2019-11-14

Directorate-General for Energy
European Commission
1049 Bruxelles/Brussel
Belgium

Copy:
Boverket, Box 534, 371 23 Karlskrona
Per Bolund, bostadsminister, Finansdepartementet
Hans Dahlgren, EU minister

Complaint regarding the Swedish building regulations:

Regulations do not comply with EU-directive 2010/31/EU and its guidance documents
In the Swedish building regulations BFS 2017:5, BBR25, a new calculation method was introduced, with a geographical (climate zone) adjustment factor F_{geo}. This factor F_{geo}, adjusts the calculated energy demand ($E_{uppv.}$) with the stated objective of compensating for the colder climate the further north in Sweden the building will be built.

$$EP_{\text{pet}} = \frac{\sum_{i=1}^{6}\left(\frac{E_{\text{uppv,i}}}{F_{\text{geo}}} + E_{\text{kyl,i}} + E_{\text{tvv,i}} + E_{\text{f,i}}\right) \times VF_i}{A_{\text{temp}}}$$

The value for F_{geo} goes from 0,8 in the south part of Sweden stepwise up to 1,9 in the coldest parts in the north of the country. The idea with these adjustments is to support industrialized production of buildings. The adjustments described will make it possible to market an identical building that fulfils the building regulations in one climate zone to all climate zones in the country. F_{geo} factor 1,9 is greater than 0,8 by a factor 2,4. That means a building placed in the city of Kiruna in north of Sweden will require 2,4 times more heating energy than the same building placed in Malmö, according to the calculation method for F_{geo} and its application. The difference in climate is about the same as that between Madrid and Malmö.

This adjustment factor is planned to be used the same way also in the updated regulations for BFS2020:xx, but the latter have not yet been implemented.

Common sense tells us that we should insulate the building better in the harsh northern climate zones. For this purpose the EU-directive and guidance document state that the energy demand of a building has to be set by calculating the cost-optimal values for the parameters for the reference buildings and that the calculated values may not deviate from the cost-optimal values by more than 15% (i.e. 15% lower energy demand than that calculated for the cost-optimal level.

The suggested levels for BFS2020:xx are however the calculated cost-effective levels for buildings placed in climate zones with F_{geo} 1,0. This means that the Swedish building regulations applied on buildings in zones with F_{geo} > 1,15 will note comply with the EU-directive. This includes buildings in about two thirds of the geographical area of Sweden.

Boverket has previously been informed about the issues in this letter in the consultation process, but has thus far failed to correct the methodology.

Consequences
With the suggested maximum primary energy use (PE-us) for a multi-family building in BBR2020, the suggested weighting factors (PE-factor) and typical hot water and appliance level, the accepted heating demand for a district-heated building would be 59 kWh/m2.

	(kWh/m2)	PE-factor	PE-use
Heating	59	0,7	41
Hot water	22,5	0,7	16
Appliances	10	1,8	18
Sum of PE-use			**75**

Table 1. Energy demand for a multi-family building fulfilling the BBR2020 criteria

Forum för Energieffektivt Byggande
FEBY, Blockv.12 B, 19251 Sollentuna, Sweden

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The same building moved to climate zones corresponding to the colder parts of Sweden (higher F_{geo} -factors) means that the possible energy demand for heating will increase as in table 2, column 2 and also the primary energy use if heat demand is not divided with F_{geo} (column 3), but with the definitions for PE-use where heat demand will be divided with F_{geo} , "PE-use" will not reflect the actual increase of energy for heating.

Fgeo zone	Heating (kWh/m2)	PE-use (kWh/m2)	PE-use BBR2020
1	59	75	75
1,2	71	83	75
1,4	83	92	75
1,8	106	108	75

Table 2. Energy demand for heating as a consequence of the F_{geo} factor, and the illusion of constant primary energy use.

The economic consequence's will be much higher costs for heating houses in the northern parts of Sweden, up to 100 %.

How to solve this problem

To comply with the directive the cost-effective reference houses should have been calculated for a climate on the level for F_{geo} > 1,9/1,15 = 1,65, not 1,0. This would comply with the directive as the level stays within the 15% allowable higher energy use deviation of the cost-optimal requirement.

A more realistic and accurate approach would be to have separate minimum criteria for the different climate zones. With an acceptance of + 15/- 20 % from the cost-optimal level only three reference climate zones are needed to calculate appropriate demand levels for; zone 1,0 (0,8 – 1,1), zone 1,4 (1,2 – 1,5) and zone 1,8 (1,6-1,9).

The pedagogic problems with the value of primary energy use differing with the F_{geo} factor is eliminated if the criteria for maximum PE-use differs according to the zones, instead of adjusting the buildings PE-use by the F_{geo} factor.

Stockholm 14 nov 2019

Eje Sandberg
Chairman

Forum för Energieffektivt Byggande (FEBY), www.feby.se.
FEBY is a non-profit organisation with the aim to support property managers with an energy efficient classification and certification system; FEBY Gold, Silver and Bronze, that will secure an energy efficient building regardless if it is connected to district heating or using in house heat pump systems. FEBY classification is mainly based on maximum criteria for the heat loss (transmission, ventilation and envelop air leakage) at the dimensioning outdoor temperature.

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