

Guidelines for Conducting an Energy Efficiency Design Review



1 INTRODUCTION

This document is part of the NABERS Energy rating procedure for new buildings – the Commitment Agreement. These Guidelines for Conducting an Energy Efficiency Design Review are to assist in managing the risks in the design and construction process when a building (whole, base or tenancy) is seeking to achieve a particular star rating (4, 4.5, 5, 5.5 or 6 stars) using NABERS Energy. Organisations wishing to promote a projected NABERS Energy rating prior to and during construction must sign a Commitment Agreement and follow the defined process. For full details of the Commitment Agreement process please refer to:

- Commitment Agreement (New Buildings and Refurbishments), or
- Commitment Agreement (New Tenancies, Fitouts or Refurbishments).

The following documents are to be read in conjunction with this document:

- Energy Efficiency Design Review.xls
- Guidelines for the use of simulations
- NABERS Energy Guide to Building Energy Estimation
- NABERS Energy Guide to Tenancy Energy Estimation.

1.1 THE ENERGY EFFICIENCY DESIGN REVIEW PROCESS

The Energy Efficiency Design Review process described in this document is a risk management process that OEH recommends is to be used by the person or organisation seeking to achieve a given rating. For Commitment Agreements the Energy Efficiency Design Review must be conducted by a member of the NABERS Energy Design Review Panel who is independent of the design team. Members of the Design Review Panel have excellent knowledge of NABERS Energy and have demonstrated experience in both energy efficient design and operational energy use in commercial buildings.

The process is designed to fulfil one or more of the following functions, depending on the context:

1. To inform the designers and developers of a building as to the likely energy performance and performance risks associated with their proposed building design.
2. To demonstrate to OEH that a building is an appropriate candidate for a Commitment Agreement.
3. To demonstrate to a third party (such as a client or regulatory authority) that the proposed building can realistically be expected to achieve a given rating.

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Any prediction of performance is of advisory value only and does not constitute a rating under NABERS Energy. To obtain a rating, an Accredited Assessor must rate the building after 12 months of building operation with at least 50% occupancy. The NABERS National Administrator strongly recommends that a NABERS Accredited Assessor be used to advise on the application of the NABERS Energy methodology to new or refurbished buildings entering into a Commitment Agreement.

The NABERS software rating tool and documents are available at www.nabers.com.au.

1.2 VOLUNTARY OR COMPULSORY?

The degree to which the requirements of this document are voluntary or compulsory will be determined by the context in which this document is being used. However, it is important to understand that OEH or a third party may choose to use these guidelines as a means of assessment. On the basis of adequate or inadequate performance against these guidelines, these or other bodies or individuals may choose to accept or reject the assertion that the building is capable of achieving a given star rating.

Under all circumstances, these guidelines are designed to add value to the design process. The best way to use these guidelines is to incorporate them into the design process from day one. This will help inform your building design to produce a more efficient final building more cost effectively. It will also make it easier to demonstrate compliance if this is necessary.

2 SUMMARY OF THE SCOPE OF THE ENERGY EFFICIENCY DESIGN REVIEW

The scope of NABERS Energy covers Tenancies, Base Buildings or Whole Buildings as defined below:

Tenancies	Light and power requirements for tenants occupying space in buildings where central services are supplied by the building.
Base buildings	Building central services including (but not limited to): <ul style="list-style-type: none">• Air conditioning• Common area lighting• Lifts
Whole buildings	A combination of Base Building and Tenancy energy consumption

The exact rating type chosen will depend on context, but the following guidelines are offered:

- Tenancy ratings should be used for leased premises.
- Whole building ratings should be used for owner occupied buildings.
- Base building ratings should be used for leased buildings.

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The scope of the Energy Efficiency Design Review for different rating types is summarised in Table 1.

Type/ star rating	Description of requirements
Tenancy	
4, 4.5, 5, 5.5 and 6 stars	<p>Energy Efficiency Design Review of tenancy lighting, tenant activities and process issues.</p> <p>Area definition based on description and/or drawings.</p> <p>Estimated predicted energy consumption and greenhouse emissions (see NABERS Energy Guide to Tenancy Energy Estimation).</p>
Base Building	
4 stars	<p>Energy Efficiency Design Review of building envelope, energy sources, central plant, HVAC, miscellaneous plant, metering, common area lighting, carpark lighting, ventilation, lifts and process issues.</p> <p>Area definition based on description and/or drawings.</p>
4.5, 5, 5.5 and 6 stars	<p>Energy Efficiency Design Review of building envelope, energy sources, central plant, HVAC, miscellaneous plant, metering, common area lighting, carpark lighting, ventilation, lifts and process issues.</p> <p>Area definition based on description and/or drawings.</p> <p>Dynamic computer simulation of building demonstrating reasonable likelihood of achieving target greenhouse rating and energy consumption, following the risk evaluation procedures laid out in NABERS Guide to Building Energy Estimation, NABERS Guide to Tenancy Energy Estimation and Guidelines for Specifying Computer Building Simulations.</p>
Whole Building	
4 stars	<p>Energy Efficiency Design Review of building envelope, energy sources, central plant, HVAC, miscellaneous plant, metering, tenancy lighting, tenant activities and process issues.</p> <p>Area definition based on description and/or drawings.</p>
4, 4.5, 5, 5.5 and 6 stars	<p>Energy Efficiency Design Review of building envelope, energy sources, central plant, HVAC, miscellaneous plant, metering, tenancy lighting, tenant activities and process issues.</p> <p>Area definition based on description and/or drawings.</p> <p>Dynamic computer simulation of building demonstrating reasonable likelihood of achieving target greenhouse rating and energy consumption, following the risk evaluation procedures laid out in the NABERS Guide to Building Energy Estimation, NABERS Guide to Tenancy Energy Estimation and the Guidelines for Specifying Computer Building Simulations.</p>

Table 1. Scope of the Energy Efficiency Design Review.

2.1 ENERGY EFFICIENCY DESIGN REVIEW

The primary requirement for all Commitment Agreements is an independent Energy Efficiency Design Review. This process should be conducted as follows:

- An independent energy efficiency reviewer, who is experienced in energy efficient design for commercial office buildings and who is not part of the primary design team, should be engaged at the earliest moment possible in the design process. For NABERS Energy Commitment Agreements, the reviewer must be part of the NABERS Energy Design Review Panel. A list of panel members is available on the NABERS website www.nabers.com.au.
- The technical terms of reference for the independent energy efficiency reviewer are laid out in this document and the Excel spreadsheet – Energy Efficiency Design Review.xls. This document provides a guide to the technical content of the Design Review and should be used to assist in the preparation of the base design. However the document is a guide and should not be used to limit the scope of a Design Review.
- At the point when the preliminary design is complete, the independent Energy reviewer should complete a report in the format laid out in this document and the Excel spreadsheet - Energy Efficiency Design Review.xls.

The purpose of the Energy Efficiency Design Review is to identify the potential risks and opportunities presented by the proposed design with respect to the building's energy and greenhouse performance. As the report is a risk management exercise, it is essential that all performance risks and issues are identified. It is recognised that not every risk can be addressed in the design; however, it is important that the major risks identified in the review are addressed. A "good news" Design Review that fails to identify key risks is of little value to anyone.

2.2 AREA AND COVERAGE DEFINITION

The coverage of the Design Review is to match the coverage of an accredited NABERS Energy Performance Rating for the building. If there is any doubt as to application of the NABERS Energy methodology for the inclusion or exclusion of a particular item of information (eg the area of a particular space or the energy associated with another space), advice should be sought from the NABERS National Administrator or a NABERS Accredited Assessor.

The area definition should identify the areas of the building within the scope of the building and provide a Schedule of Areas divided into lettable and non-lettable areas.

Areas to be excluded from the Design Review and the rating should be explicitly identified and floor areas for these components nominated.

Energy uses to be excluded from the rating should be explicitly identified, along with any metering requirements necessary to ensure that the energy can be excluded in an actual Performance Rating.

2.3 COMPUTER SIMULATIONS

OEH recommends a dynamic computer energy simulation model for projects intending to achieve 4 star performance under the base building or whole building rating, and requires it for buildings seeking to achieve a 4.5,

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5, 5.5 or 6 star performance level. It is strongly recommended that the simulation is commissioned at the earliest possible point of the design process and used to inform decisions throughout the design process.

Use the Guidelines for the use of simulations to help select the organisation to undertake the modelling. Energy consumption and greenhouse emissions should be calculated by your modeller using the latest version of a dynamic computer energy simulation model according to the NABERS Guide to Building Energy Estimation and NABERS Guide to Tenancy Energy Estimation.

2.4 ENERGY USE ESTIMATES FOR TENANCIES

For all Whole Building and Tenancy Commitment Agreements, energy use is to be estimated using the current NABERS Guide to Tenancy Energy Estimation. This Validation Protocol is to be used whenever an energy model is used to estimate tenancy energy use under NABERS Energy.

Appendix A is provided as an Excel spreadsheet – Energy Efficiency Design Review.xls, and provides the minimum scope for the independent Energy Efficiency Design Review covering the following areas:

- Envelope
- Roof
- Walls
- Windows and Shading
- Floors
- Building
- Energy Sources
- Central Plant
- Boilers
- Chillers
- Cooling Tower
- HVAC
- System Type and Operation
- System Design
- Miscellaneous Plant
- Domestic Hot Water
- Lifts
- Motors
- Exterior Lighting
- Metering and Monitoring
- Metering and Sub metering
- Monitoring
- Tenancy Lighting
- Lighting Power Density
- Lighting control
- Tenant Activities
- Office Equipment
- Occupancy Patterns
- Process Issues
- Design and Review Process
- Construction and Commissioning
- Handover