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Method Guide
NABERS Baseline

Metered Baseline Method

Energy Savings Scheme
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Document control

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1 About this guide

This guide details how the NABERS Baseline Method of the NSW Energy Savings Scheme (ESS) operates, the eligibility requirements to use the method, and how to calculate energy savings. This guide should be used by:

- applicants who are seeking accreditation, to assist them in completing their application, as well as
- those persons already accredited ie Accredited Certificate Providers (ACPs), to assist them in accurately calculating energy savings for this method.

Please refer to this guide to complete *Application Form: Part B - Method Details NABERS Baseline* (Application Form: Part B – Method Details) which can be found on the ESS Apply for NABERS Baseline webpage.[1]

2 Method overview

NABERS is the National Australian Built Environment Rating System. It is managed nationally by the NSW Office of Environment and Heritage, on behalf of Commonwealth, state and territory governments.

The NABERS Baseline Method provides a way to calculate and create Energy Savings Certificates (ESCs) reflecting the energy savings resulting from the improvement in a NABERS rating for a building. The baseline is determined by the Benchmark NABERS Rating Index, which can either be determined from:

- a previous NABERS rating, or
- the Benchmark NABERS Rating Index table[2] in the Rule (this must be used where no previous NABERS rating exists for the building).

The method provides NABERS rating holders an incentive to improve the energy performance of their buildings through the use of more energy efficient equipment and/or improved building management. Increasing the NABERS rating can enable creation of ESCs, and it has other benefits for building owners and tenants, such as increased occupancy and reduced electricity bills[3].

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1 The *Application Form: Part B – Method Details* can be found on the ESS website at: http://www.ess.nsw.gov.au/Methods_for_calculating_energy_savings/NABERS_Baseline/Apply_for_NABERS_Baseline

2 Table A20 of the Rule.

3 Newell, G MacFarlane, J Kok, N 2011, 'Building better returns–A study of the financial performance of green office buildings in Australia', Deakin: Australian Property Institute.

3 Method eligibility

A number of requirements must be met for the creation of ESCs using the NABERS Baseline Method, which are outlined below.

3.1 Energy saver

You must be the energy saver to create ESCs using the NABERS Baseline Method. There are two types of energy saver, as described in the following sections.

Energy saver by definition

Under the NABERS Baseline Method, the energy saver is the person or company specified on the NABERS rating certificate for the building being used to calculate energy savings.

Becoming the energy saver through nomination

The person or company that appears on the NABERS rating certificate can nominate a third party as the energy saver by completing a nomination form, generated from the Nomination Form Template[4] specific to this method, which is available on the ESS website.

You must have a valid nomination form completed in full prior to the end date of the first NABERS rating period for which you intend to calculate energy savings (ie, in respect of which you will create ESCs) for the relevant building.

3.2 Purchaser

The purchaser is not applicable to the NABERS Baseline Method.

3.3 Implementation and implementation date

Implementations (ie achieving new NABERS ratings) and implementation dates are used to determine the number of ESCs that are to be created and the date from which they are to be created.

An implementation under the NABERS Baseline Method is enabled by a NABERS rating for a building through any of the following NABERS tools:

- NABERS for Offices (base building, tenancy, or whole building)

[4] The Nomination Form Template can be found on the ESS website at: http://www.ess.nsw.gov.au/Methods_for_calculating_energy_savings/NABERS_Baseline

- NABERS for Hotels
- NABERS for Shopping Centres, or
- NABERS for Data Centres (IT equipment, infrastructure, or whole facility).

The implementation date is the end date of the first NABERS rating period for which you intend to calculate energy savings for a particular building. This date appears on your NABERS rating certificate and establishes the date from which you can create ESCs for that building.

ACPs need to apply to the Scheme Administrator to have new buildings added to their Notice of Accreditation. Each NABERS rating type for a particular building will have its own implementation date. For example, a NABERS tenancy rating at a building would have a different implementation date to a base building NABERS rating if the end date of their first NABERS rating period is different for each.

Example

An ACP wishes to calculate energy savings for the following buildings when there is an improved NABERS rating:

Site 1 – first NABERS rating period of 1/1/2014 to 31/12/2014. Therefore, the implementation date is 31/12/2014.

Site 2 – first NABERS rating period of 10/1/2014 to 9/1/2015. Therefore, the implementation date is 9/1/2015.

3.4 Eligible buildings

A building is eligible for the NABERS Baseline Method if the building:

- is located in NSW, and
- has a NABERS rating, or will have a NABERS rating issued by the NABERS National Administrator **before** calculating energy savings.

3.5 Calculation-specific eligibility requirements

The NABERS Baseline Method uses a benchmark NABERS rating index to calculate the benchmark (baseline) electricity consumption for a NABERS building.

The NABERS Baseline Method provides two calculation methods to calculate the benchmark NABERS rating index:

- Calculation method 1: look up the benchmark NABERS rating index in Table A20 of the Rule for the minimum NABERS rating that can be used as a baseline where:

  - no previous NABERS rating exists for the building, or
  - this is your preferred method.
- Calculation method 2: this calculation is based on a previous NABERS rating for the building.

Each of these calculation methods has specific eligibility requirements that must be met as outlined below.

Both calculation methods require you to use the NABERS rating for the **current rating year** to establish the benchmark. The current rating year is the year for which energy savings will be calculated, and is the year that the NABERS rating period ended.

3.5.1 Calculation method 1 – benchmark NABERS rating index

Calculation method 1 provides a benchmark NABERS rating index from Table A20 in Schedule A of the Rule (see Appendix A of this guide). This is determined from the respective building category and current rating year and is to be used where no previous NABERS rating exists, or where this is your preferred method.

To use this calculation method, your NABERS rating must have at least a star rating listed in Table A20 for the respective building category and current rating year.

3.5.2 Calculation method 2 – previous baseline NABERS rating

Calculation method 2 uses a baseline NABERS rating to calculate the benchmark NABERS rating index. The baseline NABERS rating is a previous NABERS rating for the same NABERS building and similar configuration (for example, with similar metering arrangements and on-site energy generation).

To be eligible to use this method, the baseline NABERS rating must meet a number of criteria:

- the NABERS rating must be at least one star greater than the benchmark NABERS rating index
- the end date of the baseline NABERS rating must be no more than seven years prior to the end date of the NABERS rating period for the current rating year, and
- the baseline NABERS rating must be of similar configuration to the current NABERS rating, as described below.

The rating period for the existing baseline NABERS rating must not overlap with the rating period for current NABERS rating year. If there is overlap, then calculation method 1 should be used.

Information used by the Scheme Administrator to determine if a previous rating has a similar configuration for a NABERS building

The Scheme Administrator considers the following when determining if a NABERS building has a similar configuration between a previous NABERS rating and current NABERS rating:

1. is the difference in each rated input between each rating 5% or less; and
2. are the sub-metering arrangements and on-site generation systems the same, where present.

For the second point, a NABERS building's sub-metering arrangements and on-site generation systems are considered the same if, at the time a building was rated under a previous NABERS rating and current NABERS rating, the following were met:

- sub-metering arrangements (if any) covered the same space as determined by the NABERS assessor for each rating, using the evidence specified in the 'NABERS Rules for collecting and using data' that is relevant to the type of NABERS rating; and
- on-site generating system (if any) nameplate capacity for each type of generation system was the same.

4 Calculation of energy savings

Once you have determined your eligibility, you can now calculate your energy savings. Energy savings under the NABERS Baseline Method are calculated using method 4c under clause 8.8 of the Rule. Methods 4a and 4b in the Rule are only applicable to persons who were ACPs as at 30 June 2014[5].

Before starting on the calculations, you will need to ensure that you use the correct NABERS rating data. A NABERS rating may include GreenPower[6], which is electricity sourced from an accredited GreenPower source. If GreenPower has been included in the NABERS rating, two ratings are provided on the NABERS rating certificate and NABERS energy rating report; one that includes

[5] Methods 4a and 4b instruct the ACP to use method 4c where their accreditation notice refers to method 4a or method 4b.

[6] GreenPower is a voluntary government accredited program that enables your electricity provider to purchase renewable energy on your household's or business' behalf.

GreenPower and one that excludes it. You must only use the rating that excludes GreenPower.

Once you have the NABERS rating, there are four steps to calculate energy savings using the NABERS Baseline Method:

3. calculate the measured electricity consumption
4. calculate the benchmark NABERS rating index
5. calculate the benchmark electricity consumption, and
6. calculate energy savings.

To be eligible for ESCs, these steps must be followed each year for each building, after certification of the NABERS rating.

4.1 Step 1 - Calculate measured electricity consumption

Measured electricity consumption is calculated using step 1 of method 4c of the Rule and is measured in MWh.

Measured electricity consumption = NABERS electricity + on-site unaccounted electricity.

NABERS electricity is the electricity accounted for in the NABERS rating, which is found on the NABERS energy rating report for a NABERS rating. This is usually reported in kWh, so it must be converted to MWh to complete the calculation.

On-site unaccounted electricity is the electricity consumed on-site from electricity generated on-site from a source that has not been accounted for in the NABERS rating. This may include solar PV or biogas generation where the fuel input has not been included in the rated energy consumption reported on the NABERS energy rating report. All energy consumption must be converted to MWh.

4.2 Step 2 - Calculate benchmark NABERS rating index

You must calculate the benchmark NABERS rating index to establish the baseline using one of the two calculation methods provided at step 2 in method 4c in the Rule.

4.2.1 Calculation method 1 - benchmark NABERS rating index

You choose the value in Table A20 that corresponds to:

a) the NABERS rating tool used for your rating

b) the year in which the rating period ended for that NABERS rating, and

c) the building category for your rating.

4.2.2 Calculation method 2 – baselines NABERS rating

The benchmark NABERS rating index is calculated using the following inputs:

- baseline NABERS rating
- baseline rating year[7]
- current rating year, and
- annual rating adjustment provided in Table A21 in Schedule A of the Rule (see Appendix A of this guide). This adjustment factor accounts for the changes in the NABERS rating scale.

The benchmark NABERS rating index is calculated as follows:

Benchmark NABERS rating index = baseline NABERS rating + annual rating adjustment × (current rating year – baseline rating year)

7 The year that corresponds to the end date of the baseline NABERS rating.

Example – calculating benchmark NABERS rating index using a previous NABERS rating

An ACP has a building with a 4 star rating for NABERS Offices – base building. The NABERS rating ends on 31/12/14. It has a 2 star rating for NABERS Offices – base building that ends on 31/12/10, which the ACP wishes to use as a baseline NABERS rating. The baseline rating year end date is less than seven years from the end date of the current rating year and therefore it is eligible for use in this method, assuming the sub-metering arrangements are similar for each NABERS rating.

The inputs for the equation above are:

- baseline NABERS rating = 2
- current rating year = 2014
- baseline rating year = 2010
- annual rating adjustment = 0.15

Using the above equation:

- benchmark NABERS rating index = 2 + 0.15 x (2014 – 2010)
- benchmark NABERS rating index = 2 + (0.15 x 4)
- benchmark NABERS rating index = 2.6

The benchmark NABERS rating index is 2.6.

Once a baseline NABERS rating is determined (and eligible) it becomes fixed and can be used to calculate energy savings for subsequent NABERS ratings. However, ESCs cannot be calculated twice for the same rating period. Once the end date of the baseline rating year exceeds the seven year limit, it must be reset using the most recent (or a subsequent) NABERS rating period for the building that was used to calculate energy savings.

Example – re-setting a baseline NABERS rating

An ACP previously calculated energy savings from a NABERS rating that ended 31/12/13. The end date of the baseline NABERS rating was 31/12/06.

The ACP now wishes to calculate energy savings using this method for a NABERS rating that ends on 31/12/14. Because the end date of the baseline NABERS rating occurred more than seven years ago, it must be reset using the most recent NABERS rating, or a subsequent rating, to calculate energy savings. Therefore, the new baseline NABERS rating will be reset using the NABERS rating that ended on 31/12/13.

4.3 Step 3 - Calculate benchmark electricity consumption

In order to proceed to this step, your NABERS rating must:

- have a star rating listed in Table A20 of the Rule (see Appendix A of this guide) if using calculation method 1, or
- be at least one star greater than the benchmark NABERS rating index calculated using calculation method 2.

Otherwise, no energy savings can be calculated using this NABERS rating.

The benchmark electricity consumption is calculated using the NABERS reverse calculators that are located under the 'Rating Calculator' tab on the NABERS website[8]. You will need to use the calculator that is applicable to your specific rating for your building (for example NABERS for Office - base building).

These calculators are updated regularly so you will need to check and download the most recent version of each calculator from the NABERS website.

Some of the NABERS reverse calculators may only accept star ratings that are in half or whole star increments. If your benchmark NABERS rating index is not accepted by a calculator, then round it down to the nearest half star or whole star.

4.3.1 Building details

The data required for the NABERS reverse calculator is provided from the following sources:

- NABERS energy rating report
- the benchmark NABERS rating index calculated at step 2 of method 4c of the Rule (see section 4.2 of this guide), and
- any on-site unaccounted electricity consumption reports for the NABERS rating period for which energy savings are to be calculated.

8 www.nabers.gov.au

4.3.2 Breakdown of overall building consumption by energy source

You must provide details of the breakdowns for each fuel type as a percentage of overall building energy consumption, which is a required input for the NABERS reverse calculator. Each fuel type has a different conversion factor. To do this, you will need to convert each fuel type to a standard unit of MWh, using the following fuel conversion factors:

- to convert MJ of gas to MWh = gas (MJ)/3,600
- to convert L of diesel to MWh = [diesel (L) x 38.6]/3,600
- to convert kg of coal to MWh = [coal (kg)/1000] x [energy content factor (GJ/t)][9] x [1/3.6].

Once you have converted usage to a standard unit, you will need to:

- add all sources of electricity (from the NABERS energy rating report and the onsite unaccounted electricity consumption reports)
- add up consumption from all fuel types in MWh, and
- calculate the percentage of overall building energy consumption for electricity, gas, coal and oil (including diesel).

4.3.3 Maximum allowable electricity use

The inputs you provide for each NABERS reverse calculator are used to calculate the maximum allowable electricity use in kWh. This figure is used as the benchmark electricity consumption figure and should be converted to MWh, by dividing the kWh by 1,000.

4.4 Step 4 - Calculate energy savings

You are now able to calculate energy savings. The data you need for this step is:

- benchmark electricity consumption from step 3, and
- measured electricity consumption for the current rating year as calculated in step 1.

The energy savings are calculated in accordance with the equation below:

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9 These should be sourced from Table 1: Fuel combustion emission factors – solid fuels and certain coal based products in the current version of the National Greenhouse Accounts (NGA) Factors. Dept. of the Environment (Aust. Govt.) 2014, *National Greenhouse Accounts Factors: Australian National Greenhouse Accounts*, viewed 10 October 2014, http://www.environment.gov.au/system/files/resources/b24f8db4-e55a-4deb-a0b3-32cf763a5dab/files/national-greenhouse-accounts-factors-2014.pdf

Energy savings = Benchmark electricity consumption – Measured electricity consumption.

If the difference is positive, this figure should be multiplied by 1.06 to provide the number of ESCs. If it is zero or negative, then there are no energy savings and no ESCs can be claimed for the current NABERS rating period.

5 Creating Energy Savings Certificates

The **Evidence Manual - NABERS Baseline Method** provides instructions on how to register ESCs from your NABERS Baseline Method implementations and details the requirements for keeping records that verify that the energy savings occurred.

The **Evidence Package** that accompanies the **Evidence Manual - NABERS Baseline Method** is available on the ESS website.[10]

6 Applying for accreditation

A completed application is required for a building owner or manager, or another organisation to become an ACP and generate ESCs.

An application has multiple parts, which are explained in the *Application Guide for ESS Accreditation* (Application Guide)[11]. As a minimum, you will have to provide:

- Application Form: Part A - General Details, available at: http://www.ess.nsw.gov.au/Methods_for_calculating_energy_savings/NABERS_Baseline/Apply_for_NABERS_Baseline
- Application Form: Part B - Method Details, available at http://www.ess.nsw.gov.au/Methods_for_calculating_energy_savings/NABERS_Baseline/Apply_for_NABERS_Baseline

For a full explanation of the process, please read the Application Guide.

10 http://www.ess.nsw.gov.au/Methods_for_calculating_energy_savings/NABERS_Baseline
11 http://www.ess.nsw.gov.au/How_to_apply_for_accreditation

7 Glossary

NABERS Baseline Method definitions

Term	Definition
ACP	Accredited Certificate Provider. A person accredited under the Rule to create ESCs for recognised energy saving activities.
Annual rating adjustment	An adjustment factor (0.15), used to calculate the benchmark NABERS rating index by subtracting the baseline rating year from the current rating year and multiplying the difference by 0.15.
Baseline NABERS rating	A previous NABERS rating for the same NABERS building and similar configuration (metering arrangements and on-site energy generation).
Baseline rating year	The year that corresponds to the end date of the NABERS rating that is used as the baseline to determine the benchmark NABERS rating index using calculation method 2.
Benchmark NABERS rating index	The star rating used to calculate the maximum allowable electricity consumption for the building.
Current rating year	The year that corresponds to the end date of the NABERS rating period that is used to calculate energy savings.
Energy saver	Refer to section 3.1 of this guide.
Energy saving certificate	A certificate created under the ESS from a recognised energy saving activity and equals 1 tonne of CO_2
ESC	Energy Savings Certificate
ESS	Energy Savings Scheme
Rule	Energy Savings Scheme Rule of 2009
Implementation	Refer to section 3.2 of this guide
NABERS	National Australian Built Environment Rating System
NABERS Baseline Method	A calculation method from the Rule that uses a NABERS rating to calculate energy savings for a NABERS building.
NABERS building	A building that has been rated under NABERS.
NABERS electricity	The electricity accounted for in the NABERS rating for a NABERS rating period, reported in the NABERS energy rating report.
NABERS rating	A certified energy rating, expressed as a number of stars, for a NABERS building.
NABERS rating period	The 12 month period for the NABERS rating that is used to calculate energy savings.
NABERS reverse calculators	Tools provided by the NABERS National Administrator that are used to calculate the maximum allowable electricity consumption, for the purpose of calculating the benchmark electricity consumption for a building.
RESA	Recognised Energy Saving Activity

Appendices

A Activity definitions and equipment requirements

7.2 Calculation method 1

Table A20 from Schedule A of the Rule - benchmark NABERS rating index

NABERS Rating tool	Building category	Year of NABERS Rating End Date							
		2013	2014	2015	2016	2017	2018	2019	2020
Offices	Built prior to 1 November 2006	3.7	3.9	4.0	4.2	4.3	4.5	4.6	4.8
Offices	Built after 1 November 2006	4.7	4.9	5.0	5.2	5.3	5.5	5.6	5.8
Hotels	Built prior to 1 November 2006	2.8	3.0	3.1	3.3	3.4	3.6	3.7	3.9
Hotels	Built after 1 November 2006	3.8	4.0	4.1	4.3	4.4	4.6	4.7	4.9
Shopping Centres	Built prior to 1 November 2006	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4
Shopping Centres	Built after 1 November 2006	4.3	4.5	4.6	4.8	4.9	5.1	5.2	5.4
Data Centres	Built prior to 1 November 2006	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1
Data Centres	Built after 1 November 2006	4.0	4.2	4.3	4.5	4.6	4.8	4.9	5.1

7.3 Calculation method 2

Table A21 from Schedule A of the Rule - NABERS annual rating adjustment for benchmark NABERS rating index

NABERS Rating tool	Building category	Annual Ratings Adjustment
Offices	All	0.15
Hotels	All	0.15
Shopping Centres	All	0.15
Data Centres	All	0.15