



GREEN STAR - MULTI UNIT RESIDENTIAL V1 ✦

FACT SHEET & BUSINESS CASE

green building council australia

greenstar

Multi Unit Residential v1

THE GREEN BUILDING COUNCIL OF AUSTRALIA (GBCA) LAUNCHED THE GREEN STAR – MULTI UNIT RESIDENTIAL V1 RATING TOOL IN JULY 2009 TO PROMOTE THE DESIGN AND CONSTRUCTION OF HIGH-PERFORMANCE GREEN RESIDENTIAL DEVELOPMENTS.

The Green Star – Multi Unit Residential v1 rating tool enables building owners and developers to:

- minimise the environmental impacts of their developments
- reduce Australia's greenhouse gas emissions
- receive recognition for more environmentally sustainable design
- deliver health benefits and financial savings for building occupants.

ABOUT GREEN STAR

The GBCA launched the Green Star environmental rating system for buildings in 2003. Green Star evaluates the green attributes of building projects based on nine categories, including energy and water efficiency, indoor environment quality and materials.

Green Star is a holistic rating tool, evaluating not only environmental attributes, but also features that affect occupant health and wellbeing, such as indoor environment quality and access to transport. Green Star rating tools can be used to rate the environmental attributes of a building at the design phase as well as at the end of construction (known as 'As-Built').

IMAGE:

Converso 8 Waterside Place
4 star Green Star - Multi Unit Residential v1

WHY BUILD A GREEN MULTI UNIT RESIDENTIAL FACILITY? ♦



ENVIRONMENTAL BENEFITS

High rise apartments in Australia are energy and water guzzlers. A NSW Energy Australia study found high rise apartment use 30 per cent more power than a typical detached house. Much of this is in the common areas such as foyers and car parks where lights are often inefficient and are left on night and day.

In the residential sector, emissions reductions can be achieved through energy efficient lighting and appliances, refrigeration, heating and cooling and through greater use of natural light. Green Star-rated buildings do just that.

\$26,000 SAVING EACH YEAR IN ENERGY CONSUMPTION

The Redfern Housing Redevelopment in Sydney was awarded a 5 Star - Green Star rating under the Multi Unit Residential PILOT in 2009. Green initiatives include rainwater collection and greywater treatment, solar hot water systems, solar photovoltaic cells for lighting and passive ventilation.

The project's design aims to reduce energy consumption by 74 per cent when compared with standard residential buildings of similar size. This reduction in CO2 emissions is equivalent to taking 100 cars off the road. What's more, the energy efficiency measures are predicted to save around \$26,000 across the entire building in energy consumption each year alone.

Water efficient fittings and fixtures, as well as the reuse of rainwater and treated greywater, will ensure around 45 per cent of all water demand on the site is met by non-potable water. The predicted saving of 4,700 cubic metres of water a year is equivalent to around 2 Olympic-sized swimming pools or 33,571 bathtubs. Based on current Sydney Water prices, the cost savings will be around \$7,500 a year across the entire tenancy.

LOWER OPERATING COSTS

Green buildings are built for high energy and water efficiency, so they are cheaper to operate. International research has confirmed that green buildings:

- consume 26 per cent less energy than the average building
- generate 33 per cent less greenhouse gas emissions.

Green buildings can provide residents with a buffer against future increases in water and energy services costs and protect against services shortages. High efficiency appliances, increased insulation, reduced lighting loads, passive solar heating and ventilation, and water conservation measures all lead to more dollars in the bank.

ELECTRICITY BILLS DOWN BY 25%

The Lilyfield Housing Redevelopment in Sydney achieved a 5 Star Green Star rating in 2009. Housing NSW invested in environmentally sustainable initiatives such as gas-boosted solar hot water systems, 267 square metres of solar panels and a 4 kilowatt photovoltaic system to power common area lighting. The gas-boosted hot water system caters for 60 per cent of hot water consumption and delivers annual savings of \$19,000 - or \$213 per unit - meaning the annual electricity bill for households will decrease by 25 per cent.

IMAGE:
Lilyfield Housing Redevelopment
5 star Green Star - Multi Unit
Residential v1

65% REDUCTION IN HEATING AND COOLING

With its 4 Star Green Star – Multi Unit Residential rating, Convesso 8 Waterside Place in Melbourne will deliver a 65 per cent reduction in business-as-usual heating and cooling energy through a high performance double glazing system and insulation to all walls and ceilings. A master electricity switch has been built into the entry of each apartment – enabling residents to reduce their standby power - which accounts for 10 per cent of all household electricity consumption in Australia – with the flick of a switch.

The apartment complex also features a number of measures to ensure maximum water efficiency and reuse throughout the building, including water efficient dishwashers, washing machines, tap ware and shower heads. These features are expected to reduce potable water consumption by a quarter compared to standard practice. The result will be reduced energy and water bills for residents, and improved environmental outcomes at the same time.

A HEALTHIER, HAPPIER PLACE TO LIVE

According to the OECD’s Environmentally Sustainable Buildings report (2003), illness from indoor air pollution has become one of our most acute building challenges – with building materials, ranging from paints to carpets, leading to occupational health issues.

Green buildings have better ventilation and indoor environment quality, which improves people’s health and sense of well-being. Green buildings also provide more access to daylight, improving people’s mental health and performance. For example, a Canadian study found that people suffering from depression recovered 15 per cent faster in sunny rooms, when compared with those in dark rooms. An American study of more than 21,000 students found students in a daylit room achieved a 20 per cent faster progression in maths and 26 per cent progression in reading.

GREEN SPACES FOSTER COMMUNITY

The Lilyfield Housing Redevelopment not only incorporates environmentally sustainable design features to improve the building’s energy and water efficiency, but also includes green initiatives to foster community and healthy living among residents. The building design features a large central courtyard, providing tenants with a secure and private open space. The communal garden facilities have been designed to enhance the residents’ sense of community, as well as provide them with the opportunity to grow their own fresh vegetables and reduce the carbon mileage accumulated through the mass transportation of produce.

EMPOWERING THE LOCAL COMMUNITY

The Redfern Housing Redevelopment project recognised the important links that Australia’s indigenous people have with the suburb, and so mandated a minimum of 20 indigenous construction workers. This was a ‘first’ for a public housing project in Australia, and was rewarded with a Green Star Innovation point (INN-1). Empowering the local community was an integral part of the sustainable development, and Housing NSW provided employment opportunities to both Aboriginal and long-term unemployed people to enhance their business skills, increase their knowledge of ESD issues and improve the social and economic conditions for both the individuals and their community.

IMAGE:

The Summer
4 star Green Star - Multi Unit Residential v1



ATTRACTIVE TO TENANTS AND INVESTORS

Green buildings are easier to market in an environment where people want to be a part of the solution to climate change. Green buildings show higher returns on assets and increased property values. The McGraw Hill Construction Report (2007) found that green building can increase building values by 7.5 percent and improve return on investment by 6.6 per cent. By going green, owners can also increase occupancy ratios by 3.5 per cent.

SUSTAINABLE LIVING ATTRACTS BUYERS

The first Green Star residential certification was awarded in May 2009 to 'The Summer' in Western Australia, for its 4 Star Green Star development. The Summer incorporates an extensive range of environmental design techniques such as dual aspect to allow natural ventilation, solar shading, energy efficient appliances and rainwater storage. The developer of the project was overwhelmed by the demand for the sustainable apartments. "We had no idea just how significant sustainable living is to the lives of many people and we are definitely looking to increase the bar on all our future projects," Match Managing Director Lloyd Clark said.

SMART FINANCIAL INVESTMENT

The 4 Star Green Star Convesso 8 Waterside Place also delivers dividends for the developer. Vivas Lend Lease's Executive Director, Hugh Martin, says: "It is clear that sustainable buildings like Convesso make business sense. They represent smart financial investments today and environmentally responsible investments in our future."

ENVIRONMENTAL BENEFITS:

- Protect ecosystems and biodiversity
- Improve air and water quality
- Reduce waste
- Conserve natural resources
- Reduce greenhouse gas emissions

ECONOMIC BENEFITS

- Reduce operating costs
- Save 20-30 per cent on energy and water costs
- Enhance asset value and profits
- Optimise life-cycle economic performance
- Increase access to government incentives
- Enhance investor opportunities

HEALTH AND COMMUNITY BENEFITS

- Improve air, thermal and acoustic environments
- Enhance occupant comfort and health
- Eliminate harmful chemicals such as volatile organic compounds and carbon dioxide
- Minimise strain on local infrastructure by providing access to transport
- Contribute to overall quality of life

KEY ATTRIBUTES ✦

THE GREEN STAR - MULTI UNIT RESIDENTIAL V1 RATING TOOL IS APPLICABLE TO NEW MULTI UNIT RESIDENTIAL FACILITIES, AND EXTENSIONS TO AND MAJOR REFURBISHMENTS OF EXISTING MULTI UNIT RESIDENTIAL FACILITIES OF TWO UNITS OR MORE, PROVIDED THEY MEET GREEN STAR ELIGIBILITY CRITERIA.

The rating tool has undergone a rigorous assessment period after a pilot phase, and refinements to the calculators and credits have already received positive feedback from industry.

The Green Star – Multi Unit Residential v1 rating tool has many credits in common with the other Green Star rating tools but also includes a number of credits specific to the multi unit residential sector. These sector specific credits include metering, natural ventilation, trip reduction, energy and water efficient appliances, swimming pool and spa water efficiency, and communal outdoor facilities.

The Green Star – Multi Unit Residential v1 rating tool also includes a customised energy calculator. While the Green Star – Office suite of rating tools incorporates energy modelling consistent with the National Australian Built Environment System (NABERS) Energy tool, an equivalent modelling protocol did not exist for the multi unit residential sector.

The Multi Unit Residential v1 rating tool will address residential buildings containing two or more dwellings with over 80 per cent of floor area for residential uses.

The result is a single third party certification that the residential market can understand and trust, and that property developers can use to demonstrate their development's green credentials.

CERTIFICATION ✦

Green Star ratings will be awarded as outlined below:

The rating tools have been developed to be equitable across building sectors. This means a 5 Star Green Star – Multi Unit Residential v1 project will demonstrate a similar level of industry leadership as 5 Star Green Star – Office v3 project.

Projects with ratings of 1, 2 or 3 Stars cannot receive certification, as these ratings represent minimum, average and good practice, whereas Green Star aims to recognise and reward best practice and above.

THESE RATING TOOLS HAVE BEEN DEVELOPED TO BE EQUITABLE ACROSS BUILDING SECTORS.



4 Star Green Star Certified Rating

Weighted score of 45-59
Signifies 'Best Practice'



5 Star Green Star Certified Rating

Weighted score of 60-74
Signifies 'Australian Excellence'



6 Star Green Star Certified Rating

Weighted score of 75-100
Signifies 'World Leadership'

CATEGORIES AND CREDITS IN GREEN STAR ✦

GREEN STAR - MULTI UNIT RESIDENTIAL V1



MANAGEMENT

- Green Star Accredited Professional
- Commissioning
- Building Tuning
- Independent Commissioning Agent
- Building Users' Guides
- Environmental Management
- Waste Management
- Metering

INDOOR ENVIRONMENT QUALITY



- Dwelling Ventilation
- Natural Ventilation
- Daylight
- Thermal Comfort
- Hazardous Materials
- Internal Noise Levels
- Volatile Organic Compounds
- Formaldehyde Minimisation
- Electric Lighting Levels
- Private External Space

ENERGY

- Conditional Requirement
- Greenhouse Gas Emissions
- Peak Energy Demand Reduction
- Unoccupied Areas
- Energy Efficient Appliances



TRANSPORT

- Provision of Car Parking
- Fuel-Efficient Transport
- Cyclist Facilities
- Commuting Mass Transport
- Trip Reduction Mixed-Use



WATER

- Occupant Amenity Water
- Water Meters
- Landscape Irrigation
- Heat Rejection Water
- Fire System Water
- Water Efficient Appliances
- Swimming Pool/Spa Water Efficiency



MATERIALS

- Recycling Waste Storage
- Building Re-use
- Recycled Content and Re-used Products & Materials
- Concrete
- Steel
- PVC Minimisation
- Sustainable Timber
- Design for Disassembly
- Dematerialisation
- Flooring
- Joinery
- Internal Walls
- Universal Design



LAND USE & ECOLOGY

- Conditional Requirement
- Topsoil
- Reuse of Land
- Reclaimed Contaminated Land
- Change of Ecological Value
- Communal Garden Facilities



EMISSIONS

- Refrigerant ODP
- Refrigerant GWP
- Refrigerant Leaks
- Insulant ODP
- Watercourse Pollution
- Discharge to Sewer
- Light Pollution
- Legionella



INNOVATION

- Innovative Strategies and Technologies
- Exceeding Green Star Benchmarks
- Exceeding Green Star Scope

CATEGORY WEIGHTINGS ✦

	ACT	NSW	NT	QLD	SA	TAS	VIC	WA
Management	8%	8%	8%	8%	8%	8%	8%	8%
IEQ	20%	20%	20%	20%	20%	20%	20%	20%
Energy	25%	25%	25%	25%	25%	20%	25%	25%
Transport	10%	10%	10%	10%	10%	10%	10%	10%
Water	15%	15%	13%	13%	18%	18%	18%	15%
Materials	10%	10%	10%	10%	10%	10%	10%	10%
Land Use & Ecology	7%	7%	9%	9%	4%	9%	4%	7%
Emissions	5%	5%	5%	5%	5%	5%	5%	5%

The Innovation Category is not subject to an environmental weighting factor as the innovation could fall under any number of Green Star categories. More information and additional guidance on the weightings for the Green Star – Multi Unit Residential v1 rating tool can be found on the GBCA website.

NEXT STEPS ✦

- Download the Green Star – Multi Unit Residential v1 rating tool. This is freely available for self-assessment and can be downloaded from the GBCA website: www.gbca.org.au
- Join the GBCA. Demonstrate your company's commitment to sustainability, actively influence the future direction of green building and gain access to green building education, training and resources, as well as significant member discounts on certification. Find out more at: www.gbca.org.au/membership/
- Register your project with the GBCA for an independent third party accredited assessment. This process costs varies depending on the size of your project and whether or not you are a GBCA member. Find out more about the certification process and how to register: www.gbca.org.au/green-star/certification/
- Purchase additional technical manuals. As part of your certification fee you will receive 2 free Green Star - Industrial v1 Technical Manuals. You may like additional manuals for your team, which can be purchased from our online store: www.gbca.org.au/shop/
- Attend a workshop. The GBCA holds regular workshops on the Green Star rating tools. As part of your certification fee you may receive one free In- House Certification Workshop. Please contact your Case Manager to see if you are eligible. There are also introductory and advanced classes on Green Star; register online: www.gbca.org.au/courses.asp
- Train your entire project team on the tool. The GBCA can organise in-house training so that all your project team and sub-contractors are aware of the implications of developing a Green Star project. To obtain an in-house quote please email education@gbca.org.au

SPONSORS

Platinum

Brisbane City Council
The Laminex Group
City of Sydney

Gold

Department of Transport, Energy &
Infrastructure, South Australia
Stockland
Land Development Agency, Australian
Capital Territory
Mirvac

Silver

Stairlock International

CONTACT

Green Building Council of Australia

Phone: (02) 8239 6200

Email: info@gbca.org.au

www.gbca.org.au

**For help on how to market your Green
Star project:** marketing@gbca.org.au

**For information on membership of the
GBCA:** membership@gbca.org.au

To register your Green Star project:
greenstar@gbca.org.au



BUSINESS CASE REDFERN HOUSING REDEVELOPMENT PROJECT

IMAGE:

Redfern Housing
5 star Green Star - Multi Unit Residential v1

PROJECT DATA

Location

57-75 Walker Street, Redfern NSW

Applicant

Housing NSW

Total Floor Area

9,304m2 NLA

Project Manager

Thinc Projects

Architect and Landscaping Consultant

LFA Pacific

Structural/Civil Engineer

Opus International Consultants

Building Services Engineer

Timar Partnership

Quantity Surveyor

Page Kirkland

Acoustic Consultant

Day Design

Local Planning Authority

City of Sydney Council

The Redfern Housing Redevelopment in Sydney was only the second public housing development in Australia to achieve a Green Star rating, and was awarded a 5 Star Green Star rating under the Multi Unit Residential PILOT in 2009.

Representing 'Australian Excellence' in environmentally sustainable design, this project for Housing NSW sets a new standard for social housing developments, and demonstrates that environmentally, economically and socially sustainable outcomes are achievable.

According to the Green Building Council of Australia's Chief Executive, Romilly Madew, the Redfern Housing Redevelopment project is a 'triple bottom line success story'.

"The project team took a holistic approach to the development, and addressed the social sustainability issues alongside the more commonly recognised environmental and economic ones," she says.

Housing Minister Frank Terenzini said "The 5 Star Green Star rating for the Redfern housing redevelopment demonstrates leadership in innovation and design and underscores the State Government's commitment to leading the way in best environmental practice."

WHERE COMMUNITY BELONGS

The project involves the demolition of ten existing two and three storey public housing buildings, and the construction of new low-to-medium rise accommodation. The 106 public housing dwellings will be comprised of 66 apartments and 40 townhouses, as well as two community rooms.

The goal of the redevelopment project is to deliver new public housing with a more appropriate mix of housing types that promotes a greater level of community within the area. Specifically, the new development will provide more adaptable and accessible housing for aged and disabled members of the community.

The design features an external façade which is both contemporary and sympathetic to the existing semi-detached and historic dwellings in the Redfern area. As a result, the development will be integrated into and enhance the urban landscape.

SMART SAVINGS

Mr Terenzini said that by working with existing and new developments, Housing NSW is ensuring that the asset base will be climate change adaptable for the future, as well as assisting tenants to lower their energy bills and reduce greenhouse gas emissions.

“Housing NSW has been working with tenants to support positive behavioural change to reduce energy use in the home and has also been working to go beyond state government energy targets.”

Green initiatives within the Redfern redevelopment, such as rainwater collection and greywater treatment, solar hot water systems, solar photovoltaic cells for lighting and passive ventilation, will help achieve this aim and deliver cost savings for both Housing NSW and the low-income tenants who live in the development.

The project’s design aims to reduce energy consumption by 74 per cent when compared with standard residential buildings of similar size. What’s more, the energy efficiency measures are predicted to save around \$26,000 across the entire development in energy consumption each year alone.

The reuse of rainwater and treated greywater, will ensure around 45 per cent of all water demand on the site is met by non-potable water, and water-efficient fittings and fixtures are being installed throughout. The predicted saving of 4,700 cubic metres of water a year is equivalent to around two Olympic-sized swimming pools or 33,571 bathtubs. Based on current Sydney Water prices, the cost savings will be around \$7,500 a year across the entire tenancy.

SOCIAL SPIRIT

Australia’s indigenous people have a long association with Redfern, moving to the suburb in the 1920s for employment opportunities and affordable housing. They formed a strong and vibrant community which is still in evidence today.

Recognising the links between indigenous people and the suburb, a minimum of 20 construction workers on the project were required to be indigenous. This was a ‘first’ for a public housing project in Australia, and was rewarded with a Green Star Innovation point (INN-1).

Empowering the local community was an integral part of the sustainable development, and Housing NSW provided employment opportunities to both Aboriginal and long-term unemployed people to enhance their business skills, increase their knowledge of ESD issues and improve the social and economic conditions for both the individuals and their community.

OTHER ESD INITIATIVES FEATURED IN THE PROJECT:

Indoor Environment Quality

- All 106 apartments are naturally-ventilated and there is no air conditioning in the development

Energy

- Gas-boosted solar hot water is installed in apartment buildings and instantaneous gas hot water systems in townhouses
- PV cells for common area lighting
- Use of low embodied energy materials where possible

Water

- Rainwater harvesting for toilet flushing and laundry
- Greywater treatment system for landscape irrigation

Innovation

- Exceeding the benchmarks of TRA-1 by providing significantly less car parking than the minimum – 6 dedicated disabled parking spaces are provided on the site
- There is no general parking but generous bicycle storage is provided

Land Use and Ecology

- Remediation of a contaminated site
- Use of native landscaping.