



MEMO

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SUBJECT: North One Hotel and Apartments GHG Emissions Assessment

OUR REF: PS125269_MEM_One North Hotel and Apartments GHG Emissions Assessment_Rev0

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This memo presents a high-level greenhouse gas (GHG) emissions estimate for the operation of the proposed One North Hotel and Apartments development. This development is located 2km from Darwin along the beachfront, comprising of 168 hotel rooms/villas and 53 serviced apartments/foreshore villas as well as recreational spaces such as pool, gym, spa facilities and restaurant/bar areas.

This GHG emissions assessment has been prepared to support the EPA referral report required for the project. Specifically, it supports the response to the NT EPAs Environmental Factor and Objective outlined in Table 1.

Table 1: NT EPAs Environmental factor and objective applicable to this assessment

THEME	FACTOR	ENVIRONMENTAL OBJECTIVE
AIR	Atmospheric Processes	Minimise greenhouse gas emissions so as to contribute to the NT Government's goal of achieving net zero greenhouse gas emissions by 2050.

GHG EMISSIONS ESTIMATE

The preliminary GHG emissions estimate for the proposed One North Hotel and Apartments development is outlined in Table 2 below. The results are presented in tonnes of carbon dioxide equivalent (tCO₂e) per year which encompasses emissions of carbon dioxide, methane and nitrous oxide.

Table 2: Annual GHG emissions estimate and percentage breakdown

EMISSIONS SOURCE	ENERGY SOURCE	TCO2E/YEAR	%
Heating Ventilation and Air Conditioning (HVAC)	Elec.	815	37%
Equipment (e.g. computers, servers, TVs etc.)	Elec.	326	15%

Lighting	Elec.	255	12%
Lifts	Elec.	204	9%
Cooking	LPG	175	8%
Domestic hot water (DHW)	Elec.	110	5%
Maintenance activities (e.g. gardening, cleaning)	Elec./ diesel/petrol	110	5%
Misc. recreational activities	Elec./ diesel/petrol	110	5%
Pumps (e.g. irrigation and lagoon pumps)	Elec.	44	2%
Refrigerants	N/A	22	1%
Waste management equip. (e.g. compactors)	Elec.	22	1%
TOTAL		2,193	100%
Proportion of NTs annual emissions		0.01%	
Proportion of Australia's annual emissions		0.0004%	

ASSUMPTIONS

The following assumptions have been made when completing this GHG estimate:

- The assessment includes allowance for scope 1 and 2 emissions only
- Indirect (Scope 2) emissions factor for mains electricity for the Northern Territory is 0.62 as per the National Greenhouse and Energy Reporting (Measurement) Determination 2008 (Schedule 1).
- Swimming pools are not heated.
- The estimate assumes 0% external contribution from Green Power
- No contribution from zero carbon onsite solar PV has been included
- Generators are only used during emergency incidents such as mains power outages; therefore, these have been excluded from the calculation.
- Laundry will be completed offsite; therefore, this is a Scope 3 emission and has been excluded from the calculation.
- Refrigerant impacts assumed to be 1% of total annual GHG emissions as per the Hotel Carbon Measurement Initiative v.1.1 Methodology (World Travel & Tourism Council, December 2016).

LIMITATIONS

This GHG emissions estimate is high level based on design documentation and reference documents listed in this memo and based on an assumed operating profile. It is intended to provide an indicative figure for GHG emissions for the proposed development. Actual emissions will depend on the final design, operational procedures, occupancy rates and usage.



METHODOLOGY

This GHG emissions assessment has been prepared in accordance with the National Greenhouse and Energy Reporting (NGER) Scheme.

A high-level energy balance has been prepared based on the area schedule to calculate the operational energy consumption of the proposed development.

Due to the preliminary nature of the assessment, percentage allowances have been assumed for some emissions sources.

The GHG emissions assessment results were compared to the energy budget provided by the client and results from the NABERS reverse calculator. The calculated emissions approximately align with NABERS for Hotels performance of 4 star.

ASSESSMENT BOUNDARY

The scope of this GHG emissions estimate encompasses all predicted scope 1 and 2 operational GHG emissions for the proposed the One North Hotel and Apartments development. In line with the NGER Scheme, Scope 3 emissions have been excluded. The following table provides a description of the emissions categories included in the assessment boundary.

Table 3 GHG emission categories

SCOPE	DESCRIPTION	EMISSIONS SOURCES APPLICABLE TO THIS DEVELOPMENT	INCLUDED/ EXCLUDED
1	Direct emissions released to the atmosphere as a result of an activity on site. E.g. combustion of fossil fuels.	<ul style="list-style-type: none"> — Refrigerants — LPG (for cooking) — Petrol/diesel (for Misc. maintenance / recreational equipment) 	Included
2	Indirect emissions, primarily from electricity usage.	<ul style="list-style-type: none"> — Heating Ventilation and Air Conditioning (HVAC) — Lighting — Domestic hot water — Lifts — Pumps — Equipment (e.g. computers, servers TVs) — Misc. maintenance / recreational equipment (electric) 	Included
3	Indirect emissions that occur as a consequence of the activities of a facility, but from sources not owned or controlled by the facility.	<ul style="list-style-type: none"> — Transport to/from site — Laundry — Waste management offsite — Office or commercial consumables — Food — Chemicals and chlorination (other than refrigerants) 	Excluded

REFERENCE DOCUMENTS

The following sources have been referenced to complete this assessment:

- One North Hotel and Apartments Town Planning Architectural Drawings, Rev A (Hachem, 19/02/21)
- National Greenhouse and Energy Reporting (Measurement) Determination 2008 (Schedule 1)
- Hotel Carbon Measurement Initiative v.1.1 (World Travel & Tourism Council, Dec 2016)
- Australian Government’s States and Territories Greenhouse Gas Inventory
- Correspondence from project team
- NABERS for Hotels Reverse Calculator.

GHG EMISSION REDUCTION OPPORTUNITIES

There are various measures that could be considered during design development and operations to reduce operational GHG emissions. As shown in Figure 1, the emissions sources that contribute to the highest proportion of total annual emissions are HVAC, equipment, lighting, cooking and lifts. These emissions sources should, therefore, be the focus of any emissions reduction measures.

Potential measures to be considered are outlined in Table 4. This list provides a summary of options that could be investigated to reduce GHG emissions and contribute to achieving the NT Government’s goal of achieving net zero greenhouse gas emissions by 2050.

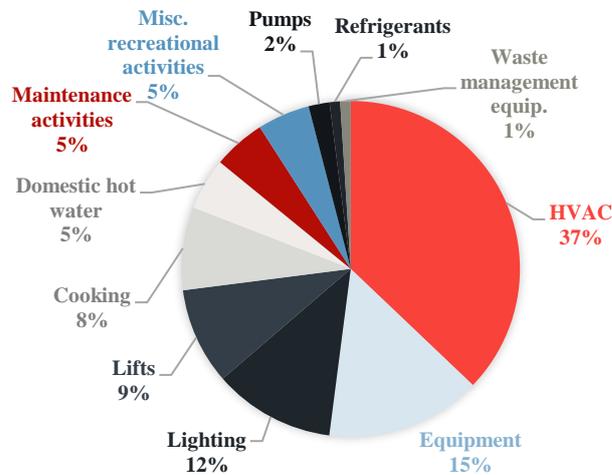


Figure 1 GHG emissions percentage breakdown

Table 4: Proposed GHG emissions reduction measures

EMISSIONS SOURCE	PROPOSED MEASURE
Project wide	<ul style="list-style-type: none"> — Implementation of a comprehensive commissioning and tuning program following construction to ensure building systems are operating efficiently and as designed. — Inclusion of solar PV on the level 6 roof (or elsewhere depending on design development). The system capacity will depend on the extent of the green roof across the development and available space for solar. — Purchase of carbon offsets or offsite renewable energy.

	<ul style="list-style-type: none"> — All-electric services and equipment – designing and operating the resort facility with all electric services and equipment (i.e. no fossil fuels combusted onsite) allows for purchase of renewable energy to supply electricity. — Energy management system – this allows for monitoring and control of building energy supply to identify areas to reduce unnecessary consumption. — Adopt a commitment to certify or benchmark the project against a third-party ratings scheme such as Green Star or NABERS for Hotels.
HVAC	<ul style="list-style-type: none"> — Installation ceiling fans in hotel rooms and other spaces throughout the resort to reduce reliance on air conditioning systems. Ceiling fans also improve occupant comfort by promoting air flow. — Smart controls on air conditioning systems to allow for remote control of systems, temperature limiting and automatic shutdown depending on occupancy. — Optimisation of passive measures at the detailed design stage such as natural ventilation strategies, natural cooling, thermal mass, improved insulation, window orientation and shading strategy — Implementing equipment with natural refrigerants with low global warming potential and/or the use of refrigerant leak detection systems
Equipment	<ul style="list-style-type: none"> — Specification and procurement of efficient equipment. For example, procure TVs / computers within one energy rating star of best available as per the Australian government’s energy rating system.
Lighting	<ul style="list-style-type: none"> — Installation of efficient LED lighting throughout the development — Smart lighting systems such PE sensors, timers and remote-control capability
Lifts	<ul style="list-style-type: none"> — Place stairs in prominent locations throughout the resort to promote use and reduce reliance on lifts. — Automatic controls for lighting and air-conditioning within lift car.
Cooking	<ul style="list-style-type: none"> — Consider switching to all electric cooking appliances to eliminate combustion of fossil fuels onsite and allow for purchase of renewable energy.

Should you have any queries please do not hesitate to contact us.

Yours sincerely,

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