

ISO/TR 52000-2:2017-06 (E)

Energy performance of buildings - Overarching EPB assessment - Part 2: Explanation and justification of ISO 52000-1

Contents		Page
Foreword		vi
Introduction		vii
1	Scope	1
2	Normative references	1
3	Terms and definitions	2
3.1	Buildings	2
3.2	Indoor and outdoor conditions	3
3.3	Technical building systems	3
3.4	Energy	4
3.5	Energy performance	4
3.6	Energy calculation	4
3.7	General information on terms and definitions	4
3.7.1	General	4
3.7.2	Overarching terms and definitions	4
3.7.3	Difference between definition and specification	5
3.7.4	Undefined and/or unspecified policy related terms	5
4	Symbols, units, subscripts and abbreviations	5
4.1	Symbols	5
4.2	Subscripts	6
4.3	Abbreviations	6
5	Description of the overarching framework and procedures	6
5.1	Output of the method	6
5.2	General description of the procedures and routing	7
5.3	Selection criteria between the methods	7
5.4	The over-arching reference modular structure	7
5.4.1	Purpose	7
5.4.2	Systematic modular structure of the standards	7
5.4.3	The connection between the modules - step by step implementation	8
5.4.4	Systematic consecutive numbering of the standards	10
6	Overarching preparation steps	11
6.1	General	11
6.2	List of types and categories	13
6.2.1	Type of object	13
6.2.2	Building category and space categories	14
6.2.3	Type of application	15
6.2.4	Types of assessment	15
6.2.5	Building services	16
6.3	Identification of types and categories for a specific case	17
6.4	Example cases	17
6.4.1	General	17
6.4.2	Example case 1	18
6.4.3	Example case 2	19
6.4.4	Example case 3	19
6.4.5	Example case 4	20

6.4.6	Example case 5	21
6.4.7	Example case 6	22
7	Calculated energy performance of buildings	22
7.1	Output data	22
7.2	Calculation intervals and calculation period	22
7.2.1	Calculation interval	22
7.2.2	Calculation period	25
7.3	Input data	25
7.3.1	Product data	25
7.3.2	System design data	25
7.3.3	Operating conditions	25
7.3.4	Constants and physical data	27
7.3.5	Other data	27
7.4	Description of the calculation procedure	28
8	Measured overall energy performance and comparison with calculations	28
8.1	General	28
8.2	Output of the method	29
8.3	Measurement intervals and measurement period	29
8.4	Input data	30
8.4.1	Product data	30
8.4.2	System design data	30
8.4.3	Operating conditions data	30
8.4.4	Constants and physical data	31
8.4.5	Other data	31
8.5	Measurement procedures	31
8.6	Calculation of the energy performance based on measured energy	31
8.7	Comparison between calculated energy performance and measured energy performance	31
8.8	Measured energy performance reporting	32
9	Overall assessment of the energy performance of buildings	32
9.1	Categorization of building and/or spaces	32
9.2	Combination of building services included in EPB in each space	32
9.3	Useful floor area and air volume	32
9.4	Normalization to building size	33
9.4.1	Reference size	33
9.4.2	Normalization	35
9.4.3	Reference floor area	35
9.5	Assessment boundary and perimeters	35
9.5.1	General principles	35
9.5.2	Assessment boundary for multiple buildings	36
9.6	Overall energy performance	36
9.6.1	Weighted overall energy balance	36
9.6.2	Primary energy factors	37
9.6.3	Greenhouse gas emission factors	39
9.6.4	Additional weighting factors	39
9.6.5	Costs factors	39
9.6.6	Weighting factors for exported energy	39
9.6.7	Energy flows	42
9.7	Share of renewable energy	43
9.7.1	General	43
9.7.2	Amount of primary energy from renewable source EP_{ren}	43
9.7.3	Amount of total primary energy EP_{tot}	43
9.7.4	Examples of RER calculation	43
9.8	Energy performance indicators for technical building systems	45
9.9	Calculation methods for energy performance indicators per part of a building and/or service	45
10	Zoning	46

10.1	General	46
10.2	Thermal zones and service areas	48
10.3	Spaces	48
10.4	Zoning rules	50
10.4.1	Principle	50
10.4.2	Specific zoning criteria	51
10.5	Assignment rules	52
10.5.1	Subdivision	52
10.5.2	Recombination	54
10.6	Zoning procedure	55
11	Calculation of the energy performance, routing and energy balance	55
11.1	General	55
11.2	Overall calculation procedure (steps)	55
11.3	Calculation principles of the recovered gains and losses	56
11.4	Effect of building automation and control (BAC) and technical building management (TBM)	56
11.5	Climatic and external environment data	61
11.6	Overall energy performance	61
11.6.1	General	61
11.6.2	Electricity and other energy carriers with exportation	61
11.6.3	Energy carriers without exportation	72
11.6.4	Exported heat on-site produced and not included in thermal use of the building	72
12	Common overarching output - General	73
12.1	General	73
12.2	Tabulated overview of the amounts of energy per energy carrier and energy service	75
12.2.1	Absolute values	75
13	Additional information to the over-arching EPB standard	89
13.1	Worked out examples	89
13.2	Application range	89
13.3	Regulation use	89
13.4	Validation test	90
13.5	Quality issues	90
Annex A (informative) Input and method selection data sheet -- Template		91
Annex B (informative) Input and method selection data sheet -- Default choices		93
Annex C (informative) Common subscripts		101
Annex D (informative) Calculation of measured energy performance		108
Annex E (informative) Calculation methods for energy performance indicators per part of a building and/or service		109
Annex F (informative) Alphabetic index of terms		116
Annex G (informative) Electrical grid related indicators		117
Annex H (informative) Proposal of indicators for the assessment of nearly Zero-Energy Buildings (NZEB)		118
Annex I (informative) Lighting systems		121
Annex J (informative) Calculation examples		123
Annex K (informative) Flow diagram		170
Annex L (informative) List of technologies		174
Bibliography		178