Energy Performance Certification of Buildings Pathway in the Czech Republic

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Kiev 17.-19.1.2011
Principles of energy certification

Government perspective

Business perspective
WHO IS THE SPEAKER?

Ing. Petr Vogel

Specialist Consultant EkoWATT (Centre for RES and EE)
Chairman of Board of Directors Czech Green Building Council
Official founder and member of Steering committee CZGBC

Focused on building industry:

• Energy efficiency
• Indoor environment
• Ecology
• Computer simulations
• Integrated planning
Principles of energy certification
**Principals of energy certification**

Inspiration by appliances
- Market startup
- Mass production uniformity
- Technological development force

Mandatory for appliances from 2001
- Washing machines
- Refrigerators, freezers
- Dishwashers
- Electrical ovens
- Light bulbs
- Air-conditioning units
PRINCIPALS OF ENERGY CERTIFICATION

Mass production vs. Building individuality
Measurement vs. Planning
Electricity vs. Different fuels

Vs.
PRINCIPALS OF ENERGY CERTIFICATION

1. **Goals** of building energy certification

- Raise awareness of energy consumption of buildings
- Positive and endorsement label

- Minimum requirements

- Operation costs and ecological impact feeling of buyers
- Market basis and marketing

- Comparison between buildings
- Tool to decide incentives

**Duty vs. Interest**
Government perspective
TIMEFRAME AND CONTENT

1. 2000
   Energy audits (406/2000 and 2006 Coll.)

2. 2002
      • Attempt to establish integrated approach
        • Common principles, design, methodology of calculation

3. 2009
   Practical implementation in the CR from 1.1.2009 (148/2007 Coll.)

4. 2010
      • Ambitious goals towards nearly zero energy buildings
      • Even more ambitious goals for government and municipality sector
      • Certification of single apartments
      • Cost optimality
TIMEFRAME AND CONTENT

**Practical implementation in the CR from 1.1.2009** (148/2007 Coll.)

- For all new buildings
- >1000 m² floor area alternative heating systems considerations
  - Renewables
  - Thermal heat pump
  - Cogeneration
  - Central heating/cooling distribution network

- For energy significant renovations (>1000 m² floor area)
- Energy significant (>25% of building envelope, >25% of the overall energy consumption)

- Regular inspection of boilers and air-conditioning systems
TRAINING OF ACCREDITED PROFESSIONALS

- Certified experts
- Ensured by Ministry of Industry and Trade

- Expansion of the list of energy auditors
  - Energy audit
  - Energy certificate
  - Control of boilers and air-conditioning systems

- Expansion with authorized experts from Czech Chamber of Chartered Engineers and Technicians engaged in Construction

- Exams to prove skills
  - Committee of minimum 10 experts, 5 need to be present (Ministry of Industry and Trade, State Energy Inspection, Energy regulator Office, Academicians, Experts from Industry)
  - Legislation, methods of calculation, assessment, terms etc.

- About 780 certified people nowadays
STEPS FOR CERTIFICATION

1. Phase of construction
   - Assessment of final construction permit project documentation

2. Issuance of certification
   - Condition for construction permit
   - Reviewed by Local Building and Construction Authorities
   - Valid for 10 years

3. Communication of the result
   - Certification got to be handed when rented or sold
   - Operator of building accessed by public got to place the EC on visible place
WHAT DOES THE CERTIFICATION INCLUDE?

Protocol
Given tables

One Page Label
Given design and tables
WHAT DOES THE CERTIFICATION INCLUDE?

Based on what the designer could affect

- Building geometry, usage description
- Thermal building envelope characteristics
- Technology characteristics
  - Heating
  - Ventilation
  - Air-Conditioning
  - DHW systems
  - Artificial lighting
- Fuel and renewable energy sources
- Energy needs
- Identification of the building and of the assessor

Appliances not included

Problem of overlapping responsibilities
Problem of higher prices
## REQUIREMENTS

<table>
<thead>
<tr>
<th>kWh/m².rok</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Family house</strong></td>
<td>&lt; 51</td>
<td>51-97</td>
<td>98-142</td>
<td>143-191</td>
<td>192-240</td>
<td>241-286</td>
<td>&gt;286</td>
</tr>
<tr>
<td><strong>Multi-dwelling house</strong></td>
<td>&lt; 43</td>
<td>43-82</td>
<td>83-120</td>
<td>121-162</td>
<td>163-205</td>
<td>206-245</td>
<td>&gt;245</td>
</tr>
<tr>
<td><strong>Hotel a restaurants</strong></td>
<td>&lt;102</td>
<td>102-200</td>
<td>201-294</td>
<td>295-389</td>
<td>390-488</td>
<td>489-590</td>
<td>&gt;590</td>
</tr>
<tr>
<td><strong>Office buildings</strong></td>
<td>&lt; 62</td>
<td>62-123</td>
<td>124-179</td>
<td>180-236</td>
<td>237-293</td>
<td>294-345</td>
<td>&gt;345</td>
</tr>
<tr>
<td><strong>Hospitals</strong></td>
<td>&lt; 109</td>
<td>109-210</td>
<td>211-310</td>
<td>311-415</td>
<td>416-520</td>
<td>521-625</td>
<td>&gt;625</td>
</tr>
<tr>
<td><strong>Education buildings</strong></td>
<td>&lt; 47</td>
<td>47-89</td>
<td>90-130</td>
<td>131-174</td>
<td>175-220</td>
<td>221-265</td>
<td>&gt;265</td>
</tr>
<tr>
<td><strong>Sport facilities</strong></td>
<td>&lt; 53</td>
<td>53-102</td>
<td>103-145</td>
<td>146-194</td>
<td>195-245</td>
<td>246-297</td>
<td>&gt;297</td>
</tr>
<tr>
<td><strong>Retail</strong></td>
<td>&lt; 67</td>
<td>67-121</td>
<td>122-183</td>
<td>148-241</td>
<td>242-300</td>
<td>301-362</td>
<td>&gt;362</td>
</tr>
</tbody>
</table>
• Small renovations (<1000 m² floor area)
• Renovations where measures are not economical or technically applicable (proven by energy audit)
• Renovations with cultural heritage conflicts

• Agricultural buildings (with low heating energy consumption)
• Industrial manufacturing buildings
• Experimental buildings
• Buildings with occasional usage, like religious buildings
• Temporary buildings (<2 years)
• Small buildings (<50 m² floor area)
ASSESSMENT METHOD

Comparability vs. Real energy needs estimation

Asset rating vs. Operational rating

One climate zone conditions
Binding input values
Binding calculation method

Real statistical climate zone conditions
Measured or expert estimation inputs
More flexible calculation method

Incentive program – strict rules
Comparability of the design

Economical operation analysis
Environmental operation analysis

Be aware not to have various different rating methods!
ROUGH PRICES ON MARKET

Family houses
10 th. CZK / 400 EUR, 3 th. CZK / 120 EUR with other product

Multi-dwelling houses
10-30 th. CZK / 400-1200 EUR

Office building
40-100 th. CZK / 1600-4000 EUR

Retail
40-100 th. CZK / 1600-4000 EUR

Others even more specific case by case
Business perspective
**BALANCE BETWEEN PEOPLE, ECONOMY AND ENVIRONMENT**

1. **Business - Supply**
   - Economy – reaction to demand
   - Marketing
   - Inovations
   - Ecology - CSR

2. **Public and investors - Demand**
   - Economy – operation costs
   - Lifestyle
   - Ecology - responsibility

3. **State - Regulation**
   - Economy – efficient operation and industry, efficient budget
   - Ecology – to improve living conditions

www.czgbc.org
The Czech Green Building Council is a non-profit association encouraging the market, educational, and legislative conditions necessary to promote high performance construction that is both sustainable and profitable.

Main general priorities of the council:
- Certification
- Legislation
- Public and professional education
CZECH GREEN BUILDING COUNCIL PROMOTES

1. Energy

2. BREEAM

3. DGNB

4. LEED

5. SB Tool CZ

6. Voluntary

Mandatory

Energy

Material

Pollution

Profit & Economy

Management

Waste

Land Use & Ecology

Health & Comfort

Transport

Water

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Thank you for your attention
Questions?

Petr Vogel

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