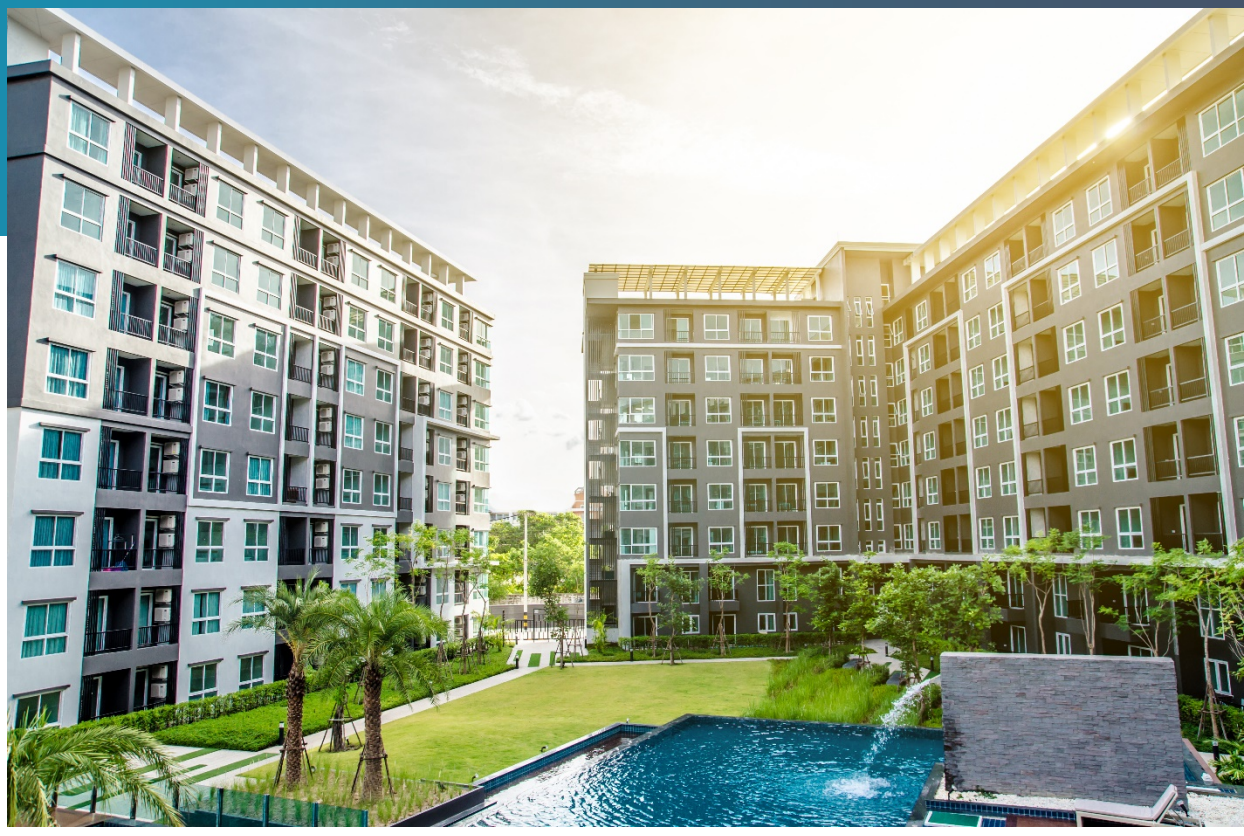
NABERS

NABERS Energy and Water Ratings for Apartment Buildings

The Rules

VERSION 1.1



Formatting conventions used in this document

Text appearing with a grey tint in the background is explanatory text only. It is not part of the Rules

Text appearing **dark blue and bold** is a defined term, as explained in Section 3 *Definitions*.

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Contents

1 The Rating and The Rules

The National Australian Built Environment Rating System (NABERS) is a performance based rating system managed by the **National Administrator.**

To obtain a NABERS for Apartment Buildings energy or water rating, an **Assessor** accredited by NABERS must use the Rules as set out in this document, and any other Rulings as issued by the **National Administrator**.

1.1 Key Terms used in the Rules

The language used in this document is intentionally generic as there are many different ways (and terminology) in which apartment buildings are owned and managed across Australia.

Throughout the Rules the following key terms are used. Due to their frequency they are not highlighted in the same way that other defined terms are highlighted throughout the document.

- **Scheme** refers to the entity being rated – in most cases a single strata scheme consisting of apartments; an apartment building.

1.
- **Body corporate** refers to the entity that owns or controls the common areas, common services and common facilities – such as an owners corporation, strata company etc. This does not need to be a legal entity in itself.

2.
- **Mixed use scheme** refers to more than one use type within a single scheme, for example commercial and residential lots in the same scheme.

3.
- **Layered arrangement** refers to a development where a scheme shares some or all utility meters, services and facilities with other schemes or legal entities. A registered plan or management document will exist that specifies each party's entitlement, responsibility and financial contribution towards the operation and upkeep of each of the shared resources.

  In some cases it may make the most sense to rate the entire layered arrangement in one rating, and NABERS allows for this. However, where metering allows for separate schemes to be rated, Assessors should do this.

- **Paid for by the body corporate** refers to, if the body corporate:
  - pays directly for the energy and/or water consumption; or
  - makes a financial contribution towards the energy and/or water consumption for services and facilities shared in a layered arrangement; or

- does not recoup any of those costs from apartment owners or occupants based on sub-metered usage to apartments.

Note: This term is also applicable to body corporates that are “limited owners corporations” in Victoria where their lot owners also pay fees directly to other body corporates in a layered arrangement that contribute towards the energy and/or water consumption for services and facilities they share.

The table below shows how the NABERS key terms relate to the different terms used in each of the states.

NABERS Rules	ACT	NSW	NT	QLD	SA	TAS	VIC	WA
body corporate	owners corporation	owners corporation	body corporate	body corporate	strata corporation	body corporate	owners corporation	strata company
common property	common property	common property	common property	common property	common property	common property	common property	common property
lot	unit	lot	lot	lot	lot	lot	lot	lot
scheme	units plan	strata scheme	unit title scheme	community titles scheme	strata scheme	strata scheme	owners corporation	strata scheme
strata plan	units plan	strata plan	plan of subdivision	survey plan + community management statement	strata plan	strata plan	plan of subdivision	strata plan

1.2 What questions does the assessor need to answer?

All schemes are different, and the Rules are designed to let even the most complex schemes be rated.

The ratings for most schemes can be simplified to the following:

- Collecting 12 months of energy and/or water bills as paid for by the body corporate;
- Answering the following questions and verifying the answers on a site visit

Rating Type	Questions	Section in the Rules
Energy and Water	How many apartments are there?	Section 5
Energy and Water	Are apartments provided with air conditioning or condenser water from a central system?	Section 6.3.1

Rating Type	Questions	Section in the Rules
Energy and water	Does the scheme share facilities and services through a layered arrangement? If so, then the associated energy and water use must be included in the rating.	Section 12
Energy and Water	Is it a mixed use scheme? If so, then consumption used **solely** by non-residential lots can be excluded.	Section 9.4.3
Energy	How many lift serviced apartments are there?	Section 6.3.2
Energy	Is there a pool, and is it heated?	Section 6.3.3
Energy	Is there a gym?	Section 6.3.3
Energy	How many car parking spaces are there and are they mechanically ventilated?	Section 8
Water	Do apartments have their own cold water meters?	Section 7.3.1
Water	Are apartments provided with domestic hot water from a central system?	Section 7.3.1

2 Background – What does the tool cover?

At their simplest, the NABERS for Apartment Buildings ratings provide a star rating for the energy and water consumption of the common property in a scheme.

Whilst this gives a simplified understanding, significant variation in how schemes are structured means that the rating is often more complex in practice.

NABERS has adopted the following key principles in the development of the benchmark and these Rules to ensure a meaningful comparison.

The principles listed are provided for background and reference only, and must not be used solely by the Assessor to determine the boundary of the rating. The Assessor must first use the requirements outlined in the Rules.

Where an Assessor is unsure of the rating boundaries, what consumption to include, or any other matter, they must contact the **National Administrator** for clarification – nabers@environment.nsw.gov.au.

2.1 Paid for by the body corporate

If the body corporate:

- pays directly for the energy and/or water consumption; or
- makes a financial contribution towards the energy and/or water consumption for services and facilities shared in a layered arrangement; and
- does not recoup any of those costs from apartment owners or occupants based on sub-metered usage to apartments;

then this consumption has been included in the benchmark.

For most schemes, all energy and water consumption associated with common property must be included in the calculation of the rating.

In many schemes, some energy and/or water consumption used in the apartments is also paid for by the body corporate. The benchmark has been designed to adjust for this, allowing these schemes to be rated fairly. The most common example is where there is a single water meter for the whole scheme.

Note: This term is also applicable to body corporates that are “limited owners corporations” in Victoria where their lot owners also pay fees directly to other body corporates in a layered arrangement that contribute towards the energy and/or water consumption for services and facilities they share.

2.2 Exceptions for fair comparison

NABERS makes the following exceptions to allow for fair comparison between schemes.

Energy consumption of central domestic hot water systems

NABERS recognises that in a small number of schemes, gas consumption associated with central domestic hot water systems, which provides hot water to apartments, is paid by the body corporate. This consumption has not been included in the benchmark. Recognising this and maintaining a fair comparison between schemes, energy associated with a central domestic hot water system can be excluded from a scheme's rating, even though it may be paid for by the body corporate.

Where a central domestic hot water system provides gas to common property uses (for example a shower in a pool or gym) this must be included.

Commercial and retail lots

NABERS only rates the residential component of the scheme. Where schemes also have commercial and retail lots, the energy and water consumption that is paid by the body corporate and is directly and **solely** associated with these lots can be excluded from the rating to ensure fair comparison of schemes. Energy and water consumption for shared services and facilities must be included in full.

Required energy and water consumption

In a very small number of schemes, there may be energy and water consumption which is consumed by the common property of the scheme, but not paid for by the body corporate. For example, where the common area lighting of a scheme is fed through individual apartment distribution boards, and is paid for by the residents in these apartments. There are a number of such categories where NABERS requires the inclusion of this energy and water consumption, even where it is not paid for by the body corporate. More information on these categories can be found in Section 9 *Energy and water coverage.*

2.2.2 Where the body corporate has some degree of control - Layered arrangements

Where a scheme exists in a layered arrangement and shares facilities or services with other schemes or entities, the rating must include the proportion of related consumption that the body corporate has a degree of control over.

In this principle "degree of control" refers to where the scheme has control or ownership over shared facilities or services, or has voting rights which relate to the consumption.

This requirement may mean that it could be easier or more appropriate to rate multiple strata schemes in one rating. This is allowed.

3 Definitions

3.1.1 Definitions

The following table provides terms and associated definitions which must be used when interpreting this document.

Term	Definition
Acceptable data	**Data** which meets the applicable accuracy and validity requirements of these Rules. Acceptable **data** does not include **unacceptable estimates**.
Acceptable estimate	**Acceptable estimates** are values derived from an estimation method permitted by these Rules in place of incomplete or uncertain **data**. **Acceptable estimates** can still only make up 5% of the rating, referred to as the **potential error**.
Apartment	An **apartment** is considered to be a self-contained unit of accommodation comprising kitchen, sleeping, living and bathroom facilities within a building that contains many such residential dwellings.
Apartment Building	A **apartment building** contains multiple apartments in a configuration that includes dwellings stacked vertically and linked via common access ways.
Assessor	An Accredited **Assessor** of the NABERS scheme, authorised by the **National Administrator** to conduct accredited ratings specifically for apartment buildings.
Auditor	A person contracted to the **National Administrator** to perform audits of NABERS rating applications.
Billing Period	The continuous 12-month period of **data** which is used for an individual meter in the rating.
Commitment Agreement	The **Commitment Agreement** allows developers and building owners to promote and market excellent greenhouse performance of new and refurbished **apartment buildings** from the design and construction phases.
Data	Information which depends for its accuracy on: • measurements to a known standard of accuracy, or • verified specifications with a given tolerance for accuracy, or • other objective evidence.
End use	A purpose or activity that water or energy is used for.

Term	Definition
Estimate	Information relying on an **Assessor's** subjective judgement of the values to be used in place of incomplete or uncertain **data**. NABERS considers estimates to either be **acceptable estimates** or **unacceptable estimates** for the purposes of the rating. Acceptable estimates are added to the **potential error** of the rating. **Unacceptable estimates** cannot be used.
Material	Energy and water consumption that accounts for more than 1% of the total greenhouse gas emissions and total water consumption of the scheme for a NABERS rating, respectively.
Metering system	Device(s) providing an individual measurement which includes all of the following: • the meter; and • the processes that convert the initial meter signal into an energy reading (for example, current transformers and K factors for electricity meters and pressure correction factors for gas meters); and • the interface through which the meter reading is taken (for example, manual readings, **utility** software or a Building Management System).
NABERS Calculator	The rating calculator provided by NABERS for use by **Assessors** in the calculation of accredited ratings.
National Administrator	The body responsible for administering the NABERS scheme, in particular for: • establishing and maintaining the standards and procedures; and • determining issues that arise during the operation of the scheme and the making of ratings; and • accrediting **Assessors** and awarding accredited ratings in accordance with NABERS standards and procedures.
Non-utility meter	An energy or water meter that is owned or operated by a third party other than a **utility**. In case of embedded networks, where the embedded network provider does not own or operate the network meters, they qualify as being non-utility meters.
Occupant	A person living in an apartment within the **scheme**.

Term	Definition
Potential error	The total of all estimates (including assumptions, approximations, and unverified **data**) included in the rating assessment. The **Potential error is** capped at 5%, beyond which a scheme becomes unrateable. The rating calculator automatically calculates the **potential error** based on the **data** provided. Refer to Section 13.2 *Appendix B - Accuracy calculation procedure* for more information on how the **potential error** is calculated.
Rating period	The period of 12 months of **data** upon which the rating is based.
Ruling	An authoritative decision by the **National Administrator** which acts as an addition or amendment to the **Rules**.
Source	A type of energy or water supply, e.g. electricity, GreenPower™, gas, diesel, renewable energy, recycled water etc.
Unacceptable estimate	**Unacceptable estimates** are values used in place of incomplete or uncertain **data,** derived from an estimation method **not** permitted by the **Rules** and cannot be included in the rating.
Utility	An organisation or company that sells energy or water. This definition may include embedded network providers, where they own and operate the network meters.
Utility meter	An energy or water meter that is owned and operated by a **utility**.
Validation	The process of checking a **metering system**, and if necessary adjusting and re-checking, to ensure its measurements of consumption are correct.
Validity period	A NABERS rating is based on twelve months of **data**, called the **rating period**. Once certified, the rating is valid for up to twelve months, called the **validity period**.
Verification	Confirmation by examination and objective evidence that specified requirements have been met (usually, that **data** is accurate and correct), for example by: • comparison of independent measurements or observations, or of measurements and specifications; or • logical or statistical analysis of **data** for consistency with known requirements.

3.1.2 Key Terms and Category Definitions

These definitions are not highlighted throughout the document, but provided here for reference for the assessor. The assessor must also review the reference section for full details.

Item		Definition	Reference
Key Terms	Scheme	Scheme refers to the entity being rated – in most cases a single strata scheme consisting of apartments; an apartment building.	Section 1.1
	Body Corporate	Body corporate refers to the entity that owns or controls the common areas, common services and common facilities.	Section 1.1
	Paid for by the body corporate	Paid for by the body corporate refers to, if the body corporate: • pays directly for the energy and/or water consumption; or • makes a financial contribution towards the energy and/or water consumption for services and facilities shared in a layered arrangement; and • does not recoup any of those costs from apartment owners or occupants based on sub-metered usage to apartments;	Section 1.1
	Mixed use scheme	Mixed use scheme refers to more than one use type within a single scheme, for example commercial and residential lots in the same scheme.	Section 1.1
	Layered arrangement	Layered arrangement refers to a development where a scheme shares some or all utility meters, services and facilities with other schemes or legal entities.	Section 1.1
	Total apartment count	A count conducted by an **Assessor** of the total number of apartments in a scheme, in accordance with the NABERS rules.	Section 5
Service Categories for Energy	Lift serviced Apartment	An apartment is considered to be a lift serviced apartment if the building in which the apartment is located has a lift(s) or escalator(s) that provides transportation between all floors of the building (a one floor exception is allowed) and is for general occupant use.	Section 6.3.2
	Centrally air-conditioned apartments	An apartment is considered to be a centrally air-conditioned apartment if it is part of the total apartment count and has heating (outside climate zones 1 & 2) **and** cooling services where the energy consumption is paid for by the body corporate.	Section 6.3.1

Item		Definition	Reference
	Condenser water serviced apartments	An apartment is considered to be a condenser water serviced apartment if it has a connection to a condenser water service (pump, heat rejection device) where the energy consumption is paid for by the body corporate; and the energy consumption of the air conditioner which uses this service as a heat source or sink is not paid for by the body corporate.	Section 6.3.1
	No central air-conditioning service apartments	An apartment is considered to be a no central air-conditioning service apartment if it does not qualify as being a centrally air-conditioned apartment or a condenser water serviced apartment.	Section 6.3.1
	Swimming pool	The scheme can be considered to have a swimming pool if there is one or more heated or non-heated swimming pools that some **occupants** have access to and the energy usage, or part of the energy usage associated with the swimming pool is paid for by the body corporate. Swimming pools are categorised as heated if there is temperature control with active heating or cooling of the pool water that is enabled for operation for at least one month each year	Section 6.3.3
	Gym	The scheme can be considered to have a gym if the gym is a minimum of 25m^2 and the energy usage, or part of the energy usage associated with the gym is paid for by the body corporate.	Section 6.3.3
Service Categories for Water	Central air-conditioning service (water)	An apartment is considered to be a central air-conditioning service (water) apartment if the apartment is a centrally air-conditioned apartment (Section 6.3.1); or the apartment is a condenser water serviced apartment (Section 6.3.1)	Section 7.3.2
	Centrally metered water supply	An apartment is considered to be a centrally metered water supply apartment if the apartment does not have a utility operated cold water meter dedicated to the cold water supply of that apartment; and acceptable data is not available through which individual apartment water use can be identified.	Section 7.3.1
	Apartment water meter with central domestic hot water	An apartment is categorised as an apartment water meter with central domestic hot water if the cold water use of the apartment is measured by its own utility meter; and there is a central domestic hot water system that supplies hot water to this and other apartments. This means domestic hot water is provided to the apartment in a way that bypasses the apartment's own cold water meter; and acceptable data is not available through which individual apartment domestic hot water use can be identified.	Section 7.3.1

Item		Definition	Reference
	Apartment water meter with no central domestic hot water	An apartment is categorised as apartment water meter with no central domestic hot water if the cold water use of the apartment is measured by its own utility meter; and there is no central provision of domestic hot water. This means domestic hot water is provided to the apartment via its own cold water meter and heated downstream of the meter.	Section 7.3.1

4 Key Concepts

4.1 How is a rating awarded?

An accredited NABERS rating is awarded when the **National Administrator** certifies a rating completed by an **Assessor**. The **National Administrator** may independently audit the rating and assist in resolving complex technical issues.

In order to complete a rating the **Assessor** must refer to:

- The Rules (this document); and
- Rulings – rules released by the **National Administrator** which add to the Rules; and
- The **NABERS Calculator** – a tool which processes the **data** from the scheme and calculates the rating.

4.2 How should Assessors interpret the Rules and Rulings?

Assessments for an accredited rating must comply with the version of the Rules and any relevant Rulings current on the day the rating application is lodged to NABERS, unless the **National Administrator** has specifically approved otherwise in writing.

A Ruling takes precedence if there is any conflict with the Rules. If there is a conflict between Rulings, the most recent takes precedence.

All Rulings and new versions of the Rules are published on the NABERS website www.nabers.gov.au.

4.2.1 What if a situation is not covered by the Rules?

The Rules are intended to cover most schemes, however there may be situations which are not completely covered. The **Assessor** must contact the **National Administrator** if this occurs, or if they are unsure about how to apply the Rules.

Where an **Assessor** is unsure how to apply the Rules, the **National Administrator** may resolve the issue through interpretation of the Rules or advising to use a specific procedure that aligns with the intention of the Rules. Written correspondence from the **National Administrator** is required as evidence.

A procedure not in the Rules may only be used for a particular rating with prior written approval from the **National Administrator**. Approval to use the same procedure must be sought from the **National Administrator** each time it is proposed to be used. Approval is entirely at the discretion of the **National Administrator**.

4.3 The rating period

A NABERS rating is based on twelve months of **data**, called the **rating period**. Once certified, the rating is valid for up to twelve months, called the **validity period**.

It takes time for the **Assessor** to complete a rating, so 120 days is given to lodge the rating after the end of the **rating period**. Ratings lodged after the 120 days will have a reduced validity period to ensure all ratings are based on current **data**.

The **Assessor** must also respond to all questions from the **National Administrator** within 10 working days.

More information on the **rating period**, **validity period** and time limits for submission can be found in Section 13.5 *Appendix E – The rating period*.

4.4 Newly built or major refurbishment

New buildings or buildings subject to major refurbishment can begin the **rating period** for a NABERS rating 1 year after all residential lots have been financially settled. If the **Assessor** is unsure whether this condition has been met, and the development is less than 4 years old, contact the **National Administrator**.

This means that a new building may obtain a NABERS rating 2 years after financial settlement, once they have 12 months of operational **data**.

Schemes subject to a **Commitment Agreement** must follow the requirements in the Commitment Agreement contract.

4.5 Acceptable data and acceptable estimates

An assessment for an accredited NABERS for Apartment Buildings rating must be based on the **data** or **acceptable estimates** specified in the Rules (including applicable **Rulings**) or as directed by the **National Administrator**.

4.5.1 Standards for acceptable data and acceptable estimates

Data

If accurate and verifiable **data** is available, it must be used. Where a section of the Rules allows more than one type of data source to be used and no particular priority is given, the following order of preference applies:

1) **data** obtained directly by the **Assessor**.

2) **data** provided by a third party without a significant interest in the operation or performance of the scheme or its equipment (such as an energy or water utility or a consultant engaged to provide independent advice) including:

   - documents or other records provided by a third party which can be verified by the source (for example, utility bills); or

- documents or other records which cannot be independently verified but whose authenticity and accuracy is attested to by a credible and responsible person; or
- verbal information provided by a credible and responsible person, recorded in writing by the **Assessor** with the full name, position and contact details of the person giving the information.

3) **data** provided by the scheme commissioning the rating, or a third party with a significant interest in the operation or performance of the scheme or its equipment (such as a facility manager, technical contractor or equipment supplier) including:

- documents or other records provided by a party to an agreement or transaction which can be verified by another party to the same agreement or transaction (for example, contracts or other legal agreements);
- documents or other records which cannot be independently verified but whose authenticity and accuracy is attested to by a credible and responsible person; or
- verbal information provided by a credible and responsible person, recorded in writing by the **Assessor** with the full name, position, and contact details of the person giving the information.

Acceptable estimates

If **acceptable data** is not available, **estimates** (including assumptions, approximations and un-validated **data**) can be used if they are deemed to be **acceptable estimates** by the Rules.

Acceptable estimates must total to no more than ± 5% of the overall rating, as calculated using the **NABERS Calculator**. This limit is referred to as the **potential error**.

Where the **potential error** is greater 5%, the scheme cannot be rated until sufficient **acceptable data** and/or **acceptable estimates** are obtained to reduce the **potential error** below 5%.

Please refer to Section 13.2 *Appendix B - Accuracy calculation procedure* for more information on how the **potential error** is calculated.

4.6 Site visit

Assessors must visit the scheme to be rated during their assessment in order to:

- become familiar with the layout, services and features of the scheme; and
- confirm that documentation provided for the assessment is accurate, complete and up-to-date; and
- confirm servicing and metering configurations; and
- check that apartments have been correctly included in the total apartment count; and

- check for inclusions and exclusions to the energy and water coverage (Refer to Section 9 *Energy and water coverage)*; and
- visit plant rooms to ensure that all relevant equipment is covered under the meters included in the rating; and
- verify that the type of usage of the scheme is consistent with the intent of the rating tool (Refer to Section 5.3.1 *What is an apartment*?) ; and
- confirm if the scheme is mixed use scheme or if it is part of a layered arrangement; and
- resolve any other issues that arise.

The site visit must take place during or up to 120 days after the **rating period**. This is to ensure the visit is relevant to the rating.

In most cases, the **Assessor** does not need to inspect the interior of the apartments.

There may be circumstances where access to part of the common property of the scheme is refused on safety or security grounds. The **Assessor** must explain why they could not access these spaces and fully document the reasons on the rating application. If there are known impacts on the quality of the information obtained for the assessment (for example, an **acceptable estimate** must be used in the absence of verified **data**) then these must also be fully described.

Only **Assessors** can undertake a site visit for a NABERS rating. If the **Assessor** cannot conduct the site visit, they may delegate this task to another **Assessor** accredited specifically for Apartment Buildings.

The **Assessor** submitting the rating is responsible for the accuracy of the **data** and must make sure that the visit follows the rules. The **Assessor** must obtain and retain all the evidence required to prove their assumptions for auditing purposes.

If there are significant difficulties visiting the scheme's common property, please discuss with the **National Administrator**.

4.7 Documentation and record-keeping

4.7.1 Documentation required

An assessment may be based on copies of original documents such as utility bills, strata plans and other records as long as the **Assessor** is satisfied that they are, or can be verified to be, true and complete records of the original documents or files. Access to original documents is highly desirable if they are available.

Summaries or other derivative documents that quote the original source documents are not the same as verifiable copies of the originals.

4.7.2 Records to be kept by Assessors for seven years for audit

Assessors must keep all records on which an assessment is based. The records kept by **Assessors** must be to such a standard that it would be possible for another **Assessor** or an **Auditor** to accurately repeat the rating from only the documents provided.

This includes records of assumptions and all information and calculations used as the basis for **acceptable estimates**. The records kept must be the actual documents used for the assessment or verifiable copies. Summaries are not acceptable.

Digital copies of documents are considered acceptable in all cases.

Records must be kept for seven years from the date the rating application was lodged.

5 Total Apartment Count

5.1 Summary

NABERS for Apartment Buildings ratings are created by making adjustments to the benchmark based on key scheme variables. One of these variables is the total number of apartments in the scheme.

This information is used in the rating as a basic index for the size of the common property.

5.2 Process overview

	Step	Reference
1	Ensure that the minimum requirements for the rating have been met	Section 5.3
2	Identify all apartments	Section 5.4
3	Identify any periods where apartments were not habitable	Section 5.4.1

5.3 Minimum requirements for a rating

5.3.1 What is an apartment?

For the purposes of a NABERS for Apartment Buildings rating an apartment is considered to be a self-contained unit of accommodation comprising kitchen, sleeping, living and bathroom facilities within a building that contains many such residential dwellings.

This includes:

- Apartments used for long term residential occupancy;
- Apartments used as casual short-term accommodation or serviced apartments;

providing they have the facilities described above.

Under the National Construction Code definitions, that part of the scheme that is being rated would typically be classified as the common property of a Class 2 building. Developments classified as Class 1b and Class 3 would typically not be rated.

5.3.2 Minimum Requirements

In doing the total apartment count, the **Assessor** must verify that the scheme meets the minimum requirements for a rating. In order to be eligible for a rating the scheme must contain multiple apartments in a configuration that includes:

- At least 4 apartments in total; and
- At least 2 apartments stacked vertically; and
- One or more points of entrance to the scheme footprint that serve more than one apartment.

These apartments must have been habitable during the rating period. This ensures there is sufficient common property to be rated.

5.4 Counting the total number of apartments

As part of undertaking a NABERS rating, **Assessors** must count the total number of apartments within the scheme. This count must be verified by the **Assessor** by one of the following methods (listed in order of preference):

- reference to the strata plan or as-built plans that show the number of apartments
- reference to other evidence such as an apartment directory or letterboxes from within the scheme
- physical identification of apartments during the site visit

Currency of information

The **Assessor** must verify that the total apartment count matches the configuration of the scheme during the **rating period**.

Changes to apartment layouts

If two apartments have been combined into one, or one split into two, the **Assessor** may count the arrangement as is currently in place as long as evidence can be provided (for example reference to the apartment directory or photographs of the letterboxes).

For dual-key apartments, where one door leads to two apartments, two apartments must be counted regardless of whether it is used as one or two apartments.

5.4.1 Adjusting for habitability

An apartment is habitable at all times other than when it is still under construction and is not occupied. The end of the construction is determined on the basis of the issue of an occupancy certificate.

Casual refurbishment or renovation of an apartment is not counted in the consideration of habitability. The **Assessor** must identify all periods of uninhabitability and confirm all apartments were habitable for the number of days included in the rating.

An apartment that is vacant but habitable must be included in the total apartment count.

If an apartment is uninhabitable, then the **Assessor** must determine the number of days in the **rating period** for which each apartment was habitable**.** The proportion of the **rating period** during which each apartment was habitable is then used as an adjustment factor when counting the affected apartment in both the number of apartments and the subsequent service categories. The number of days that the apartment was habitable must be recorded on the total apartment count.

The following scenario illustrates this principle.

A scheme with 100 apartments undergoes major repairs to a number of floors, making 25 apartments uninhabitable for 80 days. The effective number of apartments is:

75 apartments + 25 apartments x (365-80) days /365 days = 94.5 apartments

5.5 Documentation required

The **Assessor** must provide the following documentation complying with Section 4.5 *Acceptable data and estimates*:

- Written confirmation that the minimum requirements for the rating have been met; and
- Strata plans or as-built plans from which the number of **apartments** can be counted; or
- Photographic evidence of apartment directories, letterboxes or similar that demonstrate the number of **apartments**; or
- **Assessor's** notes listing a count of **apartments** on each floor including:
  - A list of floor numbers;
  - A list of apartment numbers for each floor; and
  - A photograph of the apartment number for the highest numbered-apartment on each floor; and
- Written evidence for periods in which apartments were not habitable, or habitable for the entire rating period, as the case may be.

The total apartment count must align with the information provided by apartment in

- Sections 6 *Service Categories for Energy;* and
- Section 7 *Service Categories for Water;* and
- Section 8 *Car Parking Spaces – Energy only.*

Some schemes have "missing" floors, e.g. no floor 4 or no floor 13. The **Assessor** must ensure that documentation is sufficient to show that these floors are genuinely absent rather than merely missing from the rating documentation.

6 Service Categories for Energy

6.1 Summary

The NABERS for Apartment Buildings ratings categorise schemes based on the services **paid for by the body corporate** comprising:

- common property services & facilities, and
- services provided by the body corporate to apartments, even if in other schemes these services might be the personal expenses of owners and/or occupants.

These categories are defined by NABERS and are different for the Energy and Water Ratings.

The categories allow NABERS to make adjustments for schemes with different levels of central servicing for fair comparison.

For most schemes there will only be one choice in each service category. For schemes where the body corporate provides and pays for different services to different apartments, this chapter also outlines how to calculate the rating.

6.2 Process

6.2.1 Process overview

	Step	Reference
1	Refer to the total apartment count. Only apartments included within the total apartment count need to be categorised. Note that the number of apartments attributed in each category should be adjusted to reflect habitability.	Section 5
2	For each apartment, determine whether it can be counted as a centrally air-conditioned apartment. If it can then count it as such.	Section 6.3.1
3	For each apartment that is not a centrally air-conditioned apartment, determine whether it can be counted as a condenser water serviced apartment. If it can then count it as such.	Section 6.3.1

	Step	Reference
4	All apartments that cannot be categorised as being a centrally air-conditioned apartment or a condenser water serviced apartment are counted as no central air-conditioning service apartments.	Section 6.3.1
5	For each apartment, determine whether it can be counted as a lift serviced apartment. If it can then count it as such.	Section 6.3.2
6	For the scheme (**not** the apartments), determine whether it has one or more swimming pools.	Section 6.3.3
7	For the scheme (**not** the apartments), determine whether it has one or more gyms.	Section 6.3.3

6.3 Service Categories for Energy Definitions

6.3.1 Central air conditioning services

Each apartment must be categorised into one of the categories listed in this section.

Centrally air-conditioned apartments

An apartment is considered to be a centrally air-conditioned apartment if:

- it is part of the total apartment count; and
- has heating **and** cooling services where the energy consumption is paid for by the body corporate.

It is not necessary for local air circulation fans to be included within this energy supply. In addition, apartments with only fan energy paid for by the body corporate do not fall in this category.

In tropical and sub-tropical regions (National Construction Code climate zones 1 and 2) it is not necessary for an apartment to be provided heating to qualify as a centrally air-conditioned apartment.

In the situation where only central cooling (no heating) is provided outside of tropical and sub-tropical zones, the apartments do not qualify as being centrally air-conditioned apartments. The apartments may qualify as being either condenser water serviced apartments or no central air-conditioning service apartments, as detailed below.

If the scheme only provides heating in any location the scheme is classified as no central air conditioning serviced.

Condenser water serviced apartments

An apartment is considered to be a condenser water serviced apartment if:

- It is part of the total apartment count; and
- Has a connection to a condenser water service (pump, heat rejection device) where the energy consumption is paid for by the body corporate; and

- The energy consumption of the air conditioner which uses this service as a heat source or sink is not paid for by the body corporate.

No central air-conditioning service apartments

An apartment is considered to be a no central air-conditioning service apartment if it does not qualify as being a centrally air-conditioned apartment or a condenser water serviced apartment.

Apartments serviced differently

Some schemes may have different levels of air-conditioning available to apartments. For example, central condenser water may be provided to only some apartments.

The Assessor must provide a separate count of apartments under each arrangement if more than one arrangement exists.

This only applies to air conditioning services (not to other features such as pools and gyms) that are part of common property but only accessible to some of the apartments.

6.3.2 Lift serviced apartment

Each apartment must be assessed to determine if it is a lift serviced apartment.

An apartment is considered to be a lift serviced apartment if the building in which the apartment is located has a lift(s) that provides transportation between all residential floors of the building except one.

This means the lift should serve all the floors except one to be counted as a lift service for NABERS – i.e. in a 12 floor building, the lift can serve 11 floors, where occupants are required to walk to the top floor.

The lift must also be for general occupant use, rather than being a dedicated goods or service lift. Ground floor apartments are included in this count, even if they do not require the lift for access.

6.3.3 Scheme categories

For NABERS Energy ratings, the scheme may be categorised into the additional following energy service categories:

- Swimming pool; and
- Gym.

Swimming pool

The scheme can be considered to have a swimming pool if:

- There is one or more heated or non-heated swimming pools that some **occupants** have access to; and
- The energy usage, or part of the energy usage associated with the swimming pool is paid for by the body corporate.

Swimming pools are categorised as heated or unheated as follows:

- A swimming pool that is heated or cooled and enabled for operation for at least one month each year is counted as heated.

The **Assessor** must determine whether the pool has been available for use for the **rating period.**

If a pool has been closed for maintenance or otherwise unavailable to **occupants** for more than 1 month the **Assessor** must determine the proportion of the year (to the nearest whole month) that the occupants have had access to at least one swimming pool.

Gym

The scheme can be considered to have a gym if:

- There is one or more gyms that are permanent; and
- Some **occupants** have access to; and
- The gym is more than 25m^2 in size; and
- The energy usage, or part of the energy usage associated with the gym is paid for by the body corporate.

Make-shift areas or areas that have been temporarily allocated for gym equipment do not qualify as a gym. If a gym has been closed for maintenance or otherwise unavailable to **occupants** for more than 1 month the **Assessor** must assess the proportion of the year (to the nearest whole month) that the occupants have had access to at least one gym.

6.4 Documentation required

6.4.1 Apartment count

Evidence used in Section 5 *Total Apartment Count* is required, including adjustments for habitability which should be applied in all servicing categories.

This means the numbers of apartments counted in service categories should equal the total number of apartments adjusted for habitability.

6.4.2 Central air conditioning

The following documentation is required:

- Mechanical schematic plans indicating the provisioning of central air-conditioning services to apartments; and/or
- **Assessor's** description of mechanical services including diagrams showing the servicing arrangements and photographs of key equipment items including:
  - For centrally air-conditioned apartments: chillers and boilers or Variable Refrigerant Flow (VRF) condensers
  - For condenser water serviced apartments: cooling towers

No documentation is required for schemes that are entirely comprised of no central air-conditioning service apartments.

6.4.3 Lift serviced apartments

The documentation required for lift serviced apartments is:

- The number of floors in the building in which the apartment is located (**Assessor** statement is sufficient); and
- For a building with more than 6 floors including the ground floor, no further evidence required; or
- For a building with less than 6 floors including the ground floor
  - Photographic evidence of the presence of a lift; and
  - Evidence that the lifts serves at least all floors, except a maximum of 1.

6.4.4 Swimming Pool

The following documentation is required:

- Mechanical schematic plans indicating the provisioning of a swimming pool(s) and associated heating equipment (if relevant); and/or
- **Assessor** site visit notes and photographs of **swimming pool** and associated heating equipment (if relevant); and
- Written or photographic evidence showing that the swimming pool can be treated as one and is not a spa; and
- **Assessor** notes or other evidence supporting any claim that the swimming pool qualifies as being a heated swimming pool; and
- **Assessor** notes on the basis of justification for the number of months during the rating period that the swimming pool has been available for use.

6.4.5 Gym

The following documentation is required:

- Evidence showing that the gym area is greater than 25 m^2 ; and
- **Assessor** notes on the basis of justification for the number of months during the rating period that the gym has been available for use.

7 Service Categories for Water

7.1 Summary

The NABERS for Apartment Buildings ratings categorise schemes based on the services that are paid for by the body corporate comprising:

- common property services & facilities, and
- services provided by the body corporate to apartments, even if in other schemes these services might be the personal expenses of owners and/or occupants

These categories are defined by NABERS and are different for the energy and water ratings.

These categories allow NABERS to make adjustments between schemes with different levels of central servicing by making an adjustment to the benchmark.

For most schemes there will only be one choice in each service category. For schemes where the common property provides different services to different apartments, this chapter also outlines how to calculate the rating.

7.2 Process

7.2.1 Process overview

	Step	Reference
1	Determine if the scheme is eligible for a water rating. It's not rateable if the body corporate's water usage is not metered.	
2	Prepare the total apartment count. Only apartments that are on the total apartment count can be included in the water service categorisation process. Note that the number of apartments attributed in each category should be adjusted to reflect habitability.	Section 5
3	Determine whether the apartment has its own cold water meter. If not, it is categorised as a centrally metered water supply apartment.	Section 7.3.1

	Step	Reference
4	If not a centrally metered water supply apartment, determine whether the apartment can be categorised as: • Apartment water meter with no central domestic hot water; or • Apartment water meter with central domestic hot water.	Section 7.3.1
5	Determine whether the apartment can be categorised as a central air-conditioning services (water) apartment.	Section 7.3.1

7.3 Water Service Category Definitions

7.3.1 Central water service categories

Each apartment must be categorised into one of the categories listed in this section. These are listed in priority order.

Centrally metered water supply

An apartment is considered to be a centrally metered water supply apartment if:

- The apartment does not have a utility operated cold water meter dedicated to the cold water supply of that apartment; and
- Acceptable sub-metering data is not available through which individual apartment water use can be identified.

If sub-metering data is available that enables the cold water supply to the apartment to be excluded - without excluding any common property water use - then the apartment's water use must be excluded and the apartment is not counted as being a centrally metered water supply apartment.

Apartment water meter with central domestic hot water

An apartment is categorised as an apartment water meter with central domestic hot water if:

- The cold water use of the apartment is measured by its own utility meter; and
- There is a central domestic hot water system that supplies hot water to this and other apartments. This means domestic hot water is provided to the apartment in a way that bypasses the apartment's own cold water meter; and
- Acceptable sub-metering data is not available through which individual apartment domestic hot water use can be identified.

If sub-metering data is available and accessible that enables the central domestic hot water supply to the apartment to be excluded – without excluding any common area water use – then the apartment central domestic hot water use must be excluded from the rating and the affected apartment must not be counted as being an apartment with central domestic hot water.

Apartment water meter with no central domestic hot water

An apartment is categorised as apartment water meter with no central domestic hot water if:

- The cold water use of the apartment is measured by its own utility meter; and
- There is no central provision of domestic hot water. This means domestic hot water is provided to the apartment via its own cold water meter.

7.3.2 Central air-conditioning service (water)

Each apartment must be assessed, to determine if it is a central air-conditioning service (water) apartment. It is a central air-conditioning service (water) apartment if:

- The apartment is a centrally air-conditioned apartment (Section 6.3.1); or
- The apartment is a condenser water serviced apartment (Section 6.3.1).

7.4 Documentation required

7.4.1 Apartment count

Evidence used in Section 5 *Total Apartment Count* is required, including adjustments for habitability which should be applied in all servicing categories.

This means the numbers of apartments counted in service categories should equal the total number of apartments adjusted for habitability.

7.4.2 Central water service apartments

The following documentation is required:

- Hydraulic schematic plans identifying the water meters used in the assessment and demonstrating the water service category; and/or
- **Assessor** diagrams of the water metering configuration identifying the meters included in the assessment.

7.4.3 Central domestic hot water serviced apartment

The following documentation is required:

- Mechanical/hydraulic schematic plans indicating the provisioning of central domestic hot water services to apartments and may include common areas; and/or
- **Assessor** description of mechanical services including photographs of key equipment items such as water heaters and circulation pumps; and
- **Assessor** notes confirming that water supply to the domestic hot water is captured within the rating.

7.4.4 Central air conditioning service (water)

For apartments classified as central air-conditioning service (water) no further documentation is required in addition to that specified in Section 6.4.1 *Apartment count*

8 Car Parking Spaces – Energy only

8.1 Summary

NABERS for Apartment Buildings ratings are created by making adjustments to the benchmark based on key scheme variables. One of these variables is the number of car parking spaces in the scheme and whether these car parking spaces are naturally or mechanically ventilated.

The number of car parks is only required for NABERS Energy ratings.

8.2 Process

8.2.1 Process overview

	Step	Reference
1	Identify the car parking spaces that are permitted to be counted in the rating.	Section 8.3
2	For each car parking space, determine whether it can be counted as being mechanically ventilated.	Section 8.3.2
3	All remaining car parking spaces are counted as being naturally ventilated.	Section 8.3.3

8.3 Car Parking spaces

8.3.1 Car parking spaces permitted for inclusion in the rating

For the NABERS Energy rating, a car park space must be counted for the scheme if its energy consumption is paid for or controlled in whole or in part by the body corporate. This includes car parking spaces for occupants, their visitors and leased out for other uses. This may also include car parking spaces outside of the scheme. The energy associated with permitted car parking spaces must be included in the rating.

The car park spaces must also be purpose-built to be included in the rating assessment. Please get in touch with the **National Administrator** if the space that was not originally designed as a car park space is now being used as one. Additionally, if a purpose-built car park is no longer being used as one, it cannot be included in the rating assessment.

Car parking spaces outside the scheme being rated

If a car parking space is outside of the scheme, and only a portion of the energy consumption is paid for or controlled by the body corporate, then the associated energy allocation to the rating is done based on the following, in the order of preference:

1. The energy inclusion is calculated through apportioning the total car park energy use based on the number of car park spaces allocated to the scheme and other users; or
2. The energy inclusion is the same portion of car parking energy costs paid for by the body corporate.

> For example, if the body corporate only pays for 5% of the energy consumption, then only 5% of the car parking spaces should be included.

Large car parks for non-residential spaces

If the body corporate owns and controls a large car park serving non-residential spaces (such as commercial, retail etc.), which is defined as:

- More than 25% of the total number of car parking spaces; and
- More than 20 car parking spaces in total

In such cases, the car park spaces may be excluded, if the energy consumption of the car parking spaces is separately metered and can also be excluded. The energy exclusion is calculated through apportioning the total car park energy use based on the number of car park spaces allocated to the residential and non-residential spaces.

If the energy consumption cannot be excluded, then the **Assessor** should include the total number of car parks as permitted car parking spaces.

8.3.2 Mechanically ventilated car park spaces

A car parking space is permitted to be counted as a mechanically ventilated car parking space if:

- The car parking space is **not**:
  - In the open air; or
  - Adjacent to or within 3 parking space widths of a section of wall that is 50% or more grilled/louvered or open to permit natural ventilation; and
- There is a car park supply or exhaust fan serving the car park level that the car parking space is on; and
- The car park fans either:

- Run continuously; or
- Are on a timeclock and meet the required compliance standards; or
- Are controlled on the basis of carbon monoxide sensor operation.

8.3.3 Naturally ventilated car parking spaces

A car parking space is counted as a naturally ventilated car parking space if it is not a mechanically ventilated car parking space as identified in Section 8.3.2 *Mechanically ventilated car park space*.

Where an **Assessor** is unsure of the ventilation in the car park, these spaces must be counted as a naturally ventilated car parking space.

8.4 Documentation required

The following documentation is required:

- Car park as-built plans or **Assessor's** mockup of car parking space layout showing the layout of the car parking spaces and the A**ssessor's** allocation of the car parking spaces to naturally ventilated and mechanically ventilated; and
- **Assessor** documentation justifying the allocation of car parks as mechanically ventilated, showing the general location of car park supply/exhaust vents, and **assessor's** notes as to the nature of car park fan control.

9 Energy and water coverage

9.1 Summary

There are three distinct steps to determining how much energy and water a scheme uses.

- Identify all the sources of energy and water to the scheme
- Determine which of these sources must be included in the calculation of the rating
- Calculate the consumption from these sources, including correction for any estimates or missing data.

This section outlines the steps the Assessor must take for the first two steps. The last step is covered in Section 10 - *Consumption data*.

9.2 Process

9.2.1 Process overview

In order to determine that the required energy and water coverage of the rating has been met, the **Assessor** must comply with the following process:

	Step	Reference
1	Confirm all energy and/or water **sources** to the scheme.	Section 9.3
2	Confirm all energy and/or water **sources** which are paid for by the body corporate. These must be included in the rating, except where NABERS allows their exclusion.	Section 9.3
3	Confirm that the sources cover the **end uses** as required by NABERS. If not all **end uses** are captured then additional sources must be identified.	Section 9.4

9.3 Confirm all energy and water sources

To confirm all energy and water **sources** to the scheme, the **Assessor** must consider:

- All sources of external energy supplied to the scheme; and
- All sources of external water supplied to the scheme, including ground water, external surface water such as untreated dam water from outside the scheme and externally supplied recycled water **sources** – whether potable or not; and
- All sources of external energy and water which the scheme (or for "multiple owners corporations" in Victoria, its owners) is required to contribute to through any layered arrangement that it is a part of; and
- The financial statements of the scheme and any layered arrangement that it is part of.

The Assessor must take the following specific steps to confirm all energy and water **sources** have been identified.

1. Ask the scheme to identify all the energy/water supplies for the scheme, including batch-delivered supplies, GreenPower™ and recycled water; and
2. Review service drawings, where available, to identify all supply points. For example, single line diagrams, electrical schedules and hydraulic diagrams; and
3. Review the scheme to check for equipment requiring different types of energy/water supply (e.g. electricity gas, diesel, potable, recycle); and
4. Review metering arrangements to ensure that all relevant **utility** and **non-utility meters** have been included in the assessment; and
5. Review financial statements for the scheme and other related entities in a layered arrangement to ensure that all utility accounts have been identified; and
6. Review shared services and assess that all energy **sources** associated with the provision of these services have been identified. More information on how to account for shared facilities and services can be found in Section 12 *Shared services and facilities*.
7. Conduct a site visit to confirm energy **sources** and sharing arrangements.

9.3.1 Unmetered supplies

Schemes with water or energy supplied from an unmetered source (for example, water supplied from a river, bore or well water) for **end uses** other than fire systems cannot be rated until metering compliant with The Rules has been installed and 12 months of **acceptable data** obtained.

This does not include natural groundwater seepage that would normally be discharged. This can be reused in the scheme without penalty.

9.4 Confirm energy and water coverage

Once the Assessor has identified all the sources of energy, they must then identify which sources should be included in the rating.

All energy and water used by the scheme during the **rating period**, where it is paid for by the body corporate and is not directly and solely associated with non-residential uses **must be included**.

In addition, all the sources the scheme is required to contribute to through any layered arrangement that it is a part of **must be included**.

Any exclusion must only cover the specific item being excluded. This means that every item to be excluded must be assessed separately and the justification for its exclusion included in the documentation.

The **Assessor** must examine available single-line diagrams, electrical circuit schedules, water reticulation diagrams and visit the plant rooms to ensure that all relevant equipment is covered under the meters included in the energy rating.

9.4.1 Required energy coverage

The **Assessor** must make sure that, **at a minimum**, the following energy **end uses** are captured by the sources which have been identified. This is regardless of whether the body corporate pays for the energy usage for these end-uses.

- Common-area lighting and power (for example lift lobbies, foyers, plant rooms, fire stairs, at least all permitted car parks, and common-area toilets); and
- Exterior lighting, excluding street lighting paid for by a local council; and
- Central ventilation to common areas; and
- Central ventilation to apartments (for example bathrooms and kitchens); and
- Water pumping (energy).
- Exterior signage associated with the scheme's identity, builder, manager or developer;
- Generator fuel where it serves central services including backup generators;
- Other car park energy such as car stackers; and
- General services such as garbage compactors, plant and garbage room ventilation, security systems, etc.

If this energy is not included within the sources captured in Section 9.3 *Confirm all energy and water sources* then additional sources must be identified.

Variable cross check

Assessor must also complete a cross check of energy consumption covered by the rating. As per the requirements of the rating tool, if the energy consumption as listed in the table below is paid for the body corporate then it must be included in the rating.

Where the following variables are being used, the following energy consumption must also be included. If the energy consumption cannot be included, then the scheme cannot be rated until it can be included.

Variable	Required energy consumption	Reference
Centrally air-conditioned apartment	Air conditioning energy consumption	Section 6.3.1
Condenser water serviced apartment	Condenser water system energy consumption	Section 6.3.1
Lift serviced apartments	Lift energy consumption	Section 6.3.2
Pool	All associated pool energy consumption	Section 6.3.3
Gym	All associated gym energy consumption	Section 6.3.3
Car Parking Spaces	All associated car park energy consumption	Section 8

9.4.2 Required water coverage

The **Assessor** must make sure that, at a minimum, the following water **end uses** are captured by the sources which have been identified. If these **end uses** are not covered by the sources already captured then the water consumption not paid for by the body corporate must also be included in the rating.

- Common area air-conditioning; and
- Fire services; and
- Cleaning; and
- Irrigation within the site boundary (for water).

If this water is not included within the sources captured in Section 9.3 *Confirm all energy and water sources* then additional sources must be identified.

Where the following variables are being covered, the following water consumption must also be included.

Variable	Required water consumption	Reference
Centrally air-conditioned apartment (water)	Air conditioning water consumption	Section 7.3.2
Centrally metered water supply apartment	In-apartment water consumption	Section 7.3.1
Central domestic hot water	Central domestic hot water consumption	Section 7.3.1

9.4.3 Exclusions

General Principle

Energy and/or water use may only be excluded from a rating if:

- The energy and/or water is not required under the Rules to be included in the rating; and
- There is a methodology within the Rules that permits the exclusion.

Occupant use

Energy and water use which is paid for by **occupants** based on their own metered use can be excluded, provided it is separately metered in compliance with Section 11 *Non-utility Metering*.

Energy use in apartments and for central domestic hot water systems.

The following components can be excluded, provided they are separately metered in compliance with Section 11 *Non-utility Metering*:

- Electricity and/or gas use within individual apartments;
- Electricity and/or gas use of a central domestic hot water system which provides hot water to apartments.

Where a central domestic hot water system provides domestic hot water to common property usage (for example a shower in a pool or gym) this should be included.

In some case, the energy use for common property domestic hot water usage is**:**

1. Not separately sub-metered through hot water meters; and/or
2. Not paid for by the body corporate

Examples of such domestic hot water use include building manager office washrooms, garbage rooms etc. In such cases, the Assessor must:

1. Assess the **materiality** of the usage and obtain sufficient evidence to support that the domestic hot water use is not material;
2. Provide the National Administrator with the evidence and get approval to proceed with the rating.

Materiality can be assessed through the number of unmetered domestic hot water outlets/frequency of use/general on-site observations etc. The rating can proceed if the domestic hot water use in the common property is found to not be material. Conversely, if the use is found to be material, the rating cannot proceed without including the associated energy use.

Mixed use within a scheme

Energy and water use **solely** associated with lots within a scheme that are not residential may be fully excluded if the use is separately metered in compliance with Section 11 *Non-utility Metering* and the energy and water use is not included in the required coverage.

If no compliant metering exists, **Assessors** should refer to Section 10.8 *Methods for estimating small amounts of data.*

An example of energy and/or water consumption that may be excluded is air conditioning serving a commercial lot on the ground floor of a building.

An example of a service which cannot be excluded is the energy consumed by common area lighting or lifts which are shared between the commercial lots and the residential floors.

Electric vehicle charging points

The energy associated with electric vehicle charge points does not form part of the energy coverage and is not required to be included. Emissions associated with moving vehicles are not included in the scope of ratings.

Transmission towers

The energy used by antennas/transmission towers that provide service to the locality/suburb are not part of the energy coverage. Typically this would be where a scheme leases roof space to a telecommunications company to operate their telecommunications equipment for servicing of the locale.

Large car park for retail use

If the body corporate owns and controls a large car park serving retail – more than 25% of the total number of car parking spaces and more than 20 car parking spaces in total – then the energy consumption associated with the car park may be excluded, if the energy consumption of the car parking spaces is separately metered and can also be included.

If the energy consumption cannot be excluded, then the **Assessor** should include the total number of car parks as permitted car parking spaces.

9.5 Documentation required

9.5.1 Utility metering

Where the **data** for an energy or water **source** is based on **utility** metering **only**, the **Assessor** must

- For energy ratings: obtain current single-line diagrams or electrical circuit schedules for the source; and
- For water ratings: obtain current water reticulation diagrams or water meter schedules for the source; and
- check to ensure that the utility metering covers each of the required **end uses** for the rating type; and
- retain evidence of these checks for auditing purposes.

9.5.2 Non-utility metering

Where the **data** for an energy or water **source** includes **data** from **non-utility metering**, the **Assessor** must show that:

- the location and identifier (meter number) of:
  - each non-utility meter used for an inclusion and/or an exclusion in the rating, and
  - each **utility meter** used in the rating, and
- the location of each of the major uses for energy or water identified in Section 9.4 *Confirm energy and water coverage.*

9.5.3 Single line diagrams

Where no current single-line diagram (for energy) or water reticulation diagram (for water) is available for a source, then, in order of preference:

- The **Assessor**/**body corporate** must engage a specialist to draft the single-line diagram (for energy) or water reticulation diagram (for water)
- the **Assessor** must document, to the best of their knowledge, the different energy or water **sources** under all meters to ensure all energy and water **sources** are captured.

It is recommended that schemes update their single-line diagrams and water reticulation diagrams as part of the Non-utility Meter Management Plan under Section 11.5 *Instituting a NABERS non-utility Meter Management Plan*

9.5.4 Financial statements

The **Assessor** should obtain the scheme's financial statements confirming that all meters have been accounted for. The financial statements should specifically show each utility account that the body corporate pays for.

If the financial statements do not provide the details of specific utility accounts, and only refer to utility type (i.e. electricity, gas, water etc.), the Assessor should verify that the sum of individual utility bill charges are equal to the charges listed in the financial statements.

9.5.5 Exclusions

The **Assessor** must provide calculations or documentation confirming any consumption to be excluded from the rating and substantiating the grounds for the exclusion.

10 Consumption data

10.1 Summary

There are three distinct steps to determining how much energy and water a scheme uses.

- Identify all the sources of energy and water to the scheme
- Determine which of these sources must be included in the calculation of the rating
- Calculate the consumption from these sources, including correction for any estimates or missing data.

Section 9 - *Energy and water coverage* covers steps 1 and 2. This section outlines the last step. This step includes the measurement, processing and use of energy and water consumption **data**. It includes provisions to allow **acceptable estimates** to be made and used in limited circumstances when actual measurements are not available.

Where a scheme shares facilities and services, consumption can be calculated using the methods outlined in Section 12: *Shared services and facilities*.

10.2 Process overview

Assessors must comply with the following process:

	Step	Reference
1	Assess the accuracy of each source of energy and water as identified in the previous chapter.	Section 10.3
2	Check the **data** format and units for each energy **source**, converting the units if necessary.	Section 9.4
3	For each source, ensure that **acceptable data** is available for the 12 month **rating period**.	Section 10.5
4	Check that the **data** is from meter readings and does not rely on estimates.	Section 10.5.4 Section 10.7
5	Determine if a small amount of **data** requires estimating, using one of the approved methods in the Rules.	Section 10.8
6	Calculate the energy consumption where fuel was batch-delivered.	Section 10.9

7	Confirm the total percentage of accredited GreenPower used in compliance with Section 13.4 *Appendix D – GreenPower™* The "headline" GreenPower percentage may not exactly match the actual percentage for each bill, with adjustments made by the utility to balance this over time. So care should be taken to confirm the actual GreenPower amounts applied.
8	Check if the water **source** contains a portion of recycled water. The known percentage of recycled water is treated as recycled water. The remainder, including any unknown portions of recycled water, is treated as mains supply.

10.3 Assess the accuracy of each energy and water source

For each source of energy and water included in the rating, the **Assessor** must assess the accuracy of the **source**. They must do this by undertaking the following steps:

- **Check if any of the bills for that source were estimated.**

  Consumption from estimated utility bills is not considered **acceptable data** and may not be used for NABERS ratings. If a utility bill is estimated, the **Assessor** must use Section 10.5 *12 months of acceptable data for each source* to calculate the consumption to be used in the rating.

- **Check the data for anomalies.**

  Consumption may not be an estimate but may still be inaccurate. The **Assessor** must use their experience and judgement to identify any anomalies in the **data** (accounting for seasonal variation) and to investigate any significant anomaly.

  This must be completed for utility and non-utility **data**. The **Assessor** must contact the **National Administrator** before proceeding if the anomaly cannot be explained as the rating may not be able to proceed.

- **Check whether the source includes any non-utility meters for inclusion or exclusion of energy or water.**

  If **non-utility meters** are used in the assessment, the **Assessor** must check that all necessary validation (and correction of **data**) is complete (see Section 11 *Non-utility Metering*).

- **Check if any other assumptions were made about consumption.**

  If they were, the **Assessor** must calculate the total amount of consumption affected by each assumption. Where the **Assessor** has calculated this total in line with the Rules, it is considered an **acceptable estimate** and must be added the relevant **potential error**.

- **Where there is a required end use which must be included or excluded for which there is no data, the Assessor may use one of the**

methods listed under 10.8 *Methods for estimating small amounts of data*.

These amounts will be added to the **potential error**. For the rating to be permitted, the total **potential error** must not exceed the limits given in Section 4.5 *Acceptable data and estimates*.

10.3.1 High voltage electricity metering

NABERS Energy ratings are based on low-voltage metering. It is acceptable to use **non-utility meters** on the low voltage (LV) side for the energy use measurements if a scheme's main electricity **utility meters** are situated on the high voltage (HV) side of the transformers. This is provided there are no connections to energy uses within the scheme that bypass the LV meters. The LV meters must cover 100% of the scheme electricity **end uses**.

The **Assessor** must reconcile the LV meters against the HV meters to ensure that no meters are missing or reading incorrectly. As a guideline, transformer losses are expected to be less than 10%. Losses above this figure must be re-investigated to find the source of the discrepancy and ensure the losses are not caused by unaccounted power used from the scheme.

The **Assessor** may use values above 10% losses if they have obtained evidence that the losses are not from electricity used by the scheme. The HV metering is to be used in absence of this evidence.

The high-voltage utility metering can be used in the absence of complying non-utility low voltage meters. No allowance is made for losses in this situation.

10.3.2 Thermal energy measurements

Some schemes export or import thermal energy using water as a medium. An example is chilled water being pumped from one scheme to another.

These systems are complex and it is difficult to measure the thermal energy in the water, relate it back to energy input to the thermal plant and calculate the greenhouse gas emissions.

Due to this complexity and because such systems are uncommon, they are treated in a separate document to these **Rules** titled *Validation Protocol for Thermal Energy Exclusions*. This ruling is available on the NABERS website nabers.gov.au

10.4 Utility bill units and formats

Assessors must check the data units and formats for each energy **source**, converting the units if necessary.

Some utilities provide a “headline” consumption figure separately from the billed quantities. In the event of conflict in information, it is always the billed quantities that take precedence. In addition, utility bills may include a total scheme consumption figure but bill on a figure that removes utility measured downstream consumption. Care is required to ensure that the correct figure, relevant to the rating coverage, is used.

10.4.1 Utility units

The units of consumption that **Assessors** should seek on **utility** bills are:

Utility	Units
NABERS Energy ratings:	
Electricity	kWh (kilowatt hours) or MWh (megawatt hours); GJ (Gigajoules)
Natural Gas	m^3 (cubic metres) at standard temperature and pressure; MJ (Megajoules) or GJ
LPG	LPG must be entered into the Calculator as Gas and the units are in MJ, not in L (litres) or m^3 (cubic metres).
Fuel oil (diesel, heating oil, etc.)	L (litres); GJ
NABERS Water ratings:	
Water, all sources	kL (kilolitres) (=m^3)

10.4.2 Natural gas bill formats

Some natural gas utility bills do not have units listed on them. The **Assessor** must check with the utility what the units are and the conversion factors used.

For example, Western Australian gas utility bills generally don’t have units. They are often expressed as kWh as the utility has divided the MJ value through. Multiply the kWh value by 3.6 MJ/kWh to obtain the energy in MJ.

10.4.3 Energy bill formats

Some electrical energy bills are presented in the following format:

Total Energy = Energy (kWh) + Losses (%)

For a NABERS Energy rating, network distribution losses must be removed prior to entry into the **NABERS Calculator**.

10.5 12 months of acceptable data for each source

For each source, **Assessors** must ensure that **acceptable data** is available for the 12 month **rating period**.

10.5.1 Utility and Non-utility meters

Utility meters are to be used in preference to **non-utility meters**. Non-utility meters are used in the absence of utility **data** or where the **data** from **non-utility meters** provides more reliable **data**, such as when utility reads are too infrequent and require adjustment.

Non-utility meters may also be used where they are the primary source of **data** rather than using a utility meter and a significant number of exclusions. Where a **non-utility meter** is used as primary **data**, it is entered into the calculator as if it were a utility meter. Normal validation requirements for the **non-utility meter** still apply.

Minimum frequency of non-utility meter readings

All **non-utility meters** used to provide **data** for energy or water consumption inclusions or exclusions must have a record of readings that is both:

- at least as frequent as the **utility meter** under which the **non-utility meter** lies; and
- at least quarterly (i.e. four readings with an **average** gap between readings of at least 10 weeks).

The **Assessor** must retain this record of readings in case of audit.

10.5.2 Standard for acceptable data

Utility consumption figures must cover one complete and continuous year, allowing for missing **data** as specified in Section 10.6 *Correcting utility meter readings*.

Each **billing period** provided by the utility must be recorded as a separate line item in the **NABERS Calculator** to show the pattern of consumption throughout the rating period.

Stand-alone NABERS Energy or Water ratings – where a scheme is targeting a single rating

The following provisions apply where **data** cannot be gathered for exactly the same period for different utility accounts:

- The **rating period** must align exactly with actual readings of the **billing period** for the main and largest utility account, or non-utility account where there is no utility account; and
- Consumption **data** that accounts for at least 80% of the rating result (in $kg{\cdot}CO_2$ or kL/m^2) must fall within the **rating period**, as specified in Section 10.6 *Correcting utility meter readings;* and
- For a NABERS Energy rating, each piece of consumption **data** – such as each utility meter and each **non-utility meter** – must cover a continuous 12-month period that is displaced from the **rating period** by no more than two months; and
- For NABERS Water rating, each piece of consumption **data** – i.e. each utility meter and each **non-utility meter** – must cover a continuous 12-month period that is displaced from the **rating period** by no more than:

- two months for monthly or quarterly period; or
- four months for every six month period; and

- Any displacement must be as close as possible to the **rating period**, to avoid unrepresentative or subjective selection of consumption data.
- Additional consumption **data** outside what is required to cover the continuous 12-month period must not be included in the rating. This means that the **Assessor** cannot include more **data** points than necessary in a non-utility inclusion or exclusion. This is because this may bias the **data** and therefore the rating when applying an apportionment.

Combined NABERS Energy and Water ratings – where a scheme is targeting both ratings

When a combined NABERS Energy and Water rating is being conducted, the same **rating period** must apply to both ratings. If it is not possible to gather utility **data** for exactly the same period for both ratings, the **rating period** is based on the **data** gathered for the NABERS Energy rating. The following provisions apply:

- The energy consumption **data** must meet the same criteria as given above for a stand-alone NABERS Energy rating; and
- The consumption **data** for each water **source** must cover a continuous 12-month period that is displaced from the **rating period** by no more than:
  - two months for monthly or quarterly or
  - four months for every six month period; and
- Additional consumption **data** outside what is required to cover the continuous 12-month period must not be included in the rating. This means that the **Assessor** cannot include more **data** points than necessary in a non-utility inclusion or exclusion. This is because this may bias the **data** and therefore the rating.

Billing Periods

Assessors are required to enter the **billing period** for the consumption data for each **utility** and **non-utility meter** in the NABERS calculator. The **rating period** should be aligned as closely with the **billing period** as possible.

For each piece of consumption **data** the **billing period** must align with one of the following:

- the start date of the first bill or reading; or
- the last date or last reading.

This is to avoid apportioning of the consumption **data** at the beginning and end of the **rating period**.

10.5.3 Non-utility meter records

If **data** from non-utility meters is included in a NABERS rating, the following must be recorded and retained for audit:

Data required	Acceptable record or format	Examples of unacceptable records
All meters		
Date of reading	Day/month/year	Month/year; day/month; month
Meter identification	Meter number or label that can be directly cross-referenced to the single-line diagram	No identification; label not clearly identifiable on single-line diagram
Meter reading	Meter reading, either direct from the meter or from the metering interface	No meter reading; 'units used' without the actual meter reading
Electricity meters		
K factor	Meter K factor	No K factor
Calculated electricity reading	Calculated consumption figure in kWh, based on meter readings and k-factor	Any figure that cannot be derived from the meter reading and k-factor; any figure without units
Gas meters		
Meter pressure	Meter pressure, with units	No meter pressure; no units
Meter pressure correction factor	Meter pressure correction factor	No meter pressure correction factor
Monthly energy density	Energy density of gas (MJ/m^3) from **utility** bill	No energy density data; no units on energy density data; energy density data not supported by evidence from utility
Calculated gas reading	Calculated gas consumption figure in MJ	Any figure that cannot be derived from the gas meter reading, pressure correction factor and monthly energy density; any figure without units
Water meters		
Meter multiplier	Meter multiplier to convert readings to kL or m^3	No meter multiplier
Calculated water reading	Calculated water consumption figure in kL or m^3	Any figure that cannot be derived from a meter reading or meter multiplier; any figure without units

10.5.4 GreenPower™

The GreenPower™ program aims to decrease greenhouse gas emissions associated with electricity generation and to facilitate the installation of new renewable energy generators across Australia. As such, the purchase of GreenPower, accredited under the National GreenPower Accreditation Program, is considered to be the purchase of a zero greenhouse emission energy **source**.

GreenPower may be purchased at the time of consumption, or retrospectively as a separate purchase from the energy consumed. This process ensures that an equivalent amount of accredited GreenPower is purchased and added to the electricity grid. Visit www.greenpower.gov.au for further information.

Each NABERS energy rating is broken down into 2 components –

- A star rating that is calculated with GreenPower; and
- A star rating that is calculated without GreenPower.

The first recognises the use of GreenPower as zero emission electricity and the second counts GreenPower as standard grid electricity to reflect the actual energy efficiency of the scheme.

More information on how to apply GreenPower™ to the scheme's rating can be found in Section 13.4 *Appendix D – GreenPower™*.

10.5.5 Externally supplied recycled water

Each NABERS water rating is broken down into 2 components –

- A star rating that is calculated with supplied recycled water; and
- A star rating that is calculated without supplied recycled water.

The first recognises the use of the externally supplied recycled water and does not include the associated water consumption in the rating (improving the rating).

The second treats externally supplied recycled water as mains water use to reflect the actual water efficiency of the scheme.

Recycled water should be applied to the rating using the correct inputs in the **NABERS Calculator.**

10.6 Correcting utility meter readings

The **Assessor** must check that the **data** from utility meter readings does not rely on estimates by the supplier. If it does then the method outlined in this Section must be followed.

Where there is an unresolvable gap in the primary billing **data**, (for example, caused by a change of supplier or meter) the **Assessor** may calculate an **acceptable estimate** of the unrecorded consumption by interpolating between adjacent bills under the following conditions:

- If the consumption of the relevant **source** is climate-independent, the interpolation must be based on the **average** daily consumption figures of the adjacent bills; and

- If the **utility** consumption is climate-dependent, then the interpolation must use a climate-based correlation.

If a climate-based correlation is used, the Assessor must provide details of the correlation method, the climate **data** used and explain why the correlation method was chosen.

Regardless of the interpolation method used, the **Assessor** must add the entire **acceptable estimate** of unrecorded consumption to the relevant **potential error**.

Under no circumstances is it permissible to extrapolate outside available data. The scheme cannot be rated if the data does not cover a full continuous 12 month period.

10.6.1 Adjusting for gaps at the start or end of the Billing Period

If an energy or water **source** is missing a valid meter reading at the start or end of the **billing period** (for example, because the bill is missing or the reading was estimated by the utility), the consumption for the full **billing period** cannot be calculated using that **data** alone.

If accurate (non-manual) cumulative readings are available from before or after the **billing period**, the **Assessor** may use the cumulative meter readings to calculate the consumption.

Cumulative reads available before and after must be treated as if it was taken on the first or last day (as appropriate) of the **billing period**.

Otherwise, the **Assessor** may use a manual meter reading from before or after the **rating period** to calculate consumption if all of the following conditions apply:

- The **Assessor** is able to reconcile the manual meter reading with a history of meter readings that measure the consumption to a date after the end of the **billing period**, either as meter readings from utility bills or as manual readings meeting the frequency and **data** recording requirements of Section 11 *Non-utility meter records.*
- The reading must be treated as if it was taken on the first or last day (as appropriate) of the **billing period**, regardless of the actual period of time between the day of the reading and the start or end (as appropriate) of the **billing period**; and
- The reading must clearly align with the consumption history for the meter.

Manual meter readings are **acceptable data** if these requirements are met.

10.6.2 Adjusting for gaps during the Billing Period

In some cases an energy or water **source** is missing a valid meter reading during the **billing period** (for example, because the bill is missing or the reading was estimated by the utility).

The total consumption for the missing period can be accurately determined using the method below when valid meter readings are available for the period immediately before and immediately after missing or estimated readings.

The calculated consumption is considered to be **acceptable data** and may be used in the assessment without being added to the relevant **potential error**.

Energy sources other than natural gas

For energy **sources** other than natural gas the **Assessor** must do the following:

- Calculate the total metered consumption in the period by using the meter readings before and after the missing or estimated reading(s); and
- Obtain any relevant factor required to convert the metered consumption to actual consumption; and
- Use the actual consumption as calculated using the relevant factor as the total consumption for the period.

Assessors are to exercise care when performing these calculations and obtain written documentation to confirm the use of any conversion factors if not documented on the relevant utility bills.

Interval data

Some utilities will bill a meter based on a remote meter reading system that transmits the consumption **data** but not the cumulative readings. This makes it impossible to reconcile an estimated bill as meter readings before and after are not available. This method outlines the procedure for using this **data**.

This method is only usable for utility **data** and cannot be used for **non-utility meters**.

The automated system will detect when it does not receive a certain amount of **data** from the meter and the bill will be listed as an 'estimate'. Where this is the case, the **Assessor** may use the following method:

- Obtain written confirmation from the Utility that the reason the bill was 'estimated' was because of missing **data**. If it is any other reason, contact the **National Administrator** to obtain approval to use this method; and
- Obtain the complete **data** set of interval readings from the Utility for the estimated month. Identify all the days where there is missing **data** (this will usually be a '0' read); and
- Remove the entire 24 hour period of any day that has a missing **data** point. The energy use for these days are to be interpolated using the nearest complete weekdays bounding the missing days. This means that weekend days with missing **data** will be treated like weekdays; and
- The **data** is to be entered into the **NABERS Calculator** as individual line items for the actual and interpolated values. This means that for an estimated bill, there will be a minimum of three entries for that bill - the actuals on either side of the interpolated value and the interpolated value; and
- The interpolated **data** is an **acceptable estimate** is added to the **potential error.**

Natural gas

Missing gas consumption can also be determined using meter readings, however additional consideration is required due to the complexities of converting gas meter readings to energy consumption.

Where a bill is missing or estimated but valid meter readings are available before and after the missing period, the gas consumption can be determined by using the following methodology:

- Calculate the total metered gas flow in the period by using the readings before and after the missing or estimated reading(s); and
- Obtain the correction factor (CF) for the gas meter from:
  - the estimated bill for the period (if available); or
  - the utility bills before or after the missing period; or
  - written documentation provided by the utility.

The correction factor is used to convert the metered consumption from the meter pressure to standard atmospheric pressure. It is sometimes in utility bills under alternative an name, such as pressure correction factor or conversion factor.

Obtain the gas Heating Value (HV) at atmospheric pressure during the period between the valid readings. This value must be obtained from one of the following sources, listed in order of preference:

- written documentation provided by the utility for the period between the two readings, or, if not available
- the average heating value for the period between the two readings, in the case there are utility bills (estimated or actual) fully covering such period, or, if not available
- the following default values must be used for the period between the two readings, depending on the state where the scheme are located:

State/Territory	Heating value (MJ/m^3)
ACT	38.3
NSW	38.3
NT	40.5
QLD	39.5
SA	38.3
VIC	38.8
WA	41.5

Calculate the gas consumption by using the following formula:

$$Gas\ Consumption = \left(R_E - R_B\right) \times CF \times HV$$

where:

R_B and **R_E** = the meter reading at the beginning and end of the period, respectively

CF = the correction factor, and

HV = the heating value (MJ/m^3).

Example

Two consecutive monthly bills have been estimated by the utility. Estimated readings were taken on 31 March and 30 April. Valid meter readings for the period immediately before and immediately after the estimated readings were available in adjacent utility bills. The reading for 1 March was '10,000' and the reading for 31 May was '12,150'.

The pressure correction factor was obtained from the utility bills and was equal to 1.1. The average heating value for all the bills between the two accurate readings (this includes the two estimated bills) was 39 MJ/m^3.

The total gas consumption between 1 March and 31 May can be calculated as:

(12,150 - 10,000) x 1.1 x 39 = 92,235 MJ

10.7 Correcting non-utility meter readings

The **Assessor** must check that the **data** from non-utility meter readings does not rely on estimates. If a non-utility metering system has been found to given incorrect or incomplete measurements of consumption when validated then then method outlined in this Section must be followed.

Where a **non-utility metering system** has been found to require adjustment as a result of **validation** checks, the **Assessor** must investigate the type of fault and the consumption **data**. This investigation will determine whether it is possible to accurately calculate (not estimate) the correct values for the consumption **data** from the metering system.

10.7.1 Assessments where corrections can be made

The rating can proceed where the **Assessor** can calculate the correct values for the consumption **data**. The **Assessor** must retain full documentation of the error found, the incorrect records from the **metering system**, and the calculations used to correct the **data** for audit.

In the absence of any other evidence, a correction must be based on the **assumption** that the error in the metering system is applied to all **data** collected for the current rating assessment.

For example, if the CT ratio for an electricity meter was out by a factor of +20%, the overall electricity consumption **data** for that meter must be corrected by -20%. Similarly, if the CT wiring of an electricity meter was incorrect but the consumption for each phase was recorded by the meter, this can be used to reconstruct the actual consumption and the reconstructed **data** can be used as **acceptable data**.

However, consumption **data** cannot be reconstructed if the CT wiring of an electricity meter was incorrect and the meter also did not record the energy consumption for each phase.

10.7.2 Assessments where corrections cannot be made

Where it is not possible to calculate the correct values from incorrect **metering system data**, then:

- for exclusions, the rating can proceed if the consumption is **included** in the rating, or if Section 10.8.2 *Exclusions based on financially reconciled utility costs;* or
- for inclusions, the rating can proceed if the consumption is an **acceptable estimate**, created using the method in Section 10.8 *Methods for estimating small amounts of data*

  However, if it does not comply with the requirements of Section 4.5.1 *Standards for acceptable data and acceptable estimates*, the rating cannot proceed and the scheme cannot be rated until a full **rating period** of accurate **data** has been obtained.

10.8 Methods for estimating small amounts of data

10.8.1 Including small un-metered electricity uses

A small amount of un-metered electricity from equipment can be included to the **acceptable estimates** and **potential error**. This may be required where an un-metered item is required for inclusion under the **energy coverage** requirements.

This method is applied to inclusions only. It may not be used for exclusions or where acceptable metered **data** is available for the equipment.

Large equipment or a high number of small pieces of equipment may not fit within the **potential error** and if this occurs, the rating cannot proceed until appropriate metering is installed and acceptable energy use **data** is available to cover the **rating period.**

Electricity use is estimated using the following steps:

1) Identify all un-metered equipment or plant to be estimated.
2) Determine the power consumption in kW at maximum capacity from nameplate **data** or equipment specifications.
3) Determine an appropriate duty cycle for the equipment from suitable specifications or records.
4) Calculate the annual hours – typically 24 hours a day.
5) Estimate the annual energy use as:

   Energy use (kWh) = nameplate power (kW) x Duty cycle (%) x annual hours (h)

Some equipment may modify the annual hours as they are either on timers or demand based equipment. **Assessors** must provide full justification for any reduction in hours.

10.8.2 Exclusions based on financially reconciled utility costs

The **Assessor** may estimate the consumption for the end uses outside the coverage (such air conditioning used by a commercial lot in a mixed use scheme) by applying a fixed proportion to the metered consumption where:

- a **utility meter** measures the aggregate consumption for a variety of water or energy **end uses**, some inside the coverage of a rating but others outside it; and
- there is no **non-utility meter** which only measures those **end uses** inside or those outside the scope of coverage; and
- the **utility** costs associated with the meter are allocated to the various end uses according to a fixed proportion of the meter readings.

The estimated consumption may be excluded from the assessment if it is added to the relevant **potential error**.

This method is intended for the exclusion of small uses within a scheme. Financially reconciled utility costs can be used to include energy and water consumption for shared services and facilities without being added to the potential error, see Section 12 *Shared services and facilities*.

10.8.3 Exclusions where data is incomplete (temporary meters)

If a scheme has used temporary meters to collect a small amount of data and wants to extrapolate for use over 12 months, contact the **National Administrator** for a ruling.

10.9 Batch-delivered supplies

Energy or water supplies delivered in batches, such as diesel fuel, bottled gas, or tank-delivered water, must be included within an assessment if they are within the scope defined for the rating.

10.9.1 Measurement and estimation

In general, quantity **data** for batch deliveries must be taken from supplier invoices or similar documentation or from measurement systems (such as meters, scales or unit counting) at the point of delivery.

To ensure that all applicable deliveries during the **rating period** are included in the assessment for a rating, the **Assessor** must identify the supervisors or managers responsible for each batch-delivered **source** and obtain:

- a written statement of what deliveries were received during the **rating period**; and
- copies of the bills from suppliers showing the details of the deliveries; and

- descriptions of the measurement or estimation methods used.

If all the bills are available, then the total consumption from the bills can be used in the rating.

Calculating an acceptable estimate from capacity measurements

An **acceptable estimate** can be calculated from the quantity of a batch-delivered supply from capacity measurements of storage tanks if:

- there have been no recorded deliveries, or the minimum number of bills specified in above is not available; and
- the batch-delivered supply represents less than 5% of the total greenhouse gas emissions or water consumption for the **scheme** to be rated.

Acceptable estimates are, in order of preference:

1) Regular capacity readings to determine consumption
2) One reading taken by dip-stick, sight gauges or other method and the difference between full tank and current level to determine consumption
3) The total capacity of the tanks.

The **Assessor** must ensure that all tanks used are included in the capacity measurements, including reserve tanks.

Any deliveries during the year must be added to the **acceptable estimate**.

Batch-delivered recycled water (NABERS Water ratings only)

Where recycled water is delivered to storage tanks, the quantity of water must be measured at the delivery to the tank. Water measured from the discharge will potentially double-count top up water.

Batch-delivered water for direct uses (NABERS Water ratings only)

No estimates are allowed where delivered water is used without being stored in a storage tank (for example, applied directly to landscaping or used for testing or direct filling of sprinkler systems, cooling systems etc.).

10.10 Energy generated and water captured within the scheme

10.10.1 Cogeneration and trigeneration systems

There are a separate Rulings available on the NABERS website www.nabers.gov.au for cogeneration and trigeneration systems. For further information please contact the **National Administrator**.

10.10.2 Other energy generation systems

Where energy is generated for use in the scheme and is either:

- Connected on the user side of the consumption meter which records the relevant external energy supply to the scheme; or
- Used on scheme independently of utility-supplied systems;

then it will reduce the amount of utility-supplied energy required.

Electricity generated within the scheme is not included in the external **sources** covered by a NABERS rating, and will therefore improve the rating when low-emission or renewable energy technologies are used.

In this case **utility** billing **data** must be used without modification.

Externally supplied energy **sources** (such as gas, fuel oil, or electricity used by heat pumps) used to generate energy must be included within the rating.

Electricity generated by the scheme but exported to an external user (such as a nearby building or the electricity grid) does not improve the energy performance of the scheme.

The exported energy cannot be subtracted from the utility-supplied consumption as it has no impact on the energy consumption of the scheme being rated.

10.10.3 Rainwater capture and recycling

Where water is collected or recycled within the scheme (for example, by rainwater harvesting or treatment of waste water from the scheme) and is either:

- connected on the user side of the meter which records the relevant external water supply to the scheme; or
- used within the scheme independently of utility-supplied systems

then this is equivalent to water efficiency measures and would be expected to result in a better rating. No modification of external water **source data** is required in this situation.

No discount of water use within the scheme is allowed against water exported from the scheme under any circumstances.

10.11 Documentation required

10.11.1 Utility metering

Where **utility** metering **data** is included in an assessment, the following documentation must be obtained by the **Assessor**, used in the assessment, and retained for audit:

- utility bills showing consumption records for the **billing periods;** or
- a spreadsheet or other electronic record from the utility showing consumption for the **billing periods**, with a clear indication of the meter identification and reading, and at least one utility bill that can be shown to reconcile against the electronic **data**. Where the utility provides an online portal with billing information, actual bills for reconciliation are not required.

10.11.2 Non-utility metering

Where **non-utility metering data** is used for inclusions or exclusions, the following documentation must be obtained by the **Assessor**, used in the assessment, and retained for audit:

- records of meter readings and associated factors as specified in Section 10.5.3 *Non-utility meter records*; and
- evidence of non-utility **metering system** validation as specified in Section 11 *Non-utility Metering.*

10.11.3 HV Metering

Where LV meters are used in place of a utility HV meter, a Single line diagram showing the locations of the LV meters used respective to the HV meter.

10.11.4 GreenPower™ and recycled water

Where applicable, the **Assessor** must obtain documentation of:

- GreenPower purchases, including confirmation of the allocation of bulk purchases; and
- the **source**, quantities and any non-recycled component of externally-supplied recycled water.

10.11.5 Small end-use electricity inclusions

Where the small end-use electricity inclusions method has been used, the following documentation must be retained for audit:

- The calculations, including a clear explanation of method and all assumptions; and
- Photos/records of name plate capacities; and
- Documentation used to determine duty capacity if it is not 100%; and
- Documentation used to determine annual hours.

10.11.6 Exclusions based on financially reconciled utility costs

In addition to metered data the following is required:

- Any agreements by the scheme with third parties concerning apportionment of **utility** costs for shared facilities; and
- Any calculations associated with the financial reconciliation

10.11.7 Batch deliveries

The **Assessor** must make a note of the method of measurement or estimation for each **source** in the **NABERS Calculator**.

The documentation to be retained for audit must include :

- the statements of what deliveries occurred during the **rating period**, including contact details for the responsible person who supplied the information; and
- a description of the measurement or estimation method(s) used; and
- all **data** used to calculate the measurements or **acceptable estimates**, and
- details of all calculations.

Batch-delivered recycled water (NABERS Water ratings only)

Where some or all of the batch-delivered water is from a recycled or reclaimed source, whether potable or not, the following documentation is also required:

- written confirmation from the supplier that states:
- that the water supplied is recycled or reused, including the percentage of recycled or reclaimed water within the supply; and
- the source of the water (such as the location of the supplier)

11 Non-utility Metering

11.1 Summary

This section outlines how to ensure the accuracy and correctness of non-utility metering systems which provide the **data** to be used in NABERS ratings.

11.2 Process

	Step	Reference
1	If **data** from non-utility meters is included in a NABERS rating, then the Assessor must check if these meters need to be validated.	Section 11.3
2	If the meters need to be validated, then the Assessor should check to see if there is a NABERS non-utility meter management plan in place for the scheme. If there is then this should be followed.	Section 11.4
3	If there is no plan then one must be implemented.	Section 11.5

Validation is required because non-utility electricity meters can vary significantly in their ability to correctly measure energy consumption. Common problems include incorrect wiring of the meter and incorrect meter multipliers (CT ratios). In addition Remote Meter Reading Systems (RMRS), such as a Building Management Systems (BMS), can vary significantly in how they interpret the measured consumption of a non-utility meter.

11.3 Metering systems requiring validation

Non-utility **metering systems** require **validation** if they include:

- a meter with a CT; or
- a gas meter; or
- a Remote Meter Reading System (including an interface to a Building Management System used to transmit meter **data**).

Direct connect meters with no RMRS, and pulse meters with an on-board counting device and no RMRS, are exempt from these requirements.

11.3.1 Non-utility electricity meters

All **non-utility meters** (inclusions or exclusions) with CTs require validation and adjustment if necessary by a licensed electrician or electrical engineer. This is to ensure that the CT ratio (meter multiplication factor) and wiring are correctly configured.

Embedded Networks

Embedded networks typically fall into three separate categories:

- Utility owns and manages the meters, and sells electricity: The utility has installed utility grade meters, owns the meters, is responsible for maintaining them and sells electricity. In this instance, the meters are considered to be utility meters and do not require validation under the NABERS rules.
- The scheme installs, owns and manages the meters, with a meter reading provider responsible for reading the meters: The scheme has installed a sub-meter network suitable for billing and the meter reading provider is reading the meters and is responsible for the billing and transaction side. In this case, the meters require validation as the main role of the meter reading provider is limited to meter reading and administration of the costs.
- Utility installs and manages the meters, and sells electricity; the scheme own the meters: The utility has installed utility grade meters, and is responsible for maintaining them and sells electricity. The scheme however, owns the meters. In this instance, the meters are considered to be utility meters and do not require validation under the NABERS rules.

Please contact the National Administrator if you encounter other arrangements or are unsure how to assess this.

11.3.2 Non-utility gas meters

All non-utility gas meters require validation and adjustment if necessary by a competent person with an understanding of gas meters. This ensures that the pressure correction factor corrects the measured volume of the non-utility meter to the same pressure conditions used by the **utility meter**.

Validation of the gas meter includes measuring the pressure at the meter to calculate the pressure correction factor. The pressure correction factor is used to adjust the volume of gas by the amount it has been compressed to accurately calculate the energy content.

$$\text{Pressure Correction Factor} = \frac{\text{Measured pressure (absolute)}}{\text{Atmospheric pressure}}$$

11.3.3 Remote Meter Reading Systems

All Remote Meter Reading Systems (RMRS) connected to **non-utility meters** selected for validation must also be validated to ensure the final consumption amount used is correct. This must be conducted by a competent person with an understanding of the meters and the RMRS to ensure the meter **data** is correctly interpreted. At minimum, the person must:

- Confirm the units of consumption are consistent at the RMRS and the meter face; and
- Record at least two readings from the meter and corresponding RMRS over the same time period.

11.3.4 Pulse meters

Consumption measurements from a pulse meter can only be used in a NABERS rating if the pulse meter has an on-board counting mechanism which provides an absolute count – rather than a pulse to an external device.

If Remote Meter Reading System (RMRS) is being used to record pulse meter readings it must be checked to ensure it is accurately recording the measured consumption, using the method outlined in the previous section.

Where the pulse meter is manually read, validation is not required.

11.4 Checking previous compliance with NABERS

If the scheme is already covered by a Non-utility Meter Management Plan as specified in Section 11.4 *Non-utility Meter Management Plans*, then the **Assessor** must:

- Seek evidence of validation for all **metering systems** that were due to be validated since the last rating assessment; and
- Identify any **metering systems** that have been altered since the previous rating assessment, and seek evidence of validation for them; and
- For each meter that requires adjustment as a result of the validation checks, follow the procedure in Section 10.7 *Correcting non-utility meter readings* to obtain acceptable corrected **data** or **acceptable estimates** where possible. If this is not possible, the rating cannot proceed.

The **Assessor** must also check that 12 months of **acceptable data** is available for the spaces covered by any altered **non-utility metering systems**.

11.4.1 Standard for acceptable data

The **Assessor** may only accept evidence of validation of a **non-utility metering systems** in the form of a certificate of currency or other written evidence that:

- confirms that a **metering system** requiring validation has been checked in accordance with *Appendix D – Guide to non-utility metering system validation*, and found to be correctly recording consumption; and
- confirms that the check took place within the last 10 years; and
- applies to the present condition and configuration of the **metering system** without any alteration.

11.5 Instituting a NABERS non-utility Meter Management Plan

If there is no NABERS Non-utility Meter Management Plan for the scheme to be rated, or if a Plan exists but the **Assessor** has not been provided with acceptable evidence of compliance, then a new Non-utility Meter Management must be prepared and put into effect for the scheme.

There are two stages in a Non-utility Meter Management Plan.

11.5.1 Initial Validation Stage

This is a program to validate all **un-validated metering systems** for the scheme.

The time allowed to complete this stage depends on whether any of the **metering systems** included in a random sample (as determined using the method below) are found to require correction.

If any corrections are required, this stage must be completed as soon as possible so that 12 months of correct **data** can be made available for the next rating.

If no corrections are required, then this stage must be completed within three years.

Selecting a random sample

All **metering systems** covered by the rating that require **validation** but do not have evidence of validation ('**un-validated metering systems**') must be comprehensively listed and categorised by meter type (such as pulse water meter, CT electrical meter, or gas meter).

A random sample of at least 10% of each listed meter type must then be chosen from the list, and the selected **metering systems** validated as specified in this Section. The sample of meters must exclude meters validated for prior ratings in the last ten years.

The **Assessor** must oversee or review the selection process and ensure that the sample was randomly chosen. The **Assessor** must document for audit:

- the list of **non-utility meters** from which the sample was chosen; and
- the sampling method used; and
- which **metering systems** were selected; and
- the results of the validation checks for each meter checked.

Meters requiring adjustment

Where one or more of the randomly selected non-utility **metering systems** are found to require adjustment before they can meet the validation requirements, then:

- all un-validated **metering systems** for the scheme covered by the rating must be validated so as to ensure that correct **data** is collected in the 12-month period before the next NABERS Energy or Water for Apartment Buildings rating (as appropriate); and

- the **Assessor** must determine any correction to be applied to the **data** collected from the **metering systems** found to be incorrect, as specified in Section 9.8 *Correcting non-utility meter readings,* otherwise the **data** from the meter cannot be used.

If a metering system requires adjustment then this must be done by appropriately qualified and licensed persons according to the applicable standards and procedures for the equipment.

Results of validation

Where all the randomly selected **non-utility metering systems** meet the validation requirements, then:

- the rating can proceed; and
- the scheme must implement a program to validate (and correct if necessary) the remaining un-validated **metering systems** within the timeframe within the Non-utility Meter Management Plan as specified in Section 8.5.2 *Non-utility Meter Management Plans.*

11.5.2 Ongoing revalidation stage

This is a rolling program to re-validate all non-utility **metering systems** requiring validation for the scheme. This program must ensure that every **non-utility metering system** requiring **validation** is re-validated whenever it is altered, or otherwise at least every 10 years.

As part of this validation, it is recommended that the scheme should have all single-line diagrams verified and updated to reflect the current meter coverage and locations.

All validation checks undertaken as part of a Non-utility Meter Management Plan must, as a minimum, comply with the requirements specified this Section.

11.6 Documentation required

As a minimum, a Non-utility Meter Management Plan must:

- uniquely identify each applicable **metering system;** and
- show the details of the last validation check for that **metering system**, if any; and
- nominate the date by which the next regular validation check for that **metering system** must be completed; and
- record the validation of any altered non-utility **metering systems**.

12 Shared services and facilities

In a scheme within in a layered arrangement that shares facilities or services with other schemes or entities, the rating must include the proportion of related consumption that the body corporate has a degree of control over. In this principle “degree of control” refers to where the scheme has control or ownership over shared facilities or services, or has voting rights which relate to the consumption. This requirement may mean that it could be easier or more appropriate to rate multiple strata schemes in one rating. This is allowed

Where the scheme being rated shares services and facilities with another scheme or separate legal entity, the energy and water consumption associated with the services and facilities must be apportioned for inclusion in the rating using the methods in Section 12.4 *Methods of apportioning consumption*.

These methods can also be used for a mixed use scheme with shared services or facilities.

A service refers to a system which provides electricity, gas, domestic cold water, domestic hot water, chilled water and/or any other form of thermal energy transfer. In most cases, the consumption associated with a service must be measured directly.

A facility refers to a physical amenity, like shared common areas, a pool, gym or a lift. In most cases, the consumption associated with a facility can be apportioned.

12.1 Process overview

Assessors must comply with the following process:

	Step	Reference
1	Assess if consumption is associated with a shared service and therefore can be directly measured. If so then the consumption relating to the scheme must be measured and allocated to the rating.	Section 12.2
2	If consumption cannot be directly measured, and is associated with a facility, then the **Assessor** must use one of the methods listed for apportioning consumption.	Section 12.3 Section 12.4

12.2 Shared services – measured consumption

Where the energy or water consumed is associated with a shared service and can be directly measured then the measured consumption attributable to the scheme **must** be included in the rating. This relates to the provision of electricity, gas, domestic cold water, domestic hot water, chilled water or other forms of thermal energy transfer.

If metering does not exist, or is not compliant with Section 11 *Non-utility Metering* then all the consumption must be included in the rating, unless one of the methods in Section 10.8 *Methods for estimating small amounts of data* can be used. This energy or consumption cannot be apportioned.

This includes overflow water consumption, often termed "residual water consumption".

An example of an **end use** which is measurable is chilled water provision from an air conditioning system. In this case direct **end uses** can be measured using thermal metering. If thermal metering does not exist, then the Assessor must include the total energy of the **end use** and cannot apportion it using the methods outlined below.

For thermal energy measurements refer to Section 10.3.2 *Thermal energy measurements*.

In some cases, energy and water exclusions based on financial reconciliations (See Section *12.4.2 Priority 2: Financial reconciliation*) for the entities covered under this section is permissible. However, in doing so, the energy/water exclusion gets added to the **potential error**. This is primarily for small end-uses or small energy transfers where metering may not be feasible, for further information see Section *10.8.2 Exclusions based on financially reconciled utility costs*.

12.3 Shared facilities - apportioned consumption

Apportioned consumption can only be used when the direct consumption of an individual scheme cannot be directly measured, as outlined in the previous section. An example list of **end uses** for energy and water which may be apportioned are listed below. These lists are not exhaustive.

Contact the **National Administrator** if there is a shared facility that is not covered by the list below and the **Assessor** is unsure how it should be treated.

12.3.1 Examples of facilities which can be apportioned

Energy consumption

Examples of shared facilities which can be apportioned for energy consumption include:

- Common external grounds (such as external lighting and security features);
- Swimming pools;
- Gyms, spas, saunas;
- Amenities like tennis courts and theatres;
- Restaurants;
- Foyers, lobbies, and shared areas (note this does not include foyers, lobbies and shared areas within the scheme being rated, only those shared with other schemes);
- Loading docks and other back of house facilities such as garbage rooms;
- Embedded network (such as switch rooms);
- Communications rooms;
- Vertical transport;
- Fire system pumping;
- Car park lighting and ventilation; and
- Sewer, stormwater and waste water pumping (including the energy consumption of wastewater treatment plants).

Water consumption

Examples of shared facilities which can be apportioned for water consumption include:

- Irrigation of common external grounds;
- Swimming pools;
- Gyms, spas, saunas;
- Amenities like tennis courts and theatres;
- Cafes and restaurants;
- Fire system;
- End of trip facilities (for example cyclist amenities); and
- Cleaning.

12.4 Methods of apportioning consumption

The following methods of apportioning are allowed in order of priority. If none of the methods outlined below can be applied, then the entire energy and/or consumption for the shared facility must be included in the rating of the scheme.

Contact the **National Administrator** if the scheme has access to logged data which it can use in apportioning.

Assessors must take note of the following:

- If there are other uses on the meter which are not included in the required coverage of the rating these can also be excluded if they are separately sub-metered. If they are not separately sub-metered they can be included at the same proportion as the remainder of the consumption; and
- For each of these methods metering may cover more than one facility.

12.4.1 Priority 1: Apartment number-based apportioning

If there is more than one apartment building sharing a facility but only some of the buildings are within the scheme, this method may be used. The ratio of consumption should be calculated based on the number of apartments in each building and this ratio should be applied to the energy consumption.

For example, there are two apartment buildings which share a pool:

1. Apartment Building 1 has 200 apartments and is within the scheme

2. Apartment Building 2 has 100 apartments and is outside of the scheme

The ratio of apartments is therefore 200 : 100.

The energy consumption of the pool is applied to Apartment Building 1 using the ratio of 2:3. The remainder (1:3) is applied to Apartment Building 2.

To use this method the following conditions must be met:

- Sufficient compliant metering is in place to determine the energy use of the shared facility during the **rating period**, (see Section 11 *Non-utility Metering*); and
- An apartment count compliant with the Rules (see Section 5 *Total Apartment Count*), must be prepared for each building sharing the facility, even those that are not part of the scheme.

This method meets the standard for **acceptable data** and is not included in the **potential error**.

12.4.2 Priority 2: Financial reconciliation

The energy and/or water used by a shared facility may be apportioned based on entitlements shown on registered titles or on contractual or legal agreements (such as strata management statements) to each user sharing the facility when the following conditions are met:

- Financial allocation to apartments across the layered arrangement must be less than 50% of the amount apportioned (where layered arrangement consists of residential strata schemes only); and

- Sufficient compliant metering is in place to determine the energy and/or water use of the shared facility during the **rating period**; and
- Legal or contractual documentation that is compliant with the relevant standards for **acceptable data** is available, assigning a proportion of the costs of the energy use captured by the meter to each building or user sharing the service; and
- The energy use may be apportioned based on the proportion of the costs which is allocated to each building in the agreement or contract; and
- The **Assessor** can verify and justify that the reconciliation is a reasonable approximation and does not impose an unfair advantage or disadvantage to the rating.

12.5 Documentation Required

For both measured and apportioned consumption, the consumption documentation requirements as the same as for utility or non-utility meters, as outlined in the Rules. In addition, the following is required.

12.5.1 Priority 1 Apartment number-based apportioning

- The total apartment count for all buildings sharing the facility; and
- Any calculations associated with the apartment-based apportioning.

12.5.2 Priority 2: Financial reconciliation

- Any relevant registered title documents
- Any agreements by the scheme with third parties concerning apportionment of **utility** costs for shared facilities; and
- Any calculations associated with the financial reconciliation.

13 Appendices

Summary

13.1 Appendix A – Information checklist for accredited ratings

The following information may be required for a rating. It should be obtained from the scheme before a scheme visit, and then confirmed during the scheme visit and subsequent assessment.

This checklist covers most of the information needed, but individual ratings may require additional information or documentation depending on the individual circumstances of the scheme.

		Information checklist	Reference
Total Apartment Count	❑	Confirmation from the **Assessor** that the minimum requirements have been met	Section 5.3
	❑	**Data** validating the number of apartments in the scheme to be rated. The source of the **data** may be: • Strata plans or as-built plans from which the number of **apartments** can be counted; or • Photographic evidence of apartment directories, letterboxes or similar that demonstrate the number of **apartments**; or • **Assessor's** notes listing a count of **apartments** on each floor including: A list of floor numbers A list of apartment numbers for each floor A photograph of the apartment number for the highest numbered-apartment on each floor The total apartment count must align with the information provided by apartment in Sections 6 *Service Categories for Energy,* Section 7 *Service Categories for Water* and Section 8 *Car Parking Spaces – Energy only*	Section 5.4

		Information checklist	Reference
Energy Service Category	❑	Documentation validating the number of apartments in each of the following categories: • Centrally air-conditioned apartments • Condenser water serviced apartments • Lift serviced apartments Documentation includes: • Mechanical schematic plans of air-conditioning services to apartments and/or • **Assessor** description plus photographs illustrating air-conditioning arrangements and key equipment items including: o For centrally air-conditioned apartments: chillers and boilers or Variable Refrigerant Flow (VRF) condensers o For condenser water serviced apartments: cooling towers • Number of floors in the scheme • Evidence of presence of a lift	Section 6
	❑	Documentation validating the presence of a pool and/or gym. Documentation includes: • Mechanical schematic plans indicating the provisioning of a swimming pool(s) and associated heating equipment (if relevant); and/or • Assessor site visit notes and photographs of swimming pool and/or gym and associated heating and cooling equipment (if relevant); and • Evidence showing that the gym is greater than 25m^2 and that the swimming pool is not a spa; and • Assessor notes or other evidence supporting any claim that the swimming pool qualifies as being a heated swimming pool; and • **Assessor** notes on the basis of justification for the number of months during the rating period that the swimming pool and/or has been available for use.	Section 6

		Information checklist	Reference
Water Service Category	❑	Documentation validating the number of apartments in each of the following categories: • Central air conditioning services (water) • Single water meter • Apartment water meter with no central hot water • Apartment water meter with central domestic hot water	Section 7
	❑	Documentation includes: • Documentation as per energy services category for central air conditioning services • Hydraulic schematic plans identifying the water meters used in the rating • **Assessor** mock-up of the water metering configuration • Mechanical/hydraulic schematic plans indicating the provisioning of central domestic hot water services to apartments and may include common areas; and/or • **Assessor** description of mechanical services including photographs of key equipment items such as water heaters and circulation pumps; and • **Assessor** notes confirming that energy supply to the domestic hot water is captured within the rating	Section 7

		Information checklist	Reference
Car Parking Spaces – Energy only	❑	Documentation validating the number of car parking spaces. Documentation includes: • Car park as built plans or **Assessor's** mock-up of car parking space layout showing the layout of the car parking space and the assessor's allocation of the car parking spaces to naturally ventilated and mechanically ventilated • **Assessor** documentation justifying the allocation of car parks as mechanically ventilated, showing the general location of car park supply/exhaust vents, and **Assessor's** notes as to the nature of car park fan control.	Section 8
Energy and water coverage and consumption	❑	Single-line diagrams, electrical circuit schedules and water reticulation diagrams to ensure all energy and water **sources** are included. Where **non-utility meters** are used this must also include: • the location and identifier (meter number) of each **non-utility meter** used for an inclusion in the rating, and each **utility meter** used in the rating, and • the location of each of the major uses for energy or water identified in Section 9.4 *Confirm energy and water coverage*	Section 9
	❑	Financial Statements confirming that all meters have been accounted for	Section 9
	❑	Calculations or documentation confirming any consumption to be excluded from the rating, and substantiating the grounds for the exclusion.	Section 9
	❑	Evidence of accuracy and **validation** of high voltage electricity meters and all other **non-utility meters**, and records of readings of **non-utility meters**.	Section 10.3 Section 11
	❑	**Utility** billing **data** covering the full 12 months of the **rating period** for each energy or water **source** (as appropriate) used on the **scheme**. This must be either: • utility bills showing consumption records for the **rating period**, or • a spreadsheet or other electronic record from the utility showing consumption for the **rating period**, with a clear indication of the meter identification and reading, and at least one utility bill that can be shown to reconcile against the electronic **data**.	Section 10.5 Section 10.6

		Information checklist	Reference
	❑	Where non-utility meters are used - records of meter readings and associated factors as specified in *Non-utility meter records*,	Section 10.5.3
	❑	Documentation of any GreenPower or recycled water purchases, including the allocation of bulk purchases.	Section 10.5
	❑	Calculations and documentation validating any small end use inclusions or exclusions through financial reconciliation including	Section 10.8
	❑	Bills for deliveries of any discrete (batch) supplies, showing quantities delivered and how they were measured. If the **data** does not include enough separate deliveries, then obtain any regular records of storage capacity readings.	Section 10.9
Shared facilities and services	❑	Documentation validating any apportioning including: • The total apartment count for all buildings sharing the facility • Any calculations associated with the apartment based apportioning • Any agreements by the scheme with third parties concerning apportionment of **utility** costs for shared facilities • Any calculations associated with the financial reconcilation	Section 12

13.2 Appendix B - Accuracy calculation procedure

The **NABERS Calculator** includes sections for calculating the error that could result if inaccurate assumptions, approximations or un-verified **data** are used in an assessment. It is important that this 'worst-case' error is known and is kept within limits so that NABERS ratings can be relied upon for comparison.

Potential Error – energy and water consumption

For all **data** inputs except hours, the **potential error** is the total of all **acceptable estimates** (including assumptions, approximations, and un-verified **data**) used in place of **acceptable data**.

Total rating accuracy

The combined effect of all assumptions, **acceptable estimates**, and un-verified **data** on a rating is calculated in the **NABERS Calculator** as follows:

- Calculate a 'Case A' rating using all the assumptions, **acceptable estimates**, and un-verified **data** intended to be used in the assessment.

Calculate the **potential error** for each **data** input.

Calculate a 'Case B' rating in which the **potential errors** are:

- (for all **data** except for energy and water consumption **data**) added to the 'case A' inputs, or
- (for energy and water consumption **data**) subtracted from the 'case A' inputs.

The 'Case A' rating meets the accuracy requirements of this section if the results from the rating calculator for the 'case A' and 'case B' ratings differ by no more than 5% (in $kgCO_2/m^2$ or kL/m^2, as appropriate).

13.3 Appendix C – Guide to non-utility metering system validation

Section 13.3.1 should be used as a guide by a competent person[1], licensed electrician or electrical engineer to ensure that the Remote Meter Reading System (RMRS) is interpreting the **non-utility meter data** correctly.

Section 13.3.2 should be used as a guide by the licensed electrician or electrical engineer for non-utility electricity meters with current transformers (CTs) to ensure they are properly installed, functioning correctly and interpreted correctly.

Section 13.3.3 should be used as a guide by a competent person to verify that the pressure correction factor corrects the measured volume of the non-utility gas meter to the same pressure conditions used by the **utility** gas meter.

[1] A 'competent person' could be an Assessor with an understanding of the meter in question.

Where errors with a non-utility **metering system** are identified, it is expected that the **non-utility meter** or RMRS will be adjusted and re-tested as part of the **validation**, and the adjustment documented.

If a **metering system** requires adjustment then this must be done by appropriately qualified and licensed persons according to the applicable standards and procedures for the equipment.

13.3.1 Remote Meter Reading Systems

RMRS are used to read the meters from a remote location. They are used to simplify the reading process or because of accessibility issues with manually reading a meter. RMRS are common for both electricity and water metering.

The RMRS can record the consumption of the meter through a pulse output or through a protocol that directly reads the meter register. The connection to the meter can be through a hard-wired, wireless or radio frequency connection.

Most remote water reading systems use pulse output type meters, either hard-wired or via radio frequency transmitters. Electricity meters use a combination of pulse output and direct reading of the meter consumption.

The RMRS can be part of an existing Building Management System (BMS) or a dedicated system.

To ensure that an RMRS is interpreting the meter **data** correctly, confirm that a unit of consumption on the RMRS corresponds to a unit of consumption as measured at the meter.

At least two readings of the **non-utility meter** and corresponding RMRS must be undertaken at the same two time periods, and the results documented. Where the results identify a discrepancy between the **non-utility meter** and RMRS, the RMRS must be adjusted and at least two more readings taken to confirm it is accurately measuring consumption. All readings and any adjustments must be documented.

13.3.2 Electricity meters

Electricity meters can be single-phase, commonly used for residential or small tenancies, or three-phase used for larger tenancies. They can be basic electro-mechanical meters or fully electronic with analog (dial) or digital displays.

They are either ‘whole current’ (direct connect) where all the electricity flows through the meter, or current transformer (CT) meters where the transformer reduces the current flow through the meter by a defined ratio.

A whole current meter is typically used for loads up to 100 amps and CT meters for larger loads. The more recent exception to this is where small panel-mounted electronic meters are installed that use CTs regardless of the current flow.

CT ratios are expressed as a ratio of the primary current to the secondary current. For example, a ratio of 300:5 means that when 300 amps flows through the CT then 5 amps flows through the meter. If the meter does not have the ability to program this ratio through some configuration, then the meter reading would need to be multiplied by this ratio to arrive at the actual consumption recorded by the meter.

This ratio is also known as the meter multiplier, meter factor or K factor. In the case of a CT ratio of 300:5, the multiplier or K factor would be 60. As a note, all CTs have a ratio of the ‘value’:5 with the ‘value’ generally indicating the maximum current for the circuit that is metered.

Analog electromechanical meter

available in either whole current (direct connect) or CT type meters.

Typical three-phase electronic meters

available in either whole current (direct connect) or CT type meters with little to distinguish them other than the labelling on the meter, unless the cover has been removed. CT type meters have 10 connections, while whole current meters have 7 connections.

Panel-mounted electronic meter using CTs

Exemption for manually read whole current meters

Whole current (direct connect) meters without CTs that are manually read, with no interpretation by a RMRS, are excluded from these rules.

Checking the Current Transformer (CT) ratio and meter wiring

Record the CT ratio and verify, where appropriate, that the meter is correctly configured to this ratio. Where the CT ratio is not programmed into the meter, verify that the CT ratio has been correctly applied to the meter readings to arrive at the actual consumption.

Cross check the wiring of the meter and the CTs for:

- CTs not connected
- reverse CT connection errors, which will significantly reduce the recorded consumption
- cross phase CT connection errors, where CTs are not matched to the same phase voltage
- phase sequence connection errors
- faulty or missing potential fuses, which can significantly reduce the recorded consumption and may cause failure of the meter.

Record the CT ratio or multiplier that is required to convert the meter reading to kWh.

Where it is not possible to identify the CT ratio, a qualified electrician can use a power meter to confirm the reading by measuring the actual current flow through the circuit being metered and the corresponding phase to the meter. The following calculation would then apply to determine the CT ratio:

$$\text{The CT ratio ('value':}\mathbf{5}\text{)} = \frac{\text{measured circuit amps (e.g. 120 amps)}}{\text{measured meter amps (e.g. 2 amps)}} \times 5\mathbf{:5}$$

$$= 300\mathbf{:5}$$

Checking meters in place to avoid shutdown

If wiring and CTs associated with **non-utility meters** cannot be safely accessed and visually checked without a partial or total shutdown, the following methods can be used to confirm that each **non-utility meter** is properly installed, functioning correctly and interpreted correctly.

If a meter checked by these methods is found to require adjustment, then the check after adjustment must fully comply with Section 10.4.2/2 above.

A shutdown to allow safe access may then be unavoidable.

Verification using a power meter	A qualified electrician can verify the operation and accuracy of the **non-utility meter** using a portable power meter to record the consumption of the metered circuit over a period. This is achieved by taking meter readings at the start and end of that period and comparing the measured consumption over the same time period on the power meter. Where the difference in the power meter and **non-utility meter** readings is greater than 10%, this indicates a problem with the **non-utility meter** wiring or CTs, which requires correcting.
Verification from measured current	A qualified electrician can identify the average current in the circuit being metered using a clamp-on ammeter or similar device. At the time of the measurement, the consumption being measured must be indicative of the average usage in the metered circuit, and must be relatively constant in the usage at that time. For each phase, select a test period of at least one hour and read the **non-utility meter** at the start and end of this period. The readings taken by the electrician within this period can be converted to an average kilowatt (kW) value: • divide the average amps by 1.4 for three-phase supply • multiply the average amps by 0.24 for a single-phase supply. The kW reading is converted to kilowatt per hour (kWh) based on the time of the period and compared to the **non-utility meter** consumption for that same period. Where the difference between the value derived from the clamp-on ammeter readings and the **non-utility meter** reading is greater than 10%, this indicates a problem with the **non-utility meter** wiring or CTs, which requires correcting.

Where either of these methods are used for **validation**, the CT ratio and meter multiplier programmed in the **non-utility meter** must be recorded.

Example

A three-phase circuit with a **non-utility meter** was measured for one hour and the amps were recorded at an average of 14 amps per phase. This reading was converted to 10 kW i.e. 14 amps divided by 1.4 for three-phase supply. The difference between this figure and the **non-utility meter** readings should therefore be 1 kWh (i.e. 10%) or less over that one hour period. Any greater difference in the meter readings would indicate that the meter must be corrected.

13.3.3 Gas meters

Record the meter pressure and the correction factor required to adjust the reading to m^3 under standard pressure. This **data** can be collected from the **non-utility meter** and compared with the **utility meter**, or obtained from the gas supplier.

13.3.4 Example of a validation record for electrical non-utility meters

Scheme name:

Scheme address:

Name of person undertaking validation:

Qualification and/or certified licence number:

Date of validation:

Non-utility meter ID (meter no. or tenancy / unit no.)	**Non-utility meter description** (meter brand and type)	**Meter wiring checked***	**Remote meter reading** Confirmation of the accurate interpretation of system reading the non-utility meter at the same two time periods (where applicable)				**CT ratio** (only applicable for CT type meters)	**Meter multiplier; K factor; or meter factor** (only applicable for CT type meters)	**Power meter check (kWh)** (only required where it is not possible to identify the CT ratio)
			Time A		**Time B**				
			Remote Metering Reading System readings	Corresponding manual non-utility meter readings from meter face	Remote Metering Reading System readings	Corresponding manual non-utility meter readings from meter face			
Example	Example	Yes	Time A: 12:25		Time B: 12:32		300:5	60	1600 kWh
			12357.90	12357.90	18256.31	18256.31			
			Time A:		Time B:				
			Time A:		Time B:				

*The meter wiring check for CT type meters should check for: reverse CT connection errors; cross phase CT connection errors; phase sequence connection errors; and faulty or missing potential fuses.

Signed to record that the above non-utility meters
are correctly configured and have been validated: .....

13.3.5 Example of a validation record for gas non-utility meters

Scheme name: Scheme address:

Date of validation: Name of person undertaking validation:

Non-utility meter ID (meter no. or tenancy / unit no.)	**Non-utility meter description** (meter brand and type)	**Remote meter reading** Confirmation of the accurate interpretation of system reading the non-utility meter at the same two time periods (where applicable)				**Meter pressure (kPa)**	**Correction factor**
		Time A		**Time B**			
		Remote Metering Reading System readings	Corresponding manual non-utility meter readings from meter face	Remote Metering Reading System readings	Corresponding manual non-utility meter readings from meter face		
Example	Example	Time A: 12:25		Time B: 12:32		116.372	1.1485
		12357.90	12357.90	18256.31	18256.31		
		Time A:		Time B:			
		Time A:		Time B:			
		Time A:		Time B:			

Signed to record that the above non-utility meters
are correctly configured and have been validated: .....

13.3.6 Example of a validation record for water non-utility meters with a Remote Meter Reading System (RMRS)

Scheme name: Scheme address:

Date of validation: Name of person undertaking validation:

Non-utility meter ID (Meter no. or tenancy / unit no.)	**Non-utility meter description** (Meter brand and type)	**Remote meter reading** Confirmation of the accurate interpretation of system reading the non-utility meter at the same two time periods (where applicable)			
		Time A		**Time B**	
		Remote Metering Reading System readings	Corresponding manual non-utility meter readings from meter face	Remote Metering Reading System readings	Corresponding manual non-utility meter readings from meter face
Example	Example	Time A: 12:25		Time B: 12:32	
		12357.90	12357.90	18256.31	18256.31
		Time A:		Time B:	
		Time A:		Time B:	
		Time A:		Time B:	

Signed to record that the above non-utility meters
are correctly configured and have been validated: .....

13.4 Appendix D – GreenPower™

GreenPower™ can be used to improve a scheme's NABERS rating.

More information on how it must be applied is included in this appendix.

13.4.1 Separate purchases

Separate purchases of GreenPower are those that are not included within the utility bill.

The purchase of any GreenPower bought separately to offset actual energy consumption must have occurred before the date the rating application was submitted.

The **Assessor** must verify that the GreenPower was used within the scheme. For assessments where a separate GreenPower purchase was made, the scheme must provide written confirmation that the GreenPower purchase was used for the scheme in question only.

13.4.2 On-sold GreenPower

In schemes where the **utility** supply is distributed to apartments through scheme operated **non-utility meters**, it is possible to on-sell the GreenPower to **apartments**.

On-sold GreenPower cannot be included in the calculations for the **NABERS Energy rating**.

In this situation, the **Assessor** must assume that no GreenPower was used within the energy coverage of the NABERS Energy rating unless written evidence demonstrates otherwise.

13.4.3 Bulk purchases

Where a bulk GreenPower purchase must be divided between a number of properties, the **Assessor** must provide documentation from the scheme to the **National Administrator** with a spreadsheet indicating the exact amount of GreenPower (in kWh) allocated to each property.

This information must also be replicated for each rating to allow for cross-checking. Proof of the GreenPower purchase must be supplied with each rating application.

13.4.4 Exclusions

Use the following method in allocating GreenPower to energy use exclusions:

- Where an exclusion is due to use by another entity excluded in the rating (for example, an apartment building on-selling electricity to residents through a non-utility meter), documentation must be obtained to determine the amount of GreenPower used within the scheme. No GreenPower can be included in the rating where it is ambiguous or no documentation exists.

Where an exclusion is due to being outside the energy coverage but is still owned or operated by the **scheme** (for example, partial exclusion of a car park), the GreenPower must be allocated to the excluded meter in the same proportion as it was bought for the utility meter.

13.4.5 Standard for acceptable data

In all cases, the actual percentage or amount of GreenPower supplied must be explicitly assessed from the bills or as advised in writing by the GreenPower provider.

Assessors must check whether a GreenPower purchase was capped to a specific amount, and if so, must ensure the correct figure has been used.

13.5 Appendix E – The rating period

A NABERS rating is based on twelve months of **data**, called the **rating period**. Once certified, the rating is valid for up to twelve months, called the **validity period**.

13.5.1 Allowance for lodgement

It takes time for the **Assessor** to complete a rating, so 120 days is given to lodge the rating after the end of the **rating period**. Ratings lodged after the 120 days will have a reduced validity period to ensure all ratings are based on current **data**.

The following scenarios illustrate this principle.

Scenario 1

A NABERS Rating is lodged with the **National Administrator** within 120 days of the end of the **rating period**. It will be valid for 365 days from the date of certification.

For example:

- The rating period is 1 January 2017 to 31 December 2017. The due date is therefore 30 April 2018.
- The **Assessor** lodges the rating on 1 February 2018, and the Administrator certifies it on 5 February 2018. This is before the due date.
- The rating will therefore be valid for 365 days from the date of certification (5 February 2018).
- It will expire on 5 February 2019.

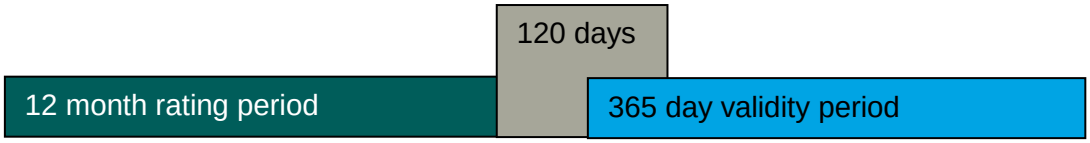

Figure 1: A rating that is lodged within 120 days of the end of rating period.

Scenario 2

A NABERS Rating is lodged with the **National Administrator** more than 120 days after the end of the **rating period**. It will be valid for 365 days from the end of the **rating period**.

For example:

- The rating period is 1 January 2017 to 31 December 2017. The due date is therefore 30 April 2018.
- The **Assessor** lodges the rating on 1 June 2018, and the Administrator certifies it on 6 June 2018. This is after the due date.
- The rating will therefore be valid for 365 days from the end of the rating period (31 December 2017).
- It will expire on 31 December 2018.

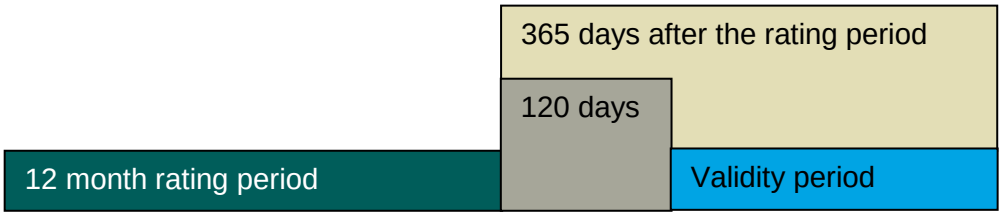

Figure 2: A rating that is lodged after 120 days from the end of rating period.

13.5.2 Allowance for responses

Assessors are given 120 days after the **rating period** to lodge Ratings with the **National Administrator**. The **Assessor** should allow 10 working days for a response from the **National Administrator.** The **National Administrator** then allows a further 10 working days for the **Assessor** to respond to any queries that arise from quality assurance checks before certification.

If the **Assessor** has not responded adequately to all queries and the Rating has not been certified within 130 days of the end of the **rating period**, the rating will only be valid for up to 365 days from the end of the **rating period**. This does not include the time taken by the **National Administrator**,

Scenario 3

For example:

- The rating period is 1 January 2017 to 31 December 2017. The due date is therefore 30 April 2018.

- The **Assessor** lodges the rating on 29 April 2018, 119 days after the end of the rating period. The **National Administrator** responds on 3 May 2018 requesting further clarification.
- If the **Assessor** provides adequate clarification within 10 days the rating will be valid for 365 days from the date of certification. So, if the **Assessor** responds on the 8th of May, the Rating will be certified and valid until the 8th of May 2019.
- If the **Assessor** does not respond with clarification until the 30th of May the rating will only be valid until 365 days from the end of the rating period, so it will expire on the 31 December 2018.
- If the **Assessor** is required to provide clarification multiple times the maximum time allowed for the **Assessor** to respond is a total of 10 days.

13.5.3 Adjusting the Rating period

After the rating has been lodged, the **Assessor** may require the **rating period** to be changed. The **rating period** may only be adjusted by a maximum of 62 days from the first lodgement. A new rating will need to be created if the **Assessor** would like to adjust the **rating period** by more than this.

A rating is required to comply with The Rules that are current at the time of lodgement. **Assessors** are advised to seek advice and request a Ruling (if needed) prior to lodging ratings that may require one.

13.5.4 Lodging Successive Ratings

For a scheme which already has a current rating there are two options to complete another rating of the same type: Replace or Renew.

Replace

The Replace option allows the new rating to replace the existing rating immediately upon certification.

There will be loss of the existing rating's remaining validity period. This option might be chosen if the new rating is better than the existing rating.

Figure 3: The existing rating is replaced by a new rating, expiring the existing rating upon certification.

Renew

When a site is most concerned with maximising validity time, they can choose the 'renew' option.

Under the Renew option, the new certified rating will begin its validity period once the existing rating expires.

The new rating is valid for a maximum of 365 days from the date of activation. If the new rating's validity period begins more than 120 days after the end of the **rating period** the validity will be reduced, as the validity period cannot exceed 485 days from the end of the **rating period**. This is to ensure current **data** is used.

Using this option maximises the validity period of the existing rating and eliminates any gap between an expiring rating and a new rating. However, the validity of the new rating can be reduced if the rating uses a **rating period** that is much earlier than the validity period.

An expired rating can be renewed. The validity period will begin on the date of certification, rather than the date the previous rating expired.

Scenario 4

The new rating begins its validity period within 120 days after the end of the **rating period**.

For example:

- The current rating's validity period expired 31 December 2017.
- The rating period is 1 October 2016 to 30 September 2017 for the renewal rating.
- The **Assessor** lodges the renewal 1 November 2017 and it is certified by the **National Administrator** 7 November 2017.
- The validity period for the renewal will be 1 January 2018 – 31 December 2018.

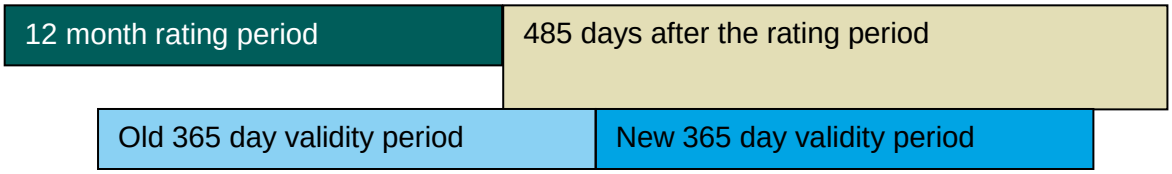

Figure 4: The validity period for the new rating begins once the old rating expires. The new validity period is 365 days.

Scenario 5

The new rating begins its validity period over 120 days after the end of the **rating period**.

For example:

- The current rating's validity period expired 31 December 2017.
- The rating period is 1 August 2016 to 31 July 2017 for the renewal rating.
- The **Assessor** lodges the renewal 1 November 2017 and it is certified by the **National Administrator** 7 November 2017.
- The validity period for the renewal will be 1 January 2018 – 28 November 2018, 485 days after the end of the rating period.

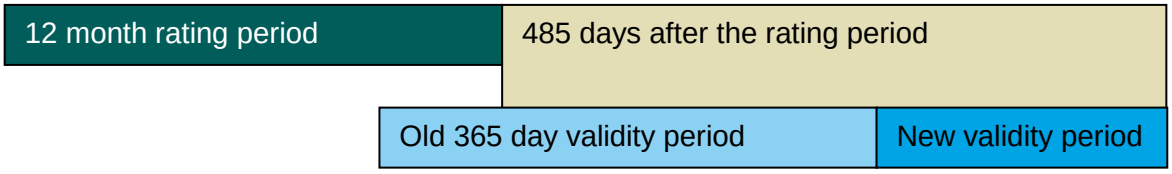

Figure 5: The validity period for the new rating begins once the old rating expires. The new validity period is less than 365 days.

The 485 days is the total of the 120 days allowed for assessment plus the 365 days of validity.