Full text

Executive Order amending the Executive Order on the Publication of the Danish Building Regulations 2010 (BR10)[1)]

1.

The following amendments shall be made to Executive Order no. 810 of 28 June 2010 on Publication of the Danish Building Regulations 2010 (BR10) as amended by Executive Order no. 1309 of 29 November 2010 and Executive Order no. 792 of 29 June 2011:

(1) The following *footnote* to the title of this Executive Order shall be inserted:
»1) The Executive Order comprises provisions to implement parts of Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings (buildings directive), Official Journal of the European Union 2003 no. L 1, p. 65, as most recently amended by Directive 2010/31/EU of the European Parliament and of the Council of 19 may 2010, Official Journal of the European Union 2010 no. L 153, p. 13, and parts of Directive 2005/36/EC of the European Parliament and of the Council of 7 September 2005 on the recognition of professional qualifications in the EU, Official Journal of the European Union 2005 no. L 255, p. 22, as most recently amended by Commission Regulation (EU) no. 213/2011 of 3 March 2011, Official Journal of the European Union 2011 no. L 59, p. 4.«

(2) *The explanatory comments* to *Appendix I, 1.3.1(4),* shall have the following wording:
»(1.3.1(4)) On 1 October 2010, the Danish National Survey and Cadastre became the competent land registration authority for the City of Copenhagen and Frederiksberg Municipality; see Act no. 12 of 11 January 2010 amending the legislation on parcelling out and other registration in the Land Register.«

(3) *The explanatory comments* to *Appendix I, 1.3.2(4) para 4,* shall have the following wording:
»(1.3.2(4) para 4) On 1 October 2010, the Danish National Survey and Cadastre became the competent land registration authority for the City of Copenhagen and Frederiksberg local authority; see Act no. 12 of 11 January 2010 amending the legislation on parcelling out and other registration in the Land Register.«

(4) *The explanatory comments* to *Appendix I, 1.3.3(3) para 5,* shall have the following wording:
»(1.3.3(3) para 5) On 1 October 2010, the Danish National Survey and Cadastre became the competent land registration authority for the City of Copenhagen and Frederiksberg local authority; see Act no. 12 of 11 January 2010 amending the legislation on parcelling out and other registration in the Land Register.«

(5) In *Appendix I, 1.4(2) para 2*, the following shall be inserted as *third sentence*:
»For all buildings established as low-energy buildings 2015 or under building class 2020, documentation of the airtightness of the building envelope by testing is required.«

(6) In *Appendix I, 1.4(2) para 2*, the following shall be inserted after the last sentence::
»In respect of building class 2020, the municipality must, regardless of the provisions of 1.3.1 and 1.3.2, require documentation for properly calculated verification of the observance of the energy performance framework in at least 10% of the construction projects. Documentation must be carried out by an independent energy consultant. Documentation must be submitted before a building permit is granted.«

(7) In *the explanatory comments* to *Appendix I, 1.4(2) para 2*, the following shall be inserted after the last sentence:
»An independent energy consultant means a consultant working for a company certified as an energy consultant business. The energy consultant must not be involved in the construction process. The energy consultant can be appointed by the building owner.«

(8) In *Appendix I, 1.5(1) para 1*, the following shall be inserted after »services«: »established in connection with buildings comprised by 1.3.1(1) paras 3-5«.

(9) In *the explanatory comments* to *Appendix I, 1.5(1) para 1,* »(1.5(1) paras 1-3)« shall be amended to: »(1.5(1) paras 1-5)«.

(10) In *the explanatory comments* to *Appendix I, 1.5(1) para 5,* »(1.5(1) para 3)« shall be amended to: »(1.5(1) para 5)«.

(11) In *the explanatory comments* to *Appendix I, 1.5(1) para 8,* »(1.5(1) para 6)« shall be amended to: »(1.5(1) para 8)«.

(12) *The explanatory comments* to *Appendix I, 1.6(1),* shall have the following wording:
»C (1.6(1)) Building works covered by 1.6(1) paras 2 and 3 must observe the building right stipulated in 2.7. If this is not possible, an application must be made for permission following the municipality's general assessment, and the building work must not be commenced until permission has been given.

If the building work cannot observe the relevant provisions of Parts 3-8, an application must be made to the municipal council for exemption, and the building work must not be commenced until such exemption has been granted.«

(13) In *the explanatory comments* to *Appendix I, 1.6(1) paras 2 and 3,* the *second sentence* shall have the following wording:
»The provision applies to the total area of such buildings, including existing buildings on the plot not exceeding 35 m2 or 20 m2.«

(14) In *Appendix I, 1.6(1) para 2,* »but see para 3« shall be amended to: »established in connection with buildings comprised by 1.3.1(1) paras 3-5«.

(15) In *the explanatory comments* to *Appendix I, 1.6(1) para 4,* »(1.6(1) para 2 and paras 4-5)« shall be amended to: »(1.6(1) para 4 and paras 6-7)«.

(16) In *the explanatory comments* to *Appendix I, 1.6(1) para 8,* »(1.6(1) para 6)« shall be amended to: »(1.6(1) para 8)«.

(17) In *the explanatory comments* to *Appendix I, 1.6(1) para 9,* »(1.6(1) para 7)« shall be amended to: »(1.6(1) para 9)«.

(18) In *the explanatory comments* to *Appendix I, 1.6(1) para 10,* »(1.6(1) para 8)« shall be amended to: »(1.6(1) para 10)«.

(19) In *the explanatory comments* to *Appendix I, 1.6(1) para 11,* »(1.6(1) para 9)« shall be amended to: »(1.6(1) para 11)«.

(20) In *the explanatory comments* to *Appendix I, 2.7.7(1),* »In accordance with 1.5, notice must be given in the case of erection of more than two buildings« shall be amended to: »In accordance with 1.6(1) paras 2 and 3, notice must be given in the case of erection of more than two small buildings«.

(21) In *the explanatory comments* to *Appendix I, 4.5(1)*, the second sentence shall be repealed.

(22) In *the explanatory comments* to *Appendix I, 4.6(1)*, the following shall be inserted after the last sentence:
»See the Danish Enterprise and Construction Authority's guide to handling moisture in construction.«

(23) In *the explanatory comments* to *Appendix I, part 6.2(1)*, the following shall be inserted as the *third paragraph*:
»Requirements for thermal indoor climate based on DS 474, Code for indoor thermal climate, apply to optional low-energy class 2015 and optional building class 2020. See 7.2.1(13).«

(24) The following *explanatory comments* to the heading in *Appendix I, 6.3.1.3,* shall be inserted:
»(6.3.1.3(1)-(3)) 7.2.5.1(11) on requirements for the CO2-content of air applies in respect of optional building class 2020.«

(25) In *Appendix I, 7.2.1(11),* »low energy performance framework« shall be amended to: »the energy performance framework for class 2015 low energy buildings.«

(26) In *Appendix I, 7.2.1*, the following shall be inserted as *7.2.1(12)* and *7.2.1(13):*
»7.2.1(12) For buildings supplied with district heating, an energy factor of 0.6 applies to verification that the energy performance framework observes building class 2020. Regardless of supply type, an energy factor for electricity of 1.8 applies to verification that the energy performance framework observes building class 2020.
7.2.1(13) The thermal indoor climate on sunny days must be documented through calculation for dwellings, institutions, offices, etc. in low-energy class 2015 and building class 2020. The thermal indoor climate must only exceed 26°C for a few hours compared to the reference year. For buildings other than dwellings, the client determines the number of hours per year during which the indoor temperature of 26°C must not be exceeded. For dwellings, a temperature of 26°C must not be exceeded for more than 100 hours per year, and a temperature of 27°C must not be exceeded for more than 25 hours per year.«

(27) In *the explanatory comments* to *Appendix I, 7.2.1(12)* and *(13)*, the following shall be inserted:
»(7.2.1(12)) No factor has been established for district cooling, but district cooling may be factored in similar to other principles for cooling; see Appendix 6.
(7.2.1(13)) The thermal indoor climate is specified on the basis of DS 474, Code for indoor thermal climate. Documentation of the thermal indoor climate must be based on a simulation of conditions in the critical room based on Design Reference Year, DRY. For dwellings, documentation may be made based on simplified calculations. For buildings other than dwellings, the number of hours with temperatures exceeding 26°C must be determined by the client in relation to DRY.«

(28) In *Appendix I,* the *headline* of *7.2.4* shall have the following wording:
»7.2 4 Low energy buildings 2015«

(29) In *Appendix I,* the following new *sub-part* shall be inserted after 7.2.4.2:

»7.2.5 Building class 2020

7.2.5.1 Common provisions for buildings covered by building class 2020

7.2.5.1(1) Buildings covered by the provisions of 7.2.5.2 or 7.2.5.3 must be built such that the design transmission loss does not exceed 3.7 W per m² of the building envelope in the case of single-storey buildings, 4.7 W for two-storey buildings and 5.7 W for buildings with three storeys or more. The calculation does not factor in the area of windows and doors nor transmission loss through them. For buildings with high ceilings and which are comparable with two-storey buildings or buildings with three storeys or more, the corresponding transmission loss must be, respectively, 4.7 and 5.7 W/m² of the building envelope.
7.2.5.1(2) The energy gain through windows must not be less than 0 kWh/m²/year during the heating season. The energy gain through rooflights must not be less than 10 kWh/m²/year. For skylight domes, the U value must not exceed 1.20 W/m²K.
7.2.5.1(3) External doors and hatches must not have a U value exceeding 0.80 W/m²K. External doors with glazing must not have a U value exceeding 1.00 W/m²K or an energy gain through the door during the heating season of less than 0 kWh/m² per year. The provisions in 7.6 apply to fire doors.
7.2.5.1(4) Gates must have a maximum U value of 1.40 W/m²K.
7.2.5.1(5) Air changes through leakage in the building envelope must not exceed 0.5 l/s/m² of the heated floor area when tested at a pressure of 50 Pa. The result of the pressure test must be expressed as the average of measurements using overpressure and underpressure. For buildings with high ceilings, in which the surface area of the building envelope divided by the floor area is greater than 3, air change may not exceed 0.15 l/s per m² of the building envelope when tested at a pressure of 50 Pa.
7.2.5.1(6) Dwellings, student accommodations, hotels, etc. in building class 2020 must have a glazed area of at least 15% of the floor area in habitable rooms and kitchen/family rooms if the light transmittance of the glazing is higher than 0.75. If the light transmittance is lower, the glazed area must be increased correspondingly. Skylight areas are factored in by a factor of 1.4.
7.2.5.1(7) In offices, schools and institutions, etc. not covered by 7.2.5.1(6) but established as building class 2020, the glazed area in teaching rooms and occupiable rooms must be at least 15% of the floor area if the the light transmittance of the glazed area is greater than 0.75. If the light transmittance is lower, the glazed area must be increased correspondingly. Skylight areas are factored in by a factor of 1.4.
7.2.5.1(8) Ventilation installations must incorporate heat recovery with a dry temperature efficiency of no less than 75%. Ventilation installations for one dwelling must incorporate heat recover with a dry temperature efficiency of no less than 85%.
7.2.5.1(9) The specific power consumption for ventilation must not exceed 1,500 J/m³. However, for installations providing power for one dwelling, the limit is 800 J/m³.
7.2.5.1(10) Shared RE units established in connection with new buildings and where the client for the new building contributes financially to the establishment of the RE units may be included in the energy performance framework of the new buildings. The RE unit must be established in the building or in the vicinity.
7.2.5.1(11) It must be ensured that the CO2 content of the indoor air does not exceed 900 ppm for extended periods of time.
7.2.5.1(12) Under building class 2020, warm air heating must not be the sole source of heating of the building. This provision does not apply to production halls, etc.

7.2.5.2. Energy performance framework for dwellings, student accommodation, hotels, etc.

A building may be classified as a building class 2020 when the total demand for energy supply for heating, ventilation, cooling and domestic hot water per m² of heated floor area does not exceed 20 kWh/m²/year.

7.2.5.3 Energy performance framework for schools, institutions, etc. not covered by 7.2.5.2

Offices, schools, institutions and other buildings not covered by 7.2.5.2 may be classified as building class 2020 when the total demand for energy supply for heating, ventilation, cooling, domestic hot water and lighting per m² heated floor area does not exceed 25 kWh/m²/year.

7.2.5.3(2) For buildings or building sections in building class 2020 whose requirements include, for example, a high level of lighting, extra ventilation and high consumption of domestic hot water, or which are used for extended periods, or buildings with high ceilings, the energy performance framework must be augmented in proportion to the calculated increase in energy consumption. Process energy such as ventilation of fume cabinets is not included in the energy performance framework.«

(30) In *the explanatory comments* to *Appendix I, 7.2.5*, the following shall be inserted:

»(7.2.5.1(1)) The design transmission loss must be determined as specified in DS 418, Calculation of heat loss from buildings. "Windows" includes rooflights and skylight domes.
(7.2.5.1(2)) The energy gain is calculated as specified in Appendix 6 and is based on a weighted average. However, verification of the energy performance framework includes windows with the actual information about solar heat transmittance and U value for each window.
(7.2.5.1(3)) The requirement for external doors apply to a standard size of 1.23 x 2.18 m. External doors with glazing also include sliding doors. In place of external doors with glazing, a choice may be made between using doors observing the U value requirement or doors observing the energy gain requirement of no less than 0 kWh/m² per year.
(7.2.5.1(5)) Documentation of air changes must be made on the basis of testing according to DS/EN 13829, Thermal performance of buildings – Determination of air permeability of buildings – Fan pressurisation method. The municipal council requires documentation of air change for all buildings established as building class 2020; see 1.4(2) para 2.

(7.2.5.1(6)) Daylight is paramount to health and wellbeing. The size and placing of windows greatly affects the view. Large window areas without effective solar screening may cause overheating and glare problems. A more even distribution of windows and possibly larger north-facing windows may reduce the need for electric lighting.
(7.2.5.1(7)) Light transmittance applies to the glazing used. Compensation for glazing with less light transmittance is achieved by increasing the area proportionately. Glazed areas smaller than the building height does not contribute significantly to the daylight level. As an alternative to calculating glazing area, daylight levels may be considered satisfactory if the daylight factors for the rooms/spaces are higher than three as documented by calculation. The daylight provisions may imply that solar control glazing cannot be used in some buildings.
(7.2.5.1(9)) Power consumption for air movement is calculated as specified in DS 447, Code of practice for mechanical ventilation installations.
(7.2.5.1(10)) This provision allows inclusion of shared RE units such as wind turbines, shared solar heating systems, solar photovoltaic arrays or geothermal systems if the RE units is established in connection with the new building. The client for the new building must contribute financially to the establishment of the RE units.
(7.2.5.1(11)) The requirements for the ventilation rate in offices, schools and institutions, see 6.3.1.3, are not in itself sufficient under all conditions to ensure that the CO2 content of the indoor air does not exceed 900 ppm for extended periods of time. The ventilation system should therefore be fitted with variable output depending on the load, so that the air change rates are higher in the rooms that are most heavily loaded and less in the rooms where the demand is less.
(7.2.5.1(12)) Solutions involving warm air heating where all the rooms/spaces of the dwelling or building constitute one shared temperature zone will cause comfort problems and will not observe the provision.
(7.2.5.3) Building class 2020 is expected to become mandatory for public new builds by the end of 2018 and for other new builds by the end of 2020.
(7.2.5.3(1)) The low energy performance framework only applies to buildings heated above 15°C.
(7.2.5.3(2)) For limits on high levels of lighting, extra ventilation, high consumption of domestic hot water or use for extended periods, see SBi Guidelines 213, Bygningers energibehov [Energy demands of buildings]. Appendix 6 contains assumptions for calculating increments for buildings with high ceilings. Increments following consumption in services comprised by energy requirements should be expected to be reduced as the requirements are tightened.«

(31) In *Appendix I, 7.4.1(1),* », 7.4.3« shall be deleted:

(32) In *the explanatory comments* to *7.4.1(1),* »and 7.4.3« shall be deleted:

(33) In *the explanatory comments* to *Appendix I, 8.3(6)-(10)*, the following new paragraph shall be inserted before »(8.3(6))«:
»(8.3(6)-(10)) More stringent requirements are imposed in respect of ventilation systems related to building class 2020; see 7.2.5.1(8)-(9).«

(34) In *Appendix 6,* the *fourth paragraph* and the related *headline* under the headline »2. Calculation of energy demands of buildings« shall be repealed and the following be inserted instead:

»District cooling

District cooling is often comprised by various cooling processes. This may be cooling by seawater or groundwater cooling supplemented by a conventional cooling system to cover the cooling needs during periods when the temperature level in seawater is too high. Cooling by seawater or groundwater cooling may be replaced or supplemented by cooling from a district heating system where surplus heat from waste incineration or industry is used to produce cooling water via an absorption cooling system. This cooling process is not particularly energy efficient, but makes sense during periods when the alternative is to reduce surplus heat by cooling.
To verify observance of the energy performance framework, cooling efficiency is calculated as a weighted average of the different cooling processes during the various operating periods. For free cooling using seawater and groundwater cooling, electricity consumption for pumps and auxiliary equipment is included in the calculation. For absorption cooling systems based on surplus heat, the system's energy efficiency can be replaced by the cooling efficiency COP of 4.0 for a good, conventional cooling system. This provides incentives to use cooling based on surplus heat, while also opting for a robust solution that is durable once the possibility of surplus heat production no longer exists.

Shared RE units

Where new builds are established with shared RE units, this must be factored into the energy performance framework provided that the owners of the buildings contribute financially to the establishment. The calculation must take account of all losses. For example, a solar heating system may have heat losses from the accumulator tank, pipe losses up to the individual building, and power consumption for the pumps and automation. In respect of solar heating systems, the possibility of factoring in applies to systems established as part of new builds outside a district heating area. However, this restriction does not apply to e.g. solar cell arrays or wind turbines.«

2.

(1) This Executive Order shall take effect on 24 August 2011.

(2) The Executive Order shall govern applications for building permits or notices submitted after the effective date of the Executive Order. If the building work does not require permission or notice, the Executive Order is mandatory for all building works that are commenced after the Executive Order has come into force.

The Danish Enterprise and Construction Authority, 18 August 2011

Finn Lauritzen

/ Dorte Nøhr Andersen

Official notes

[1)] The Executive Order comprises provisions to implement parts of Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings (buildings directive), Official Journal of the European Union 2003 no. L 1, p. 56, as most recently amended by Directive 2010/31/EU of the European Parliament and of the Council of 19 may 2010, Official Journal of the European Union 2010 no. L 153, p. 13, and parts of Directive 2005/36/EC of the European Parliament and of the Council of 7 September 2005 on the recognition of professional qualifications in the EU, Official Journal of the European Union 2005 no. L 255, p. 22, as most recently amended by Commission Regulation (EU) no. 213/2011 of 3 March 2011, Official Journal of the European Union 2011 no. L 59, p. 4.