

The Rules

Metering and Consumption

Version 2.1 — May 2024



Cover photo: A gas meter servicing a CHP unit of an office building.

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1 Introduction

1.1 General

NABERS UK is a performance-based rating scheme that operates across England, Wales, Scotland and Northern Ireland. It is managed by CIBSE Certification Ltd, referred to as the **Scheme Administrator**. The scheme is owned and licensed by NABERS, who also own and administer the Australian NABERS rating system.

NABERS ratings are expressed as a number of stars, as follows:

NABERS rating	Performance comparison
6 stars ★★★★★★	Market leading building performance
5 stars ★★★★★	Excellent building performance
3 stars ★★★	Market average building performance

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

This document presents the metering and consumption **Rules** that are common for all NABERS UK ratings. It is intended that this document be read in accordance with *NABERS UK The Rules — Energy for Offices*. Its purpose is to provide the standard for the collection and assessment of metering and consumption data for energy. As such, it presents the minimum requirements of what **Assessors** must adhere to when they are conducting a NABERS UK rating.

This document contains **Rules** for **Assessors** conducting an energy rating for metering and consumption as follows:

- Identifying all the sources and supply points of energy and confirm that they are permitted by NABERS UK, see Section 4.2.
- Check the sources and supply points to confirm that the required minimum energy coverage can be met, see Section 4.3.
- Confirm the types of supply points and meters that are present and adhere to **validation** requirements as applicable, see Section 0.
- Calculate the consumption from each of the **utility metering systems** to be considered when calculating the rating, including correction for any estimates or missing data, see Chapter 5.
- Calculate the consumption from each of the **non-utility metering systems** to be included in the rating, including correction for any estimates or missing data, see Chapter 6.
- Validate meters where **non-utility metering systems** have been used to calculate consumption in accordance with these **Rules**, see Chapter 7.

- g) Calculate the consumption from any small **end use** estimations and batch supplies, see Chapter 8.
- h) Calculate the consumption from any renewable energy on-site, see Chapter 9.

These **Rules** provides guidance for **Assessors** where such schemes are present.

These **Rules** will supersede *NABERS UK The Rules — Metering and Consumption*, v1.1, 2022.

1.2 Interpretation of the Rules and Rulings

These **Rules** are to be read in conjunction with the respective NABERS **Rulings** as they apply to the specific building type. **Rulings** are used to address specific issues that may arise after the publication of the **Rules**.

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 with NABERS UK, unless—

- a) the **Scheme Administrator** has specifically approved otherwise in writing; or
- b) the assessment is conducted under the terms of a NABERS Design for Performance Agreement (refer to <https://www.cibsecertification.co.uk/nabers-uk/products/design-for-performance/useful-downloads/>) which specifies an earlier version of the **Rules**.

Note: **Rules** texts are amended as required by additional **Rulings** which are published on the NABERS UK website at <https://www.cibsecertification.co.uk/nabers-uk/products/energy-for-offices/useful-downloads/>.

Where a conflict between these **Rules** and existing **Rulings** is present, the requirements of the **Rulings** take precedence over the **Rules**.

1.3 Situations not covered by the Rules

Assessors must comply with these **Rules** unless prior approval has been sought and approved by the **Scheme Administrator**.

Where appropriate, **Assessors** may contact the **Scheme Administrator** to propose an alternative methodology, outlining the circumstances and rationale. Prior approval for use is required and may be granted conditionally, on a case-by-case basis and at the **Scheme Administrator's** discretion.


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

1.4 How to use this document

The term “**Rules**” refers to a body of works produced by NABERS UK that specify what must be examined, tested and documented when an **Assessor** conducts a rating. Wherever the term is used in this document from Chapter 3 onwards, it refers to this document, *NABERS UK The Rules — Metering and Consumption*. Other **Rules** documents mentioned in the text are distinguished from the present document by the inclusion of their title.


Text appearing **dark green** and **bold** is a defined term. Defined terms can be found in Chapter 2 of these **Rules** or in the terms and definitions chapter of the respective **Rules** document.

The following formatting conventions may appear in this text:

 Important requirements and/or instructions are highlighted by an information callout box.

Note: Text appearing with a grey background is explanatory text only and is not to be read as part of the **Rules**.

Example: Text appearing with a green background is intended to demonstrate a worked example of the respective **Rules** section or **Ruling** section.

 This is a documentation requirement callout box.

1.5 What is new in this version

A detailed list of the main changes made between this version and the previous version, is given in Appendix C.

1.6 Related documents

The following document has been referenced within these **Rules**:

NABERS UK The Rules — Energy for Offices, v2.1, 2024

Note: The following documents are NABERS Australia documents which are relevant to NABERS ratings under the NABERS UK scheme. Not all aspects of these Australian documents are applicable to NABERS UK and therefore some interpretation may be required.

NABERS Ruling — On-site Renewable Electricity Generation Systems, v1.1, 2021

NABERS Ruling — Shared Services and Facilities, v1.0, 2022

NABERS Ruling — Treatment of Cogeneration and Trigeneration Systems, v1.2, 2022

NABERS The Interim Rules — Thermal Energy Systems, v1.0, 2021

2 Terms and definitions

This chapter lists the key terms and their definitions that are integral to the proper use of this document.

Term	Definition
acceptable data	Data which meets the applicable accuracy and validity requirements of these Rules.
acceptable estimate(s)	The values derived from an estimation method permitted by these Rules in place of incomplete or uncertain data. Estimates that do not satisfy the above specifications are deemed unacceptable and cannot be used in the rating.
Assessor(s)	An accredited person authorised by the Scheme Administrator to conduct NABERS UK ratings.
Auditor	A person contracted to the Scheme Administrator to perform audits of NABERS UK rating applications.
base building	The technical entity defined by the services within the minimum energy coverage defined in <i>NABERS UK The Rules — Energy for Offices</i> .
billing period(s)	The continuous 12-month period of data which is used for an individual meter in the rating.
cloud metering system	An electrical metering system where voltage, current and phase data is gathered from an electrical network by sensors. This data is then transmitted via the cloud (this is a type of RMRS) to software that calculates energy usage. Note: Cloud meters are considered “non-cumulative” meters for the purposes of NABERS UK.
embedded network	A privately operated electricity network where the network operator/owner has a utility meter and has the ability to on-sell electricity to users downstream of this utility meter. Note: Most office buildings in the UK use embedded networks for supplying office tenants and the base building systems.
end use(s)	A purpose or activity (or a group of related purposes and activities) that energy is used for.
heating, ventilation and air-conditioning (HVAC)	Any system that is used for heating, ventilating or conditioning the air in an enclosed space.
metering system(s)	A system of one or more devices providing an individual measurement.

Term	Definition
NABERS rating input form	The rating input form provided by the Scheme Administrator for use by Assessors in the calculation of accredited ratings.
Net Internal Area (NIA)	<p>The floor area, determined in accordance with the measurement standard for rated area, of spaces that can be used as offices within the rated premises.</p> <p>Note: This is essentially the space within the permanent walls of the building, but excluding spaces for:</p> <ul style="list-style-type: none"> c) Public access and use, including stairs, escalators, lift lobbies and passageways. d) Building mechanical, air conditioning, electrical and other utility services. e) Staff and cleaning facilities, including toilets, tea rooms and cleaners' cupboards. <p>The Assessor should refer to the relevant measurement standard for rated area documents that provide a definitive list of inclusions and exclusions.</p>
non-utility metering system(s)	An energy metering system that is owned or operated by a third party other than a utility.
potential error	<p>The total of acceptable estimates (including assumptions, approximations, and unverified data) for rated area and energy consumed, and the acceptable estimates less the default value for rated hours, occupied workstation count.</p> <p>The NABERS UK rating input form automatically calculates the potential error based on the data provided.</p>
rated premises	The building or building section to be rated.
rating period	The 12-month base period for the rating, requiring at least 12 continuous months of acceptable data upon which the rating is based.
rating scope	The scope of the rating, either base building, whole building or tenancy, see Section 1.1.
Remote Meter Reading System (RMRS)	A system whereby meter readings and other crucial meter data are sent to a data collection system. Such a system provides virtual meter access when physical access is not possible.
Rules	Authoritative document produced by the Scheme Administrator that specifies what must be covered by an Assessor in order to produce a rating.
Ruling(s)	An authoritative decision by the Scheme Administrator which acts as an addition or amendment to the Rules.

Term	Definition
Scheme Administrator	<p>The body responsible for administering NABERS UK, in particular the following areas:</p> <ul style="list-style-type: none"> a) Establishing and maintaining the standards and procedures to be followed in all aspects of the operation of the system. b) Determining issues that arise during the operation of the system and the making of ratings. c) Accrediting Assessors and awarding accredited ratings in accordance with NABERS UK standards and procedures. <p>The functions of the Scheme Administrator are undertaken by CIBSE Certification Ltd.</p> <p>Note: The term “Scheme Administrator” applies to the NABERS UK context and should not be confused with the term “National Administrator” that appears in NABERS Australia publications.</p>
tenancy	The technical entity defined by the services within the minimum energy coverage defined in <i>NABERS UK The Rules — Energy for Offices</i> .
utility	<p>An organisation or company that holds a licence to retail electricity or gas, and that sells energy as its primary business.</p> <p>For NABERS UK purposes, building owners and their agents who on-sell electricity or gas to tenants are not considered to be utilities.</p>
utility metering system(s)	An energy metering system that is owned and operated by a utility.
validation	The process of checking the configuration of a metering system for a NABERS UK rating, and if necessary, adjusting and re-checking, to ensure the configuration is correct.
validity period	The post-certification period during which the rating is valid for up to 12 months.
whole building	The technical entity defined by the services within the minimum energy coverage defined in <i>NABERS UK The Rules — Energy for Offices</i> .

3 Key concepts and procedures

3.1 General

As part of a NABERS UK rating scheme, **Rules** provide requirements within the specific rating tools. These **Rules** apply to any building type eligible for a NABERS UK rating using the NABERS UK energy rating tools.

3.2 Eligibility criteria

A building is considered eligible for a NABERS UK rating if all of the following eligibility criteria are met:

- a) *Building type*: During the **rating period**, the building to be rated occupies a building or part of a building that is categorised as an office.
- b) *Energy coverage of the premises*: Minimum energy coverage for the **rating scope** and spaces included is met, as described in Chapter 4.
- c) *New buildings and major refurbishments*: New buildings or buildings undertaking major refurbishments are eligible for a NABERS UK rating as soon as 12 months of a **rating period** can be completed. In these cases, the **rating period** can start as soon as the building is open to and accessible by the public.

A NABERS UK rating is based on a 12-month **rating period**. Once certified, the rating is valid for 12 months from the certification date (the **validity period**). For further information, see Appendix A.

3.3 Rating period

A NABERS UK rating is based on a 12-month **rating period**. Once certified, the rating is valid for a further 12 months after the **rating period** — this is called the **validity period**.

It takes time for the **Assessor** to complete a rating. Therefore 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 respond to all questions from the **Scheme Administrator** within 10 working days to avoid impacting the validity of the rating.

Note: The 10 working days are included in the 120-day lodgement period.

Assessors may submit a NABERS UK energy rating for the same premises as a combined rating application. When submitting a combined rating application, both ratings must have the same **rating period**.

More information on the **rating period**, **validity period** and time limits for submission can be found in Appendix A.

3.4 Standards for acceptable data and estimates

3.4.1 General

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

Data and estimates must be of an acceptable standard. The decision process for determining **acceptable data** and **acceptable estimates** in Sections 3.4.2 and 3.4.3 must be followed, except where another process is specifically allowed by a provision of these **Rules**.

Note: Specific procedures related to standards for **acceptable data** and **acceptable estimates** in individual sections of these **Rules** take precedence over the standards in Sections 3.4.2 and 3.4.3. Where specific procedures are followed, the requirement for compliance with Sections 3.4.2 and 3.4.3 is deemed to be satisfied.

3.4.2 Acceptable data

If accurate and verifiable **acceptable 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:

- a) Data obtained directly by the **Assessor**.
- b) Data provided by a third party without a significant interest in the operation or performance of the building or its equipment (such as an energy **utility**), including one of the following:
 - 1) Documents or other records provided by a third party which can be verified by the source, e.g. **utility** bills.
 - 2) Documents or other records which cannot be independently verified but whose authenticity and accuracy is attested to by a credible and responsible person without a conflict of interest.
 - 3) Written information provided by a credible and responsible person, which includes their full name, position and contact details of the person giving the information.
 - 4) 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.
- c) Data provided by the owner commissioning the rating, or a third party with a significant interest in the operation or performance of the building or its equipment (such as a facility manager, technical contractor or equipment supplier), including one of the following:
 - 1) 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, e.g. contracts or other legal agreements.

- 2) Documents or other records which cannot be independently verified but whose authenticity and accuracy is attested to by a credible and responsible person without a conflict of interest.
- 3) 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.

3.4.3 Acceptable estimates

If **acceptable data** is not available, estimates (including assumptions, approximations and unvalidated data) can be used if they are deemed to be **acceptable estimates** in accordance with these **Rules**.

Acceptable estimates must total to no more than $\pm 5\%$ of the overall rating greenhouse gas emissions or water consumption, as calculated when using the **NABERS UK rating input form**. Where they are greater than 5 %, the building cannot be rated until sufficient **acceptable data** and/or **acceptable estimates** have been obtained.

3.5 Site visits

3.5.1 General

For every rating application, **Assessors** must conduct a site visit to inspect the **rated premises**. The purpose of the site visit is as follows:

- a) Become familiar with the layout, services and features of the **rated premises**.
- b) Confirm that documentation provided for the assessment is accurate, complete and up-to-date.
- c) Check that all required spaces have been included in the **Net Internal Area (NIA)**.
- d) Check for inclusions in and exclusions from energy coverage (as appropriate).
- e) Check floor configuration.
- f) Visit plant rooms to ensure that all relevant equipment is covered under the meters included in the rating.
- g) Resolve any other issues that arise.

An **Assessor's** inspection of the **rated premises** is expected to include a physical check of the servicing arrangements provided to all tenancies sampled according to Section 4.2.1.

There may be circumstances where access to all or part of the premises is refused due to safety or security concerns. If this occurs, the **Assessor** must explain why they could not access these spaces, and fully document this in the **NABERS UK rating input form**. Any known impacts on the quality of the information obtained for the assessment must also be fully described, e.g. an **acceptable estimate** has been used in the absence of verified data.

3.5.2 Delegating site visit to another Assessor

Where an **Assessor** cannot undertake a site visit to inspect the **rated premises**, **Assessors** may delegate this task to another **Assessor** accredited specifically for offices.

The **Assessor** lodging the rating is responsible for the accuracy of the data. The **Assessor** must obtain and retain all the evidence required to prove their assumptions for auditing purposes, in accordance with the documentation requirements listed in Chapter 10.

3.5.3 Situations where site visit cannot be conducted or delegated

Where there are significant difficulties visiting the site, the **Assessor** cannot conduct a site visit or cannot delegate this task to another **Assessor**, guidance must be sought from the **Scheme Administrator** prior to submission of the rating application.

3.6 Documentation and record-keeping

3.6.1 Required documentation

An assessment may be based on copies of original documents such as **utility** bills, signed leases 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 preferred if they are available. Partial copies of original documents must be sufficient to identify the original document including date, title and file name.

3.6.2 Record-keeping for auditing purposes

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 using 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 or other derivative documents that quote the original source documents are not acceptable, even if prepared by the **Assessor** from original documents.

Digital copies of documents are considered acceptable in all cases.

Records must be kept for 7 years from the date the rating application was lodged and be made available for audit on request.

Note: **Assessors** remain responsible for the ratings they have conducted, even if they move companies.

A list of the usual documentation for a rating is presented in Chapter 10, however, additional documentation may also be required to permit an **Auditor** to accurately repeat the rating using only the documents provided.

3.7 Alternative methodologies

Assessors may be required to use alternative methodology for obtaining or interpreting data for an assessment where standard methods outlined in the NABERS UK **Rules** cannot be applied. At a minimum, the alternative methodology must be one of the following:

- a) Equivalent to the preferred method in terms of its results, accuracy and validity.

- b) Acceptable in place of the preferred method, subject to the data resulting from the alternative method being treated as an estimate in accordance with Section 3.3, or other specified conditions on the use of the data.
- c) All alternative methodologies must be approved by the **Scheme Administrator** prior to use. For further information, please contact the **Scheme Administrator**.

4 Supply points and minimum coverage

4.1 General

This chapter discusses the following steps in the rating process:

- a) Identify all the sources and supply points of energy (e.g. meters and batch delivery) and confirm supply points used in the rating are permitted by NABERS UK.
- b) Check the sources and supply points to confirm the required minimum energy coverage can be met.
- c) Confirm the types of supply points and meters that are present, and adhere to **validation** requirements as applicable.



For documentation requirements, see Section 10.2.

4.2 Energy sources and supply points

4.2.1 Conducting a site visit

The **Assessor** must identify all energy sources and supply points to the premises. A thorough site inspection must be conducted in order to ensure that all instances of energy have been considered in the **Assessor's** analysis for the rating.

The **Assessor** must identify all sources of supplied external energy to the building, including the following:

- a) Electrical including renewable.
- b) Gas.
- c) Diesel.
- d) Thermal (chilled, heating or condenser water).
- e) Solid fuels, e.g. coal.

The **Assessor** must also identify and report on all energy exported from the premises for other uses.

The **Assessor** must keep any notes and/or photos as evidence of the inspection. To ensure that no instances of energy supply have been missed, all the following steps must be taken:

- 1) Ask the building managers/facilities managers to identify all the energy sources and associated accounts for the premises, including batch-delivered supplies.
- 2) Review service drawings, where available, to identify all supply points, e.g. single-line diagrams, electrical circuit schedules.

- 3) Review the premises (including plant rooms and switchboards) to check all equipment requiring different types of energy supply is covered by the identified supply points, e.g. electricity, gas, diesel, chilled water, heating hot water.
- 4) Review the premises to check for any unmetered sources of energy to the premises.
- 5) Ask building managers/facilities managers to identify all the services on site that may be shared with other premises, and the energy supplies and associated accounts for those services.
- 6) Collect all details of **end uses**, sources and meters relevant to the inspection.



For documentation requirements, see Section 10.2.1.

4.2.2 Supply points permitted by NABERS UK

Supply points are used to determine consumption. The following supply points are permitted by NABERS UK:

- a) **Utility metering systems**: These are to be used in preference to **non-utility metering systems** and do not need to be cumulative meters.
- b) **Non-utility metering systems**: These must meet the requirements of Section 0 and Chapter 6.
- c) Batch delivery supply bills where the supplier has stated the quantity supplied.
- d) Thermal meters, refer to *NABERS The Interim Rules — Thermal Energy Systems*.

In some cases, an **Assessor** may not be able to determine consumption from a supply point. If this occurs, other methods, such as estimation, are allowed in specific situations in accordance with these **Rules**, for further information, see Chapter 8.

4.3 Minimum energy coverage

4.3.1 General

Once the sources and their supply points have been determined, **Assessors** must ensure that all the required energy **end uses** for each rating are covered. These are listed in the **Rules** documents and are not repeated here.

If an **end use** is required to be included in the rating but is not covered by one of the supply points identified, then the **Assessor** must use one of the alternative allowable methods listed in Chapter 8 to ensure the minimum energy coverage requirements can be met.

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



For documentation requirements, see Section 10.2.2.

4.3.2 Checks of sources and supply points

Sources that supply energy exclusively to **end uses** that are outside the required minimum energy coverage can only be excluded from the rating if permitted by these **Rules**.



For documentation requirements, see Section 10.2.3.

4.3.3 Additional checks of sources and supply points

Assessors must also undertake the following checks, where relevant, of all sources and supply points:

a) **Base building** ratings:

- 1) All tenant meters must initially be considered as sources to the **base building**. They must only be excluded in accordance with these **Rules**. Tenant distribution boards must be reviewed to ensure that none of the **base building end uses** have been connected.

The common instance of components of a **base building HVAC** plant being on the tenant meters is covered under Section 8.2.1. Other instances of connected **base building** power and lighting may include cleaner's power points, lifts, or lobby lighting on whole floor tenancies.

- 2) **Assessors** must check all **end uses** to be included for the rating, including **end uses** that are located in spaces not included in the rated area calculation.

b) **Tenancy** ratings:

- 1) **Base building** distribution boards must be identified and reviewed to ensure none of the **tenancy end uses** have been connected.
- 2) **Assessors** must check if a **tenancy** has been supplied with any energy from the following:
 - i) Tenant meters on other floors.
 - ii) Meters in the main switch room.
 - iii) Uninterruptable Power Supply (UPS) or essential power systems on other floors.
 - iv) Diesel backup power systems elsewhere in the premises.
 - v) Chilled water or hot water supplies from the **base building** to a **tenancy** computer server room.
 - vi) Renewable power from an on-site renewable energy system.

If there is any energy from sources listed in Items i) to v) above, then this energy must be included in the rating.

- c) **Assessors** must check all **end uses** to be included for the rating, including **end uses** that are located in spaces not included in the rated area calculation.

4.4 Confirmation of metering systems and validation requirements

4.4.1 General

Data from **utility metering systems** is to be used in preference to data from **non-utility metering systems**.

Utility metering systems do not need to be validated for a NABERS rating.

Data from **utility metering systems** can be used for inclusions or exclusions, regardless of whether they are non-cumulative or cumulative.



For documentation requirements, see Section 10.2.4.

4.4.2 Use of non-utility metering systems

Non-utility metering systems can be used in the following circumstances:

- a) In the absence of a complete set of **utility** data.
- b) Where the data from **non-utility metering systems** provides more reliable data, such as when **utility** reads are too infrequent and require adjustment or the **utility metering systems** are on the high-voltage side of the transformers, see Section 4.4.5.
- c) Where a **non-utility metering system** is a more direct source of consumption data, e.g. where the alternative would be a **utility** meter and a significant number of exclusions.

Where a **non-utility metering system** is used as primary data source, it is entered into the **NABERS UK rating input form** as if it were a **utility metering system**. Normal **validation** requirements for the **non-utility metering system** still apply.

Where **non-utility metering systems** are used, the **Assessor** must record and retain documentation that identify all **non-utility metering systems**, including written reports and diagrams.



For documentation requirements, see Section 10.2.4.

Note 1: Where a rating is carried out based on inputs from only **non-utility metering systems**, **Assessors** should, where possible, reconcile all meters against a **utility** meter.

Note 2: Advice from **utility** companies about which meters service the building always need to be cross-checked on site to ensure errors have not been made. The **Assessor** should record the meter reading on each meter at the time of the site inspection.

4.4.3 Meter accuracy for non-utility metering systems

NABERS UK does not provide specific requirements on the accuracy class for meters. However, it does require that **metering systems** are validated in accordance with Chapter 7.

Assessors must ensure that meters installed will accurately read data at the levels required, e.g. if low or variable gas flows are expected, the gas meters installed must be able to measure at these low flows. Particular care should be taken with turbine gas meters and electricity meters rated for much higher currents than are actually being recorded.

Section 4.4.4 provides further information on different metering types permitted in NABERS UK ratings.

4.4.4 Types of non-utility meters

4.4.4.1 General

The following sections outline the different types of non-utility meters and how data from these meters can be treated for the purpose of a NABERS UK rating.

4.4.4.2 Cumulative meters

Cumulative **metering systems**, for the purposes of NABERS UK, have a permanent on-board counting mechanism which accumulates consumption data.

Data from these meters, when used as non-utility meters, can be used for allowable inclusions or exclusions in a NABERS UK rating.

Non-utility metering systems relying solely on records created from pulse readings are considered cumulative if the pulse meter has an on-board counting mechanism to permanently store accumulated consumption data (otherwise known as an absolute count).

4.4.4.3 Non-cumulative meters

Non-cumulative, **non-utility metering systems** are meters which do not meet the definition of a cumulative meter.

Data from non-cumulative meters must not be adjusted to fill in missing data.

When using data from these meters for an inclusion, the following requirements apply:

- a) The data must be reconciled against an energy balance from a parent **utility metering system**.
- b) Virtual meters must not be used in this reconciliation.

If the data from these meters cannot be confirmed to be 100 % complete using the above requirements (e.g. full interval data is available), then the data must only be used for exclusions.

It is the expectation of the **Scheme Administrator** that this data reconciliation is undertaken by metering providers and not by NABERS UK **Assessors**.

4.4.4.4 “Soft” meters or equipment sensors

“Soft” meters or equipment sensors include sensors, fan speeds and data output from variable speed drives. Readings from these meters must convert detected current, phase and voltage into an energy reading (measured in kWh). This data is only considered **acceptable data** for exclusions in a NABERS UK rating.

Readings calculated from current and voltage only (apparent power) or sensor data, such as fan speeds, are unacceptable. Energy readings that are based on intermittent, instantaneous power measurements rather than integrated power are also unacceptable.

4.4.4.5 Virtual meters

Virtual meters are effectively not physical meters. Virtual meters refer to calculating consumption data, typically by subtracting the data of one meter from another to obtain the difference. They may also include a sum of smaller meters downstream to create a virtual meter.

Virtual meters cannot be used where an energy balance against a parent **utility metering system** is required, including the following:

- a) Non-cumulative **non-utility metering systems**, where the data is used for inclusions, see Section 4.4.4.3.
- b) High-voltage meters, see Section 4.4.5.

All **non-utility metering systems** used for virtual meter calculations must be validated in accordance with these **Rules**.

Virtual meter calculations must be conducted using the **NABERS UK rating input form**. This means that all non-virtual meter data must be entered, without manipulation, into the **NABERS UK rating input form**.

Note: For premises with a very large number of virtual meters, there are certain situations where entry of individual virtual meters into the **NABERS UK rating input form** may not be necessary. The **Assessor** should seek further advice from the **Scheme Administrator** to confirm if these situations apply to the premises being rated.



For documentation requirements, see Section 10.2.4.

4.4.5 High-voltage electricity metering

NABERS UK ratings are based on low-voltage metering.

It is acceptable to use **non-utility metering systems** on the low-voltage (LV) side for the energy use measurements in the following instances:

- a) A premise's main electricity **utility metering systems** are situated on the high-voltage (HV) side of the transformers.
- b) There are no connections to energy uses within or outside the premises that bypass the LV meters. The LV meters must cover 100 % of the electricity **end uses**.

The **Assessor** must reconcile the LV meters against the HV meters to ensure that no meters are missing or reading incorrectly. Virtual meters (see Section 4.4.4.5) cannot be used in this reconciliation.

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 premises.

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

The HV **utility metering system** must be used in the absence of non-utility low-voltage meters which comply with these **Rules**. No allowance is made for losses in this situation.



For documentation requirements, see Section 10.2.5.

5 Utility metering consumption data

5.1 General

This chapter discusses calculating the consumption from each of the **utility metering systems** to be considered when calculating the rating, including correction for any estimates or missing data in the rating process.

5.2 Process overview

The process to calculate consumption from **utility metering systems** must be in accordance with Table 5.2.

Assessors must comply with all steps.

Table 5.2: Process to calculate consumption from utility metering systems

Step	Task	Reference
1	Check the utility metering system data format and units, converting where necessary.	Section 5.3
2	For each utility metering system , ensure that acceptable data is available for the 12-month rating period .	Section 5.4
3	Where required, correct utility metering system data in accordance with these Rules .	Section 5.5



For documentation requirements, see Section 10.3.


5.3 Data unit and format checks

5.3.1 General

Assessors must check the data units and formats for each **utility metering system** and convert them where necessary.

Billed quantities may be provided by utilities as either hard copy **utility** bills or an electronic consumption record. **Assessors** should see Section 10.3.1 for specific requirements on acceptable billing formats.

Some utilities provide a “headline” consumption figure separately from the billed quantities. In the event of conflicting information, the billed quantities always take precedence.

 For documentation requirements, see Section 10.3.1.

5.3.2 Units

The units of consumption that **Assessors** should identify on **utility** bills are outlined in Table 5.3.2.

Table 5.3.2: Units of consumption for utility bills

Utility	Units
Electricity	Kilowatt hours (kWh) or megawatt hours (MWh); gigajoules (GJ).
Natural gas	Cubic metres (m ³) at standard temperature and pressure; megajoules (MJ), GJ or kWh.
LPG	LPG must be entered into the NABERS UK rating input form as “Gas” and the units are in megajoules, not in litres or cubic metres.
Fuel oil, e.g. diesel, heating oil	Litres (L); GJ.
Solid fuels (coal)	Kilograms (kg).


5.3.3 Energy bill formats

NABERS UK ratings utilise metered site energy. Any modifications by the **utility** or any other party to the metered energy for any reason other than the accurate representation of metered site energy must be ignored.

5.4 12 months of acceptable data for each utility metering system

5.4.1 General

Consumption data from each **utility metering system** must be reviewed by the **Assessor**. The **Assessor** must ensure that **acceptable data** covers one complete and continuous year, allowing for estimated and missing data as specified in Sections 5.4.2 and 5.4.3.

 For documentation requirements, see Section 10.3.1.

5.4.2 Check if any bills have been estimated

Consumption from estimated **utility** bills is not considered **acceptable data** and must be corrected before use in NABERS UK ratings.

It is also considered good practice to ensure that the preceding bill does not contain estimated data. If the preceding bill contains estimated data or is non-existent, guidance should be sought from the **Scheme Administrator**.

Note: For requirements on correcting estimated data, see Section 5.5.

5.4.3 Check data for anomalies

The **Assessor** must review the monthly or periodic data from each **utility metering system** over the **rating period** and scan the data for anomalies, such as one of the following:

- a) Meter rollovers, i.e. where the readings return to “0”.
- b) Meter changes.
- c) Meter faults.
- d) **Remote meter reading system (RMRS)** faults.
- e) Irregular readings.
- f) Disproportionate consumption values.

In some cases, 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 investigate any significant anomaly. Any investigation must be documented for audit, see documentation requirements in Section 10.3.1.

The **Assessor** must contact the **Scheme Administrator** before proceeding if the anomaly cannot be explained, as the rating may not be able to proceed.

5.4.4 Billing periods

Assessors are required to enter the **billing period** for each **utility metering system** into the **NABERS UK rating input form**.

For each **utility metering system**, the **billing period** must align with one of the following:

- a) The start date of the **billing period** with the start date of the first bill or reading.
- b) The end date of the **billing period** with the end date of the last bill or reading.

Assessors must also align the **billing period** as closely as possible with the **rating period**, subject to the balance of requirements in this section.

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

Each separate bill provided by the **utility** must be recorded as a separate line item into the **NABERS UK rating input form**. This recording shows the pattern of consumption throughout the **billing period**, along with the exact dates and consumption values for the respective bill.

Where data cannot be gathered for the exact same period for different **metering system** accounts:

- a) The **rating period** must align exactly with the **billing period** for the primary **utility** account, or the meter reading dates of the primary non-**utility** account where there is no **utility** account; and

b) The **billing period** for each **utility** account must match the dates on the bills.

If the billing dates of the other accounts do not align with the **rating period**, then **Assessors** must ensure the following:

- 1) Consumption data that accounts for at least 80 % of the total rating result (in kWh_e) falls within the **rating period**.
- 2) Consumption data is as close to the **rating period** as possible, with a maximum of two months displacement of data from the **rating period** allowed.

5.5 Adjusting for missing or estimated utility metering system data

5.5.1 General

The **Assessor** must check that the data from **utility metering system** readings do not rely on estimates by the **utility**. If it does, then the method outlined in this section (5.5) must be followed.

The frequency of meter readings should be as follows:

- a) At least as frequent as the **utility** meter's billing frequency.
- b) At least quarterly, i.e. four readings spaced evenly throughout the year.



For documentation requirements, see Section 10.3.1.

5.5.2 Adjusting for gaps at the start or end of the billing period

A **utility metering system** may be missing a valid meter reading at the start and/or end of the **billing period** because the bills are missing, or the reading was estimated by the **utility**. To resolve this, meter data can be used if no bills are available.

All meter readings used for this adjustment must comply with the data requirements in Section 5.2.

Where these readings are available, the **Assessor** should check them against **utility** readings.

5.5.3 Adjusting for gaps during the billing period — where cumulative meter readings are available

5.5.3.1 General

In some cases, an energy source can be missing a valid **utility metering system** reading during the **billing period**, e.g. if the bill was not available or if the reading was estimated by the **utility**.

The total consumption for the missing period can be accurately determined using the method(s) in Sections 5.5.3.2 and 5.5.3.3 when valid **metering system** readings are available for the period immediately before and immediately after the missing 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**.

5.5.3.2 Energy sources other than natural gas

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

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

Note: **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.

5.5.3.3 Natural gas

Missing gas consumption can also be determined using **metering system** readings. However, additional consideration is required due to the complexities of converting gas **metering system** readings to energy consumption.

Where a bill is missing or estimated but valid **metering system** readings are available before and after the missing period, the gas consumption can be determined using the following method:

- a) Calculate the total metered gas flow in the period by using the readings before and after the missing or estimated reading(s).
- b) Obtain the correction factor (CF) for the gas meter from one of the following, in order of preference:
 - 1) The estimated bill for the period (if available).
 - 2) The **utility** bills before or after the missing period.
 - 3) Written documentation provided by the **utility**.

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

- c) 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:
 - 1) Written documentation provided by the **utility** for the period between the two readings or, if not available.
 - 2) The average heating value for the period between the two readings, in the case there are **utility** bills (estimated or actual) fully covering such a period or, if not available.
 - 3) The default HV of 38.5MJ/m³.

- d) Gas consumption can be calculated using the following formula:

$$\text{Gas consumption} = (R_E - R_B) \times CF \times HV$$

where:

R_B = Cumulative meter reading at the beginning of the missing bill period, in m^3

R_E = Cumulative meter reading at the end of the missing bill period, in m^3

CF = Correction factor

HV = 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 $10,000 \text{ m}^3$ and the reading for 31 May was $12,150 \text{ m}^3$.

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 (including the two estimated bills) was $39 \text{ MJ}/\text{m}^3$.

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

$$(12,150 \text{ m}^3 - 10,000 \text{ m}^3) \times 1.1 \times 39 \text{ MJ}/\text{m}^3 = 92,235 \text{ MJ}$$

5.5.4 Adjusting for gaps during the billing period — where cumulative meter readings are not available

Where there is an unresolvable gap in the billing data, (e.g. due to a change of supplier or meter), the **Assessor** may calculate an **acceptable estimate** of the unrecorded consumption by interpolating between adjacent bills. The interpolation must be based on the average daily consumption figures of the adjacent bills.

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 the available data. The premises cannot be rated if the data does not cover a full continuous 12-month period.

5.5.5 Use of interval meter data from a utility

Some utilities will bill a **metering system** based on a **RMRS** 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. The method below outlines the procedure for using this data.

The **RMRS** will detect when it does not receive a certain amount of data from the **metering system** and the bill will be listed as an “estimate”. Where this is the case, the **Assessor** must use the following method:

- a) Obtain written confirmation from the **utility** that the reason the bill was “estimated” was because of missing data. If it is any other reason, the **Assessor** must contact the **Scheme Administrator** to obtain approval to use this method.

- b) Obtain the complete data set of interval meter readings from the **utility** for the estimated month. Identify all the days where there is missing data (typically a “0” reading).

Note 1: Actual consumption on weekend days may be “0” and therefore care must be taken to ensure data identified as “missing” is actually missing.

- c) For day(s) with missing data which occur on the following:
- 1) A weekday:
 - i) Remove the entire 24-h period of the day(s) that have a missing data point.
 - ii) The consumption data for removed days are to be interpolated using adjacent weekdays that have complete data.
 - 2) A weekend and the consumption data are to be used for an inclusion:
 - i) Remove the entire 24-h period of the day(s) that have a missing data point.
 - ii) The consumption data for removed days are to be interpolated using adjacent weekdays that have complete data.
 - 3) A weekend and the consumption data are to be used for an exclusion, no alteration to the consumption data is to be made.
- d) All consumption data is to be entered into the **NABERS UK rating input form** as separate line items for the actual and interpolated values.

Note 2: This means that for an estimated bill, there will be a minimum of three entries for that bill, i.e. the actuals on either side of the interpolated value and the interpolated value.

- e) The interpolated data is an **acceptable estimate** and must be added to the **potential error**.

Note 3: This method is only usable for **utility** bills received from **utility metering systems**. For **non-utility metering systems**, see Section 7.4.4.

6 Non-utility metering consumption data

6.1 General

This chapter discusses calculating the consumption from each of the **non-utility metering systems** to be included in the rating, including correction for any estimates or missing data.

6.2 Process overview

The process to calculate consumption from **non-utility metering systems** must be in accordance with Table 6.2.

Assessors must comply with all steps.

Table 6.2: Process to calculate consumption from non-utility metering systems

Step	Task	Reference
1	Check the non-utility metering system data format and units, converting where necessary.	Section 6.3
2	For each non-utility metering system , ensure that acceptable data is available for the 12-month rating period .	Section 6.4
3	Where required, adjust non-utility metering system data in accordance with these Rules .	Sections 6.5



For documentation requirements, see Section 10.4.

6.3 Data unit and format checks

Assessors must check the data units and formats for each **non-utility metering system** and convert them where necessary.

If data from **non-utility metering systems** is included in a NABERS rating, data defined in Table 6.3 must be recorded and retained for audit.



For documentation requirements, see Section 10.4.1.

Table 6.3: Data required for non-utility metering systems

Data required	Acceptable record or format	Unacceptable record or format
All meters		
Date and time of reading or interval.	Day/month/year (DD/MM/YYYY). Time in 24-h format (HH:MM) (optional).	a) Month/year. b) Day/month. c) Month. d) Hour only.
Meter identification.	Meter number or label that can be directly cross-referenced to the single-line diagram.	a) No identification. b) Label not clearly identifiable on single-line diagram.
Meter reading from cumulative meters.	Cumulative meter reading, either direct from the meter or from the metering interface.	No meter reading.
Consumption data from non-cumulative meters.	Consumption data with clear units and time period, see Section 4.4.4.3 for more information.	No consumption data or consumption data without clear units.
Electricity meters		
k-factor (CT multiplier).	Meter k-factor.	No k-factor.
Calculated electricity reading.	Calculated consumption figure in kWh, based on meter readings and k-factor.	a) Any consumption figure that cannot be derived from the meter reading and k-factor. b) any consumption figure without units.
Gas meters		
Meter pressure.	Meter pressure, with units.	a) No meter pressure. b) No units.
Meter pressure correction factor for inclusions.	The utility pressure correction factor.	No meter pressure correction factor.
Meter pressure correction factor for exclusions.	Pressure correction factor of “1”. ¹	No meter pressure correction factor.

Data required	Acceptable record or format	Unacceptable record or format
Monthly energy density.	Energy density or heating value of gas (MJ/m ³) from utility bill, see Section 5.5.3.3 for further information.	<ul style="list-style-type: none"> a) No energy density data. b) no units on energy density data. c) energy density data not supported by evidence from the utility.
Calculated gas reading	Calculated gas consumption figure in MJ or kWh.	<ul style="list-style-type: none"> a) Any figure that cannot be derived from the gas meter reading. b) Pressure correction factor and monthly energy density. c) Any figure without units.

1 To ensure accuracy of calculations, a measured meter pressure correction factor should be used where available.

Note: Where current transformer ratios (CT ratios) are taken into account in the consumption data, it is acceptable to enter a CT ratio of “1” into the **NABERS UK rating input form**.

Where non-cumulative data is used from a validated non-cumulative meter, the initial meter reading can be set to “0” in the **NABERS UK rating input form**.

6.4 12 months of acceptable data for each non-utility metering system

6.4.1 General

Consumption data from each **non-utility metering system** must be reviewed by the **Assessor**. The **Assessor** must ensure that **acceptable data** covers one complete and continuous year, allowing for estimated and missing data as specified in Sections 6.4.2 and 6.4.3.



For documentation requirements, see Section 10.4.1.

6.4.2 Check if any data has been estimated

Consumption from estimated **non-utility metering system** data is not considered **acceptable data** and may not be used for NABERS UK ratings.

Where there is estimated data, see Sections 6.5 and 7.5.

6.4.3 Check data for anomalies

The **Assessor** must review the monthly or periodic data from each **non-utility metering system** over the **rating period**. The data must be scanned for anomalies such as any of the following:

- a) Meter rollovers, where the readings return to “0”.
- b) Meter changes.
- c) Meter faults.
- d) **Remote Meter Reading System (RMRS)** faults.
- e) Irregular readings.
- f) Disproportionate consumption values.

In some cases, 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 investigate any significant anomaly. Any investigation must be documented for audit.



For documentation requirements, see Section 10.4.1.

The **Assessor** must contact the **Scheme Administrator** before proceeding if the anomaly cannot be explained as the rating may not be able to proceed.

For requirements on correcting missing data, see Section 6.5.

6.4.4 Meter reading dates for cumulative meters

Assessors are required to enter the meter reading dates for each **non-utility metering system** into the **NABERS UK rating input form**.

Assessors must have a record of readings that is both—

- a) at least as frequent as the **utility** meter under which the non-utility meter lies; and
- b) at least quarterly, i.e. four readings spaced evenly throughout the year.

Where a cumulative meter is not connected to an **RMRS** that has been validated in accordance with Section 7.4.3, it must be read on site and a record of these readings must be kept in case of audit.

Note: Cumulative meter readings can be recorded by personnel other than the **Assessor**.

6.4.5 Consumption data for non-cumulative meters

Assessors are required to enter the consumption data for each **non-utility metering system** into the **NABERS UK rating input form**. This can be entered as a “0” for the first “meter reading” and the total consumption amount for the last “meter reading”.

Data from non-cumulative meters must comply with Section 4.4.4.3.

6.4.6 Billing periods

A rating may have multiple **metering system** accounts. Where the **billing periods** for different **metering system** accounts do not align, the **billing period** of the largest **utility** account must align with the **rating period**.

If the **billing period** of the other accounts do not align with the **rating period**, then **Assessors** must ensure the **billing period** is as close to the **rating period** as possible, with a maximum of two months displacement allowed.

6.4.7 Ensure all non-utility meters are validated

If non-utility meters are used in the assessment, the **Assessor** must check that all necessary **validation** (and correction of data) is complete, see Chapter 7.

Note: If the **non-utility metering system** is part of an **embedded network**, **validation** may be required, see Section 7.3.4.

6.5 Adjusting for gaps in non-utility cumulative metering system data

6.5.1 General

This section only applies to consumption data from cumulative **metering systems**.

The **Assessor** must check that the data from **non-utility metering system** readings does not rely on estimates. If it does, then the method outlined in this section (6.5) must be followed.



For documentation requirements, see Section 10.4.1.

6.5.2 Gaps at start or end of rating period

If the meter data is used for an exclusion and there are gaps at the start and/or end of the **rating period**, then the data must be entered without adjustment.

If the meter data is used as for an inclusion, then the data must be adjusted as follows:

- a) If cumulative **Remote Meter Reading System (RMRS)** or manual readings, which comply with the data recording requirements of Section 6.4.4 are available, the **Assessor** may use the cumulative meter readings to calculate the consumption.
- b) If the meter readings match the frequency of data recording requirements in Section 6.4.4, the readings can be entered into the **NABERS UK rating input form** on the day they were taken.
- c) If the readings were taken less frequently, cumulative reads available before and after must be treated as if they were taken on the first and/or last day (as appropriate) of the **rating period**.

Note: This adjustment is to prevent unrealistic apportioning of data where regular reads are not available.

6.5.3 Gaps during rating period

6.5.3.1 Energy sources other than natural gas

Where missing consumption can be calculated from meter readings, **Assessors** can include this data and must follow the process listed in Section 5.5.3.2.

6.5.3.2 Natural gas

Where missing consumption can be calculated from meter readings, **Assessors** can include this data and must follow the process listed in Section 5.5.3.3, except for Item b) which refers to the correction factor to be used.

For **non-utility metering systems** the **Assessor** must assess the correction factor as follows:

- a) If the measured meter pressure correction factor is known, this figure must be used.
- b) If the measured meter pressure correction factor is not known and cannot be easily obtained, then the **Assessor** can use one for the following:
 - 1) The default pressure correction factor of “1” where data is used for an exclusion.
 - 2) The **utility** meter pressure correction factor in conjunction with a heating value where data is used for an inclusion.

Note: Ideally, the pressure correction factor should be obtained through measurement as this will result in more accurate gas consumption at the **rated premises**, although the **Scheme Administrator** recognises this may be a costly endeavour.

For new installations, the pressure correction factor would be provided as part of gas meter commissioning documentation.

6.5.4 Adjusting for gaps in non-utility non-cumulative metering system data

Consumption data from non-cumulative **metering systems** must not be adjusted, see Section 4.4.4.3.

7 Non-utility metering system validation

7.1 General

This chapter discusses how to validate meters where **non-utility metering systems** have been used to calculate consumption, in accordance with these **Rules**.

7.2 Process overview

The process to calculate **validation** in **non-utility metering systems** must be in accordance with Table 7.2.

Assessors must comply with all steps.

Table 7.2: Process to calculate validation in non-utility metering systems

Step	Task	Reference
1	If data from non-utility metering systems is included in a NABERS UK rating, then the Assessor must check if these meters need to be validated.	Section 7.3
2	If the meters need to be validated, then the Assessor must ensure that all metering systems are properly recorded and validated according to these Rules .	Section 7.4
3	If adjustment is required for non-utility metering systems as a result of validation checks, the Assessor must investigate whether the correct values can be calculated (not estimated).	Section 7.5



For documentation requirements, see Section 10.5.

7.3 Metering systems requiring validation

7.3.1 General

Assessors must check that all necessary **validation** (and correction of data where required) is complete.

Non-utility metering systems require **validation** if they include one of the following:

- a) A meter with a Current Transformer (CT) (even where the CT ratios are applied internally to the meter face readings).
- b) A gas meter.
- c) A **Remote Meter Reading System (RMRS)**, including an interface to a Building Management System (BMS) used to transmit meter data.

Note 1: A BMS is a computer system used to monitor and control building services, such as lighting, HVAC, fire safety and energy usage.

Note 2: While not required for a rating, the following should be validated:

- a) Direct connect meters with no RMRS.
- b) Pulse meters with no RMRS.

It cannot be assumed that newly installed **non-utility metering systems** have been validated. Evidence of **validation** must be obtained by the **Assessor**.

7.3.2 Treatment of non-utility metering systems with CTs


All **non-utility metering systems** (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 and, where applicable, programmed into the meter.

For **validation** requirements relating to **non-utility metering systems** with CTs, see Section 7.4.

7.3.3 Combined heat and power schemes

Combined Heat and Power (CHP) schemes that can provide evidence of certification under the UK Government CHP Quality Assurance (CHPQA) programme are not required to validate their metering.

Where no such certificate is available, all metering associated with the scheme is considered to be non-utility and therefore requires **validation**. **Validation** requirements for thermal **metering systems** are covered in *NABERS The Interim Rules — Thermal Energy Systems*.

 For documentation requirements, see Section 10.5.1.

Note: Information on the CHPQA programme is available from <https://www.gov.uk/guidance/combined-heat-power-quality-assurance-programme>.

7.3.4 Validation of meters in embedded networks

An owner of a premises may install, own and manage the meters in an **embedded network**. The owner is not considered a **utility** and NABERS UK requires the **Assessor** to check these meters against the NABERS UK meter **validation** requirements.

The **Scheme Administrator** must be contacted if other arrangements are encountered or there is any uncertainty regarding assessment.

7.4 Validation of metering systems

7.4.1 Electrical non-utility metering system validation requirements

7.4.1.1 General

For electrical **metering systems**, **Assessors** must determine if the meters used in the assessment are “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.

Note: Current transformer ratios are expressed as a ratio of the primary current to the secondary current.

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. All CTs have a ratio of the “value”:5 with the “value” generally indicating the maximum current for the circuit that is metered.

7.4.1.2 Manually read whole current meters

Validation of manually read whole current (direct connect) meters without CTs is not required for NABERS UK.

7.4.1.3 Checking current transformer ratio and meter wiring

For CT meters, the **Assessor** must record the CT ratio and verify that the meter is correctly configured to this ratio.

A qualified and licenced electrician must be engaged to cross check the wiring of the meter and the CTs for the following issues:

- a) CTs are not connected.
- b) Reverse CT connection errors, which will significantly reduce the recorded consumption.
- c) Cross phase CT connection errors, where CTs are not matched to the same phase voltage.
- d) Phase sequence connection errors.
- e) Faulty or missing potential fuses, which can significantly reduce the recorded consumption and may cause failure of the meter.

Where the CT ratio is not programmed into the meter, it must be verified that the CT ratio has been correctly applied to the meter readings to arrive at the actual consumption.

7.4.1.4 Checking current transformer ratio meter programming

Where the CT ratio is programmed into the meter and a separate multiplier does not need to be applied to the meter face reading, the meter programming must be reviewed, and the internal ratio recorded. Any discrepancy between the internally programmed ratio and the physical CT ratio must be treated as an installation error. Where the meter multiplier can be reviewed, the figure should be photographed on the meter face and attached to the meter **validation** form for evidence.

Where the meter's internal ratio is not able to be reviewed, a licenced electrician should verify the meter programming indirectly. This can be done via measurement with a handheld power meter or by tong testing.

When undertaking this check, the licenced electrician should record the load current on each phase and the corresponding meter current on each phase. Discrepancies between the readings on respective phases indicate that the internal ratio has not been programmed correctly and therefore must be treated as an installation error.

Where the reading from the meter face does need to be multiplied by the CT ratio to calculate the true consumption, the CT ratio or multiplier that is required to convert the meter reading to kWh should be recorded.

If it is not possible to identify the CT ratio, a licenced electrician can use a power meter to confirm the required multiplier by measuring the actual current flow through the circuit being metered and the corresponding phase to the meter. The following calculation can then be used to determine the CT ratio and the multiplier to be applied to the meter face reading:

$$\begin{aligned}\text{CT ratio (value: 5)} &= \frac{\text{Measured circuit amps (e.g. 120 amps)}}{\text{Measured meter amps (e.g. 2 amps)}} \times 5.5 \\ &= 300:5 \\ &= \text{A meter multiplier of 60 is required to convert the} \\ &\quad \text{meter face reading to actual kWh consumption}\end{aligned}$$

7.4.1.5 Validating cloud metering

If the **metering system** does not have self-identifying CTs then the CT ratio and wiring need to be confirmed in accordance with a normal CT meter, see Section 7.4.1.4.

If the system has self-identifying CTs (i.e. where the CTs have high level communications with the **cloud metering system** rather than a wire) then CT ratio **validation** is not required, and the **Assessor** should enter this into the **NABERS UK rating input form** as having no CT ratio.

For wireless CTs, a check must be performed to confirm that the CTs—

- a) have been correctly identified with the **end use**; and
- b) the voltage and current measurement correspond to the **end use**.

It must be confirmed that the system has both voltage and current measurement within the same distribution board as the CTs, separately for each phase.

7.4.1.6 Checking meters in place to avoid shutdown

A qualified and licenced electrician must be engaged when electrical wiring and CTs cannot be accessed without partial or complete shutdown of the electrical network.

The licenced electrician must verify that each **non-utility metering system** has been properly installed, is functioning correctly and is being interpreted correctly. The electrician must also fill out the NABERS UK **validation** record for electrical **non-utility metering systems**, see Appendix B.

The acceptable methods for verification include the following:

- a) Use of a portable power meter to record consumption of the metered circuit over a period of time.
- b) Use of a clamp-on ammeter or similar device to identify the average current in the circuit being metered.

The CT ratio and meter multiplier programmed in the **non-utility metering system** must also be recorded in the NABERS UK **validation** record.

Note: If a qualified and licensed electrician is unable to undertake this check, **Assessors** should seek guidance from the **Scheme Administrator**.

7.4.2 Non-utility gas metering systems

All non-utility gas meters require **validation** (and adjustment, if necessary) by a credible and responsible person with an understanding of gas meters. This ensures that the pressure correction factor corrects the measured volume of the **non-utility metering system** to the same pressure conditions used by the **utility metering system**.

Where the pressure factor cannot be physically tested or there is no data available for the meter pressure and the correction factor cannot be determined, the following values can be used:

- a) *Inclusion meters:* **Utility metering system** pressure correction factor.
- b) *Exclusion meters:* 1.

Record the meter pressure and the correction factor required to adjust the reading to m³ under standard pressure. This data can be collected from the **non-utility metering system** and compared with the **utility metering system** or obtained from the gas supplier.

Note: **Validation** of the gas meter includes measuring the gas 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.

$$\text{Pressure correction factor} = \frac{\text{Measured pressure (absolute)}}{\text{Atmospheric pressure}}$$

The meter pressure and pressure correction factor must be recorded for non-utility gas meter inclusions.

All readings and any adjustments must be documented using the meter **validation** template in Appendix B.

7.4.3 Remote meter reading systems

All **RMRS** connected to **non-utility metering systems** require **validation** to ensure the final consumption amount is correct. This must be conducted by a credible and responsible person with an understanding of the meters and the **RMRS** to ensure the meter data is correctly interpreted. At minimum, the competent person must complete the following:

- a) Confirm that consumption on the **RMRS** corresponds to meter readings as measured at the meter.
- b) Take a minimum of two readings at different time periods and document the results. For each time period, a reading from both the **non-utility metering system** and the corresponding **RMRS** is to be taken simultaneously.
- c) For **RMRS** used for counting pulses from a meter:
 - 1) If an on-board counting device is present, the **RMRS** and the on-board counting device must be read during the site inspection. The consumption on the meter face must be shown to correlate to the accumulated pulse counting on the **RMRS** over the same period.
 - 2) If an on-board counting device is not present, the **RMRS** and the **metering system** must be read during the site inspection. Interval data taken from the **metering system** must be shown to correlate to the pulse counting on the **RMRS**.

Note 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 gas metering.

The **RMRS** can record the consumption of the meter by counting 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 gas reading systems use pulse output type meters, either hard-wired or via radio frequency transmitters. Electricity meters use either pulse output or direct reading of metering consumption.

The **RMRS** can be part of an existing BMS or a dedicated system.

Note 2: For **RMRS** used for counting pulses from a meter without an onboard counting mechanism, it is considered good practice to undertake a **validation** check multiple times over the course of a **rating period** to ensure the system is operating correctly.

All readings and any adjustments must be documented using the meter **validation** templates in Appendix B.

If there is little or no consumption during the testing period, the time for taking the second reading should be extended until reasonable consumption is recorded.

Where the results identify a discrepancy between the **non-utility metering system** and the **RMRS**, the **RMRS** must be adjusted and at least two more readings taken to confirm the consumption measurement is the same.

Note 3: It is considered good practice to validate a **metering system** at the start of a **rating period** to ensure the data generated during that time is valid.

7.4.4 Validation frequency for all metering

7.4.4.1 Discounted methodology for existing buildings and metering systems

The discounted methodology for **validation** applies where the Certificate of Completion covering the **metering system** is dated before 1 January 2021. This methodology must be used for ratings submitted on or before 31 December 2023. It is provided to allow the industry to prepare for the impact of full **validation** requirements.

Under the discounted methodology, the **Assessor** must undertake the following checks of **metering system** validity:

- a) Confirm that the overall balance of sub-meters and **utility** meters is credible.

For each **utility** meter where sub-metering data is used in the rating, the sum of all sub-metered energy used for the **rating period** should be credible relative to the associated **utility** meter. If the sub-metered energy use is not credible (e.g. the sum of sub-meters is greater than the total **utility** meter energy use by more than 10 %, or the balance of un-sub-metered energy is unfeasibly small relative to the unmetered energy **end uses**) then meter **validation** is required.

- b) For tenant electricity meters, calculate the energy intensity associated with each meter in terms of kWh (in the **rating period**) per m² of **tenancy NIA** and identify the following:
- 1) Any tenancies that have an intensity more than three times the median energy intensity of the tenancies in the building. For each of these high energy intensity spaces, the **Assessor** must conduct further enquiries to establish whether there is a plausible explanation for the high intensity. Where no plausible explanation is available, the associated meter must be validated.
 - 2) Any tenancies that have an intensity of more than five times the median energy intensity of the tenancies in the building. For these tenancies, the associated meter must be validated.

Note: The **Assessor** should contact the **Scheme Administrator** with any queries in relation to this methodology, including what is deemed credible under Item a).

7.4.4.2 Standard methodology for existing buildings and metering systems

This methodology also applies where the Certificate of Completion covering the **metering system** is dated before 1 January 2021. This methodology does not come into force until 1 January 2024 but is provided for information and/or discretionary use prior to that date.

If **validation** of **non-utility metering systems** is required, the **Assessor** must randomly select at least 10 % of the following types to be validated each year:

- a) Meters with a CT.
- b) Gas meters.

c) Meters connected to a **RMRS**.

Assessors must not select a **non-utility metering system** that has previously been validated within the last 10 years if—

- 1) the **Assessor** has conducted a rating on the premises previously; or
- 2) information on previous meter **validation** is available.

Where a **non-utility metering system** requires adjustment, see Section 6.4.

7.4.4.3 Methodology for new buildings and metering systems

This method applies where the Certificate of Completion covering the **metering system** is on or after 1 January 2021.

If **validation** of **non-utility metering systems** is required, all **non-utility metering systems** used in the rating must be validated. Any **validation** that is compliant with the requirements of Section 7.4 and is less than 10 years old at the date of the rating submission may be used.

Where a **non-utility metering system** requires adjustment see Section 7.5.

7.4.5 Standard for acceptable data

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

- a) Confirms that a **metering system** requiring **validation** has been checked in accordance with this chapter and found to be correctly recording consumption.
- b) Confirms the date of **validation** took place within the last 10 years.
- c) Applies to the present condition and configuration of the **metering system** without any alteration.
- d) Provides details of the **validation** performed.

7.5 Adjustments resulting from validation checks

7.5.1 General

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 **non-utility metering system**. If adjustment is found to be needed, the following requirements apply:

- a) All **metering systems** that have never been validated, or have no proof of being validated, must be validated so as to ensure that correct data is collected in the 12-month period before the next NABERS UK energy rating. In this case, the **Assessor** cannot follow the schedule in Section 7.4.4.
- b) The **Assessor** must determine any correction to be applied to the data collected from the **metering systems** which are found to be incorrect. If this step is not completed the data from the meter cannot be used and the rating cannot proceed.

All adjustments to **metering systems** must be done by appropriately qualified and licensed persons according to the applicable standards and procedures that apply within that jurisdiction for the equipment.

7.5.2 Calculating correct values for data

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.

Note: 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.

7.5.3 Incorrect data

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

- a) for data relating to inclusions, the rating can proceed if the consumption is an **acceptable estimate**, created using the method in Chapter 8; or
- b) for data relating to exclusions, the rating can proceed if the consumption is not excluded from the rating.

If neither of these options are possible, the rating cannot proceed, and the premises cannot be rated until a full **rating period** of accurate data has been obtained.



For documentation requirements, see Section 10.5.2.

8 Small end use estimation and batch supplies

8.1 General

This chapter discusses how to calculate the consumption from any small **end use** estimations and batch supplies.



For documentation requirements, see Section 10.6.

8.2 Methods for estimating small amounts of data

8.2.1 Base building HVAC equipment on tenant's meter

It is common for some components of the **base building HVAC** within the minimum energy coverage of the rating to be metered under the tenant's meter. Where this is identified, the **Assessor** must identify the **Net Internal Area (NIA)** served by the following items of **HVAC** plant if they lie with the tenant's electricity metering and are not sub-metered:

- a) Fan coil fan motors.
- b) Pumping for on-floor circulation of chilled and/or heating hot water.
- c) On-floor fans for outside air and exhaust to the general **NIA**.

Entering this data in the **NABERS UK rating input form** causes adjustments to be made to energy data to compensate for the missing energy. Owing to the common nature of this issue, these adjustments do not contribute to the **potential error**.

Note: The adjustments made under this provision, based on 60 h/week operation, are as follows:

- a) Fan coil motors — 6.5 kWh/m².
- b) On-floor pumps for cooling — 6.5 kWh/m².
- c) On-floor pumps for heating — 1.9 kWh/m².
- d) Outside air and exhaust fans — 10.5 kWh/m².

Where hours (h) do not equal 60 then these figures are multiplied by h/60.

Adjustments made under this provision are permitted for **base building** ratings only. For **tenancy** ratings, adjustments are not permitted if these services are not sub-metered.

8.2.2 Other small un-metered electricity uses

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

This method applies to inclusions only. It must 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**. 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 procedure:

- a) Identify all un-metered equipment or plant to be estimated.
- b) Determine the power consumption in kW at maximum capacity from nameplate data or equipment specifications.
- c) Calculate the annual hours, i.e. typically 24 h/day. 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.
- d) Determine an appropriate duty cycle based on the annual hours as determined in Item c) for the equipment from suitable specifications or records.
- e) Estimate the annual energy use as follows:

$$\text{Energy use (kWh)} = \text{Nameplate power (kW)} \times \text{duty cycle (\%)} \times \text{annual hours (h)}$$



For documentation requirements, see Section 10.6.1.

8.2.3 Energy exclusions based on financially reconciled utility costs

8.2.3.1 General

The **Assessor** may estimate the consumption for the **end uses** outside the coverage by applying the fixed proportion to the metered consumption if the following applies:

- a) A **utility metering system** measures the aggregate consumption for a variety of energy **end uses**, some inside the coverage of a rating but others outside it.
- b) **Non-utility metering systems** which only measure those **end uses** inside or those outside the scope of coverage are not present.
- c) The **utility** costs associated with the meter are allocated to the various **end uses** according to a fixed proportion of the meter readings, as specified in Section 8.2.3.2.

The estimated consumption may be excluded from the assessment if it is added to the relevant **potential error**. The estimated consumption may be reduced to meet the **potential error** requirements, however, an estimate must not be increased under any circumstances.

8.2.3.2 Determining fixed proportion

If Owner/Tenant Agreement (OTA) documentation allocates a proportion of the relevant energy use, then this proportion must be used in calculating the exclusion. Otherwise, it is acceptable to determine the proportion from documentation, signed by the parties affected by the **end uses** in question. Such documentation must identify the **end use**, the meter to which this it applies, and the proportion of allocation.

If the fixed proportion cannot be determined from acceptable documentation, then no exclusion is allowed, and the entire consumption measured by the meter(s) covering the **end uses** in question must be included in the assessment.



For documentation requirements, see Section 10.6.1.

8.2.4 Energy exclusions based on area weighting

If an energy **end use** within a space could be excluded but is not adequately sub-metered, the **Assessor** may estimate the consumption within that space by undertaking the following:

- a) Taking the ratio of the floor area of the excludable space to the total floor served by the relevant meter(s) (ignoring all spaces not included in office **NIA**).
- b) Applying the ratio to the total consumption measured by the meter(s).

Note: In the total floor area calculation, **Assessors** can choose to ignore spaces not included in office **NIA**. This is to prevent unnecessary measurement for an estimate which must already fit within the **potential error**.

Estimated consumption may then be excluded if the **Assessor**—

- 1) clearly explains the calculation method used and assumptions made in the submitted documentation; and
- 2) adds the estimated consumption to the relevant **potential error**.

If these requirements are not met, then the energy **end use** within the space cannot be excluded.

This method can be used for small retail spaces on the ground floor and for small educational or medical spaces.



For documentation requirements, see Section 10.6.1.

8.3 Batch-delivered supplies

8.3.1 Real consumption measurement

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

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 the following:

- a) A written statement of which deliveries were received during the **rating period** or, if applicable, a statement that there were no deliveries.
- b) Copies of the bill(s) from suppliers showing the details of the deliveries.
- c) Descriptions of the measurements and/or methods used.

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

Note: A single bill is adequate to establish the energy or water supplied by batch to a premise.



For documentation requirements, see Section 10.6.2.

8.3.2 Calculating an alternative estimate

Where real consumption measurements cannot be determined in accordance with Section 8.3.1, an alternative estimate must be calculated for the quantity of a batch-delivered supply from capacity measurements of storage.

Alternative estimates can be determined through the use of a dipstick, sight gauges or other methods.

The **Assessor** must ensure that all commissioned tanks servicing the **rated premises** are included in the following measurements, including reserve tanks.

For the purposes of a rating, the order of preference is as follows:

- a) One reading taken at the beginning of the **billing period** and one reading taken at the end of the **billing period**, covering a continuous 365-day period and displaced by no more than 2 months from the **rating period**, and calculating the difference between the two readings in order to determine the alternative estimate.
- b) One reading taken at the end of the **rating period** and calculating the difference between the total tank capacity and the reading in order to determine the alternative estimate.
- c) The total capacity of the tanks.



For documentation requirements, see Section 10.6.2.

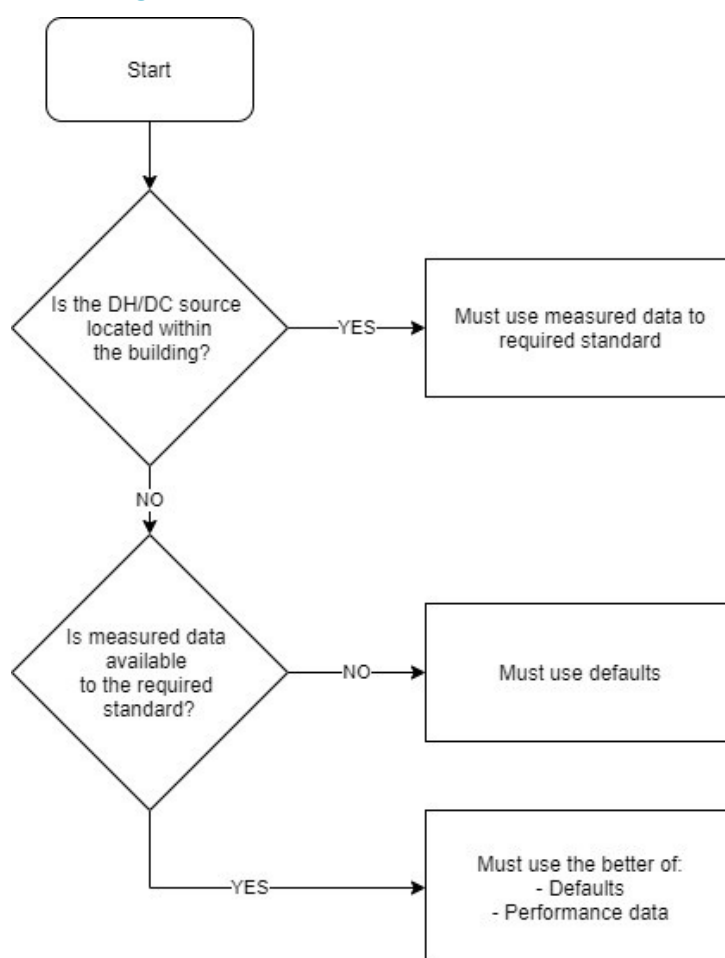
9 Generated energy

9.1 Determining energy factors

9.1.1 General

For buildings attached to external district heating or cooling schemes, there is a choice to either use default or measured kWh_e energy intensity factors for the heating and cooling supplies. However, where the district heating/cooling plant is on site, measured factors must be used, see Figure 9.1.1.

Figure 9.1.1: Determining when measurements, defaults or performance data used



9.1.2 Externally supplied chilled and hot water

The kWh_e factors for chilled and hot water supplied externally to a **base building**, **whole building** or **tenancy** shall be determined based on the default kWh_e factors for externally supplied chilled and hot water services, unless the system specific kWh_e factors are as follows:

- Available to the required standard.
- Beneficial to the NABERS UK rating being undertaken.

The system specific kWh_e factors must be calculated in accordance with *NABERS Ruling — Treatment of Cogeneration and Trigeneration Systems* and *NABERS The Interim Rules — Thermal Energy Systems*.

9.1.3 Externally supplied electricity

The kWh_e factor for externally supplied electricity to a **base building**, **whole building** or **tenancy** shall always be equal to the default kWh_e factor for electricity.

9.1.4 On-site combined heat and power or district heating/cooling

Where a combined heat and power or district heating/cooling system is located within the **rated premises**, the **base building** or **whole building** rating is determined from the energy inputs to that system.

If such a system exports electricity, chilled water or hot water to a third party, then the reduction in energy inputs relating to that export must be calculated using *NABERS Ruling — Treatment of Cogeneration and Trigeneration Systems* and *NABERS The Interim Rules — Thermal Energy Systems*.

For tenancies in such buildings, the requirements of Section 9.1.2 apply.

If any further information is required, the **Assessor** should seek guidance from the **Scheme Administrator**.

Note 1: The default figures for externally supplied services are 0.4 kWh_e/kWhth for chilled water, 0.9 kWh_e/kWhth for hot water and 1 kWh_e/kWh for electricity.

Note 2: This section (9.1) does not cover the treatment of “ambient loops” which operate to provide a heat source or sink for equipment in buildings rather than direct heating or cooling.



For documentation requirements, see Section 10.7.1.

9.2 Other on-site generation systems

Energy generated on site for use entirely within the **rated premises** will reduce the amount of grid-energy supplied.

As such, on-site energy generation must not be included in the external sources as specified in *NABERS UK The Rules — Energy for Offices*. This will typically result in an improved rating when low-emission or renewable energy technologies are used.

Energy generated on site but exported to an external user (such as a nearby building or the electricity grid) does not improve the energy performance of the **rated premises**. The exported energy must not be subtracted from the **utility**-supplied consumption as it has no impact on the energy consumption of the premises being rated.

In situations where renewable electricity is generated on site but apportioned to different users within an **embedded network**, the requirements applicable to determine the apportionment are to be found in *NABERS Ruling — On-site Renewable Electricity Generation Systems*.

Externally supplied energy sources (such as gas, fuel oil or electricity used by heat pumps) used to generate on-site energy must be included with the energy assessment.



For documentation requirements, see Section 10.7.2.

10 Documentation requirements for accredited ratings

10.1 General

The **Assessor** must keep all records on which an assessment is based, including any specific guidance or approvals given by the **Scheme Administrator**. Data retained for audit must be in a form which facilitates reviews and makes anomalies easily apparent.

Access to original documents is preferred if they are available. Copies of original documents may be used as evidence 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.

Information may be contained in many different formats. The purpose of the documentation is to provide an acceptable, credible source of the required information. In some instances, specific document types may be unnecessary for an individual rating. However, under different rating circumstances, the specific document types may carry multiple items of information required for the rating. The qualifying factor is not the type of document but that the documentation contains the required information in an acceptable format.

The information in Sections 10.2 to 10.7 is required for a rating. It is organised based on the divisions of previous chapters, see Chapters 4 to 9. All the required information should be obtained from the owner/manager of the premises before a site visit, and then confirmed during the site visit and subsequent assessment. An on-site inspection helps to verify that the information provided is accurate, current and complete.

Individual ratings may require additional information or documentation depending on the individual circumstances of the **rated premises**.

10.2 Chapter 4: Supply points and minimum coverage

Topic	Requirements	Documentation
10.2.1 Conducting a site visit	Section 4.2.1	<p>Evidence that identifies all energy sources supplied to the premises, shared services or facilities must be retained by the Assessor. This evidence can include single-line diagrams and/or metering schematics, photos, Assessor site notes and other relevant documents.</p> <p>The Assessor must keep notes and photos as evidence of their site visit, and collect all information available relating to end uses, sources and meters relevant to the inspection.</p>
10.2.2 Minimum energy coverage	Section 4.3.1	<p>To confirm minimum energy coverage requirements have been met, the Assessor must retain evidence identifying all supply points and the distribution of energy and/or water through the premises, including at the main switchboards and distribution boards throughout the premises.</p> <p>In addition, the Assessor must retain evidence of checks which confirm how each of the required end uses are covered by the supply points included in the rating.</p> <p>Such evidence is expected to include single-line diagrams, metering schematics, Assessor site notes and/or site photos. All documents may be marked up by hand.</p>
10.2.3 Checks of sources and supply points	Sections 0 and 4.3.3	<p>The Assessor must retain evidence that confirms any source or end use to be excluded from the rating and substantiates the grounds for the exclusion.</p> <p>The evidence supporting the above should be summarised in a single document, such as a marked up single-line diagram, metering schematic or reticulation diagram, or otherwise a list of sources/supply points to the building with notes to confirm whether they are included or excluded. Evidence supporting the grounds for exclusion of supply points is expected to include site photos, notes and other reticulation documentation.</p> <p>It is acknowledged that access to and labelling of distribution boards may not always be sufficient to fully substantiate the grounds for exclusion of a supply point. In these cases, the</p>

		<p>Assessor may need to make educated assumptions regarding coverage of individual distribution boards. The bases of these assumptions should be fully documented. If an Assessor is uncertain, they should contact the Scheme Administrator.</p>
10.2.4 Confirmation of metering systems	Sections 4.4.2, 4.4.3 and 4.4.4	<p>The location of all utility and non-utility metering systems used in the rating must be identified on a single-line diagram, metering schematic or reticulation diagram which is retained by the Assessor.</p> <p>Where no documentation is available for a metering system, the Assessor must document this information (by hand or otherwise), to the best of their knowledge. This information is required to satisfy the requirements of the Rules and if the Assessor is unable to document it based on their site observations, then it is expected that a third party would be engaged by the building owner to draft a single-line diagram, metering schematic or reticulation diagram. The document must also include a mark-up (by hand or otherwise) of the meter identification used when entering the metering system into the NABERS UK rating input form.</p> <p>The type of each non-utility metering system should be confirmed and recorded by the Assessor in their site notes. The types to be recorded are those listed in Section 0, e.g. cumulative, non-cumulative, soft, virtual or high voltage.</p> <p>Note: It is sufficient for the Assessor to confirm “all non-utility metering systems used in the rating are cumulative meters” in their site visit notes.</p>
10.2.5 High-voltage electricity metering	Section 4.4.5	<p>For HV electricity metering, the following must be provided:</p> <ul style="list-style-type: none"> a) 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. b) The energy balance used to justify the use of LV meters.

10.3 Chapter 5: Utility metering consumption data

Topic	Requirements	Documentation
10.3.1 Data for each utility metering system	Sections 5.3, 5.4 and 5.5	<p>Billed quantities provided by the utility must be retained by the Assessor and take the form of one of the following:</p> <ul style="list-style-type: none"> a) Utility bills for a minimum of 12 months showing consumption records for the billing periods. b) 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. However, billing information from the portal must still be provided as documentation. <p>The Assessor must also retain evidence of estimated bills (where applicable) and document how these estimates were resolved if this is not evident in the NABERS UK rating input form.</p> <p>Documentation of any related investigation and resolution of anomalies or estimations in the data should be retained by the Assessor if it is not evident from the data entered into the NABERS UK rating input form.</p>

10.4 Chapter 6: Non-utility metering consumption data

Topic	Requirements	Documentation
10.4.1 Data for non-utility	Sections 6.3, 6.4 and 6.5	All relevant data from non-utility metering systems as listed in Table 6.3 must be provided for a minimum period of 12 months.

metering systems		Documentation of any related investigation and resolution of anomalies or estimations in the data should be retained by the Assessor if it is not evident from the data entered into the NABERS UK rating input form .
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10.5 Chapter 7: Non-utility metering system validation

Topic	Requirements	Documentation
10.5.1 Validation of metering systems	Sections 7.3 and 7.4	<p>Evidence of validation for each non-utility metering system must be retained. Where applicable, evidence of CHP Quality Assurance (CHPQA) certification must also be retained.</p> <p>The Assessor must review the evidence of validation provided by the building owner or their contractor and check them for completeness. If the document is completed correctly, and does not contain any obvious errors, then the Assessor can accept the evidence and use it in the rating.</p> <p>Templates for validation of non-utility metering systems can be found in Appendix B.</p>
10.5.2 Adjustments resulting from validation checks	Section 7.5	<p>For all non-utility metering systems needing adjustment as a result of validation checks, the following must be provided:</p> <ul style="list-style-type: none"> a) Type of fault found and the consumption data. b) Full documentation of the error found, the incorrect records from the metering system, and the calculations used to correct the data for audit. c) A record of the validation of any altered non-utility metering systems.

10.6 Chapter 8: Small end use estimation and batch supplies

Topic	Requirements	Documentation
10.6.1 Methods for estimating small amounts of data	Section 8.2	<p>The documentation required for instances of end use estimation includes the following:</p> <ul style="list-style-type: none"> a) Base building HVAC in the tenant leased area. <ul style="list-style-type: none"> 1) Documentation demonstrating what base building HVAC is on the tenant meter. 2) Documentation for the NIA of affected spaces. b) Small end use electricity inclusions: <ul style="list-style-type: none"> 1) The calculations, including a clear explanation of method and all assumptions. 2) Photos/records of name plate capacities. 3) Documentation used to determine duty capacity if it is not 100 %. 4) Documentation used to determine annual hours, including full justification for any reduction in hours. c) Exclusions based on financially reconciled utility costs: <ul style="list-style-type: none"> 1) Documentation of any estimated consumption outside the coverage. 2) Any associated documentation or agreements that outlines mutual agreement signed by the parties affected by the end uses that identifies the proportion of allocation. d) Energy exclusions based on area weighting: Marked up NIA plans and calculations showing the proportion of NIA excluded to arrive at the area weighted excluded energy and metering arrangements associated with the excluded energy.
10.6.2 Batch delivered supplies	Section 8.3	<p>The documentation required for batch-delivered supplies includes the following:</p> <ul style="list-style-type: none"> a) Record of the measurement method or estimation for each source entered into the NABERS UK rating input form.

		<ul style="list-style-type: none"> b) Supplier invoices or similar documentation which states the quantity data delivered. c) The written statements of what deliveries occurred during the rating period, including contact details for the responsible person who supplied the information. d) A description of the measurement or estimation method(s) used. e) All data used to calculate the measurements or acceptable estimates. f) Details of all calculations, including those for alternative estimates.
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10.7 Chapter 9: Generated energy

Topic	Requirements	Documentation
10.7.1 Determining energy factors	Section 9.1	<p>Refer to the documentation requirements in the following publications:</p> <ul style="list-style-type: none"> a) <i>NABERS Ruling — Treatment of Cogeneration and Trigeneration Systems</i>. b) <i>NABERS The Interim Rules — Thermal Energy Systems</i>. <p>Note: These documents are NABERS Australia documents which are relevant to NABERS ratings under the NABERS UK scheme. Not all aspects of these Australian documents are applicable to NABERS UK and therefore some interpretation may be required.</p>
10.7.2 Other on-site generation systems	Section 9.2	<p>Refer to the documentation requirements in <i>NABERS Ruling — On-site Renewable Electricity Generation Systems</i>.</p> <p>Note: This document is a NABERS Australia document which is relevant to NABERS ratings under the NABERS UK scheme. Not all aspects of this Australian document are applicable to NABERS UK and therefore some interpretation may be required.</p>

Appendix A Rating period

A.1 Allowance for lodgement

A.1.1 General

A NABERS UK rating is based on 12 months of **acceptable data**, called the **rating period**. Once certified, the rating is valid for up to 12 months, called the **validity period**.

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

Sections A.1.2 and A.1.3 provide examples of this principle.

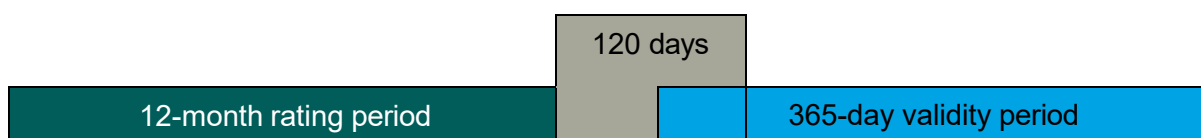
A.1.2 Scenario 1

A NABERS UK rating is lodged with the **Scheme Administrator** within 120 calendar days of the end of the **rating period**. It will be valid for 365 days from the date of certification, see Figure A.1.2.

Example: The process for date of certification will be as follows:

- The **rating period** is 1 January 2022 to 31 December 2022. The due date is therefore 30 April 2023.
- The **Assessor** lodges the rating on 1 February 2023, and the **Scheme Administrator** certifies it on 5 February 2023. This is before the due date.
- The rating will therefore be valid for 365 days from the date of certification (5 February 2023).

Figure A.1.2: Rating lodged within 120 days of end of rating period



A.1.3 Scenario 2

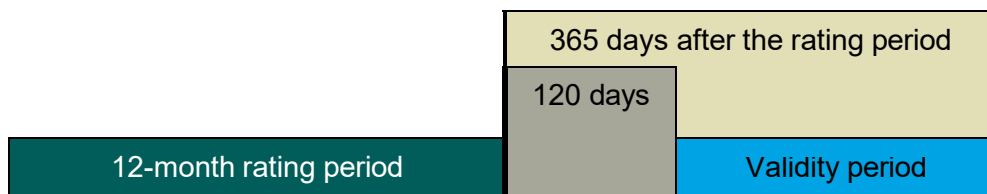
A NABERS UK rating is lodged with the **Scheme Administrator** more than 120 calendar days after the end of the **rating period**. It will be valid for 365 days from the end of the **rating period**, see Figure A.1.3.

Example: The process for date of certification will be as follows:

- The **rating period** is 1 January 2022 to 31 December 2022. The due date is therefore 30 April 2023.

- b) The **Assessor** lodges the rating on 1 June 2023, and the **Scheme Administrator** certifies it on 6 June 2023. This is after the due date.
- c) The rating will therefore be valid for 365 days from the end of the **rating period** (31 December 2022).
- d) It will expire on 31 December 2023.

Figure A.1.3: Rating lodged after 120 days from end of rating period



A.2 Allowance for responses

A.2.1 General

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

When the **Assessor** is required to provide clarification multiple times, this must be done within the allowable 10 working days period.

If the **Assessor** has not responded adequately to all queries and the rating has not been certified within 120 days of the end of the **rating period** + 10 working days, 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 **Scheme Administrator**.

Section A.1.2 provides an example of this principle.

A.2.2 Scenario

A NABERS UK rating is lodged with the **Scheme Administrator** one day before the lodgement due date (120 days from the end of the **rating period**). Depending on how quickly the **Assessor** responds to clarifications, the rating will either be valid for 365 days from the date of certification or 365 days from the end of the **rating period**.

Example: The process for date of certification will be as follows:

- a) The **rating period** is 1 January 2022 to 31 December 2022. The due date is therefore 30 April 2023.
- b) The **Assessor** lodges the rating on 29 April 2023, 119 days after the end of the **rating period**.

- c) The **Scheme Administrator** responds on 3 May 2023 requesting further clarification. The **Assessor** must provide adequate clarification by 14 May 2023 (120 days from the end of the **rating period** plus 10 working days) for the rating to be valid for 365 days from the date of certification.
- d) If the **Assessor** responds on the 8 May 2023, the rating will be certified and valid until the 8 May 2024.
- e) If the **Assessor** does not respond with clarification until the 30 May 2023, the rating will only be valid until 365 days from the end of the **rating period** and therefore will expire on the 31 December 2023.

A.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 initial timeframe.

Note: 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.

A.4 Lodging successive ratings

A.4.1 General

For a building which already has a current rating, there are two options to complete another rating of the same type, i.e. replace or renew.

Note: The **Assessor** will be prompted to select “replace” or “renew” when creating a rating. This selection can be changed just before the rating is lodged but not after.

A.4.2 Option 1: Replace

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

There will be loss of the existing rating’s remaining **validity period**. This option may be chosen if the new rating is better than the existing rating, see Figure A.4.2.

Figure A.4.2: Existing rating replaced by a new rating



A.4.3 Option 2: Renew

The renew option allows the new certified rating to begin its **validity period** immediately after the existing rating **validity period** expires. This option is often chosen when a site is most concerned with maximising the **validity period**.

As ratings are based on current data, the new **validity period** cannot not exceed 485 days from the end of the **rating period**. To ensure the new rating maximum **validity period** is achieved, the **validity period** must start within 120 days after the end of the **rating period**.

Section A.4.4 provides an example of this principle.

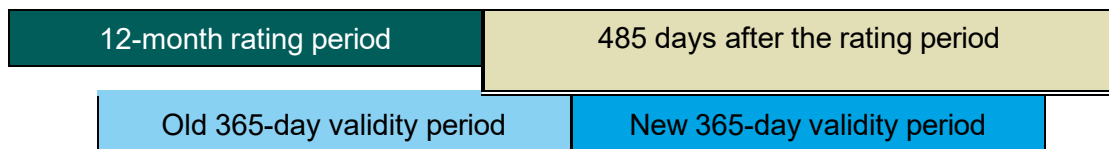
A.4.4 Scenario 1

A NABERS UK rating is lodged with the **Scheme Administrator** and the renew option has been selected. The new rating begins its **validity period** within 120 days after the end of the **rating period**, see Figure A.4.4.

Example: The process for date of certification will be as follows:

- The current rating's **validity period** expired 31 December 2022.
- The **rating period** is 1 October 2021 to 30 September 2022 for the renewal rating.
- The **Assessor** lodges the renewal 1 November 2022 and it is certified by the **Scheme Administrator** 7 November 2022.
- The **validity period** for the renewal will be 1 January 2023 to 31 December 2023.

Figure A.4.4: Validity period for new rating begins once old rating expires and new validity period is 365 days



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** will exceed 485 days from the end of the **rating period**.

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

Section A.4.5 provides an example of this principle.

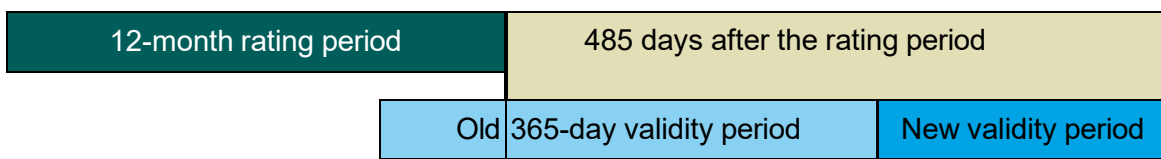
A.4.5 Scenario 2

A NABERS UK rating is lodged with the **Scheme Administrator** and the renew option has been selected. The new rating begins its **validity period** over 120 calendar days after the end of the **rating period**, see Figure A.4.5.

Example: The process for date of certification will be as follows:

- a) The current rating's **validity period** expired 31 December 2022.
- b) The **rating period** is 1 August 2021 to 31 July 2022 for the renewal rating.
- c) The **Assessor** lodges the renewal 1 November 2022 and it is certified by the **Scheme Administrator** 7 November 2022.
- d) The **validity period** for the renewal will be 1 January 2023 to 28 November 2023, 485 days after the end of the **rating period**.

Figure A.4.5: Validity period for new rating begins once old rating expires and new validity period is less than 365 days



Appendix B Non-utility metering system validation records

This appendix provides template examples of **validation** records for electrical, gas and **RMRS non-utility metering systems**.

Example 1: Validation record for electrical non-utility metering systems(See Section 7.3.2 on requirements for validating electrical **non-utility metering systems**.)

Name of premises:				Name of person undertaking validation:					
Address of premises:				Qualification and/or certified licence number:					
				Date of validation:					
ID (meter number or tenancy/unit number)	Description (meter brand and type)	Wiring check ¹	CT ratio (of installed CTs)	For externally multiplied meters:		For meters with internal multipliers:			
				Does meter face reading need to be multiplied to calculate true consumption?	If so, confirm multiplication factor to be applied to account for CT ratio	Can meter multiplier be interrogated on meter face?	If so, record meter multiplier and attach photographic evidence	If not, use tong-testing or a hand-held meter to compare measured current and meter face current per phase	
								Sub-meter current per phase	Comparison meter current per phase
				Yes/No		Yes/No		/ /	/ /
				Yes/No		Yes/No		/ /	/ /
				Yes/No		Yes/No		/ /	/ /
				Yes/No		Yes/No		/ /	/ /

1 Wiring check including reverse CT connection errors, cross phase CT connection errors, phase sequence connection errors and faulty or missing potential fuses.

Sign to record that the above non-utility metering systems are correctly configured and have been validated:

.....

Example 2: Validation record for gas non-utility metering systems(See Section 7.4.2 on requirements for validating gas **non-utility metering systems**.)

Name of premises:		Name of person undertaking validation:	
Address of premises:		Qualification and/or certified licence number:	
		Date of validation:	
Non-utility meter ID (meter number or tenancy/unit number)	Non-utility meter description (meter brand and type)	Meter pressure (kPa)	Correction factor

Sign to record that the above non-utility metering systems are correctly configured and have been validated:

.....

Example 3: Validation record for Remote Meter Reading Systems

(See Section 7.4.3 on requirements for RMRS.)

Name of premises:		Name of person undertaking validation:	
Address of premises:		Qualification and/or certified licence number:	
		Date of validation:	
ID of meter connected to RMRS (meter number or tenancy/unit number)			
Description of meter connected to RMRS (meter brand and type)			
Remote Meter Reading System readings Confirmation of accurate interpretation of system reading non-utility meter at same two time periods (where applicable)			
Time A		Time B	
RMRS readings	Corresponding manual non-utility meter readings from meter face	RMRS readings	Corresponding manual non-utility meter readings from meter face

Time A:		Time B:	
Time A:		Time B:	
Time A:		Time B:	
Time A:		Time B:	

Sign to record that the above non-utility metering systems are correctly configured and have been validated:

.....

Appendix C List of changes

The following table lists the changes to the content of *NABERS UK The Rules — Metering and Consumption*, v1.1, 2022 in order to produce this version 1.2.

Overview		
Version 2.0 (superseded)	Version 2.1 (current)	Content changes
Document location		
All Chapters	All Chapters	Minor editorial changes. Amended document to reference new Scheme Administrator.

Contact us

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