Does building labeling lead to zero energy buildings

Designer's prespective

Teet Tark

Hevac Ltd, Estonia

Hevac

Towards net zero energy buildings and building labelling

10.30 – 12.00

15.30 – 17.15

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13.30 – 15.30

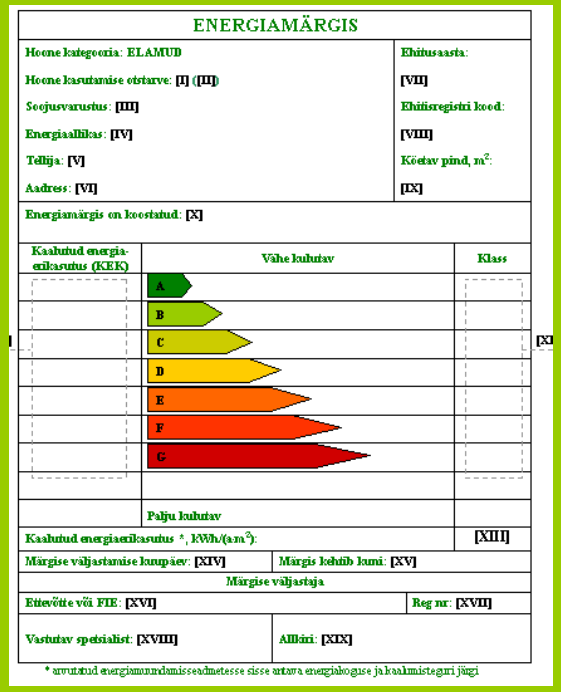
Technical plenary session 7:

Does building labelling lead to zero energy buildings?

Chair: Maija Virta, FINVAC, Finland

- There is some confusion in regards to terms and they would need to be sorted out and coordinated, both on the level of EU as well as the member states.
- If the terms and concepts are not determined then there can be misunderstandings between the Client and designer – the customer is asking for one thing, but the designer understands something entirely different.

Scale of energy certificate



ENERGIAMÄRGIS

Hoone kategooria: ELAMUD	Ehitusaasta: [VII]
Hoone kasutamise otstarve: [I] ([II])	
Soojusvarustus: [III]	Ehitisregistri kood: [VIII]
Energiaallikas: [IV]	
Tellija: [V]	Kõetav pind, m²: [IX]
Aadress: [VI]	

Energiamärgis on koostatud: [X]

Kaalutud energia-erikasutus (KEK)	Vähe kuluta	Klass
	A	
	B	
	C	[XI]
	D	
	E	
	F	
	G	
	Palju kulutav	

Kaalutud energiaerikasutus *, kWh/(a·m²): [XIII]

Märgise väljastamise kuupäev: [XIV]	Märgis kehtib kuni: [XV]

Märgise väljastaja

Ettevõtte või FIE: [XVI]	Reg nr: [XVII]
Vastutav spetsialist: [XVIII]	Allkiri: [XIX]

* arvutatud energiamuundamisseadmetesse sisse antava energiakoguse ja kaalumisteguri järgi

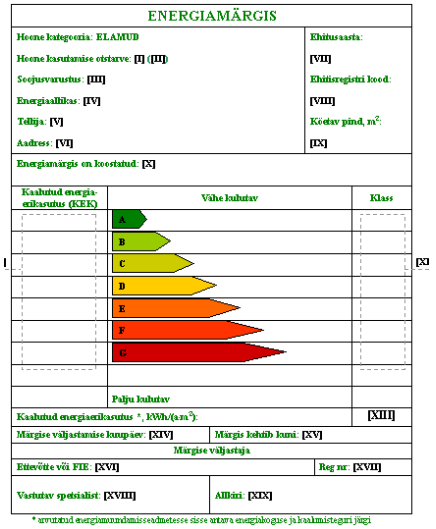
Scale of energy labels

Energy performance value, kWh/(m^{2}·a)

A+++ A+ A B C D E F G

The position on the scale for a :

- low energy building
- passive house
- nearly (net) zero energy building
- (net) zero energy building
- BREEAM
- LEED etc???



Type of building	Energy performance value, kWh/(m^2·a)						
	A	B	C	D	E	F	G
Detached house							
Apartment building							
Office building							
Hotel, canteen, supermarket etc							
Entertainment buildings							
School							
Hospital							
Swimming pool							

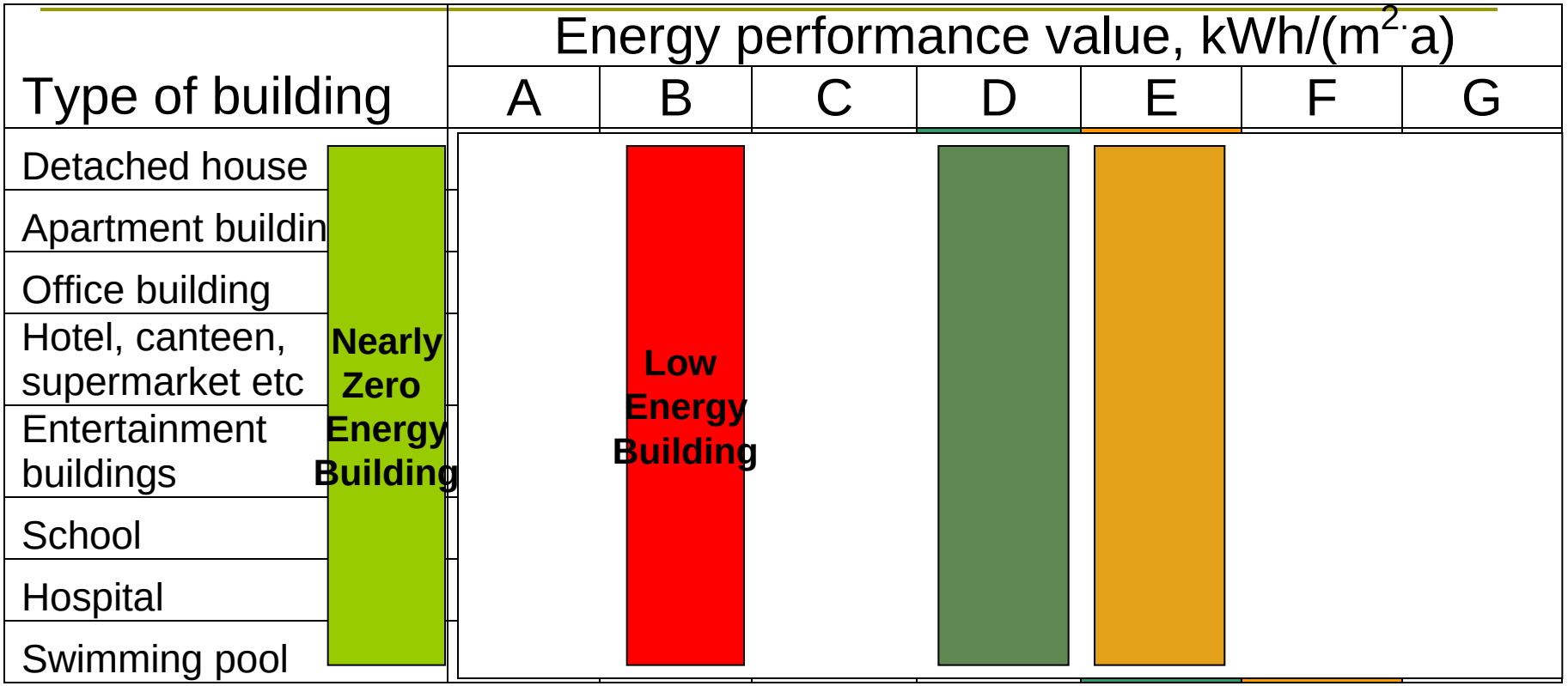
Minimum requirements of EPV for new buildings

Minimum requirements of EPV for reconstruction buildings

Type of building	Energy performance value, kWh/(m^2·a)						
	A	B	C	D	E	F	G
Detached house							
Apartment building							
Office building							
Hotel, canteen, supermarket etc							
Entertainment buildings							
School							
Hospital							
Swimming pool							

Minimum requirements of EPV for new buildings

Minimum requirements of EPV for reconstruction buildings



Minimum requirements of EPV for new buildings

Minimum requirements of EPV for reconstruction buildings

The scale of energy labels should be brought up todate, it should also accommodate :

- net nearly zero energy building
- net zero energy building ???
- net plus energy ???

We need the uniform scale of energy certificate

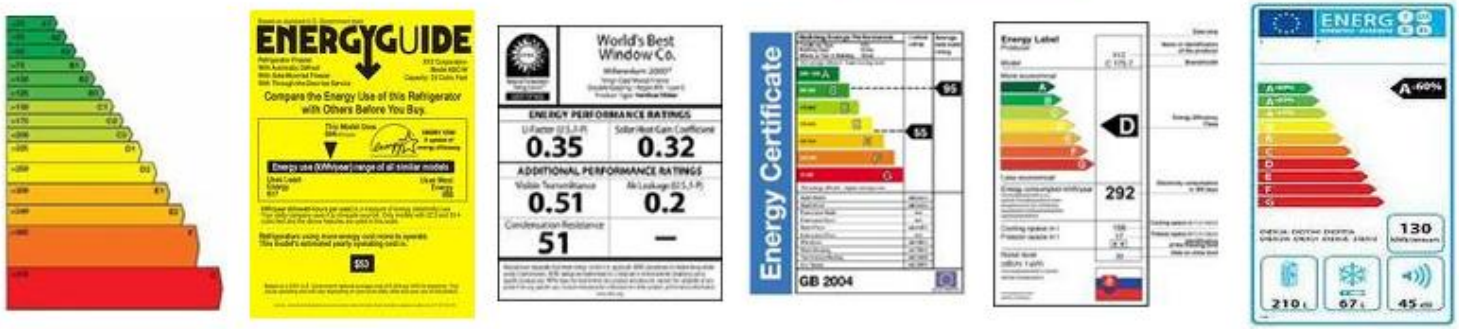
How adequate is the label?

Kaalutud energia-erikasutus (KEK)	Vähe kulutav	Klass:
KEK≤150	A	
151≤KEK≤170	B	
171≤KEK≤200	C	
201≤KEK≤250	D	
251≤KEK≤310	E	
311≤KEK≤390	F	
391≤KEK≤480	G	G
KEK≥481	H	
	Palju kulutav	

LEED Silver

Leadership in Energy & Environmental Design

Acquiring the largest number of labels should not be the aim, as in the more labels the better a building it is



Example: Existing building

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Ehitusaasta: [VII]
Ehitisregistri kood: [VIII]
Köetav pind, m^2: [IX]

Building 1

Energiamärgis on koostatud: [X]

Kaalutud energia-erikasutus (KEK)	Vähe kulutav	Klass
	A	
	B	
	C	[XI]
185	D	D
	E	
	F	
	G	
	Palju kulutav	

Kaalutud energiaerikasutus *, kWh/($a.m^2$): [XIII]

Märgise väljastamise kuupäev: [XIV] Märgis kehtib kuni: [XV]

Märgise väljastaja

Ettevõtte või FIE: [XVI] Reg nr: [XVII]

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* arvutatud energiamuundamisseadmetesse sisse antava energiakoguse ja kaalumisteguri järgi

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Ehitusaasta: [VII]
Ehitisregistri kood: [VIII]
Köetav pind, m^2: [IX]

Building 2

Energiamärgis on koostatud: [X]

Kaalutud energia-erikasutus (KEK)	Vähe kulutav	Klass
	A	
	B	
	C	[XI]
	D	
220	E	E
	F	
	G	
	Palju kulutav	

Kaalutud energiaerikasutus *, kWh/($a.m^2$): [XIII]

Märgise väljastamise kuupäev: [XIV] Märgis kehtib kuni: [XV]

Märgise väljastaja

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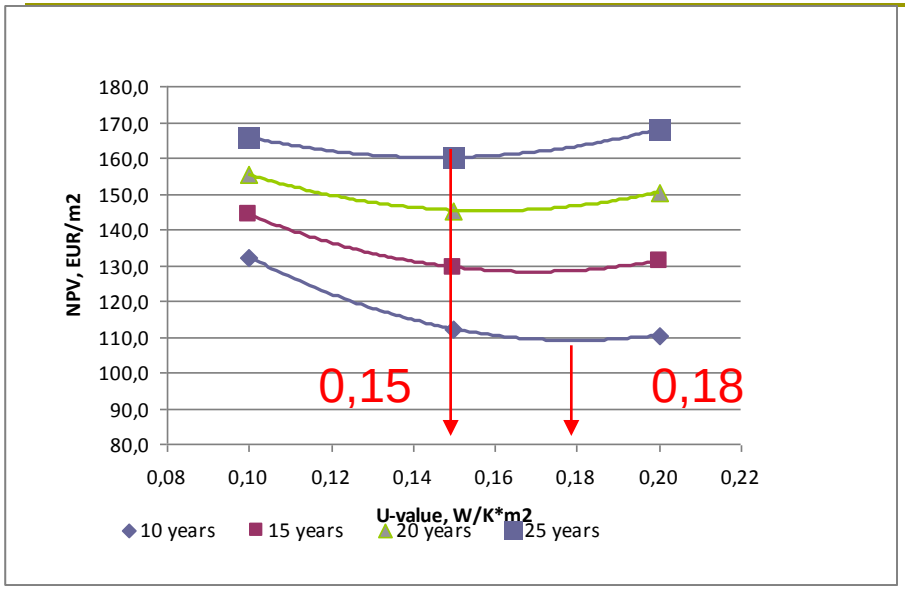
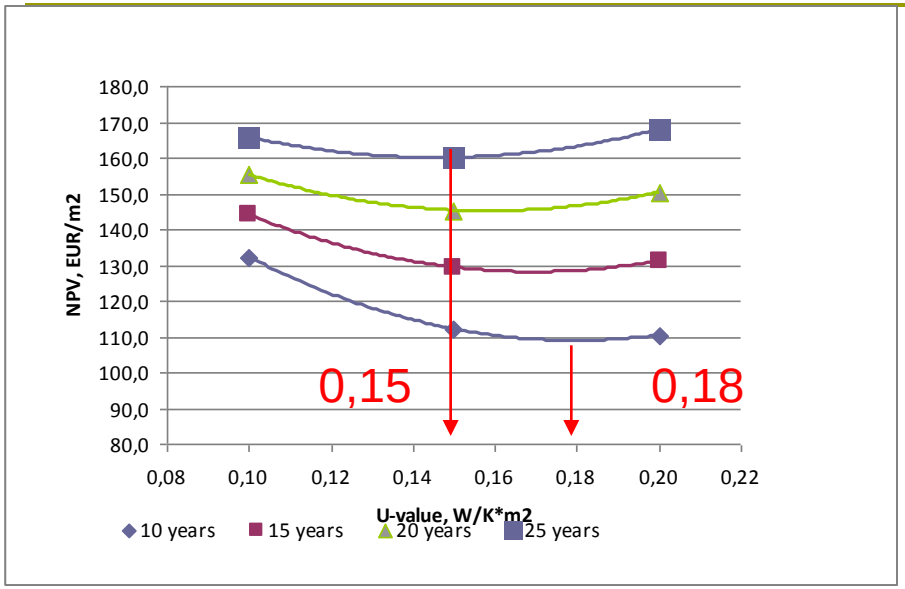
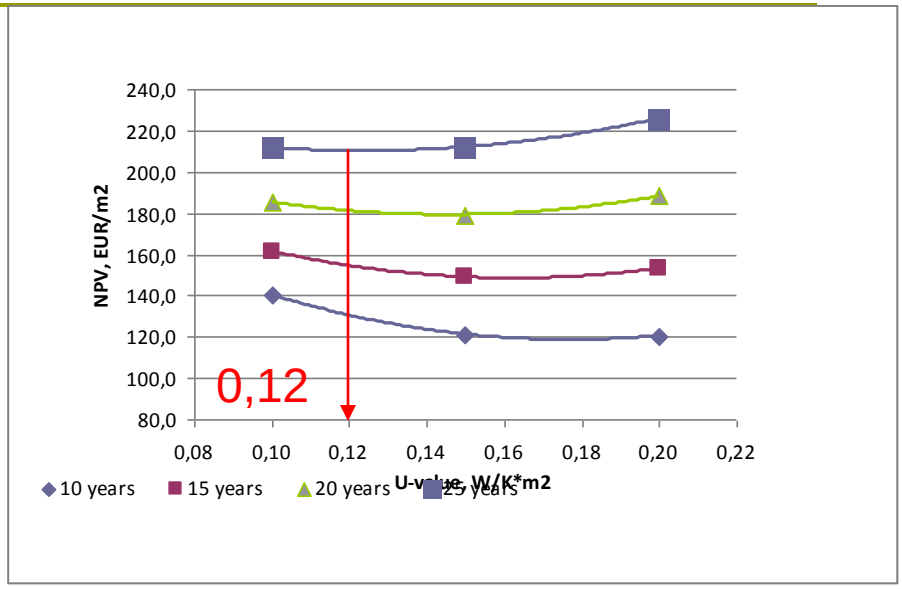
Building 1

Cost optimal solution



annual increase in energy prices: 3 %
interest rate: 5%





annual increase in energy prices: 3 %
interest rate: 5%

annual increase in energy prices: 6 %
interest rate: 5%

The calculations for cost optimal solution substantially depend on any given prerequisite data:

- -the length of the period
- -the percentage of the interest
  - It is also often different for public and private sector
- -inflation

It is very difficult to forecast the changes in the prices of energy in a longer perspective

The EU Commission have promised to work out an appropriate methodology by this summer. Hopefully it brings clarity into the methods for calculations and homogenizes the approach

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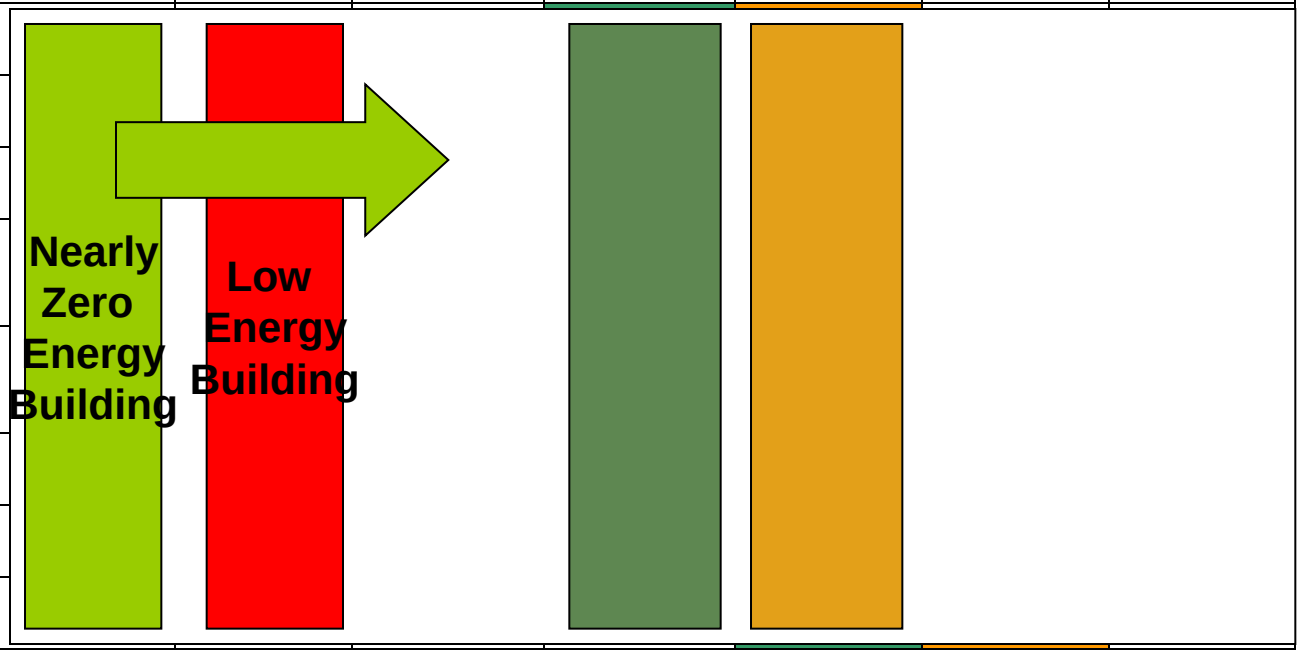

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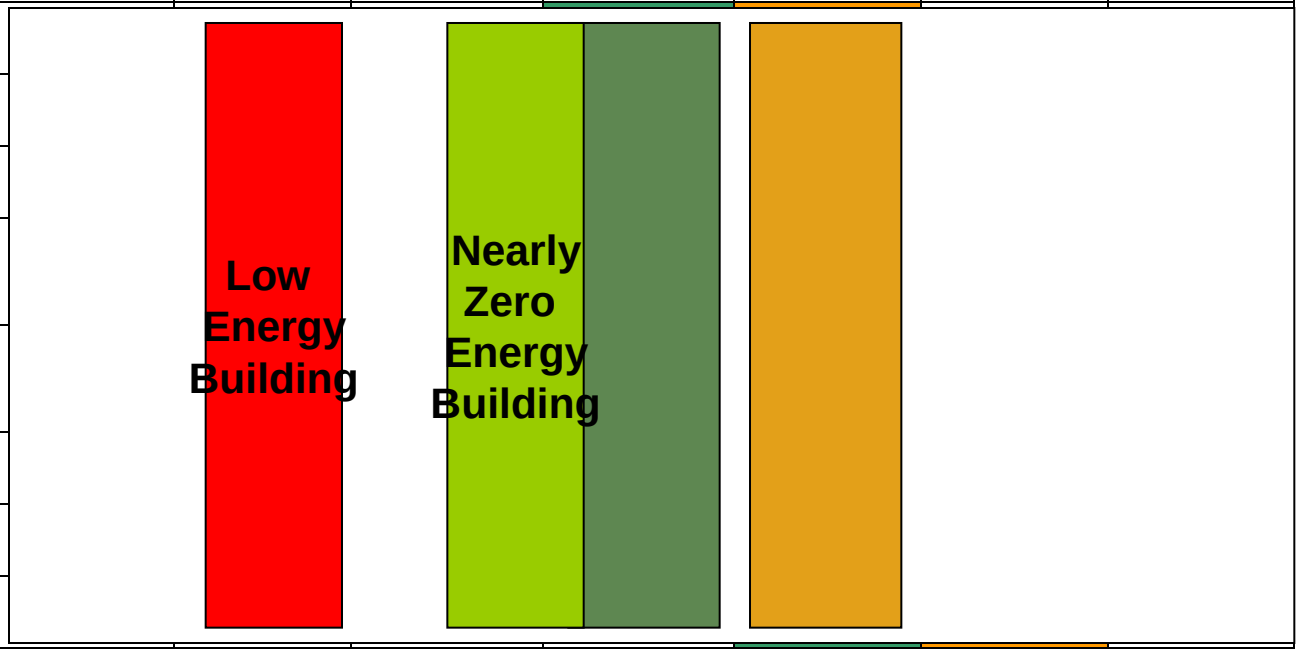

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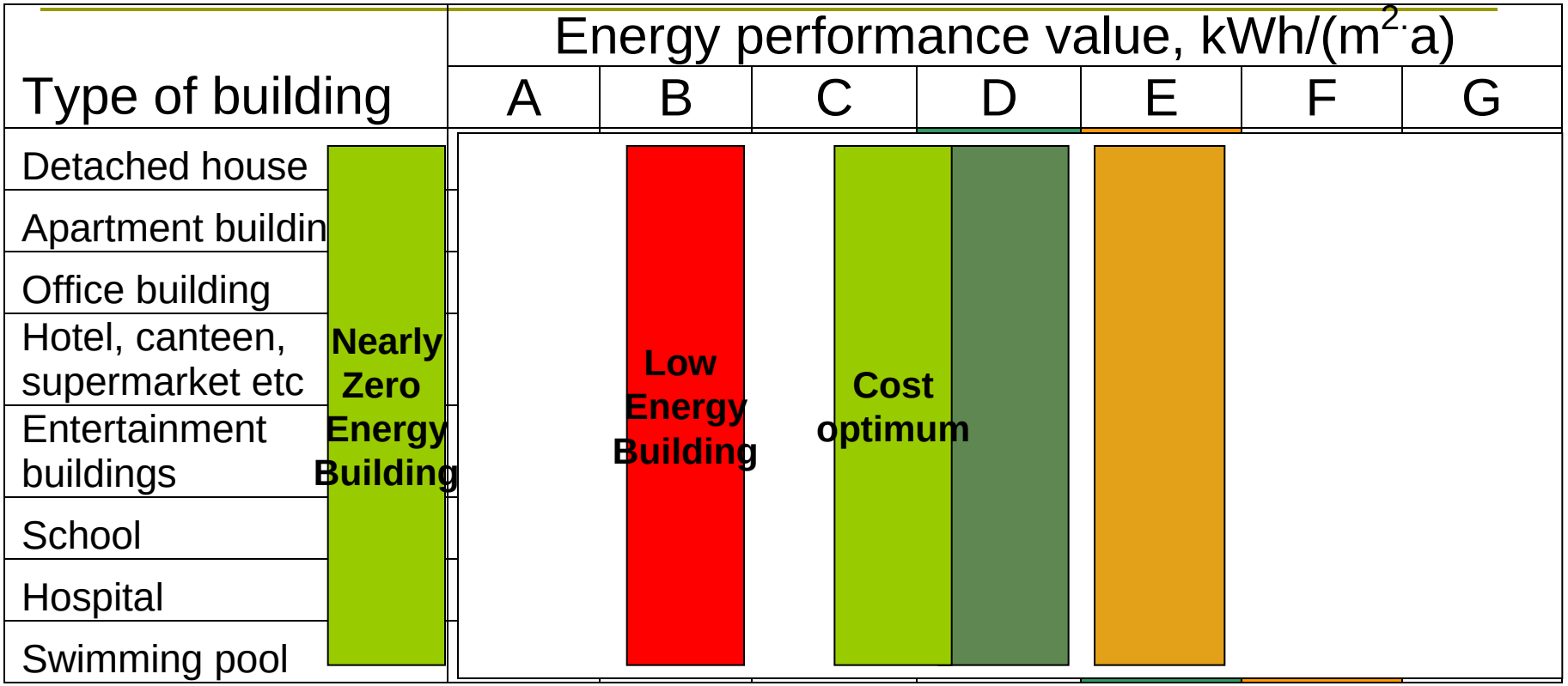

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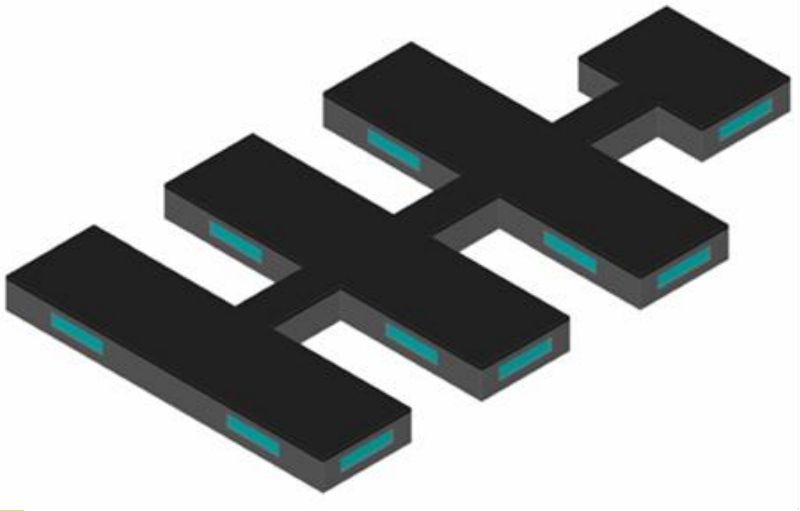
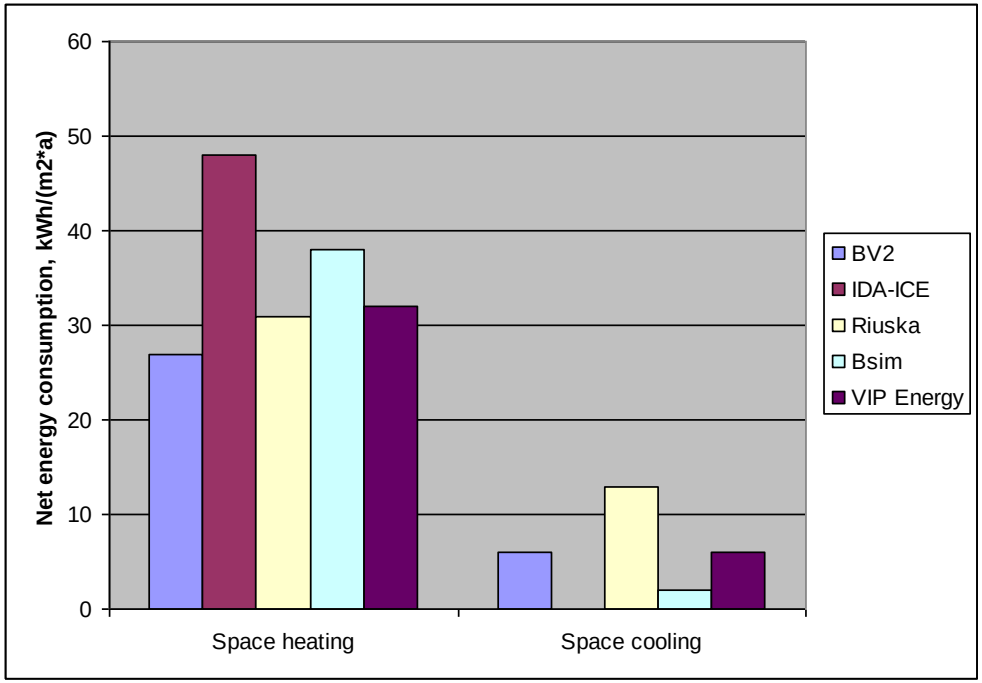
Minimum requirements of EPV for new buildings

Minimum requirements of EPV for reconstruction buildings

Energy label of new buildings

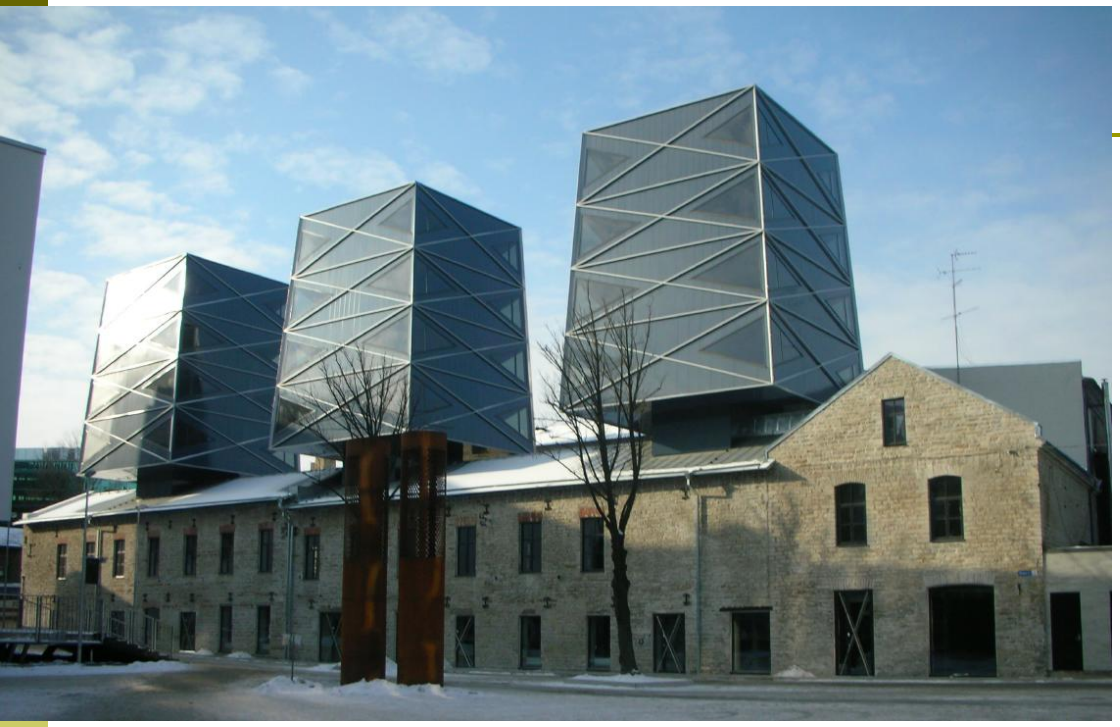
The results of the calculations for the building being designed depend on the software being used

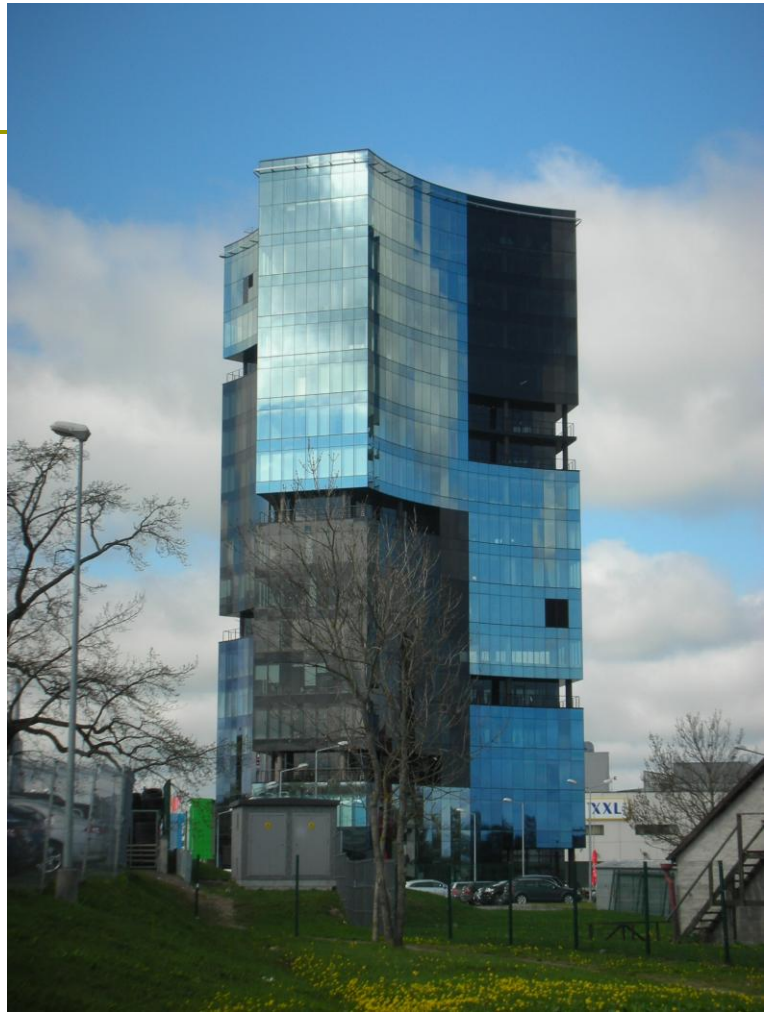




Source: H. Voll, T. Tark 2010. Energiatõhususe miinimumnõuete tõendamise ja selle kontrolli võimekuse tõstmine

- The adequacy of the energy label for the buildings being designed depends in a large part on
  - -the software being used
  - -the professional skills of the persons conducting the calculations
- The designers (including the architects) have to possess substantially more know-how about energy efficiency than they do today
- Energy efficiency must be thought of and taken into consideration during the initial stages of design

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Summary

- There is some confusion in regards to the use of terms
- There are too many different labeling systems
  - they are confusing
  - oftentimes they are not comparable
  - they express different values and goals
- The usual energy label should also give information about nnZEB, the scale of the label should be brought up to date
- Achieving nnZEB and nZEB is a great challenge for the designers and requires for them, including the architects, to have the appropriate know-how. Energy efficiency should be taken into consideration in the initial stages of designing the building.
- Quality of
  - construction works
  - supervision
  - testing and adjustments
  - commissioning
  - operation