following the idea of a “waste hierarchy”, activities such as waste avoidance, minimisation and re-use should be considered before recycling and composting. In order to capture these higher-order actions, the ratings scorecard has been designed to take into account the overall size of each business's waste stream (measured in terms of overall emissions from disposal of waste) rather than just whether or not composting or recycling are employed.

Ten of the twenty points for waste are assigned based on the business' overall waste-related emissions relative to other businesses in the same category (accommodation, food service, attractions or transport/tours). Participating businesses have been divided into these categories on account of the very different situations that exist in relation to waste for different business types (e.g. food service businesses will inevitably have higher food waste volumes than attractions such as galleries). The comparisons are also made on a per-customer basis (using customer data provided by each business) to account for the large variation in size of participating businesses.

Bonus points

The inclusion of bonus points for energy and water is designed to recognise a fundamental point about reducing greenhouse gas emissions – that reductions can occur either through a business becoming more efficient (i.e. using less energy or water to do the same task) or by changing their source of energy or water to one that has lower associated emissions.

In relation to energy, switching to low-emissions sources usually involves renewable energy options such as rooftop solar photovoltaic panels or purchasing GreenPower from an electricity retailer (with the money paid going to generators employing wind, solar, bioenergy or other green energy sources). However, the scoring system also recognises other low-carbon energy sources, such as recapturing energy that would otherwise be wasted (through co-generation or energy recovery systems).

For water, alternative low-emission sources can include rainwater tanks, greywater re-use systems or on-site dams. These sources reduce emissions by avoiding the pumping, treatment and storage involved in large-scale urban water supply systems. In some cases there may be pumping involved in the alternative water supply (e.g. pumping water from a dam or tank into buildings), which may reduce the overall carbon savings by increasing the use of electricity or fuel, but in other cases there is no such energy use (e.g. gravity-fed watering of gardens) or the energy used is from renewable sources (e.g. solar or wind pumping systems). Thus, each alternative source needs to be evaluated on a case-by-case basis.

Under the ratings systems, up to 70 bonus points may be awarded for energy and up to 10 bonus points may be awarded for water. These are added to the energy or water points from other sub-categories, but only up to a maximum overall score of 70 for energy and 10 for water. The overall effect of this arrangement is that a business may obtain the maximum score for energy or water *either* by becoming more efficient *or* by switching to an alternative low-emission source. For example, if a business does not have the most efficient lightbulbs and appliances but sources 100% of its energy from solar panels, it would still score the maximum 70 points for energy. This is justified because the business' carbon footprint for energy would be zero, even though it does not use the most efficient appliances.

Continual improvement

The ratings system is not designed to remain static but rather to lift standards over time. The standard of low-carbon practices that may earn a Gold rating at the commencement of the program may not be sufficient to earn a Gold in five years' time, as what is considered to be industry best-practice continues to evolve.

The ratings system has a number of in-built features designed to encourage businesses to continually strive to improve their performance rather than resting on their laurels.

Firstly, the initial standard of the scorecard has been set in such a way that only a minority of participating businesses will achieve a Gold rating on their first attempt. The competitive desire to reach this top-performing category, along with the financial rewards that may flow as customers choose Gold-rated business through the Low Carbon Living website, provide incentives to continually improve.

Secondly, some of the sub-categories in the ratings scorecard have been deliberately set using a sliding scale. For example, having 50% efficient lighting will earn you only 6 points of a possible 20. Moving up to 75% efficient will bring you up to 10 points. Striving hard to cover the final stretch from 75% to over 95% will earn you another 10 points (i.e. bring you up to the maximum 20 points for lighting). This provides an incentive for businesses that are performing moderately well to go the extra mile.

Thirdly, the program requires businesses that have received a Gold rating to be reassessed every two years. This ensures that they have maintained their high standards rather than falling back after achieving the Gold rating. Other businesses may request to be reassessed in order to increase their rating to Gold.

Finally, the scorecard itself is subject to review every 5 years. As best-practice continues to evolve, so must the scorecard. For example, the scorecard currently defines efficient lighting as LEDs, CFLs and T5 or T8 fluorescent battens. In a few years' time we may have new technologies that also need to be included – and some of those considered efficient today may no longer be good enough. Similarly, the benchmarks for water-efficient devices (<4.5 L/min for taps and <9 L/min for showerheads) may change over time.

Appendix 1 – Questions for self-assessment

To allow your business to be assigned a rating (Gold, Silver or Bronze) the Low Carbon Tourism program, we need a few details about your business. Please provide as much information as you can for each of the following questions.

1. Can you provide us with an estimate of business volume over the past 12 months (or a recent 12-month period)? This allows us to compare your business to other similar businesses in the region and take the form of room-nights, guest-nights, customer numbers etc.
2. Which technologies do you use most for heating, cooling and hot water (e.g. gas heaters, electric heaters, wood fires, air-conditioners, ceiling fans, pedestal fans, natural airflow, solar hot water, gas hot water etc). If you use multiple technologies, please indicate which are relied on most (e.g. 60% gas heaters, 40% electric heaters).
Heating _____
Cooling _____
Hot Water _____
3. Have any of the following measures been undertaken to improve the building's thermal performance? (please answer yes or no next to each item – add comments if required)
 - insulation – Yes/No
 - enhancing natural ventilation– Yes/No
 - appropriate glazing and use of blinds/curtains on windows– Yes/No
 - zoning (only heating/cooling certain areas) – Yes/No
 - light-coloured roofs & walls (or green roofs) – Yes/No
4. Do you obtain any of your business' energy needs from renewable sources such as GreenPower (purchased through your electricity retailer), solar PV panels, wind turbines, hydropower, woodfuel (for heating or electricity), co-generation, waste heat recapture etc?

Yes/No (please circle)

If yes, what type of energy? _____

If yes, what amount of energy do you obtain from this source annually? _____
5. Do you obtain any of your business' water needs from alternative sources such as rainwater tanks, onsite dams, greywater etc?

Yes/No (please circle)

If yes, what type? _____

If yes, what amount of water do you obtain from this source annually (if unknown please provide details such as tank size and roof area for rainfall capture)? _____

6. Do you recycle paper and cardboard waste? Yes/No
7. Do you practice composting, wormfarming or other methods for reusing organic wastes?
 - composting – No / Yes – onsite / Yes – offsite
 - wormfarming – No / Yes – onsite / Yes – offsite
 - Other (please detail): _____
8. Very briefly, please think about the major energy-using and water-using appliances or facilities for your business, apart from lighting, heating and cooling (e.g. dishwashers, refrigerators, cooking appliances, spa facilities, televisions, washers/dryers). Please outline any steps you have taken to ensure these appliances are energy-efficient or water-efficient (e.g. selecting the most efficient models, using timers, switching off when not in use, using gas rather than electricity for cooking, minimizing use in other ways):

Energy-using appliances:

Water-using appliances: