



CONCERTED ACTION  
ENERGY PERFORMANCE OF BUILDINGS

# EPBD Key Implementation Decisions in Finland

Status in December 2016

## AUTHORS

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## NATIONAL WEBSITES

[www.ymparisto.fi](http://www.ymparisto.fi), [www.energiatodistusrekisteri.fi](http://www.energiatodistusrekisteri.fi), [www.motiva.fi/energiatodistus](http://www.motiva.fi/energiatodistus)

## 1. Key Implementation Decisions, KIDs

no	Key Implementation Decisions - General Background	Description / value / response	Comments	Description
1.1	Definition of public buildings (according to article 9 b)	No definition.	In relation to article 9, public buildings do not differ from other buildings. All requirements set for new buildings apply.	
1.2	Definition of public buildings used by the public (according to article 13)	A public building, in relation to article 13, is a building where an authority provides public services in premises frequently visited by the public.	The definition of an authority; a legal organ with task and powers based on legal norms. These consist of both state and municipal authorities, state and municipal institutions as well as the Evangelical Lutheran Church and the Orthodox Church. Legislated state enterprises as well as municipal enterprises are considered public institutions.	
1.3	Number of residential buildings	1,283,291	Statistical Yearbook of Finland, 2016, Statistics Finland.	
1.4	Number of non-residential buildings	221,847	Statistical Yearbook of Finland, 2016, Statistics Finland.	
1.5	If possible, share of public buildings included in the number given in 1.4	31,842	Statistical Yearbook of Finland, 2016, Statistics Finland, includes only public service buildings (institutional buildings, buildings for assembly and educational buildings)	
1.6	If possible, share of commercial buildings included in the number given in 1.4	127,839	Statistical Yearbook of Finland, 2016, Statistics Finland, includes shop buildings, office buildings, industrial buildings and warehouses.	
1.7	Number of buildings constructed per year (estimate)	29,623	Statistical Yearbook of Finland, 2016, Statistics Finland, completed buildings and dwellings. Yearly average based on 2013-2015 (residential buildings are calculated by number of dwellings/apartments).	

1.8	If possible share of residential buildings constructed per year (estimate, included in the number given in 1.7)	98 % or 29,176	Statistical Yearbook of Finland, 2016, Statistics Finland, completed buildings and dwellings. Yearly average based on 2013-2015 (residential buildings are calculated by number of dwellings/apartments).	
1.9	If possible share of non-residential buildings constructed per year (estimate, included in the number given in 1.7)	2 % or 447	Statistical Yearbook of Finland, 2016, Statistics Finland, completed buildings and dwellings. Yearly average based on 2013-2015	
1.10	Useful floor area of buildings constructed per year in million square meters (estimate)	Not available. Only building volume (m <sup>3</sup> ) is recorded. Yearly average building volume of all completed buildings (residential and non-residential) is 32 Million m <sup>3</sup> .	Statistical Yearbook of Finland, 2016, Statistics Finland, completed buildings. Yearly average based on 2013-2015.	

## 2. KIDs for New Buildings

no	Key Implementation Decision - New Buildings	Description / value / response	Comments	Description																																																					
2.1	Requirements for energy performance of residential buildings in current building code	<p>Requirements are given as a fixed value (kWhE/m<sup>2</sup> - primary energy).</p> <p>The National Building Code of 2017 sets maximum values for overall energy consumption (E-values) calculated using the weighting factors (see CR, table 3).</p> <p>The maximum values depend on the building type and, for single-family houses, also on the area of the building.</p> <p>Calculations include also thermal comfort requirements, indoor-air quality requirements and infiltration, thermal bridges and shading devices.</p>	<p>Please note that these requirements will be given in June 2017 and as such act as NZEB requirements.</p> <p>See CR Table 3.</p> <table border="1"> <thead> <tr> <th rowspan="2">Type of building</th> <th colspan="3">Maximum value for energy consumption per year, primary energy (calculated with weight factors of energy source)</th> </tr> <tr> <th>Heated net area, A<sub>net</sub> m<sup>2</sup></th> <th>E-value kWhE/m<sup>2</sup> per year</th> <th>Massive wood construction maximum values</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Single-family houses</td> <td>A<sub>net</sub> &lt; 150 m<sup>2</sup></td> <td>200 - 0.6 A<sub>net</sub></td> <td>(200 - 0.6 A<sub>net</sub>) x 1.15</td> </tr> <tr> <td>150 m<sup>2</sup> ≤ A<sub>net</sub> ≤ 600 m<sup>2</sup></td> <td>116 - 0.04 A<sub>net</sub></td> <td>(116 - 0.04 A<sub>net</sub>) x 1.15</td> </tr> <tr> <td>A<sub>net</sub> &gt; 600 m<sup>2</sup></td> <td>92</td> <td>92 x 1.15</td> </tr> <tr> <td>Row houses</td> <td></td> <td>105 kWh<sub>e</sub>/m<sup>2</sup> per year</td> <td>105 x 1.10</td> </tr> <tr> <td>Apartment buildings</td> <td></td> <td>90 kWh<sub>e</sub>/m<sup>2</sup> per year</td> <td>90 x 1.10</td> </tr> <tr> <td>Offices</td> <td></td> <td>100 kWh<sub>e</sub>/m<sup>2</sup> per year</td> <td>100 x 1.10</td> </tr> <tr> <td>Shops etc.</td> <td></td> <td>135 kWh<sub>e</sub>/m<sup>2</sup> per year</td> <td>135 x 1.10</td> </tr> <tr> <td>Hotels, motels etc.</td> <td></td> <td>160 kWh<sub>e</sub>/m<sup>2</sup> per year</td> <td>160 x 1.10</td> </tr> <tr> <td>Schools and day care centres</td> <td></td> <td>100 kWh<sub>e</sub>/m<sup>2</sup> per year</td> <td>100 x 1.10</td> </tr> <tr> <td>Sports halls</td> <td></td> <td>100 kWh<sub>e</sub>/m<sup>2</sup> per year</td> <td>100 x 1.10</td> </tr> <tr> <td>Hospitals</td> <td></td> <td>320 kWh<sub>e</sub>/m<sup>2</sup> per year</td> <td>320 x 1.10</td> </tr> <tr> <td>Other buildings</td> <td colspan="3">Energy consumption has to be calculated but no limit values</td> </tr> </tbody> </table>	Type of building	Maximum value for energy consumption per year, primary energy (calculated with weight factors of energy source)			Heated net area, A <sub>net</sub> m <sup>2</sup>	E-value kWhE/m <sup>2</sup> per year	Massive wood construction maximum values	Single-family houses	A <sub>net</sub> < 150 m <sup>2</sup>	200 - 0.6 A <sub>net</sub>	(200 - 0.6 A <sub>net</sub> ) x 1.15	150 m <sup>2</sup> ≤ A <sub>net</sub> ≤ 600 m <sup>2</sup>	116 - 0.04 A <sub>net</sub>	(116 - 0.04 A <sub>net</sub> ) x 1.15	A <sub>net</sub> > 600 m <sup>2</sup>	92	92 x 1.15	Row houses		105 kWh <sub>e</sub> /m <sup>2</sup> per year	105 x 1.10	Apartment buildings		90 kWh <sub>e</sub> /m <sup>2</sup> per year	90 x 1.10	Offices		100 kWh <sub>e</sub> /m <sup>2</sup> per year	100 x 1.10	Shops etc.		135 kWh <sub>e</sub> /m <sup>2</sup> per year	135 x 1.10	Hotels, motels etc.		160 kWh <sub>e</sub> /m <sup>2</sup> per year	160 x 1.10	Schools and day care centres		100 kWh <sub>e</sub> /m <sup>2</sup> per year	100 x 1.10	Sports halls		100 kWh <sub>e</sub> /m <sup>2</sup> per year	100 x 1.10	Hospitals		320 kWh <sub>e</sub> /m <sup>2</sup> per year	320 x 1.10	Other buildings	Energy consumption has to be calculated but no limit values			
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2.2	Requirements for energy performance of non-residential buildings in current building code	Yes. Look 2.1																																																							
2.3	Is the performance level of nearby zero energy (NZEB) for new buildings set in national legislation?	Yes.	Ministry of the Environment Decree on the energy efficiency of new buildings 2017.																																																						
2.4	Nearly zero energy (NZEB) level for residential buildings (if set)	Yes. Look 2.1.																																																							
2.5	Nearly zero energy (NZEB) level for non-residential buildings (if set)	Yes. Look 2.1																																																							
2.6	Are nearly zero energy buildings (NZEB) defined using a carbon or environment indicator	No.																																																							

2.7	Year for nearly zero energy (NZEB) to be implemented for residential buildings	1.1.2018		
2.8	Year for nearly zero energy (NZEB) to be implemented for non-residential buildings	1.1.2018		
2.9	Is renewable energy a part of the overall or an additional requirement	Partly as part of the overall requirement.	The Building Code encourages the use of renewable energy sources and district heating, which have better weighting factors than other energy sources. Other renewables (e.g., solar heat and power) are taken into account when calculating a building's primary energy needs. (Weighting factors, see CR table 1)	
2.10	Specific comfort criteria for new buildings, provide specific parameters for instance for airtightness, minimum ventilation rates	Yes. See CR Table 2.	For new buildings, the minimum requirements for the outdoor air flows are given in the Ministry of the Environment Decree on the indoor climate and ventilation of new buildings 2017.  Requirements are also given for room temperature planning values and air leakage values.	

### 3. KIDs for Existing Buildings

no	Key Implementation Decision - Existing Buildings	Description / value / response	Comments	Description
3.1	Is the level of nearly zero energy (NZEB) for existing buildings set in national legislation?	No.		
3.2	Is the level of nearly zero energy (NZEB) for existing buildings similar to the levels for new buildings?	No.		
3.3	Definition of nearly zero energy (NZEB) for existing residential buildings (if different from new buildings)	No definition.		
3.4	Definition of nearly zero energy (NZEB) for existing non-residential buildings (if different from new buildings)	No definition.		
3.5	Overall minimum requirements in case of major-renovation	<p>The formulae to be applied for calculating the building's specific total energy consumption requirement (E-value, kWh/m<sup>2</sup>), when the design and execution of the improvements in the building's energy efficiency is based on reducing energy consumption in the building's standard use (alternative 3).</p> <p>1) Low rise, row and chain houses: E-required <math>\leq 0.8 \times E</math>-calculated</p> <p>2) Residential building block: E-required <math>\leq 0.85 \times E</math>-calculated</p> <p>3) Office: E-required <math>\leq 0.7 \times E</math>-calculated</p> <p>4) Education Building: E-required <math>\leq 0.8 \times E</math>-calculated</p> <p>5) Day care center: E-required <math>\leq 0.8 \times E</math>-calculated</p>	<p>The feasibility of measures to improve the energy efficiency of an existing building are assessed based on technical, operational and financial considerations.</p> <p>Energy efficiency improvements can be done using three alternative ways (see CR Figure 2).:</p> <p>1) Energy efficiency requirements for each building element (see values in 3.6);</p> <p>2) Energy consumption requirements for a building by building type;</p> <p>1) Low rise, row and chain houses: Energy consumption: <math>\leq 180 \text{ kWh/m}^2</math></p> <p>2) Residential building block: Energy consumption: <math>\leq 130 \text{ kWh/m}^2</math></p> <p>3) Office: Energy consumption: <math>\leq 145 \text{ kWh/m}^2</math></p>	

		<p>6) Commercial building: E-required <math>\leq 0.7 \times</math> E-calculated</p> <p>7) Commercial accommodation building: E-required <math>\leq 0.7 \times</math> E-calculated</p> <p>8) Sports hall, does not apply to indoor ice rinks and swimming pools: E-required <math>\leq 0.8 \times</math> E-calculated</p> <p>9) Hospital: E-required <math>\leq 0.8 \times</math> E-calculated</p> <p>10) Other buildings: sections 4 and 7 to be applied</p>	<p>4) Education Building: Energy consumption: <math>\leq 150 \text{ kWh/m}^2</math></p> <p>5) Day care center: Energy consumption: <math>\leq 150 \text{ kWh/m}^2</math></p> <p>6) Commercial building: Energy consumption: <math>\leq 180 \text{ kWh/m}^2</math></p> <p>7) Commercial accommodation building: Energy consumption: <math>\leq 180 \text{ kWh/m}^2</math></p> <p>8) Sports hall, does not apply to indoor ice rinks and swimming pools: Energy consumption: <math>\leq 170 \text{ kWh/m}^2</math></p> <p>9) Hospital: Energy consumption: <math>\leq 370 \text{ kWh/m}^2</math></p> <p>10) Other buildings: sections 4 and 7 to be applied</p> <p>or</p> <p>3) E-value requirements of a building by building type.</p> <p>The repairs are considered extensive, if the total costs based on the reconstruction costs related to repairs to the building envelope or the technical systems of the building are over 25% of the value of the building, excl. the value of the building land.</p>	
3.6	Minimum requirements for individual building parts in case of renovation	<p>Energy efficiency requirements for each building element, see values in table 5 in CR.</p> <p>The following requirements for the technical systems of a building:</p> <p>1) The amount of heat recovered from the exhaust air of building ventilation shall correspond to at least 45% of the amount of heat required for ventilation heating,</p>	<p>The Finnish National Building Code states that, when the technical systems of any type of existing buildings are renovated, modernised or replaced, these requirements must be met.</p> <p>Energy efficiency improvements to a building can be done using three alternative ways. The minimum energy requirements for each building element, see table 5 in CR.</p>	

		<p>2) The specific electric power of a mechanical supply and exhaust air system shall not exceed 2.0 kW/(m<sup>3</sup>/s).</p> <p>3) The specific electric power of a mechanical exhaust air system shall not exceed 1.0 kW/(m<sup>3</sup>/s).</p> <p>4) The specific electric power of a ventilation system shall not exceed 2.5 kW/(m<sup>3</sup>/s).</p> <p>5) When replacing equipment and systems, the efficiency of heating systems must be improved regarding the parts being replaced. After the replacement, the ratio between the efficiencies of the main heat production system of the building and the main heat distribution system of the premises shall be at least 0.8. The annual efficiency of the heat production system or the heat distribution system shall be at least 0.73. When the main replaced heating system of a building is a heat pump, the ratio of the SPF of the heat pump and the efficiency of the heat distribution system in the premises shall be at least 2.4. The specific electrical energy consumption of the accessories of a replaced heat distribution system shall be no more than 2.5 kWh/net m<sup>2</sup> (per heated net surface area).</p> <p>6) When replacing water and/or sewage systems, the regulations on new construction shall apply.</p>		
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## 4. KIDs for Energy Performance Certificates, EPCs

no	Key Implementation Decision - Energy Performance Certificates	Description / value / response	Comments	Description
4.1	National database for EPCs	Yes	Database established 1.5.2015.	
4.2	Number of energy performance certificates per year (for instance average of 3 years)	22,690	Number of EPCs in 2016	
4.3	Number of EPCs since start of scheme	46,000	Number of EPCs since 1.5.2015 (When the national database was established)	
4.4	Number of assessors	1002 qualified experts, of which 735 with base level qualifications and 267 with higher level qualifications	Registration is mandatory.	
4.5	Basic education requirements for assessors	<p>The expert must have suitable training and education background (e.g., a degree in building technology or architecture or, for the higher level, a master's degree in building technology or related field).</p> <p>The education background can be compensated with work experience.</p> <p>The qualification has to be approved by a test administered by the accreditation bodies. Qualification and accreditation for qualified experts is the same for all building types, public and private.</p>		
4.5	Additional training demands for assessors	No.		
4.6	Quality assurance system	The Housing Finance and Development Centre of Finland (ARA) is the administrative authority ensuring the quality of certificates and qualified experts and the appropriate preparation and use of the certificates. As the responsible authority, it can also make compliance checks of issued certificates.		

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		<p>ARA partly checks the data input of building information, the accuracy of the presented calculations, and the appropriateness of suggestions given for improving energy efficiency.</p> <p>Additionally, the ARA can initiate enforcement measures in case of negligence on the part of the building owner or the qualified expert. Measures are administrative, not penal, and include requests, warnings, orders, conditional fines, and suspension of the qualified expert.</p> <p>The display regulation is also controlled by the ARA.</p>		
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## 5. KIDs for Inspection Systems

no	Key Implementation Decision - Inspection Systems	Description / value / response	Comments (replace text)	Description
5.1	Is there a national database for heating inspections	No		
5.2	Is there a national database for cooling inspections / AC	No		
5.3	Are inspection databases combined with EPC database for registration of EPCs and inspection reports	No		
5.4	Chosen option A or B for heating systems (inspection or other measures)	Model B, alternative measures		
5.5	Number of heating inspections; reports per year (if option A)	-		
5.5	Chosen option A or B for heating systems (inspection or other measures)	Model B, alternative measures		
5.6	Number of air-condition / cooling system inspections; reports per year (if option A)	-		



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 692447.

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