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Guide to fill in an EPB standard's National Annex or National Datasheet

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Additional guidance is provided at the EPB Center website, such as

- As appendix to this Guide for personal use:
  fillable versions of the Annexes of the five so called overarching EPB standards,
- examples of National Annexes,
- FAQs,
- etc..

Please check www.epb.center for the latest information

Introduction

EPBD and EPB standards:

In June 2018 the revised Energy Performance of Buildings Directive (EPBD) was published in the Official Journal of the European Union. One of the amendments to the previous EPBD (2010) is the update of the general framework for the calculation of the energy performance of buildings.

In particular, Annex I introduces new provisions to improve transparency and consistency. Member States are required to transpose these provisions into national legislation by March 2020.

Annex I to the EPBD sets out a common general framework for calculating buildings' energy performance and, inter alia, for describing national calculation methodologies. To meet the objectives of energy efficiency policy for buildings, Energy Performance Certificates (EPCs) should be made more transparent by ensuring that all necessary calculation parameters, both for minimum energy performance requirements and for certification, are set out and applied consistently. Annex I to the EPBD has been amended to update this framework accordingly.

One of the requirements in the new Annex I is the following (with underlining by the authors of this Guide):

> *"Member States shall describe their national calculation methodology following the national annexes of the overarching standards, namely ISO 52000-1, 52003-1, 52010-1, 52016-1, and 52018-1, developed under mandate M/480 given to the European Committee for Standardisation (CEN). This provision shall not constitute a legal codification of those standards.';"*

This point addresses how buildings' energy performance is to be determined and requires Member States to describe their calculation methodologies in line with the energy performance of buildings (EPB) standards[1].

European Commission Recommendations:

In 2019 the European Commission published recommendations on how Member States should implement the requirements laid down by the EPBD:

- Commission Recommendation on building renovation
- Commission Recommendation on building modernisation

In particular chapter 3 of the first recommendation ("3. *Framework for calculating building's energy performance*") is concerned with the requirements in the EPBD that are related to the set of EPB standards:

(a) the obligations to determine and express buildings' energy performance (3.2), and

(b) *(also the subject of this Guide)* the obligation to describe national calculation methodologies transparently in line with EPB standards (3.3).

The issue of the calculation of primary energy factors under Annex I to the EPBD is addressed in the second recommendation (guidelines for the modernisation of buildings).

[1] States will have to show that they comply fully with the obligation to describe their calculation methodologies according to the standards at the latest by the transposition deadline, i.e. 10 March 2020 (171).

About this Guide:

This document provides guidance on how to fill in National Annexes (or National Datasheets) for the energy performance of buildings (EPB) standards.[2]:

(a) to describe the national choices offered by the EPB standards when these EPB standards are adopted as national calculation methodology, or
(b) to describe national calculation methodologies transparently in line with the EPB standards

It is expected that updates of this Guide will be published at regular intervals, with new examples based on interaction with national regulators, standard writers and other stakeholders.

Structure of this Guide:

- **Chapter 1** briefly describes the **background**: from *what is an EPB standard and the mandate M/480* to *what is a National Annex or National Datasheet*. Chapter 1 also provides links to pages at the EPB Center's website where more background information can be found.
- **Chapter 2**contains the **do's and don'ts** when creating a National Annex or National Datasheet.
- **Chapter 3** provides a **model National Annex** (that is also applicable to a National Datasheet)
- **Chapter 4** shows and explains **examples of tables filled in in accordance with the template of Annex A**.
- **Chapter 5** shows and discusses examples of **tables filled in that are <u>not</u> fully in accordance with the template of Annex A**.
  This can occur when the national methodology is described following Annex A of the (e.g. overarching) EPB standards as required by Annex I of the revised EPBD (2018)
- **Annex AA[3] of this Guide** gives a quick impression of the types of choices in Annex A of EN ISO 52000-1, EN ISO 52003-1, EN ISO 52010-1, EN ISO 52016-1 and EN ISO 52018-1.

[2] All EPB standards (not limited to the 5 EPB standards mentioned in EPBD Annex I)

[3] Numbered "AA" to avoid confusion with Annex A of the EPB standards or with Annex I of the EPBD

1 Background

1.1 The set of EPB standards

Each EPB standard is part of a series aiming at the international harmonization of the methodology for assessing the (overall) energy performance of buildings. Throughout this Guide, this series will be referred to as the "set of EPB standards"

The set of EPB standards has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association (Mandate M/480, 2010), to support the EPBD.

The main use of the set of EPB standards is to judge compliance with building regulations expressed in terms of limited energy use or a related quantity and to increase transparency in real-estate transactions through an energy performance certificate and/or display of the level of energy.

Each EPB standard covers an element in the overall assessment of the energy performance of a building.

More information:

- https://epb.center/epb-standards/background/
- https://epb.center/epb-standards/energy-performance-buildings-directive-epbd/
- https://epb.center/epb-standards/modular-structure/
- https://epb.center/implementation/users/

1.2 Unambiguous but flexible

As required by the Mandate, on the one hand the EPB standards are unambiguous and compatible. On the other hand they provide a certain flexibility to account for national or regional differences in climate, culture & building tradition, policy and legal frameworks (see examples in 1.3).

To ensure overall consistency, unambiguity and transparency, each EPB standard follows specific common rules.

To ensure the necessary flexibility, each EPB standard contains a normative **Annex A** — a template for all the choices that are provided in the standard as to specific methods and input data.

Informative default choices are provided in **Annex B** of each EPB standard.

More information:

- https://epb.center/epb-standards/flexibility-national-choice/

1.3 The kinds of choices in Annex A (the template to specify national/regional choices)

The kinds of choices in Annex A comprise specific choices:

- between **methods** or parts of the methods,
- in **boundary conditions** and **conditions of use**,
- in **input data**, and
- in **references** to other standards (needed for input).

A choice between different **methods**, for a specific element in the calculation, can for instancebe a choice between a detailed and a simplified method. This enables the choice

between different 'depths' in the energy performance assessment, tailored to the national context and (optionally) differentiating between building categories (e.g. residential versus non-residential) or between application (e.g. new versus [old] existing buildings).

The tables in Annex A just ask to state which method(s) is/are applicable and for which application; all procedures and equations for each method are given in the normative text.

A choice in **boundary conditions** may cover climatic data (e.g. different climatic zones), while **conditions of use** concern for instance the temperature settings and use patterns for the various space or building categories.

A choice in **input data** (e.g. default or fixed values) can range from necessary policy related factors (such as primary energy conversion factors), to (optional[4]) default technical values for specific measures or techniques (e.g. for the efficiency of an unspecified gas boiler or the *U*-value of an unspecified double glazing unit in an existing building). Obviously, the default values may depend on the typical types of certain technologies used in a country or region and their relative impact. This can be dependent on e.g. climate and use pattern; or e.g. to the practical accessibility of energy infrastructure, local energy grids, different building typologies, etc. (i.e. continental and coastal conditions could differ significantly).

A choice between **references** may e.g. be a choice between an ISO (or CEN) EPB standard or a national standard, for instance as part of a step-by-step national or regional implementation of the set of EPB standards.

Such choices may e.g. be mandatory for application in the context of specific national or regional regulations. In that case the set of choices is laid down in a National Annex or a National Datasheet, as explained in 1.4.

More information:

- See Annex A and Annex B of any[5] EPB standard to get an impression.
- See Annex AA of this guide for a quick impression of the choices for the five core EPB standards: EN ISO 52000-1, EN ISO 52003-1, EN ISO 52010-1, EN ISO 52016-1 and EN ISO 52018-1.

1.4 From Annex A to National Annex or National Datasheet

Annex A to an EPB standard is an empty template that can be filled in with national or regional data and choices[6].

[4] Note that a Table that is intended to offer the possibility to specify (national or regional and typically 'conservative') default values, in case project specific data are not or not yet available, may be left blanc; see example in 4.7,

[5] A few (CEN) EPB standards were published while not yet being fully in line with the specific common rules for all EPB standards, including the set up of Annex A and Annex B.

[6] Annex A can also be filled in by private parties who voluntarily agree on a specific set of choices for a specific (private) purpose: a private Datasheet filled in in accordance with Annex A of the EPB standard. Obviously, when reporting results from a calculation based on an EPB standard it has to be (made) clear which Datasheet has been used.

In case the EPB standards are used in the context of national or regional legal requirements, the regulator may give mandatory choices at national or regional level for such specific applications.

NOTE 1 So in this case:

— the regulators will specify the choices;

— the individual user will apply the document to assess the energy performance of a building, and thereby use the choices made by the regulators and published in a National Annex or National Datasheet.

These choices can be the same as the informative default choices from Annex B, that then become mandatory for that application. But the choices can also be adapted to national/regional needs. But in any case the choices are written following the template of Annex A.

1.5 Difference between National Annex and National Datasheet

If this Annex is filled in and published by a National Standards Body, as part of the EPB standard, it is called a '**National Annex**'. If it is filled in and published by a Member State, it is called a '**National Datasheet**'.

'National Annex' or 'National Datasheet' only affects where and how it is made available. It does not affect the content, so for the user it is only a matter of where to find it.

So, where a Member State adopts an EPB standard in full in national law (i.e. it uses the standard (as is) as part of its building regulations implementing the EPBD), it can choose:

a) to ask its National Standards Body to add or include a **National Annex** to the EPB standard, containing the national or regional choices and values, in agreement with the template of Annex A.
In this case the legal documents could refer to the EPB standards plus National Annexes as the national or regional energy performance assessment procedures.

b) to publish the filled-in Annex A as a **National Datasheet** containing the choices and national or regional values, in agreement with the template in Annex A:

(i) as a separate document referred to by the building regulations; or

(ii) as an integral part of the building regulation implementing the EPBD.

In case b) it is recommended that a National Annex to the EPB standard is prepared, containing a reference to this Datasheet[7].

The National Annex or National Datasheet is then used to meet the requirements of the EPBD and facilitate the use of the standard at national level.

NOTE Although this could be confusing, a National Standards Body is free to publish a National Annex containing different choices, for other applications than legislation.

[7] Legal requirements and choices are in general not published in standards but in legal documents. In order to avoid double publications and difficult updating of double documents, a National Annex may refer to the legal texts where national choices have been made by public authorities.

To summarize:

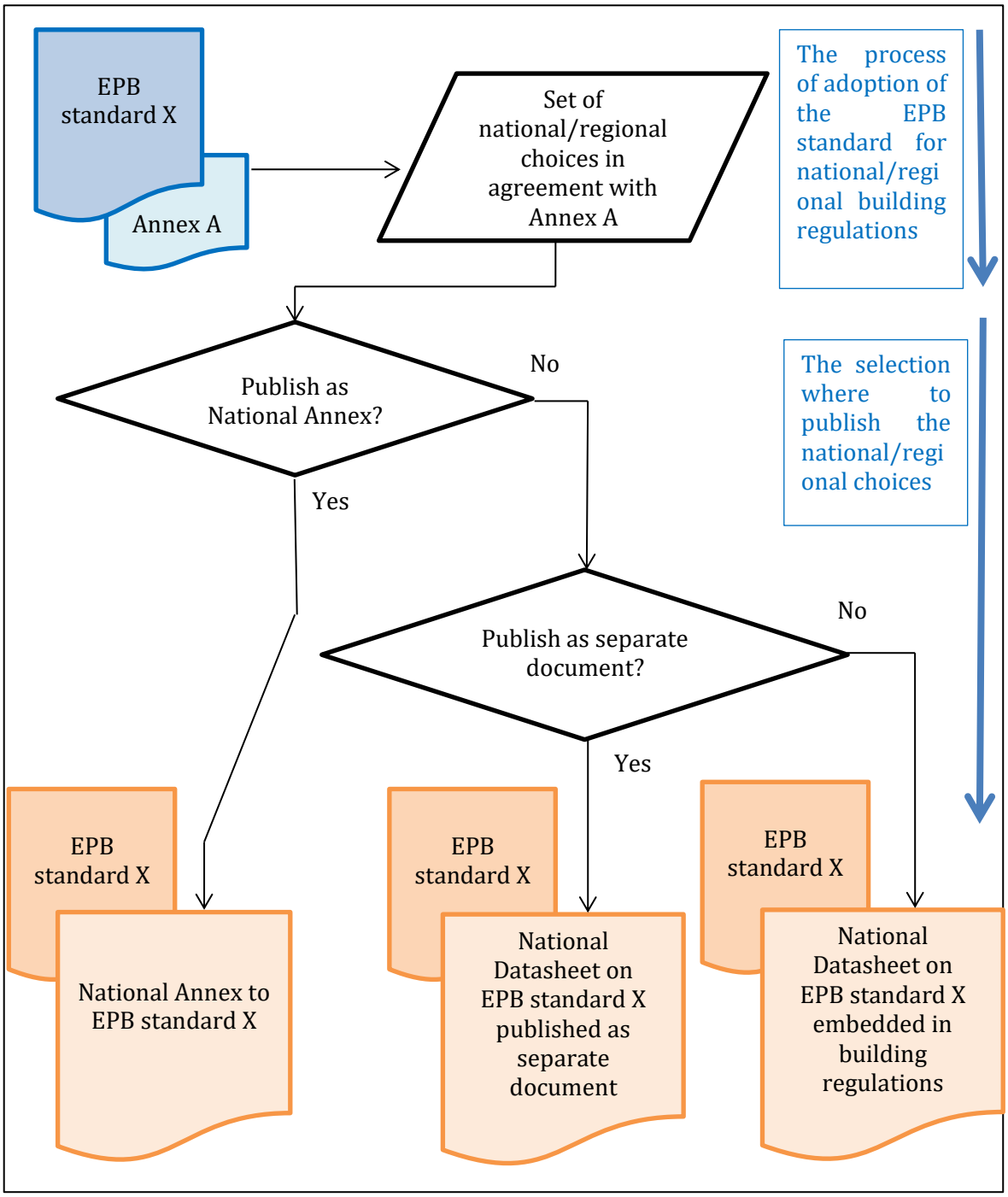

Fig. 1 – The options to publish the national/regional choices when an EPB standard is adopted in the national/regional building regulations

More information:

– https://epb.center/implementation/national-annexes/

Public availability of National Annexes and National Datasheets

In order to improve comparability, it is recommended that Member States make the description of their calculation methodologies publicly available, e.g. by uploading the filled-in templates to a website or annexing them to their building codes, etc.

Making the calculation methodology publicly available will also help Member States to fulfil the EPBD requirement to ensure that the methodology applied for the determination of the energy performance of a building shall be transparent.

The Member State could be considered to have fulfilled the obligation in Annex I to the EPBD in respect of that standard[8] by publishing the National Annex or National Datasheet together with the national regulations requiring use of the standard in question.

1.6 Different applications may require different National Annexes or Datasheets for the same EPB standard

Different National Annexes or National Datasheets are possible, for different applications.

The choices (in methods, references or input data) can be different for different building types (e.g. simple versus complex building), or building categories (e.g. residential versus non-residential building), or on the availability of data or building age (e.g. new building design or old existing building), or e.g. on climate zone, etc.

This implies that, if necessary, more than one instance may be needed for a specific table*), for a specific subclause*) or for the whole National Annex*).

*): The editorial rules for these **multiple instances** of a specific table or subclause or for the National Annex as a whole are shown in chapter 3.

Examples are presented in chapter 4.

1.7 Is this guide only relevant for Europe?

This guide frequently references the requirements of the European Directive on the Energy Performance of Buildings. Apart from that, this guide is fully applicable at global level.

1.8 If the national methodology is not fully in line with the EPB standard(s)

Topics addressed in each EPB standard can be subject to public regulation. Public regulation on the same topics can, for certain applications, override the use of the EPB standard(s).

When an EPB standard is not adopted in full by a Member State, to increase transparency and consistency, Annex A of the EPB standard should be used as a template to describe the national calculation methodology and national choices. This is required for the five 'overarching' EPB standards in Annex I to the EPBD.

If the EPB standard is not adopted in full, a formal National Annex to the EPB standard is not applicable. So the national calculation methodology and national choices should be published as a National Datasheet.

Examples are presented in chapter 5.

[8] Check the EC recommendation to this point [2] for details

2 How to create a National Annex or National Datasheet

The National Annex or National Datasheet shall follow the normative template in Annex A, using or replacing the informative default choices of Annex B.

For proper understanding it is necessary to read:

- the explanations given on the previous pages;

- the common text in A.1 (General) of each EPB standard.

Because the National Annex is a copy of Annex A of the EPB standard (completed with choices made and optional explanations), the common text of A.1 can also be found in the model of a NA.1 below.

The do's and don'ts for a National Annex of an EPB standard:

- If a national or regional data sheet is a National Annex to the EPB standard, it receives the number /NA.
- If there are more National Annexes to the same EPB standard, for instance because different Annexes are needed for different applications, these are consecutively numbered: /NB, /NC, etc.
- The decision to publish National Annexes lies with the National Standards Bodies. They can choose to publish this stapled to the standard, or as separate document(s). Regardless of the decision, they are always referred to as national Annexes and follow the denomination "…/NA" (as indicated above).
- As Annex to the national implementation of a European standard, a National Annex is always informative (the mandatory use for a specific application will be ensured by national / regional regulations).
- Since the template in Annex A is normative, the National Annex has to follow the structure and tables of Annex A. It may contain only information provided for easier implementation, for example by giving values or methods that fit the national / regional regulations.
- A National Annex must not alter any provisions of the standard. This means that only the choices can be made that are explicitly offered as a choice: additional changes are not permitted.

The do's and don'ts for a National Datasheet for an EPB standard:

- It is possible to have more National Datasheets for the same EPB standard, for instance because different Datasheets are needed for different applications.
- The decision to prepare National Datasheets lies with the national or regional authorities. They can choose to prepare this as part of the regulations, or as separate document(s).
- A National Datasheet on an EPB standard can exist parallel to a National Annex to the same standard:
  - the National Datasheet will be part of or referred to in the national or regional building regulations;
  - the National Annex may have been prepared by the National Standards Body to serve other applications.
- If the building regulations refer to an EPB standard[9] in combination with a National Datasheet, the National Datasheet has to follow the structure and tables of Annex A,

[9] A national authority is not bound by the CEN rules. They can overrule (parts of) CEN standards as they see fit. But if they overrule one or more normative elements of an EPB

since the template in Annex A is normative. The National Datasheet may contain only information provided for easier implementation, for example by giving values or methods that fit the national / regional regulations.

- If the building regulations refer to an EPB standard in combination with a National Datasheet the National Datasheet shall not alter any provisions of the standard.

standard (including overruling the template of Annex A of that EPB standard), they cannot claim that they adopted this EPB standard.

3 Model of a National Annex or National Datasheet

Explanation:

Note: this style is used for instructions and for explanation

Legend:

For this document only:

- Green font = example or dummy text

Explanation:

*This model of a **National Annex** is equally applicable to a **National Datasheet.***

DISCLAIMER:

The choices shown here are examples and do not represent recommendations.

NSB-ISO or EN xxxx/NX
(informative)

Input and method selection data sheet — Choices for country xxx, for application yyy

Contents

Page

Explanation:

A Table of Content should be a copy of the Table of Content of Annex A of the EPB standard.

Additional (optional) elements:

- Foreword

- Introduction

- Additional national information

- Bibliography

The numbering of subclauses shall be kept the same as in Annex A of the EPB standard. If there is a need for more than one instance of a subclause (for different applications), then these shall be distinguished by addition of a, b, etc.
For example:
NA.2a References
For new buildings …
NA.2b References:
For existing buildings: …

Foreword

Explanation:

National foreword to the National Annex, optional

…

Introduction

Explanation:

Introduction to the National Annex, optional.

In case of more than one National Annex to a specific EPB standard:

If there are many differences in choices between different applications, different National Annexes can be created, instead of different tables or different subclauses: one National Annex for each application.
The rules for this case are given in the common EPB text in ***NA.1*** *below.*

Here below a suggestion for a common text for the (national or regional) introduction (applicable to all National Annexes).

Remember that the green fonts are used for examples or dummy texts.

This National Annex gives the choices to be used with respect to values, methods and references in <country> when using standard ISO or EN xxxx-n in the context of … <application>….

This National Annex is in line with the template in Annex A of the standard ISO or EN xxxx-n.

This data sheet takes into account national / regional regulations, climatic conditions, traditions and a specific range of validity.

The specific national or regional regulations are: ……, ……. …… ……. ……. …… ……. ……. …… ……. ……. …… ……. ……

The specific range of validity is described in terms of the types and categories that are specified in Clause NA.3:

- Type or types of object: …….. .
- Category or categories of buildings: …….. .
- Category or categories of spaces (if applicable: …….. .
- Type or types of application: …….. .
- Type or types of assessment: …….. .

NA.1 General

Explanation:

Because a National Annex is a copy of Annex A of the EPB standard (completed with choices made and optional explanations), this subclause shall be a copy of A.1 of the EPB standard.

NOTE: Annex B of the standard itself is also a copy of Annex A, but completed with default choices. Consequently: subclause B.1 is identical to subclause A.1

***Common text for subclauses A.1 of all EPB standards** (as agreed within ISO and CEN):*

The template in Annex A of this document shall be used to specify the choices between methods, the required input data and references to other documents.

NOTE 1 Following this template is not enough to guarantee consistency of data.

NOTE 2 Informative default choices are provided in Annex B. Alternative values and choices can be imposed by national/regional regulations. If the default values and choices of Annex B are not adopted because of the national/regional regulations, policies or national traditions, it is expected that:

— national or regional authorities prepare data sheets containing the national or regional values and choices, in line with the template in Annex A; or

— by default, the national standards body will add or include a national annex (Annex NA) to this document, in line with the template in Annex A, giving national or regional values and choices in accordance with their legal documents.

NOTE 3 The template in Annex A is applicable to different applications (e.g., the design of a new building, certification of a new building, renovation of an existing building and certification of an existing building) and for different types of buildings (e.g., small or simple buildings and large or complex buildings). A distinction in values and choices for different applications or building types could be made:

— by adding columns or rows (one for each application), if the template allows;

— by including more than one version of a table (one for each application), numbered consecutively as a, b, c, … For example: Table NA.3a, Table NA.3b;

— by developing different national/regional data sheets for the same standard. In case of a national annex to the standard these will be consecutively numbered (Annex NA, Annex NB, Annex NC, …).

NOTE 4 In the section “Introduction” of a national/regional data sheet information can be added, for example about the applicable national/regional regulations.

NOTE 5 For certain input values to be acquired by the user, a data sheet following the template of Annex A, could contain a reference to national procedures for assessing the needed input data. For instance, reference to a national assessment protocol comprising decision trees, tables and pre-calculations.

The shaded fields in the tables are part of the template and consequently not open for input.

NA.2 References

In each EPB standard A.2 is the clause with Table A.1 containing the choice for references to other EPB standards.

A choice between references may e.g. be a choice between an ISO (or CEN) EPB standard or a national standard, for instance as part of a step-by-step national or regional implementation of the set of EPB standards.

Explanation copied from Clause 2 (Normative references) of all EPB standards:

NOTE Default references to EPB standards other than ISO 52000-1 are identified by the EPB module code number and given in Annex A (normative template in Table A.1) and Annex B (informative default choice in Table B.1).

EXAMPLE EPB module code number: M5–5, or M5–5.1 (if module M5–5 is subdivided), or M5–5/1 (if reference to a specific clause of the documents covering M5–5).

Remember that the green fonts are used for examples or dummy texts.

Note what is stated in NA.1: the shaded fields in the tables are part of the template and consequently not open for input.

Table A.1 is common in all EPB standards, so it should be Table NA.1 in national annex NA:

The references, identified by the module code number, are given in Table NA.1.

Table NA.1 — References (See Clause 2)

Reference	Reference document	
	Number	Title
<<See examples of Tables in chapter 4 and 5>>		

Further explanation:

Optional: add extra explanation on the national/regional choices in this subclause.

For comparison with the national annexes or datasheets in other countries it is strongly recommended to clearly mark these explanations as being distinct from the mandatory text and tables copied from Annex A. For example:

Explanation of these national choices:

….

…..

NA.3 Selection of method(s)

Drafting instructions:

Header of NA.3 is equal to header of A.3

In case of multiple instances of the same table (this applies to any table in the national annex):

If more than one instance of a table is needed within one national datasheet, for instance different tables for different applications, like a table for new buildings versus a table for existing buildings, or a table for residential buildings versus a table for non-residential buildings, they shall keep the number as in Annex A (for instance Table A.5), but with small letters added to mark the difference.

E.g. Table NA.5a and Table NA.5b.

The same rule applies if more than one instance of a subclause is needed, as explained under "CONTENT" above.

…..

Optional:

Explanation of these national choices:

….

…..

NA.4 Input data method 1

Drafting instructions:

Header of NA.4 is equal to header of A.4

…..

Optional:

Explanation of these national choices:

….

…..

NA.5 Input data method 2

Drafting instructions:

Header of NA.5 is equal to header of A.5

…..

…..

Optional:

Explanation of these national choices:

….

…..

4 Various examples of tables in agreement with the template

4.1 Introduction

For illustration purposes, we show:

1) First the Table from Annex A, the normative empty template, which will be denominated as Table A.X
2) then the same table from Annex B, the informative default choices, which will be denominated as Table B.X
3) and finally the example of table in National Annex or National Datasheet, which will be denominated as Table NA.X.

Legend:

Recommended*)[10] for each National Annex/National Datasheet:

- Black font = from Annex A (in the tables these elements are usually grey shaded)
- Black font = National data/choices that are following the data/choices of Annex B
- ~~Blue font, strike through~~ = Data/choices of Annex B that are not used as national data/choices
- Blue font = National data/choices that are not found as data/choices in Annex B, but that are in agreement with Annex A (the template; so: in agreement with the standard)

4.2 Example for any EPB standard: Table A.1

This could be a Table from any EPB standard. Here we used a fictitious example with different kinds of references in Table NA.1.

Table A.1 — References (See Clause 2)

Reference	Reference document	
	Number	Title
M2-8		
M3-5		
M3-8		
[a] If a reference comprises more than one document, the references may be differentiated.		

Table B.1 — References (See Clause 2)

Reference	Reference document	
	Number	Title
M2-8	a) ISO 52022-3	*Energy performance of buildings - Thermal, solar and daylight properties of building components and elements – Part 3: Detailed calculation method of the solar and daylight Characteristics for solar protection devices combined with glazing*
	b) ISO 52022-1	*Energy performance of buildings – Thermal, solar and daylight*

[10] This would strongly facilitate comparison with other countries

Reference	Reference document	
	Number	Title
		properties of building components and elements – Part 1: Simplified calculation method of the solar and daylight characteristics for solar protection devices combined with glazing
M3-5	EN 15316-2	*Energy performance of buildings – Method for calculation of system energy requirements and system efficiencies – Part 2: Space emission systems (heating and cooling), Module M3–5, M4–5*
M3-8	EN 15316-4-1	*Heating systems and water based cooling systems in buildings — Method for calculation of system energy requirements and system efficiencies — Part 4-1: Space heating and DHW generation systems, combustion systems (boilers, biomass)*
[a] If a reference comprises more than one document, the references may be differentiated.		

Table NA.1 — References (See Clause 2)

Reference	Reference document	
	Number	Title
M2-8.1	NSB XXXX	*….. [Title of (e.g. national) standard]*
M2-8.3	~~a)~~ ISO 52022-3	*Energy performance of buildings - Thermal, solar and daylight properties of building components and elements – Part 3: Detailed calculation method of the solar and daylight Characteristics for solar protection devices combined with glazing*
	~~b) ISO 52022-1~~	~~*Energy performance of buildings – Thermal, solar and daylight properties of building components and elements – Part 1: Simplified calculation method of the solar and daylight characteristics for solar protection devices combined with glazing*~~
~~M3-5~~	~~EN 15316-2~~	~~*Energy performance of buildings – Method for calculation of system energy requirements and system efficiencies – Part 2: Space emission systems (heating and cooling), Module M3–5, M4–5*~~

M3-5	for ref. in clause 7.4:
	NSB YYYY
	for ref. in clause 8.5:
	NSB ZZZZ
		….. [Title of (e.g. national) standard]….
		
		….. [Title of (e.g. national) standard]….

M3-8-1	EN 15316-4-1	*Heating systems and water based cooling systems in buildings — Method for calculation of system energy requirements and system efficiencies — Part 4-1: Space heating and DHW generation systems, combustion systems (boilers, biomass)*
M3-8-1/1	EN 15316-4-1:2017	*Heating systems and water based cooling systems in buildings — Method for calculation of system energy requirements and system efficiencies — Part 4-1: Space heating and DHW generation systems, combustion systems (boilers, biomass) – Clause 5.4*
M3-8-1/2	EN 15316-4-1:2017	*Heating systems and water based cooling systems in buildings — Method for calculation of system energy requirements and system efficiencies — Part 4-1: Space heating and DHW generation systems, combustion systems (boilers, biomass) – Clause 7.4*

Reference	Reference document	
	Number	Title
[a] If a reference comprises more than one document, the references may be differentiated.		

Observations on this example (Table NA.1 – References):

As recommended in this Guide:

- The Table is copied from Annex B, in black font.
- The (fixed) elements that are part of Annex A are in black font, grey shaded.
- The choices that are not used as national choices are in blue font strike through. For example, as reference for M8-3, the National Annex does not accept ISO 52022-1, suggested in Annex B.
- The choices that are added to the informative choices of Annex B are in blue font. For example, as reference for M3-5, the National Annex replaces the standard suggested in Annex B by two national standards.
- Differentiation (= different choices for different applications) is allowed according to the template (Table A.1).
  For example: M2-8 from Annex A and Annex B is in the National Annex replaced by M2-8.1 and M2-8.3: it allows a choice between two references.
  And for example M3-8-1 from Annex B is in the National Annex replaced by M3-8-1/1 and M3-8-1/2, references to specific clauses of the referenced standard. This may e.g. occur in case of alternative methods described in different clauses within the same standard.
- Overall: the Table in the National Annex is in agreement with the template of Annex A.

4.3 Example from EN ISO 52000-1: Table A.2

Table A.2 — Energy performance assessment types according to building category and application (See 5.3)

Application	Building category	Assessment type	Conditions
			-
NOTE Add rows in case of more assessment purposes.			

Table B.2 — Energy performance assessment types according to building category and application [a] (See 5.3)

Application	Building category	Assessment type	Conditions
Energy performance certificate	All categories	As built type	-
Building permit	All categories	Design type	-
Permit to use	All categories	As built type	-
Energy audit	All categories	Tailored type	-
NOTE Add rows in case of more assessment purposes.			

Table NA.2 — Energy performance assessment types according to building category and application [a] (See 5.3)

Application	Building category	Assessmen	Conditions
Energy performance certificate/Energy label	All categories	As built type	-
Building permit	All categories	Design type [a]	-
Permit to use	Offices [b]	As built type	-
~~Energy audit~~			-
Subsidy schemes and tax arrangements	All categories	All types	-
Property Valuation System	Residential	As built type	rentals
Energy performance fee scheme	Residential	As built type	rentals

a) New legislation is in preparation that might change the building permit to the As built type in the future
b) Starting from 2023

NOTE Add rows in case of more assessment purposes.

Observations on this example:

As recommended in this Guide:

- The Table is copied from Annex B, in black font.
- The (fixed) elements that are part of Annex A are in black font, grey shaded.
- The choices in Annex B that are not applicable for the National Annex are in blue font strike through
- The choices that are added compared to Annex B are in blue font.
- Overall: the Table in the National Annex is in agreement with the template of Annex A.

4.4 Example from EN ISO 52016-1: Table A.30

Table A.30 — View factor to the sky (see 6.6.8.3)

	Unshaded horizontal roof	Unshaded vertical wall
F_{sky}		

Table B.30 — View factor to the sky (see 6.6.8.3)

	Unshaded horizontal roof	Unshaded vertical wall
F_{sky}	1,0	0,5

Table NA.30 — View factor to the sky (see 6.6.8.3)

	~~Unshaded horizontal roof~~ horizontal roof, if the angle between construction and the horizontal ≤ 5°	pitched roof, if the angle between construction and the horizontal > 5° but ≤ 75 °	~~Unshaded vertical wall~~ vertical construction, if the angle between construction and the horizontal > 75°	partition constructions if inclined (faced to the ground)	partition construction between the thermal zone and an adjacent thermally unconditioned space
F_{sky}	1,0	0,75	0,5	0	0

Observations on this example:

As recommended in this Guide::

- The Table is copied from Annex B, in black font.
- The (fixed) elements that are part of Annex A are in black font, grey shaded .
- The choices in Annex B that are not applicable for the National Annex are in blue font strike through
- The choices that are added compared to Annex B are in blue font: it is allowed to add columns, because these are not fixed (not grey-shaded) in Table A.30
- Overall: the Table in the National Annex is in agreement with the template of Annex A.

4.5 Example from EN ISO 52016-1: Table A.10 and A.13

Table A.10 — Alternative choices in modelling (see 6.5.5.2, 6.5.6.3.1 and 6.5.7.1)

Description	Choice	If choice is No, describe or give reference to the applied alternative method
Use the method in 6.5.5.2 to calculate the actual temperatures and loads	Yes/No	*<free text>*
Use method in 6.5.6.3.1 for the calculation of the thermal (longwave) radiation exchange	Yes/No	*<free text>*
Use method in 6.5.7.1 for the conversion of physical properties of building elements into properties per layer (node)	Yes/No	*<free text>*
NOTE In case of one or more "No", the procedures are validated using the validation cases in 7.2, as described in that subclause.		

Table A.13 — Distribution of mass of opaque and ground floor elements (see 6.5.7.2 and 6.5.7.3)

Class	Specification of the class

Class I (mass concentrated at internal side)	<free text>
Class E (mass concentrated at external side)	<free text>
Class IE (mass divided over internal and external side)	<free text>
Class D (mass equally distributed)	<free text>

Table B.10 — Alternative choices in modelling (see 6.5.5.2, 6.5.6.3.1 and 6.5.7.1)

Description	Choice	If choice is No, describe or give reference to the applied alternative method
Use the method in 6.5.5.2 to calculate the actual temperatures and loads	Yes	Not applicable
Use method in 6.5.6.3.1 for the calculation of the thermal (longwave) radiation exchange	Yes	Not applicable
Use method in 6.5.7.1 for the conversion of physical properties of building elements into properties per layer (node)	Yes	Not applicable
NOTE In case of one or more "No", the procedures are validated using the validation cases in 7.2, as described in that subclause.		

Table B.13 — Distribution of mass of opaque and ground floor elements (see 6.5.7.2 and 6.5.7.3)

Class	Specification of the class
Class I (mass concentrated at internal side)	Construction with external thermal insulation (main mass component near inside surface) , or equivalent
Class E (mass concentrated at external side)	Construction with internal thermal insulation (main mass component near outside surface) , or equivalent
Class IE (mass divided over internal and external side)	Construction with thermal insulation in between two main mass components, or equivalent
Class D (mass equally distributed)	Uninsulated construction (e.g. solid or hollow bricks, heavy or lightweight concrete, or lightweight construction with negligible mass (e.g. steel sandwich panel), or equivalent

Table NA.10 — Alternative choices in modelling (see 6.5.5.2, 6.5.6.3.1 and 6.5.7.1)

Description	Choice	If choice is No, describe or give reference to the applied alternative method
Use the method in 6.5.5.2 to calculate the actual temperatures	Yes	Not applicable

and loads		
Use method in 6.5.6.3.1 for the calculation of the thermal (longwave) radiation exchange	Yes	Not applicable
Use method in 6.5.7.1 for the conversion of physical properties of building elements into properties per layer (node)	No	As allowed by clause 6.5.7.1, an alternative conversion method is chosen, as described in Table NA.10 bis
NOTE In case of one or more "No", the procedures are validated using the validation cases in 7.2, as described in that subclause.		

Table NA.10-bis — Alternative method in modelling thermal nodes and related properties

Node number	Layer number	Node position	Areal thermal capacity $\kappa_{pli;eli}$ [J/m² K]	Internodes conductance $h_{pli;eli}$ [W/m² K]
1	-	external surface	0	$1/(R_{c;1;eli}/2)$
2	1		$\rho_j \cdot c_j \cdot d_j$	$1/(R_{c;1;eli}/2 + R_{c;2;eli}/2)$
j+1	j	internal 4)	$\rho_j \cdot c_j \cdot d_j$	$1/(R_{c;j;eli}/2 + R_{c;j+1;eli}/2)$
pln-1 = *N*+1	N		$\rho_N \cdot c_N \cdot d_N$	$1/(R_{c;N;eli}/2)$
pln = *N*+2		internal surface	0	-

NOTE:
a The number of nodes (pln) is equal to the number of layers plus two,
b ρ_j , c_j , d_j are respectively the mass density [kg/m³], the thermal capacity by unit of mass [J/(kg K)] and the thickness [m] of i-the layer of the building element,
c $R_{c,j,eli}$ is the conductive resistance in [m² K/W], calculated as d_j/λ_j where d is the layer thickness, in [m], and λ is the layer material thermal conductivity, in [W/(m K)],
d If the internal layer is an air layer the areal thermal capacity $\kappa_{pli;eli}$ shall be zero and the internodes conductances are calculated as $h_{pli-1;eli} = h_{pli;eli} = h_a \cdot 2$,
where h_a in [W/(m²K)] is the convective-radiative air layer conductance.

Table NA.13 — Distribution of mass of opaque and ground floor elements (see 6.5.7.2 and 6.5.7.3)

Class	Specification of the class
Class I (mass concentrated at internal side)	Not applicable (see table NA.10)
Class E (mass concentrated at external side)	Not applicable (see table NA.10)
Class IE (mass divided over internal and external side)	Not applicable (see table NA.10)
Class D (mass equally distributed)	Not applicable (see table NA.10)
Class M (mass concentrated inside)	Not applicable (see table NA.10)

Observations on this example:

- The national methodology uses a different and more detailed way to describe the layers in each construction and to divide these over the 5 "RC" nodes in the model of the construction for the hourly calculation of the thermal balance in the thermal zone.
  This alternative is allowed for by EN ISO 52016-1 and therefore: deviates from the default choices in Table B.10 (→ blue font used, as recommended in this Guide), but in agreement with Table A.10 (the template).
- As a consequence, Table A.13 is not applicable, as clearly indicated.
- The alternative in the national method consists not only of values, but includes formulae that lead to values. In general, formulae and/or tables (and even a reference to national procedures for assessing the needed input data) are allowed instead of single values, as explained in the common text for all EPB standards in A.1, General[11].
- Overall: these Tables in the National Annex are in agreement with the template of Annex A.

4.6 Example from EN ISO 52016-1: Tables that are not relevant

Depending on a specific choice, it may happen that one or more other Tables in Annex A are not relevant.

For instance for Table A.2:

Table A.2 — Choice between hourly or monthly calculation method (see 5.2)

Type of object and/or application	….. b	…. b
Description	Choice [a]	Choice [a]
Only hourly method allowed	Yes/No	Yes/No
Only monthly method allowed	Yes/No	Yes/No
Both methods are allowed	Yes/No	Yes/No

[a] Only one Yes per column possible.

[b] Add more columns if needed to differentiate between type of object, type of building or space, type of application or type of assessment. Use the list of identifiers from ISO 52000-1:2017, Tables A.2 to A.7 (normative template, with informative default choices in Tables B.2 to B.7).

If the choice is: "Only *hourly* method allowed", then all Tables in Annex A for the *monthly* method are irrelevant.

In such a case the template is not violated if it is stated explicitly why these Tables are not filled in. So for instance for the example above:

Tables A.27 – A.44 are not relevant for the hourly calculation procedures.

4.7 Example from EN 16798-5-1: Tables that are not used because of optional default values or choices

Some EPB standards contain Tables in Annex A that intend to offer the possibility to specify (optional) national or regional default values or choices. For instance values for the case the project related value is still not known, e.g. in an early design stage or e.g. for specific data in old existing buildings.

For example Table A.2 of EN 16798-5-1 (and similar Tables):

[11] This common text can be read in chapter 3 of this Guide (Model of N.A.)

Table A.2 – Product description data

HEAT_REC_TYPE	DEFR_TYPE	HUM_TYPE

Table B.2 – Product description data

HEAT_REC_TYPE	DEFR_TYPE	HUM_TYPE

Table NA.2 – Product description data

HEAT_REC_TYPE	DEFR_TYPE	HUM_TYPE
No default choices: the choice is project dependent		

Observations on this example:

The intention of many of the choices in this standard is to give default choices for the case the project related value is still not known, e.g. in an early design stage.

This should be clear from the text of the standard where the references to the respective Tables are placed. For instance the text in EN 16798-5-1 referring to Table A.2/B.2 reads:

> *"In the absence of detailed information, duct leakage factors can be used depending on the duct air tightness class according to Table 10. Default tightness classes shall be defined according to the template given in Table A.2, default values are given in Table B.2."*

If it is intended at national or regional level not to provide such default values, the solution is to explain this in the Table, instead of the values, like shown in Table NA.2 above.

5 If the national methodology is not fully in line with the EPB standard(s)

5.1 Introduction

In this chapter examples are presented of **tables filled in that are not fully in accordance with the template of Annex A**.

This can occur when the national methodology is described following the National Annexes of the (e.g. overarching) standards as required by Annex I of the revised EPBD (2018).

When an EPB standard is not adopted in full by a Member State, to increase transparency and consistency, Annex A of the EPB standard should be used as a template to describe the national calculation methodology and national choices. This is required for the five 'overarching' EPB standards in Annex I to the EPBD.

If the EPB standard is not adopted in full, a formal National Annex to the EPB standard is not applicable. So the national calculation methodology and national choices should be published as a National Datasheet.

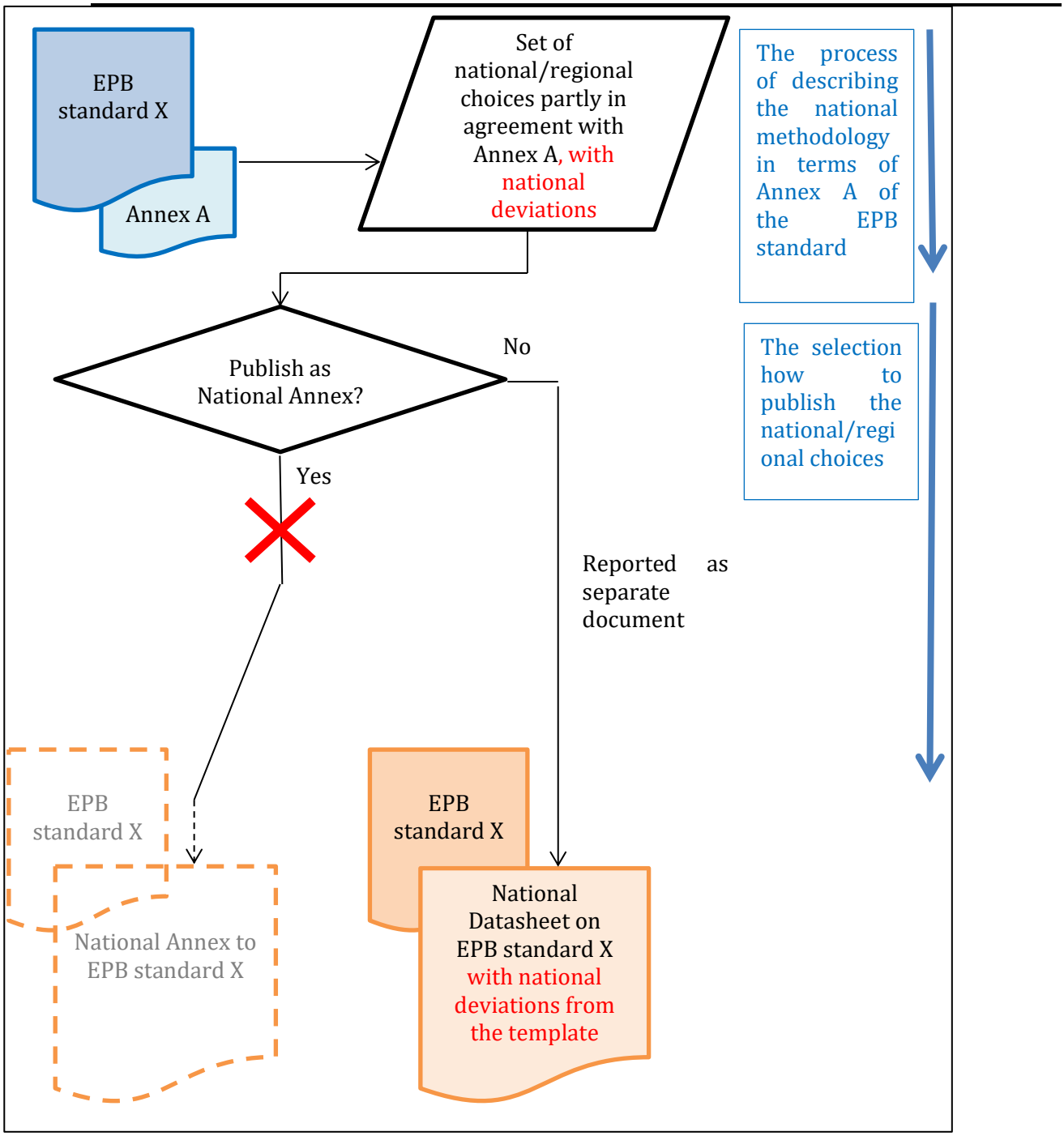

Fig. 2 – The options to publish the national/regional choices when an EPB standard is not fully adopted in the national/regional building regulations

As in the previous chapter, for illustration purposes, we show:

a) First the Table from Annex A

b) Then the same table from Annex B

c) and finally the example of table in the National Datasheet.

Legend:

Recommended*)[12] for each National Datasheet:

- Black font = from Annex A (in the tables these elements are usually grey shaded)
- Black font = National data/choices that are following the data/choices of Annex B
- ~~Blue font, strike through~~ = Data/choices of Annex B that are not used as national data/choices
- Blue font = National data/choices that are not found as data/choices in Annex B, but that are in agreement with Annex A (so: in agreement with the standard)
- ~~Red font, strike through~~ = (fixed) elements of Annex A that are not adopted (→ **not** in agreement with the standard)
- Red font = Elements or national data/choices that are not in agreement with Annex A (→ **not** in agreement with the standard)

5.2 Example from EN ISO 52000-1: Table A.16

Table A.16 — Weighting factors (based on gross or net calorific value) (See 7.3.5, 9.5.1, 9.6.2, 9.6.5 and 9.6.6.3)

Energy carrier	f_{Pnren}	f_{Pren}	f_{Ptot}	[a]
Delivered from distant				
[a] [b]				
Delivered from nearby				
Delivered from on-site				
Exported				

[a] Add a column in case of other requirements, e.g., CO_2 requirement.
[b] Add the rows of the energy carriers.

Table B.16 — Weighting factors (based on gross or net calorific value) (See 7.3.5, 9.5.1, 9.6.2, 9.6.5 and 9.6.6.3)

	Energy carrier Delivered from distant		f_{Pnren}	f_{Pren}	f_{Ptot}	K_{CO2e} (g/kW h)
1	Fossil fuels	Solid	1,1	0	1,1	360

[12] This would strongly facilitate comparison with other countries

2		Liquid	1,1	0	1,1	290
3		Gaseous	1,1	0	1,1	220
4	Bio fuels	Solid	0,2	1	1,2	40
5		Liquid	0,5	1	1,5	70
6		Gaseous	0,4	1	1,4	100
7	Electricity [c]		2,3	0,2	2,5	420
	Delivered from nearby					
8	District heating [a]		1,3	0	1,3	260
9	District cooling		1,3	0	1,3	260
	Delivered from on-site					
10	Solar	PV electricity	0	1	1	0
11		Thermal	0	1	1	0
12	Wind		0	1	1	0
13	Environment	Geo-, aero-, hydrothermal	0	1	1	0
	Exported					
14	Electricity [b c]	To the grid	2,3	0,2	2,5	420
15		To non EPB uses	2,3	0,2	2,5	420

[a] Default value based on a natural gas boiler. Specific values are calculated according to M3–8.5.

[b] It is possible to differentiate between different sources of electricity like wind or solar.

[c] These values are established in line with the default coefficient provided in Annex IV of Directive 2012/27/EU. This default coefficient is currently being reviewed and a later amendment of the above factors could be needed.

NOTE 1 Add a column in case of other requirements, e.g., CO_2 requirement.

NOTE 2 Add rows for each relevant energy carrier.

Table NA.16 — Weighting factors (based on gross or net calorific value) (See 7.3.5, 9.5.1, 9.6.2, 9.6.5 and 9.6.6.3)

	~~Energy carrier~~ ~~Delivered from distant~~		~~f_{Pnren}~~	~~f_{Pren}~~	~~f_{Ptot}~~	~~K_{CO2e} (g/kW h)~~
~~1~~	~~Fossil fuels~~	~~Solid~~	~~1,1~~	~~0~~	~~1,1~~	~~360~~
~~2~~		~~Liquid~~	~~1,1~~	~~0~~	~~1,1~~	~~290~~
~~3~~		~~Gaseous~~	~~1,1~~	~~0~~	~~1,1~~	~~220~~
~~4~~	~~Bio fuels~~	~~Solid~~	~~0,2~~	~~1~~	~~1,2~~	~~40~~
~~5~~		~~Liquid~~	~~0,5~~	~~1~~	~~1,5~~	~~70~~
~~6~~		~~Gaseous~~	~~0,4~~	~~1~~	~~1,4~~	~~100~~
~~7~~	~~Electricity [c]~~		~~2,3~~	~~0,2~~	~~2,5~~	~~420~~
	~~Delivered from nearby~~					
~~8~~	~~District heating [a]~~		~~1,3~~	~~0~~	~~1,3~~	~~260~~

9	District cooling		1,3	0	1,3	260
	Delivered from on-site					
10	Solar	PV electricity	0	1	1	0
11		Thermal	0	1	1	0
12	Wind		0	1	1	0
13	Environment	Geo-, aero-, hydrothermal	0	1	1	0
	Exported					
14	Electricity [b c]	To the grid	2,3	0,2	2,5	420
15		To non EPB uses	2,3	0,2	2,5	420

[a] Default value based on a natural gas boiler. Specific values are calculated according to M3-8.5.

[b] It is possible to differentiate between different sources of electricity like wind or solar.

[c] These values are established in line with the default coefficient provided in Annex IV of Directive 2012/27/EU. This default coefficient is currently being reviewed and a later amendment of the above factors could be needed.

NOTE 1 Add a column in case of other requirements, e.g., CO_2 ...

NOTE 2 Add rows for each relevant energy carrier.

In NSB XXXX only overall primary energy factors ($f_{P;del}$), CO_2-emissicon factors (K_{CO2}) and primary renewable energy factors ($f_{P;ren}$) are available. These tables are presented below.

Primary energy factors for delivered energy, onsite produced energy and exported energy, per energy carrier.

Energy carrier(*ci*)	**Delivered energy** $f_{P;del;ci}$	**Onsite produced energy** $f_{P;pr;us;ci}$ [a]	**Exported energy** $f_{P;exp;ci}$
Electricity (el)	1,45 [d]	1,45	1,45
Natural gas (gas)	1,0	Not applicable	Not applicable
Oil (oil)	1,0	Not applicable	Not applicable
… [etc.]			
…			

[a] Heat delivered through an onsite renewable source (thermal solar) is already taken into account: deducted from the energy to be supplied by non-renewable energy carriers for heating and domestic hot water.

…

…

[d] This value has been determined by the National Ministry xxx. …. [etc.]

…

CO_2-emissioncoefficient, $K_{CO2;ci}$, per energy carrier

Energy carrier(*ci*)	Delivered energy $K_{CO2;del;ci}$ kg/kWh	Onsite produced energy K kg/kWh	ted energy $K_{CO2;exp;ci}$ kg/kWh
… [etc.]			

Primary renewable energy factor, per renewable energy source

Renewable energy source (*ri*)	$f_{Pren;ri}$
Renewable electricity (renelect)	1,45
Ambient heat (renheat)	1,0
Ambient cold (rencold)	1,0
… [etc.]	…

Observations on this example (tables describing the national methodology, replacing Table A/B.16 from EN ISO 52000-1):

At national level it was decided not to follow the Table A.16, but to produce alternative tables, copied from the national methodology, to avoid any misunderstanding on the details of the national method.

This is regretful, because:

- Because of this decision, the national methodology is not fully adopting EN ISO 52000-1.
- It has not been checked if and why Table A.16 could not be followed. Important information that is asked for in Table A.16 is now missing, which leads to ambiguities and limits the comparability.
  For instance:
  - The national method uses the term "overall primary energy factors ($f_{P;del}$)". This term is not defined in EN ISO 52000-1. It is unclear whether this concerns "total", "non-renewable" or "renewable" energy. One would assume that "overall" is synonym to "total", but given the values in the table (not shown here in full detail) it seems to be "nonrenewable (f_{Pnren}).
  - The primary renewable energy factor (f_{Pren}) is presented, but in a separate table, which implies that there is no 1:1 consistency with the energy carriers in the first table.
    The tables suggest that all delivered electricity is non-renewable (first table), but there is no information whether it has or has not any renewable fraction…. The third table gives no information on the electricity source (supposingly PV, but e.g. electricity from combined heat and power too??) and gives no information whether it has any non-renewable fraction.
- Conclusion: with a bit more effort the Table A.16 of EN ISO 52000-1 could have been followed, with more transparency and unambiguity and closer to full adoption of EN ISO 52000-1. It is not possible to provide an example of how this could have been done, because of the ambiguities mentioned above.

5.3 Example from EN ISO 52016-1: Table A.33

Table A.33 — Simple method to determine the internal effective heat capacity. Specification of the classes (see 6.6.9)

Class	Specification of the class
Very light	<free text>
Light	<free text>
Medium	<free text>
Heavy	<free text>
Very heavy	<free text>

Table B.33 — Simple method to determine the internal effective heat capacity. Specification of the classes (monthly method; see 6.6.9)

Class	Specification of the class
Very light	Construction type is dominated by very light constructions as specified in Table B.14
Light	Construction type is dominated by light constructions as specified in Table B.14
Medium	Construction type is dominated by medium constructions as specified in Table B.14
Heavy	Construction type is dominated by heavy constructions as specified in Table B.14
Very heavy	Construction type is dominated by very heavy constructions as specified in Table B.14

Table NA.33 — Simple method to determine the internal effective heat capacity. Specification of the classes (see 6.6.9)

Only for use as example

Class [a]	Specification of the class
~~Very light~~	~~Construction type is dominated by very light constructions as specified in Table B.14~~
~~Light~~	~~Construction type is dominated by light constructions as specified in Table B.14~~
~~Medium~~	~~Construction type is dominated by medium constructions as specified in Table B.14~~
~~Heavy~~	~~Construction type is dominated by heavy constructions as specified in Table B.14~~
~~Very heavy~~	~~Construction type is dominated by very heavy constructions as specified in Table B.14~~
Closed < 250 kg/m^2	Closed or false ceiling; Timber frame construction with timber or steel frame floors Steel frame construction with timber or steel frame floors

Class [a]	Specification of the class
Open < 250 kg/m²	No or open ceiling; Timber frame construction with timber or steel frame floors Steel frame construction with timber or steel frame floors
Closed 250 to 500 kg/m²	Closed or false ceiling; Timber frame construction or steel frame construction with steel concrete or non-solid concrete floors Load-bearing masonry with wooden floors
Open 250 to 500 kg/m²	No or open ceiling Timber frame construction or steel frame construction with steel concrete or non-solid concrete floors Load-bearing masonry with wooden floors
Closed 500 to 750 kg/m²	Closed or false ceiling; Concrete column-beam skeleton construction with non-solid concrete floors Load-bearing masonry with non-solid concrete floors
Open 500 to 750 kg/m²	No or open ceiling; Concrete column-beam skeleton construction with non-solid concrete floors Load-bearing masonry with non-solid concrete floors
Closed > 750 kg/m²	Closed or false ceiling; Concrete wall-floor skeleton construction with solid and non-solid concrete floors Load-bearing masonry with solid concrete floors
Open > 750 kg/m²	No or open ceiling; Concrete wall-floor skeleton construction with solid and non-solid concrete floors Load-bearing masonry with solid concrete floors

[a] In the National Standard NSB XXXX the internal effective heat capacity is linked to the construction type and the mass of the total thermal zone (floors, walls, ceilings, furniture, etc.) is recalculated to m² of useful floor area instead of the classes "very light" to "very heavy", to do justice to the national situation. Therefore this table is adapted compared to Table A.33 (and A.14) of EN-ISO 52016-1.

Observations on this example (Table NA.33 on EN ISO 52016-1):

As recommended in this Guide:

- As starting point, the Table is copied from Annex B, in black font.
- The (fixed) elements that are part of Annex A are in black font, grey and shall not be altered to remain in agreement with the standard.
- The choices of Table B.33 that are not applicable are in black font strike through.
- By changing the types of classes (left column, grey shaded), the template of Annex A is not respected, so Table NA.33 is not in agreement with EN ISO 52016-1. This is made visible by using the red font for the altered text and red font-strike-through for the denied text of Table A.33.
- The template allows to change the specification of the classes (second column). So these specifications are in blue font (in agreement with the template, but different from Table B.33). The default specifications from Table B.33 are not applicable and therefore presented in black font strike through.
- Also the additional explanation is allowed, but different from Table B.33 and therefore in blue font.

5.4 Example from EN ISO 52016-1: Table A.46

Table A.46 — Parameters for monthly solar shading due to overhangs (See F.3.5.1.2)

Period:		<month or months>			
Orientation		A_1	B_1	A_2	B_2
North hemisphere	**South hemisphere**				
S	N				
SE-SW	NE-NW				
E-W	E-W				
NE-NW	SE-SW				
N	S				

Table B.46 — Parameters for monthly solar shading due to overhangs (See F3.5.1.2)

Period:		summer: June – September			
Orientation		A_1	B_1	A_2	B_2
North hemisphere	**South hemisphere**				
S	N	-3,023	0,045	1,285	-0,006
SE-SW	NE-NW	-1,255	0,015	0,905	-0,008
E-W	E-W	-0,684	0,005	0,610	-0,004
NE-NW	SE-SW	-0,654	0,006	0,616	-0,006
N	S	-0,726	0,007	0,616	-0,007

Table NA.46 — Parameters for monthly solar shading due to overhangs (See F3.5.1.2)

~~**Period:**~~		~~summer: June – September~~			
~~**Orientation**~~		~~A_1~~	~~B_1~~	~~A_2~~	~~B_2~~
~~**North hemisphere**~~	~~**South hemisphere**~~				
~~S~~	~~N~~	~~-3,023~~	~~0,045~~	~~1,285~~	~~-0,006~~
~~SE-SW~~	~~NE-NW~~	~~-1,255~~	~~0,015~~	~~0,905~~	~~-0,008~~
~~E-W~~	~~E-W~~	~~-0,684~~	~~0,005~~	~~0,610~~	~~-0,004~~
~~NE-NW~~	~~SE-SW~~	~~-0,654~~	~~0,006~~	~~0,616~~	~~-0,006~~
~~N~~	~~S~~	~~-0,726~~	~~0,007~~	~~0,616~~	~~-0,007~~
For the national methodology this Table is not applicable: the national method NSB XXXX uses an approach with tables for 5 different situations for obstacles, 13 angles, and 8 orientations. The national methodology also allows as option a detailed (hourly) calculation for shading that is in line with Annex F of EN ISO 52016-1. So the intermediate level as expressed in F.3.5.1.2 and Table A.46 of					

EN ISO 52016-1 is not covered in the national method.

Observations on this example (Table NA.46 on EN ISO 52016-1):

- This Table is not applicable in the national methodology. This is made visible by using the red font-strike-through for the denied text of Table A.46 and black font strike through for the denied text of Table B.46.
- By denying the option provided in F.3.5.1.2 and Table A.46 the standard **EN ISO 52016-1 is not fully adopted**.
- Such a transparent way of communicating such kinds of (in this case: minor) deviations from the EPB standard can lead to very important feed back to ISO and CEN for the next revision of the EPB standards.

6 History of this document

Date	Version	Notes
2017.09.06	Version 1.0	This document is based on the Template for each ISO or CEN EPB standard document, December 17, 2015 (Template EN-ISO EPB standards_v_2.0_2015_12_17.docx) plus editorial corrections made in the EPB standards as agreed with ISO and CEN after this date until publication (summer 2017)
2019.08.22	Draft of Version 2.0	- More explanation and more examples added. - Also examples added of Tables in National Datasheets to describe a national methodology that deviates from the EPB standard. - Draft for review
2019.10.23	Second draft of Version 2.0	- Editorial changes and further clarifications
2019.11.04	Version 2.0	- Illustration added in 1.5. - Section 4.6 and 4.7 added with examples of procedure in case a specifc Table is irrelevant. - Minor editorial changes and clarifications.

More information: www.epb.center

Comments and suggestions: https://epb.center/contact/

Annex AA

Quick impression of the types of choices in Annex A of EN ISO 52000-1, EN ISO 52003-1, EN ISO 52010-1, EN ISO 52016-1 and EN ISO 52018-1

AA.1 General

A quick impression of the types of choices provided in the EPB standards can be obtained by looking at the main types of choices provided in the five 'core' EPB standards, mentioned in the EPBD:

AA.2 EN ISO 52000-1

EN ISO 52000-1, *Energy performance of buildings — Overarching EPB assessment – Part 1: General framework and procedures* (2017)

About 30 tables with choices. For instance on:

- **Physical** parameters (e.g. *gross calorific values*).
- Differentiation into different ***building and space categories*** (distinction between -for example- single family house, apartment building, office, hospital, education, assembly, sport, restaurant, hotel, holiday home, etc.; or e.g. a less refined differentiation).
  Plus related issues such as: which categories are kept outside the **boundaries of the EPB-assessment** (for instance industrial sites, workshops, indoor parking; or any other choice of building or space categories).

  This categorization has a strong influence on the EP assessment: each category is linked to an assumed set of ***conditions of use*** (temperature, IAQ, DHW, lighting, …). By the way, the (assumed, standard) settings for these *conditions of use* are also determined nationally, in the relevant other EPB standards; see figure 1.

  Via these *conditions of use*, the categorization has also a strong effect on the need to **partition the building** into different zones or sections for the calculation: e.g. spaces with different temperature settings may require separate calculation (separate thermal zones). This, in turn, leads to more input data (e.g. the floor, façade and window area per zone).

  Moreover, the more refined the categorization and the distinction in *conditions of use*, the more likely it is that the **minimum EP requirements** need to be refined (see also EN ISO 52003-1 below).

  But on the other hand, if the categorization is less refined, the predicted energy performance may be less close to the energy performance in practice.
- Energy performance **boundaries** (e.g. whether *PV surplus to the grid* is rewarded in the energy performance or not. Or whether "*distant"* and/or "*nearby"* renewable energy sources (with –national- specification of "*nearby*") are included in the *renewable energy contribution* or not.
- **Policy factors** (e.g. Primary energy factors). The choice of PE factors for electricity versus e.g. gas and oil will have a direct effect on the competitiveness of technologies that use the one or the other energy carrier.

AA.3 EN ISO 52003-1

EN ISO 52003-1, *EPB – Indicators, requirements, ratings and certificates – Part 1: General aspects and application to the overall energy performance* (2017)

- Standardized tables for reporting in a structured and transparent manner the choices that are to be made with respect to overall EPB requirements. For example: choice on the numerical EP indicator and the EP rating method (classes).
  The tables are non-restrictive, thus allowing for full regulatory flexibility. The aim is to offer choices together with the rational (motivation, pro or con) behind each choice:
  - To offer possibility for harmonization.
  - To bring in more transparency (comparison, exchange of best practices).

The EPB procedures are very refined (many standards, dealing with all kind of details), so it would be unproductive if the energy performance requirements are formulated in a (too) simple crude way, which would be not cost optimal or cost effective for many buildings …

AA.4 EN ISO 52010-1

EN ISO 52010-1, *EPB – External climatic conditions – Part 1: Conversion of climatic data for energy calculations* (2017)

- The weather station and climatic data set.
- Method to estimate direct solar (beam) irradiance if not available from weather station (needed for conversion to tilted and vertical planes and for calculating solar shading by external obstacles).
- Solar reflectivity of the ground (fixed value or e.g. function of snow coverage).
- (Default) solar shading from surroundings (horizon) included or not.

AA.5 EN ISO 52016-1

EN ISO 52016-1, *EPB – Energy needs for heating and cooling, internal temperatures and sensible and latent heat loads – Part 1: Calculation procedures* (2017)

- Main choice: hourly and/or monthly method (choice may differ per category of buildings).
- Second main choice: specific rules for thermal zoning (in 10 steps); each step can be modified or replaced.
- Other typical national choices:
  - Options of thermally unconditioned zone types and default values for simplifications.
  - Choice between calculations with thermally coupled or uncoupled thermal zones.
  - Details such as: convective fractions, solar absorption coefficient of external opaque surfaces, view factor to the sky, etc.
  - Rules for operation of solar shading devices.
  - Choices between options and methods for calculation of shading by external objects.
- Additionally for the hourly method only:
  - Choice between a few specifically allowed alternative choices in modelling (without compromising reproducibility and transparency).
- Additionally for the monthly method only:
  - The values of various correlation factors (gain utilization factors, intermittency, …
  - The parameters for effect of movable shading devices, simplified (fixed) shading calculation, …

AA.6 EN ISO 52018-1

EN ISO 52018-1, *EPB – Indicators for partial EPB requirements related to thermal energy balance and fabric features – Part 1: Overview of options* (2017)

- Similar as for EN ISO 52003-1. For instance choices to set requirements on partial energy performance features (with optional choices on further details). Such as *yes or no* minimum requirements on one or more of the following aspects:
  - Summer thermal comfort.
  - Winter thermal comfort.
  - Energy needs for heating and/or cooling (with further specification of assumed ventilation, etc.).
  - Thermal insulation of envelope and/or individual elements.
  - Thermal bridges.
  - Windows energy performance.
  - Air tightness.
  - Solar control.

References

[1] EPB Center website (link)

[2] Commission Recommendation on building renovation, (EU) 2019/786 of 8 May 2019 (link)

[3] Commission Recommendation on building modernisation, (EU) 2019/1019 of 7 June 2019 (link)