

Energy efficiency in commercial buildings

How the National Australian Built Environment Rating System transformed the market



Summary and highlights document

The full-length guide is available to download separately

Lead Author – Bruce Precious

Bruce Precious has been at the forefront of sustainability in the built environment for over 20 years, working across the public and private sectors. A mechanical engineer, Bruce was sustainability manager at GPT and prior to that a director at the New South Wales Sustainable Energy Development Authority. Bruce currently represents the Australian Institute of Refrigeration, Air conditioning and Heating (AIRAH) on the NABERS Steering Committee.

Contact NABERS

nabers@environment.nsw.gov.au

nabers.gov.au

This publication is funded by the Australian Government Department of Industry, Science, Energy and Resources through the Climate Solutions Package.
Published May 2022

Design and Artwork by Designer Rice Pty Ltd | www.designerrice.com

Many thanks to all those who provided input, especially:

Paul Bannister, DeltaQ

Matthew Clark, Common Capital

Henning Ellerman, DENEFF, Germany

Stephen Hennessy, Chartered Institution of Building Services Engineers and NABERS Assessor, Trainer

Kevin Lockhart, Efficiency Canada

Luke Menzel, Energy Efficiency Council

Alan Pears AM, Adjunct Professor, RMIT University

Franziska Teichmann, German Secretariat for Energy Cooperation with Australia and New Zealand

Julianne Tice, Energy Efficiency Council

All those NABERS team members who contributed to this work.

NABERS editorial team

Claire Morgan and **Magali Wardle**

Editor

Karen Jamal

Director of NABERS

Carlos Flores



Australian Government
**Department of Industry, Science,
Energy and Resources**



Australia's approach to energy efficiency in commercial buildings can inspire action in other markets

Over the last 14 years, Australian offices rated using NABERS Energy have benefitted from average energy savings of 42% and have reduced greenhouse gas emissions intensity by 53%. This is one of the fastest widescale building transformations recorded anywhere in the world.

This guide to NABERS Energy in Australia can help anyone interested in driving energy efficiency gains in their country or region. Today, there is broad agreement that energy efficiency plays an essential role in our global transition to a decarbonised future. NABERS ratings are now offered in the United Kingdom and New Zealand, with growing interest from other markets. NABERS' transformational approach is adaptable, scalable and transferrable across markets and commercial property types.



NABERS provides a rating from 1 to 6 stars for energy efficiency.

3 stars shows average performance at the time a rating tool is launched. 6 stars demonstrates market leading performance.

Executive summary

With impressive impact over almost 25 years, NABERS, or the National Australian Built Environment Rating System, demonstrates how multi-faceted government and industry collaboration can drive genuine market transformation.

Those who use NABERS Energy ratings in Australia have saved an estimated AU\$1 billion in energy costs and driven down greenhouse gas emissions in the commercial building sector by more than seven million tonnes since 1998.

This guide outlines the key success factors of NABERS Energy ratings in Australia. It explains why the NABERS suite of ratings for different building types has achieved significant market penetration and why NABERS is now recognised as a key pillar of the property industry's transition to net zero emissions.

There are valuable insights here for a range of professionals worldwide, from industry participants and policymakers to investors, from sustainability advocates to energy program managers. The guide is relevant for anyone interested in best practice and solutions which can powerfully enhance energy efficiency and reduce emissions.

The success of NABERS is underpinned by seven key principles

1. Measure **actual impact**, not intent
2. Assess **building operations**, not design
3. Deliver **meaningful ratings** that the market can understand
4. Support a **simple** and **easy-to-perform** rating process
5. Achieve **reliable ratings** that everyone can trust
6. Foster **strong governance** and **trustworthy management**
7. Encourage **collaborative** rating tool development.

NABERS is expanding from offices to many building types and is now available in the UK and New Zealand

NABERS Energy’s genesis was the Australian Government’s drive to better understand and measure the energy efficiency and greenhouse gas intensity of office buildings. Since then, NABERS has matured and evolved, with ratings now providing greater visibility of environmental impacts including water, waste and indoor air quality.

Current coverage by NABERS Energy ratings in Australia:

- 4,770-plus commercial buildings including 3,800 office buildings and tenancies
- 21 million m² of office space with a current rating (226 million sq ft)
- 9 million m² (97 million sq ft) of shopping centre space with a current rating
- 74% of Australia’s commercial offices currently obtain NABERS Energy ratings on an annual basis.
- Rating tools available for building types from offices to data centres, hotels to public hospitals, residential apartments to aged care and retirement living.

A New Zealand NABERS program started in 2012 thanks to a partnership with the New Zealand Government. An office energy rating is now well established in the market with expansion to other building types underway. NABERS UK launched in 2020, and since then has grown rapidly with strong industry support.

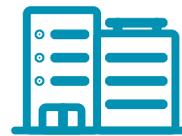
In Australia, NABERS is a nationwide government program administered by the New South Wales government. It is overseen by a national steering committee comprising representatives from all state and territory governments, and the Australian Government.



Office buildings



Office tenancies



Data centres



Hotels



Shopping centres



Apartment buildings



Hospitals (public)



Retirement living



Aged care



Warehouses



Schools



Retail stores



Due for release in 2022-2023.

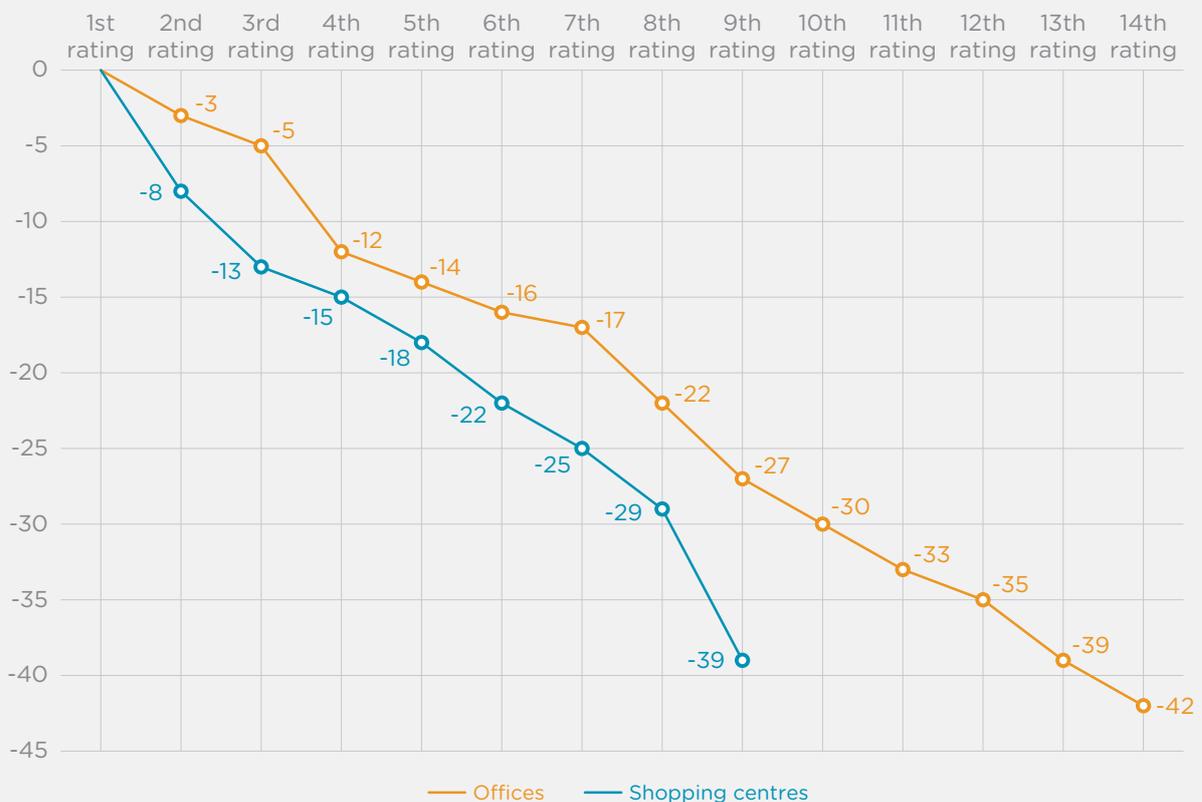
Public policy has helped transform the industry

The Australian Commercial Building Disclosure (CBD) Program requires energy efficiency information – notably a NABERS Energy rating – to be provided when large commercial office space is offered for sale or lease. This has been a powerful driver for industry participation. Established by the Building Energy Efficiency Disclosure Act 2010 and managed by the Australian Government, the CBD program initially covered commercial office space of more than 2,000 m², but was expanded to include space of 1,000 m² or more.

Unmistakable impact

Offices that have been rated with NABERS Energy over 14 rating periods demonstrate average energy savings of 42% with greenhouse gas emissions intensity dropping by 53%. Evidence shows that this trend is repeated in other sectors such as shopping centres.

Average reduction in energy use after multiple NABERS ratings (%)



Source: NABERS 2021 Annual Report - Life of Program Statistics

NABERS rating scale

One of NABERS' key success factors is a technically robust benchmark that translates into an easily understandable star rating.

The rating scale from 1 to 6 stars in half star increments motivates owners and facility managers to work towards the next star on the scale.

Everyone from the CEO down can talk about the star scale, with more stars meaning better performance. 6 stars denotes best market practice.

Aiming for NABERS 4.5 stars is a much easier concept to communicate than aiming for a normalised energy intensity of 80 kgCO₂e per m² per annum.



According to the [Low Energy High Rise Research Report](#), the simple act of disclosing a NABERS Energy rating is linked to a 0.5 star improvement in energy performance.



Steps to a rating



1. Engage

A building owner engages a NABERS Accredited Assessor.

2. Assess

The assessor undertakes an onsite visit and examines actual energy bills.

3. Submit

The assessor lodges the rating, which is then checked and certified by NABERS. Assessment and certification fees are paid. **Ratings are valid for 12 months.**

4. Promote

Unless private, the rating is published on the NABERS website and is used by building owners in reporting and promotional material.

5. Disclose (where applicable)

Under the requirements of the Commercial Building Disclosure Program, an office energy rating must be disclosed at the time of sale or lease if the building is more than 1,000 m².

6. Audit

5% of assessments are audited post-certification to maintain the rigour of the system.

7. Improve

Building owners can use annual NABERS ratings to measure the impact of building improvements over time, including as a benchmark before and after embarking on capital upgrades.

Radical collaboration

NABERS has helped create new jobs, valuable intellectual property and enabled sector-wide collaboration among a network of organisations committed to energy efficiency.

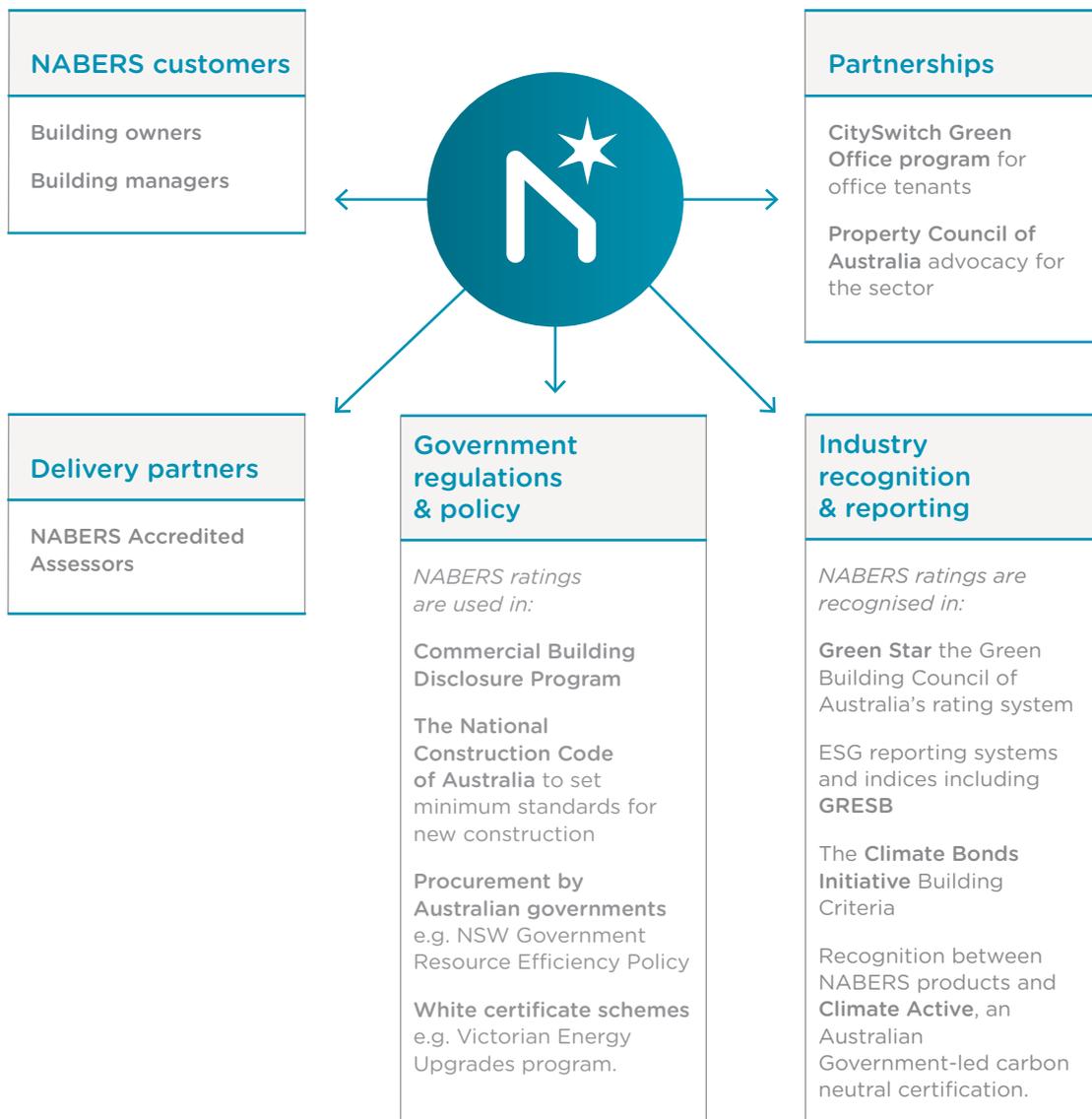
While energy and emission savings are the headline, NABERS has delivered many other benefits, from driving greater building value to supporting a collaborative and innovative network of organisations.

“The Property Council of Australia is a proud partner of the NABERS program. Our members understand the value of more efficient buildings to reduce costs and cut greenhouse pollution, and NABERS is instrumental in helping them do this.”



Ken Morrison,
Chief Executive, Property Council of Australia

Key stakeholders





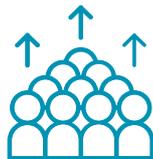
Global benchmarks of sustainability, notably GRESB and the Dow Jones Sustainability Index, have long acknowledged Australian real estate as leading the world in sustainability. In 2021, Oceania - comprising Australia and New Zealand - [topped the GRESB league table](#) for the most sustainable real estate for the eleventh consecutive year.

There is a strong case that NABERS Energy plays a foundational role in establishing excellence in design, delivery and maintenance of high performing, sustainable buildings with a focus on measured, validated performance.

Characteristics of Australia's built environment:



More than **86%** of Australia's population lives in cities



Population growth is one of the fastest in the OECD and drives high rates of new builds



32.5% of Australia's electricity was powered by renewables in 2021



Energy is usually **electricity** with small amounts of gas or onsite fossil fuels, with no district heating systems



Australia's city centres feature **high-rise buildings** dominated by offices and shopping centres owned by large property corporations; tenants typically sign leases for 10-15 years



The nation spans **eight climate zones**, with the three largest cities of Sydney, Melbourne and Brisbane in mild-to-temperate climates.

Innovation in energy services

NABERS Energy has been an important catalyst for a range of new businesses. The most obvious of these are NABERS Assessors, but NABERS has also driven the development of new allied businesses.

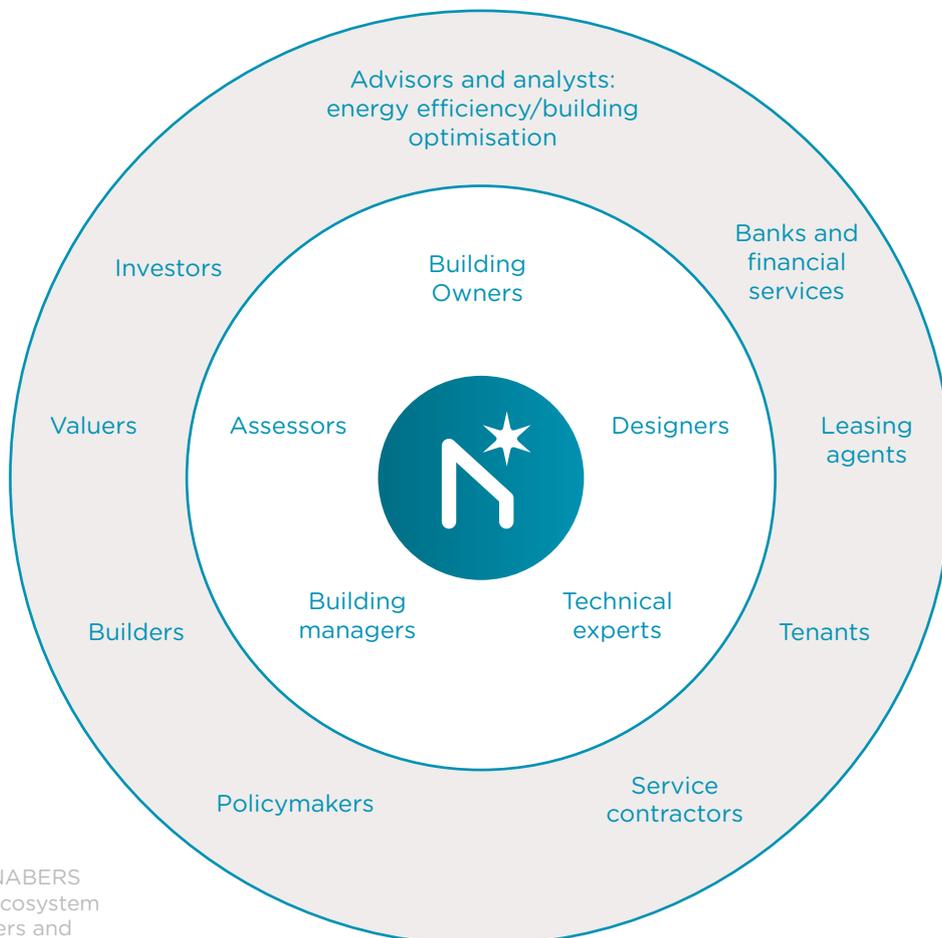
Among the businesses that NABERS has encouraged are those that provide metering systems and energy data and analytics systems that combine weather and energy data to provide predictive insights. These are technology businesses that understand how to assimilate large datasets and make powerful recommendations to maintain and improve energy performance. These companies and their innovations have a global market, and many have grown rapidly after gaining experience across a variety of building types and geographic markets.

“We’ve developed a sophisticated ecosystem of energy efficiency products and services in Australia because NABERS makes the value that energy efficiency delivers tangible. Everyone knows that improving the NABERS Energy rating of your commercial building saves energy, lowers bills money and cuts carbon.”



Luke Menzel, Chief Executive Officer, Energy Efficiency Council

The energy efficiency ecosystem



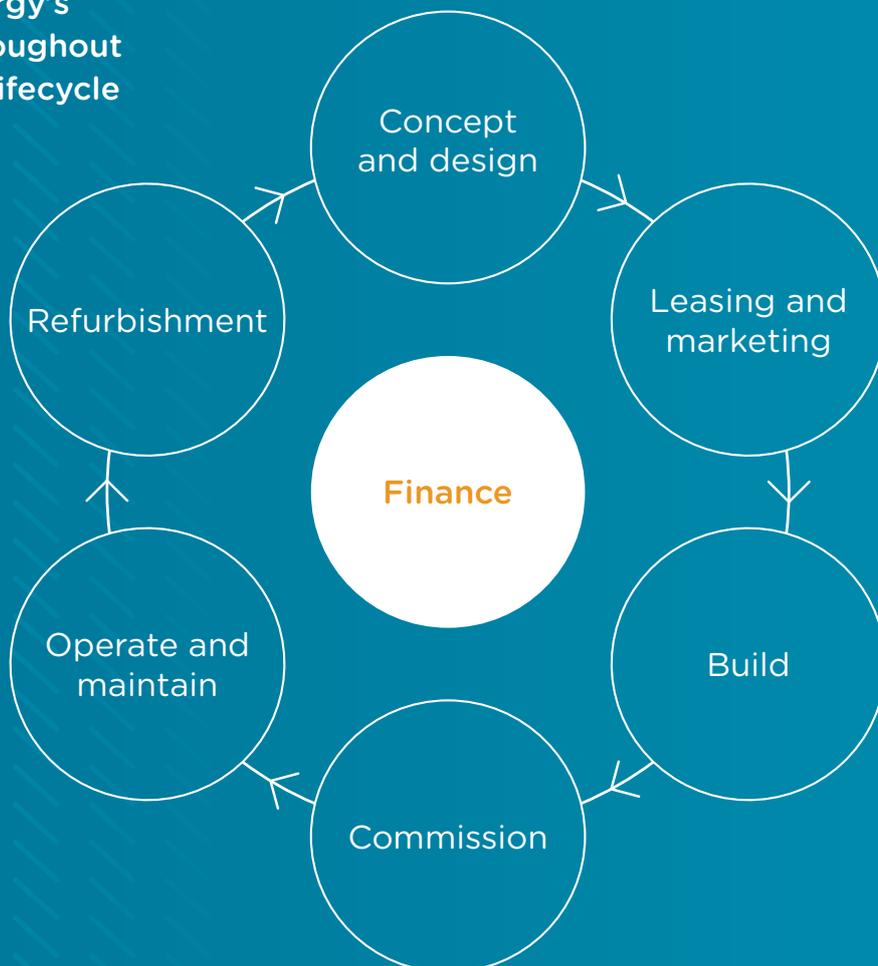
Typical users of NABERS Energy form an ecosystem that values, delivers and maintains energy efficient buildings.

In practice

NABERS Energy empowers each of the economic and technical actors involved to deliver and operate energy efficient buildings.

The NABERS rating is used as a design target, as a commissioning target, and as an ongoing operational measure of building performance. It's a trusted, government-backed brand that gives all these actors the confidence of a fair measure.

NABERS Energy's influence throughout the building lifecycle





International

The success and impact of NABERS Energy in Australia has caught the attention of property portfolios, owners and policymakers around the globe.

This section outlines key considerations for those interested in harnessing the benefits of NABERS Energy and describes how rating tools are created based on local building data.

Following close collaboration, NABERS schemes now operate in New Zealand and the United Kingdom. To achieve this, NABERS supported the development of local ratings tools and entered into licensing arrangements with delivery partners.



NABERS New Zealand

NABERSNZ is licensed to the New Zealand Government through the Energy Efficiency and Conservation Authority (EECA) and is administered by the New Zealand Green Building Council.

NABERSNZ offers Energy for Offices ratings, with a rating algorithm adjusted to suit the energy sources, emissions intensity and climate of New Zealand.

Following its launch in 2012, the program has grown steadily and now certifies more than 40 ratings each year. In 2020, the New Zealand Government announced that a 4 star NABERSNZ Energy for Office ratings would be required for government accommodation greater than 1,000 m². In 2022, product development started for a NABERSNZ Energy for Hospitals rating tool.



NABERS United Kingdom

NABERS UK launched in November 2020. The scheme, which is run by standards organisation BRE, is overseen by a steering committee comprising BRE, the UK's Better Buildings Partnership and NABERS, as well as the industry organisations including the British Council for Offices and the UK Green Building Council. The Better Buildings Partnership acts as scheme ambassador to support its uptake and success.

Two products are currently available in the UK for office buildings: Design for Performance (DfP, a local name for Commitment Agreements) to drive energy efficient new buildings, and Energy for Offices for existing buildings. All ratings are carried out by assessors trained in the UK. A local design review panel has been established for DfP.

Speaking at the launch of NABERS UK, Sarah Ratcliffe, CEO, Better Buildings Partnership celebrated the “huge leap forward for the industry in measuring and verifying the actual energy performance of UK offices”.

While the UK tool is based on the Australian Energy rating, the rating algorithm has been adapted to the UK market.

Product Development

Before NABERS can be launched in a new country, various stages of product development are needed to create a rating tool plus supporting resources. Typically, funding for this work is sourced locally.

Data collection and initial industry engagement go hand in hand. Stakeholder consultation on the rating tool is important from the outset, and as part of this, building owners may be asked to support the initiative and share data.

Industry partners enable the creation of a dataset by providing information on building size and use patterns plus performance data. Climate and energy source information is also gathered to inform rating design.

As part of the benchmarking process, technical experts review the local dataset to test then define the settings for variables such as building size or hours of operation. Variables are then incorporated into a rating algorithm and thresholds are set for the performance range of each of the NABERS six star bands.

Careful analysis of building use patterns and configuration also enables the creation of locally tailored rules to guide the rating process and support assessors.

Draft versions of the rating calculator and rules may be used to carry out trial ratings on real buildings. This enables any final adjustments to be made before training and exams are created for the accreditation of local NABERS assessors.

Once a local administrator has set up systems and operations and a group of assessors have gained accreditation, the scheme can start to certify ratings and publish rating results.

Contact us

If you are interested in implementing NABERS in your region, please contact the NABERS team: nabers@environment.nsw.gov.au

Implementing NABERS in a new region

1. Collaborate

The support and involvement of a broad range of local stakeholders is crucial. Success is more likely when industry, government and advocacy bodies collaborate to design and build a scheme that meets local needs.

2. Build on existing principles

The principles and key elements of NABERS Energy are transferable. Principles such as the measurement of operational impact based on data and the use of a clear and simple rating scale are salient in all contexts.

3. Consider your unique geography

NABERS Energy ratings must be tailored to each region, and the NABERS team has extensive experience developing new ratings tools and can play a key advisory role. The collection of local building data is critical to the benchmarking process and ensures the rating tool is fair, relevant and reflects how buildings operate in the region.

4. Create high quality governance

The local administrator could be a public sector, private sector or a not-for-profit organisation. While there are several ways to administer the scheme, high quality governance and transparent reporting are vital.

5. Scale over time

Once operational, a new scheme can expand based on government policy, industry participation and specialist expertise. Key milestones in the initial phase of operations include the training and accreditation of local NABERS assessors and the first wave of certified ratings. Once stakeholders have confidence in the scheme, NABERS ratings can support a variety of policy mechanisms, public and private procurement, ESG reporting and sustainable finance.

NABERS product development process

Phase 1



Data collection



Technical benchmarking



Rule development



Trial ratings

Phase 2



Finalised rating tool



Platform development



Assessor training



Launch

Towards a net zero future

“NABERS communicates complex and technical measures in a simple message of 6 stars - and this has been an incredibly powerful tool... For building owners, this means greater ability to access finance, the ability to track and report on progress with ESG obligations to stakeholders and to differentiate your portfolio’s standing from your peers.”



Grace Foo, Principal Consultant,
DeltaQ and NABERS Accredited Assessor and Supervisor

Future focus for NABERS Energy

NABERS Energy has an ongoing role to play as Australia works towards its whole-of-economy emissions reduction plan and net zero target by 2050. The supply side of the energy market in Australia and around the globe is undergoing a rapid transition to renewable energy but this doesn't diminish the importance of energy efficiency. Economies that achieve an effective balance between energy supply and demand will enjoy economic benefits.

In 2022, NABERS will introduce a Renewable Energy Indicator to be included on NABERS Energy certificates underneath the main star rating result. The indicator will show the proportion of renewable energy used in the building. Developed in close consultation with industry, this metric further informs stakeholders and investors and provides another means for them to compare different properties.

NABERS is also developing a method to compare the embodied emissions of new commercial buildings. The tool is due for completion in 2023 and envisaged as a voluntary rating that could enable mandatory planning policy in the future.

Even in a post-fossil fuel world, the efficient use of renewable energy will be a prime requirement of sustainable communities and there remains a considerable gap between average and best practice. In the office sector, average performance is 4.5 stars and best practice is 6 stars. Across the approximately 20 million m² of rated office space in Australia alone, this suggests annual savings of more than AUD\$500 million is obtainable.

NABERS Energy has transformed how commercial buildings are managed and ultimately how they perform. This transformation has uncovered new value for investors, owners, managers, occupants and the industry of supporting services. NABERS is a proven, flexible model with application in any market where the energy efficiency of commercial property is valued as a positive contribution to society. If it gets measured, it gets managed.

Find out more

Increasing efficiency and slashing emissions from buildings is one of the fastest and most cost-effective ways to reduce global carbon emissions. But the window to transform to a sustainable world is narrowing and the pace of change demands collaboration on a global scale.

Australians have learnt much from leadership in other jurisdictions and are proud to share this illustration of excellence and play a part in the international conversation about energy efficiency.

Please contact the NABERS team if you'd like to find out more:
nabers@environment.nsw.gov.au

Overview of the complete guide

This summary contains highlights from the complete guide. The full-length version is available to download separately. It contains comprehensive information divided into nine sections.

Australia

Property and energy market in context

History

Timeline and overview

Features

System fundamentals and steps to a rating

Impact

Energy and emissions savings by the numbers

International

How NABERS operates in NZ and the UK and can be implemented in other countries

Stakeholders

An energy efficient ecosystem in a cluster of excellence

In practice

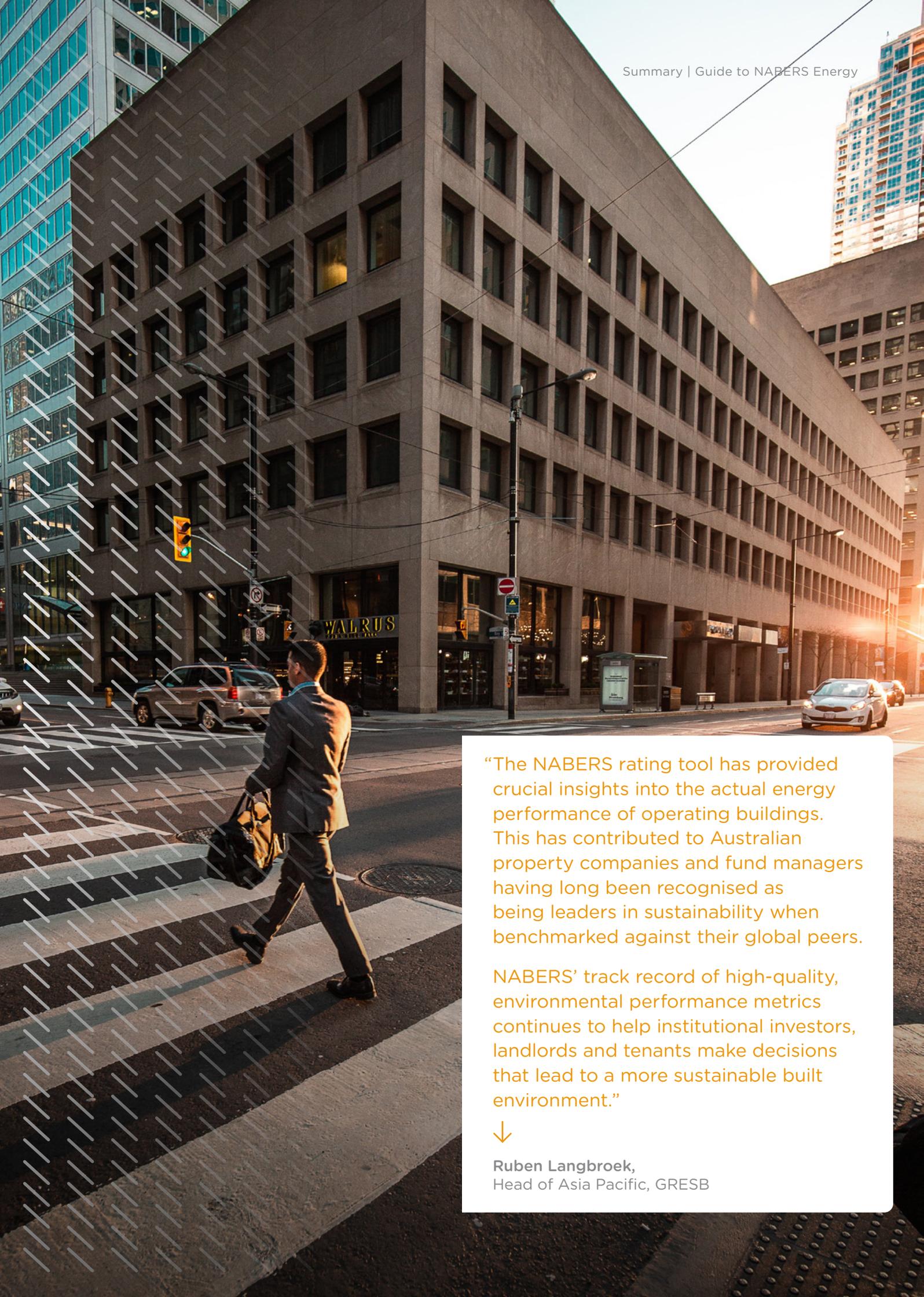
How different market actors respond to NABERS and use it every day

Rating fundamentals

Technical information on benchmarking and how ratings are certified

System elements

Presented all in one place, a list of all the parts of the system and how they interact



“The NABERS rating tool has provided crucial insights into the actual energy performance of operating buildings. This has contributed to Australian property companies and fund managers having long been recognised as being leaders in sustainability when benchmarked against their global peers.

NABERS’ track record of high-quality, environmental performance metrics continues to help institutional investors, landlords and tenants make decisions that lead to a more sustainable built environment.”



Ruben Langbroek,
Head of Asia Pacific, GRESB

The NABERS team pays respect to Traditional Custodians and First Peoples across Australia and acknowledges their continued connection to country and culture.

The team especially acknowledges the people of the Dharug nation as the Traditional Owners of Parramatta, the land on which the NABERS office is located.