Special Session 2.14

The Assessment System for Sustainable Building BNB by Taking the Example of the Complete Refurbishment BNB Module for Educational Buildings
Guideline for Sustainable Building

- introduced 2001
- since 2013 mandatory for all federal buildings
- since 2014 available in English

- sets principles
- describes requirements and assessment criteria
- identifies benchmarks and aims
- offers tools and supporting documents
Guideline

Part A
Basic Principles of Sustainable Building

Part B
Sustainable Building Projects

Part C
Recommendations for the Sustainable Use and Operation

Part D
Refurbishment of Buildings

Assessment System

BNB_New Construction

BNB_Use and Operation

BNB_Complete Refurbishment

Outdoor Facilities

Office and Administration Building

Educational Building

Laboratories

Office and Administration Building

Office and Administration Building

Educational Building

Interaction between Guideline and Assessment System (BNB)
Assessment System for Sustainable Building (BNB)

- holistic tool for sustainability assessment
- covering the entire life cycle
- addresses equally all three sustainability dimensions & the cross-sectional qualities Technical and Process Quality

Diagram:
- Ecological quality
- Economic quality
- Socio-cultural and functional quality
- Technical quality
- Process quality
- Location profile
Use Typologies and Requirements of Educational Buildings

- high degree of user satisfaction
- flexible and synergistic use of building structures
- spatial qualities inside and outside
- public accessibility
Complete Refurbishment BNB module

Complete Refurbishment
► Characteristic of the structure and the building services largely identical to new buildings
► Repair work in order to achieve more or less the same service life of the building components as new buildings
► Adaption of the physical structure to new requirements
► Dedicated rules and benchmarks for listed buildings
Criteria | Educational Building System Variant | Refurbishment

**Economy**
- 2.1.1 Building-related Life Cycle Costs
- 2.2.2 Adaptability

**Ecology**
- 1.2.1 Primary Energy Demand
- 1.2.3 Drinking Water Demand & Quantity of Wastewater
- 1.2.4 Land Consumption

**Sociocultural**
- 3.1.1 Thermal Comfort
- 3.1.3 Indoor Air Quality
- 3.1.4 Acoustic Comfort
- 3.1.5 Visual Comfort
- 3.1.6 Influence of the User
- 3.1.7 Use Qualities
- 3.1.8 Safety
- 3.1.9 Indoor quality
- 3.2.1 Barrier-free Building
- 3.2.2 Accessibility
- 3.2.3 Mobility Infrastructure
- 3.2.5 Mobility Infrastructure
- 3.3.1 Design and Urban Quality

**Technology**
- 4.1.1 Sound Insulation
- 4.1.2 Heat Insulation and Protection against Condensate
- 4.1.3 Heat Insulation and Protection against Condensate
- 4.1.4 Dismantling, Waster Separation and Utilisation
- 4.1.5 Resistance to Natural Disasters
- 4.1.6 Maintenance Friendliness of Building Systems

**Process**
- 5.1.1 Project Preparation
- 5.1.2 Integrated Design and Planning
- 5.1.3 Complexity and Optimisation of Planning
- 5.1.4 Invitation to Tender and Contract Awarding
- 5.1.5 Preconditions for Optimum Utilisation and Management
- 5.1.6 Stock Taking
- 5.1.7 Demolition Planning
- 5.2.1 Building Site / Building Process
- 5.2.2 Quality Assurance of Building Construction
- 5.2.3 Controlled Commissioning
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- 1.1.5 Eutrophication Potential
- 1.1.4 Acidification Potential
- 1.1.3 Photochemical Ozone Creation Potential
- 1.1.2 Ozone Depletion Potential
- 1.1.1 Global Warming Potential

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**Ecological Quality**

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<thead>
<tr>
<th>ECOLOGICAL QUALITY</th>
<th>22.5 %</th>
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<tbody>
<tr>
<td>Effects on Global and Local Environment</td>
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<tr>
<td>1.1.1 Global Warming Potential (GWP)</td>
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<tr>
<td>Demand of Resources</td>
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Eco-Balance

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*Ecological Quality - Eco-Balance (1.1.1-1.1.5, 1.2.1)*

- Global Warming Potential
- Ozone Depletion Potential
- Photochemical Ozone Creation Potential
- Acidification Potential
- Eutrophication Potential
- Primary Energy Demand

*Effects on the Local and the Global Environment*

*Demand of Resources*

Demolition ➔ Production ➔ Utilisation ➔ Repair ➔ Demolition
## Economic Quality

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<td>Wirtschaftlichkeit und Wertstabilität</td>
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<td>2.2.1 Space Efficiency</td>
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Economic Quality

 Lifecycle Costs (2.1.1)
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Sociocultural and Functional Quality

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Sociocultural and Functional Quality – Health, Comfort, User Satisfaction

► Indoor Air Quality (3.1.3)

► Avoidance of emissions of construction products
  ➔ indoor air measurements

► Minimisation of the CO$_2$-concentration
  ➔ max. 1000 ppm
  for mechanical and window ventilation

► Analysis of the microbiological situation
  ➔ mould growth, moisture damage, thermal bridges
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Sociocultural and Functional Quality – Health, Comfort, User Satisfaction

► Use Qualities (3.1.7)

- Qualities of circulation areas
- Inner visibility
- Flexibility of space utilization
- Storage options
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## Process Quality – Management and Design

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Process Quality – Management and Design

- Stock Taking (5.1.6)
- Demolition Planning (5.1.7)
Further Information

Kriterien - BNB Unterrichtsgebäude - Neubau (BNB_UN)
Version 2013


Die wesentlichen Unterschiede zwischen der aktuellen Version BNB_UN_2013 zu BNB_UN_2011 (Entwurf) bzw. zu BNB_UN_2011_1 können Sie der folgenden Tabelle entnehmen:

www.bnb-nachhaltigesbauen.de
Thank You for Your Patient Attention