EU-Project OPEN HOUSE

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SB 11 Special Forum: “Core Indicators”
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OPEN HOUSE
Benchmarking and mainstreaming building sustainability in the EU
based on transparency and openness (open source and availability) from model to implementation.
Grant agreement no.: 244130

The Objective

EU-Project: Seventh Framework Programme

European Overview about sustainability building standards:

Category	Indicator	Country 1	Country 2	Country 3
Environmental Quality	Global Warming Potential (GWP)			
	Risks from materials			
	Biodiversity and depletion of habitats			

- **Timeframe:** 36 months, Febuary 2010 – January 2013
- **Coordination:**
  - Management: Acciona Infrastructuras, Spain (Daniel Hiniesto)
  - Technical: Fraunhofer Institute for Building Physics (IBP), Germany (Dr. Natalie Eßig)
- **Objective:**
  - Development of a common transparent European building assessment approach
  - **Bottom-up-Approach:** OPEN House baseline will complement the existing ones and is based on existing standards, methodologies and assessment methods
  - **Now new system:** overview about country specific assessment methods/ actual building standards and supporting sustainability all over Europe and giving advice to existing systems

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The Consortium

20 partners from 11 EU countries covering the whole construction sector

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The Consortium

More than 50 faces behind: junior and senior sustainability experts

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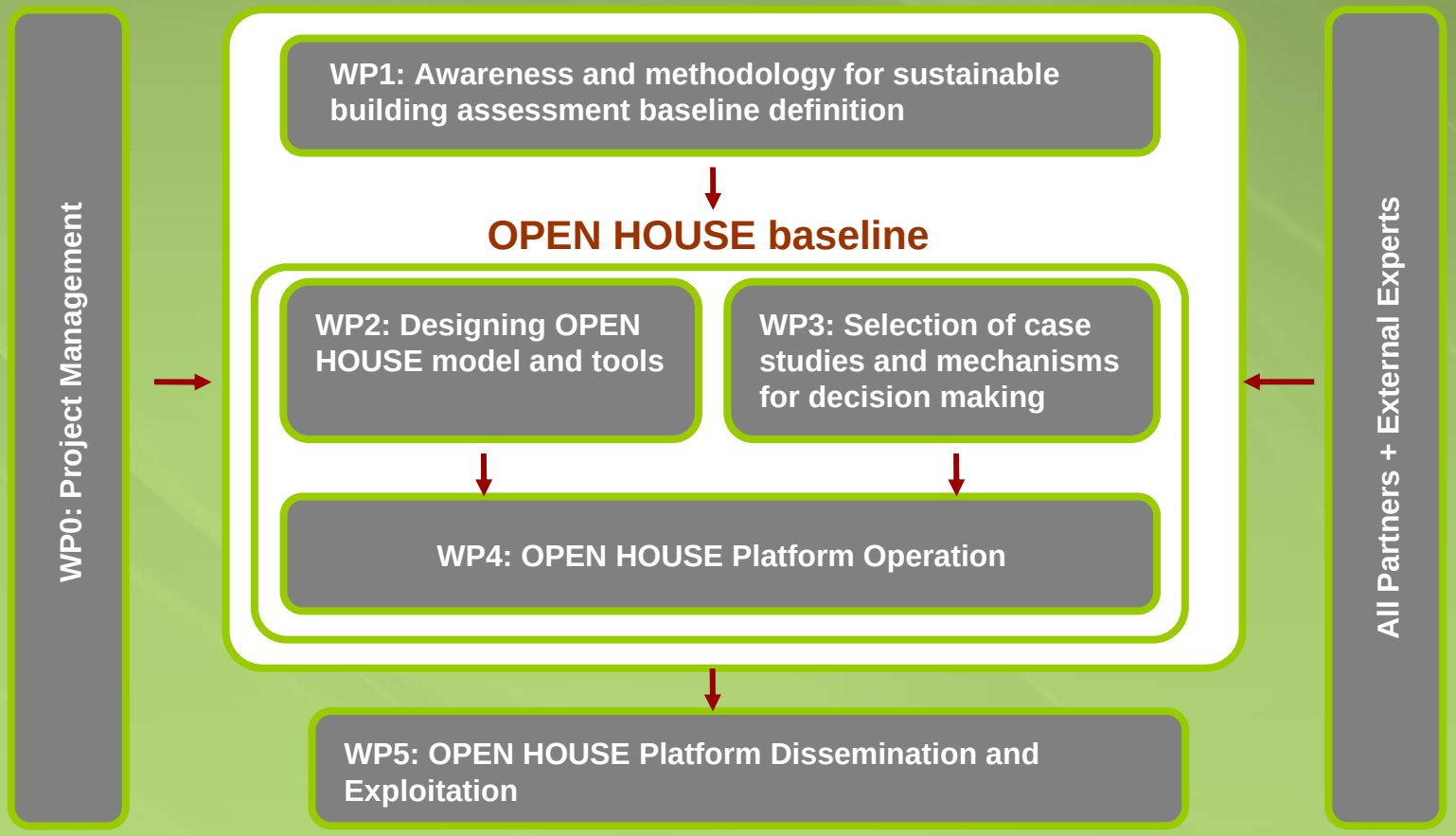
OPEN HOUSE Methodology



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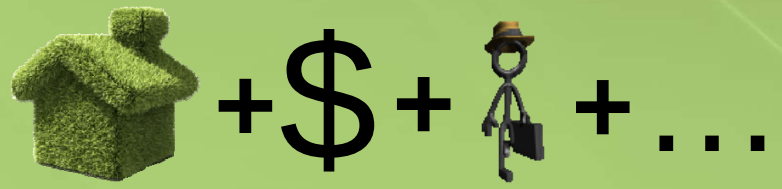
OPEN HOUSE Baseline

- **Assessment methods of the 1st generation:**

  Environmental and energy-efficient approach:
  „Green-Building-Approach“

- **Assessment methods of the 2nd generation:**

  Life-cycle-orientated approach based on sustainability pillars:
  „Sustainable-Building-Approach “



Source: Essig, N. 2010

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OPEN HOUSE Baseline (Pilot Version)

Evaluation of „all“ indicators (560 indicators)

1.LEED
2.BREEAM
3.DGNB
4.HQE
5.SB-TOOL
6.VERDE
7.LENSE
8.....

Preselection of suitable indicators (95 indicators)

1. Grouping into 6 evaluation areas
2. Questionnaire on their applicability/ feasibility in the EU-27 countries

Preselection „Full System“ (56 indicators)

1.Objectives
2.Evaluation
3.Documentation
4.Resources

„Core System“ (30 indicators)

1.Objectives
2.Evaluation
3.Calculation
4.Rating
5.Documentation
6.Resources
7.Weighting

Identification and evaluation of 37 international and 64 European rating tools from over 50 countries by questionnaires

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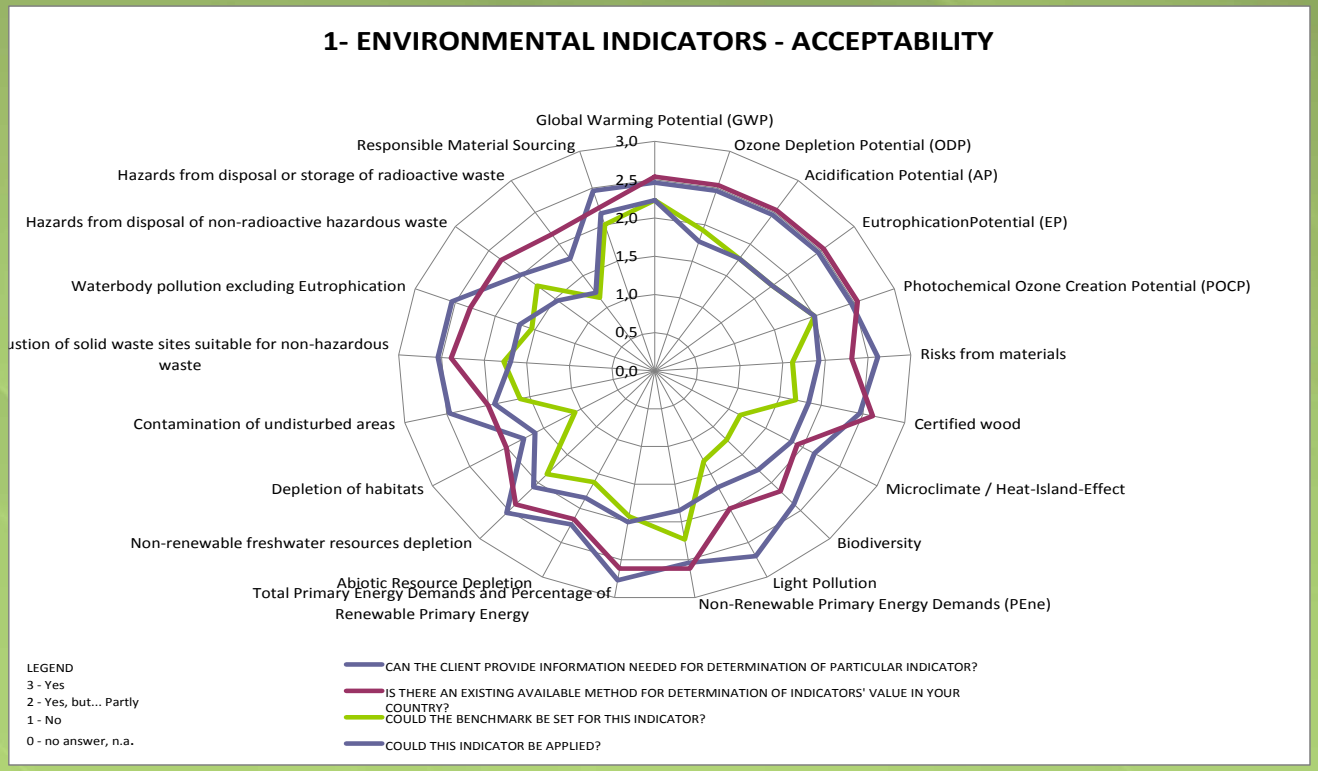

Analyses of the applicability/feasibility of the 95 pre-selected indicators in the EU-27 countries by a questionnaire in every country – Outcome: 56 indicators

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Example: Economic Quality and Technical Characteristics

Category	Nb.	Indicators	Full System	Core System
Economic Quality	3.1	Building-related Life Cycle Costs (LCC)	■	■
	3.2	Value Stability	■	
Technical Characteristics	4.1	Fire Protection	■	
	4.2	Durability of the structure and Robustness	■	
	4.3	Cleaning and maintenance	■	
	4.4	Resistance against hail, storm high water and earthquake	■	
	4.5	Noise Protection	■	
	4.6	Quality of the building shell	■	■
	4.7	Ease of Deconstruction, Recycling, and Dismantling	■	■

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Core System (30 Indicators)

Environmental Quality	GWP, ODP, AP, EP und POCP (1.1-1.5)
	Non-Renewable Primary Energy Demands (PEne)
	Total Primary Energy Demands/ Percentage of Renewable Primary Energy
	Water and Waste Water
	Land Use
	Waste
Social/ functional Quality	Barrier-free Accessibility
	Thermal Comfort
	Indoor Air Quality
	Acoustic Comfort
	Visual Comfort
	Operation Comfort
	Electro Magnetic Pollution
	Public Accessibility
	Conversion Feasibility
	Responsible Material Sourcing
	Local Material
	Bicycle Comfort
Economic Quality	Building-related Life Cycle Costs (LCC)
Technical Characteristics	Quality of the Building Shell
	Ease of Deconstruction, Recycling and Dismantling
Process Quality	Quality of the Project's Preparation
	Construction Site impact/ Construction Process
	Commissioning
The Location	Risks at the Site
	Options for Transportation

OPEN HOUSE Case Studies

- 68 case studies along Europe will be deployed by actors inside and outside the OPEN HOUSE consortium
- The case studies will be selected by tenders
  “Call for Tender” (finish: October 29th 2011) – more information: www.openhouse-fp7.eu
- Building types: new office buildings (less than 10 years) and office buildings at design stage - at least 70% office use

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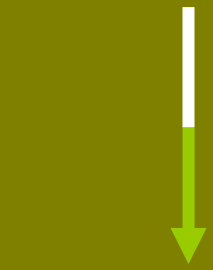
OPEN HOUSE Case Studies

OPEN HOUSE Assessment Process

- Assessment workshop with project partners
- Foto documentation at the building site
- Collecting building documents
- Analyzing the building documents
- Further meetings (if it is necessary)
- Overgiving the documents to the OH review committee
- Review by the OH review committe (4-eyes-principle)

OH Case Study



OH Certificate

- **„Basic and quick sustainability assessment" – for case studies outside the consortium:** gives first idea of sustainability level and proposes actions to improve the level, no stringent documentation needed, based on estimations, but must be reasonable
- **"Complete assessment" – for case studies inside the consortium:** complete documentation needed for "OPEN HOUSE – core indicators" and no stringent documentation for the rest of the indicators from the „OPEN HOUSE – full system"

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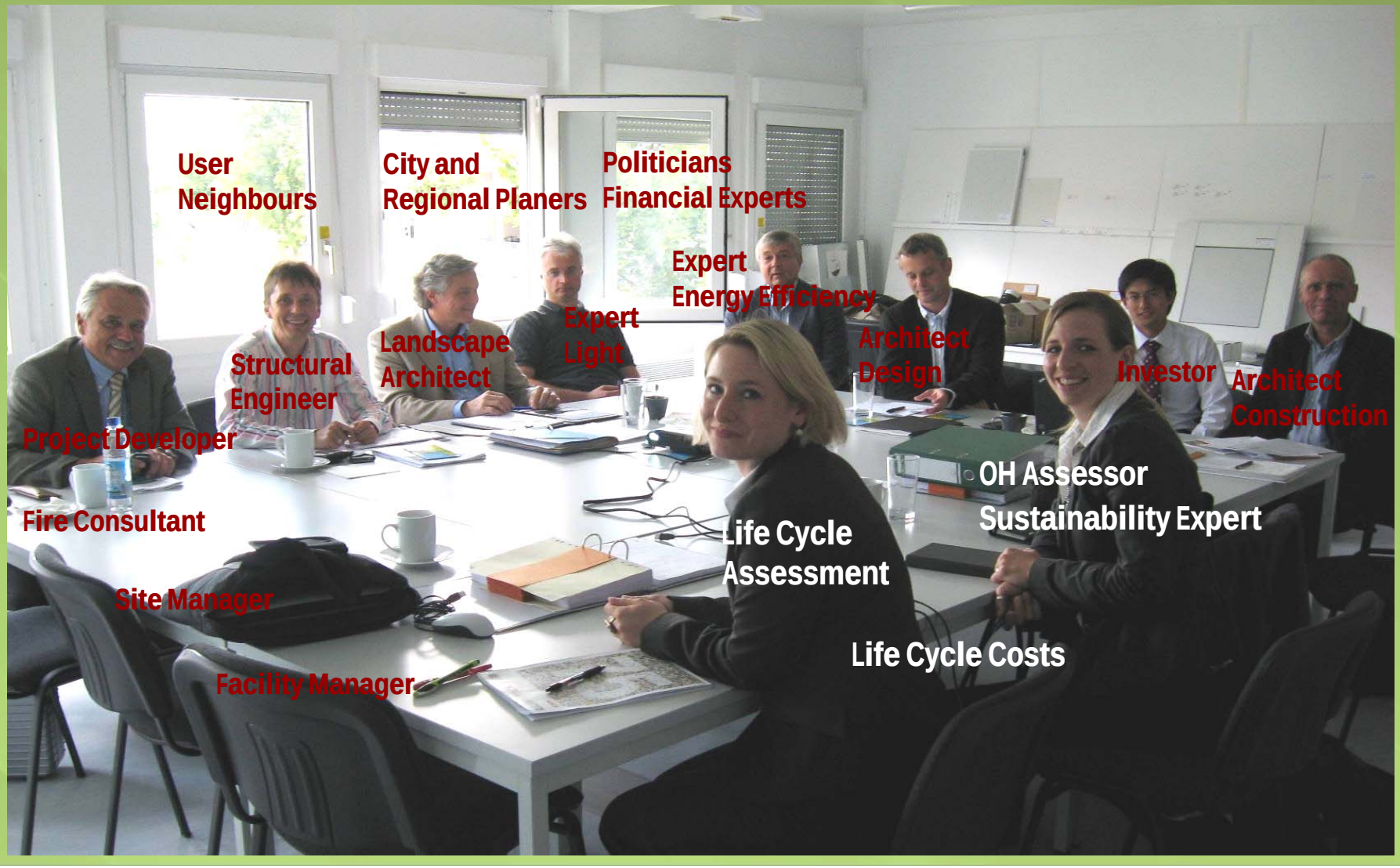
OPEN HOUSE Case Studies

Assessment Workshop



OPEN HOUSE Case Studies

Online: OPEN HOUSE building sustainability assessment portal

OPEN HOUSE Case Studies

Complete Documentation

Sustainability of the ZUB in 6 folders

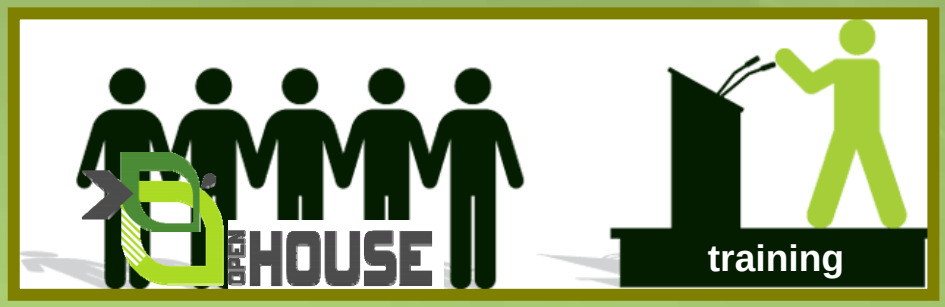
OPEN HOUSE Case Studies

OPEN HOUSE Paket for the Case Studies

- Training course
- Handbook of templates (indicator)
- Guidelines for the assessment workshops
  - Equal powerpoint presentation for the assessment workshops
  - Questionaires: what do ask the investors, planners etc.
- Manual for the OPEN HOUSE assessment process
- Manual for how to use the online plattform
- Manual for documentation

OPEN HOUSE Case Studies

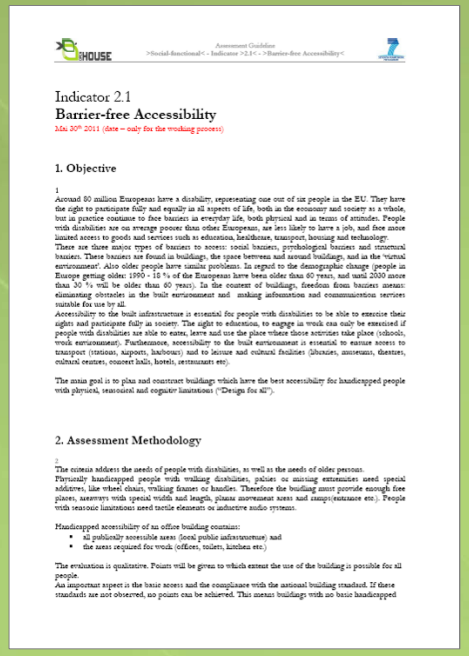
OPEN HOUSE Training Course



- **Location:** London
- **Time frame:** 2 days course (Decembre 12th and 13th, 2011)
- **Participants:** OH trainers (consortium members), awarded tenderes, subcontractors and everybody who is interested
- **Intents:**
  - Explain OH assessment procedure (documentation and review)
  - Explain OH online platform
  - Explain OH categories, indicators and how to get information
- **At the moment Fraunhofer is developing the manual for the course (pilot project ZUB)**

OPEN HOUSE Baseline (Pilot Version)

Handbook of Indicator Templates: Example “Barrier-free Accessibility”



Indicator 2.1
Barrier-free Accessibility
Mo 30th 2011 (date – only for the working process)

1. Objective

1
Around 80 million Europeans have a disability, representing one out of six people in the EU. They have the right to participate fully and equally in all aspects of life, both in the economy and society as a whole, but in practice continue to face barriers in everyday life, both physical and in terms of attitudes. People with disabilities are on average poorer than other Europeans, are less likely to have a job, and face more limited access to goods and services such as education, healthcare, transport, housing and technology.
There are three major types of barriers to access: social barriers, psychological barriers and structural barriers. These barriers are found in buildings, the space between and around buildings, and in the 'virtual environment'. Also older people have similar problems. In regard to the demographic change (people in Europe getting older: 1990 - 18 % of the Europeans have been older than 60 years, and until 2000 more than 20 % will be older than 60 years). In the context of buildings, freedom from barriers means: eliminating obstacles in the built environment and making information and communication services suitable for use by all.
Accessibility to the built infrastructure is essential for people with disabilities to be able to exercise their rights and participate fully in society. The right to education, to engage in work can only be exercised if people with disabilities are able to enter, leave and use the place where those activities take place (schools, work environment). Furthermore, accessibility to the built environment is essential to ensure access to transport (stations, airports, harbours) and to leisure and cultural facilities (libraries, museums, theatres, cultural centres, concert halls, hotels, restaurants etc).

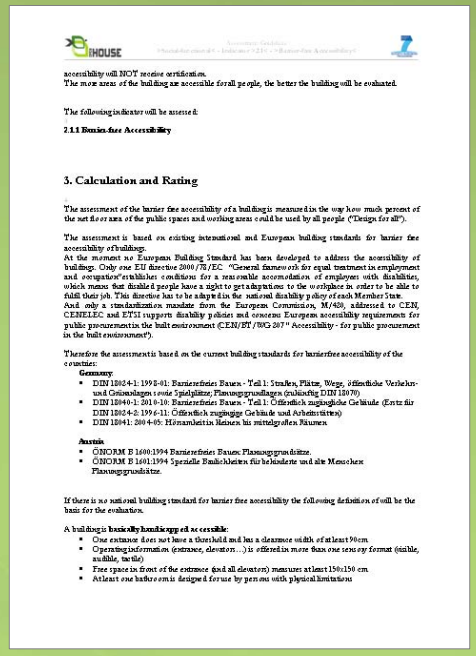
The main goal is to plan and construct buildings which have the best accessibility for handicapped people with physical, sensorial and cognitive limitations ("Design for all").

2. Assessment Methodology

2
The criteria address the needs of people with disabilities, as well as the needs of older persons.
Physically handicapped people with walking disabilities, palsies or missing extremities need special additives, like wheel chairs, walking frames or handles. Therefore the building must provide enough free places, aisleways with special width and length, plants movement zones and ramps(entrance etc.). People with sensoric limitations need tactile elements or inductive audio systems.

Handicapped accessibility of an office building contains:
- all publically accessible areas (local public infrastructure) and
- the areas required for work (offices, toilets, kitchen etc.)

The evaluation is qualitative. Points will be given to which extent the use of the building is possible for all people.
An important aspect is the basic access and the compliance with the national building standard. If these standards are not observed, no points can be achieved. This means buildings with no basic handicapped



accessibility will NOT receive certification.
The more areas of the building are accessible for all people, the better the building will be evaluated.

The following indicator will be assessed:

2.1.1 Barrier-free Accessibility

3. Calculation and Rating

3
The assessment of the barrier free accessibility of a building is measured in the way how much percent of the net floor area of the public spaces and working areas could be used by all people ("Design for all").

The assessment is based on existing international and European building standards for barrier free accessibility of buildings.
At the moment no European Building Standard has been developed to address the accessibility of buildings. Only one EU directive 2000/78/EC "General framework for equal treatment in employment and occupation" establishes conditions for a reasonable accomodation of employers with disabilities, which means that disabled people have a right to get adaptations to the workplace in order to be able to fulfil their job. This directive has to be adapted in the national disability policy of each Member State.
And only a standardization mandate from the European Commission, M/420, addressed to CEN, CENELEC and ETSI supports disability policies and concerns European accessibility requirements for public procurement in the built environment (CEN/BT/BG 207 " Accessibility - for public procurement in the built environment").

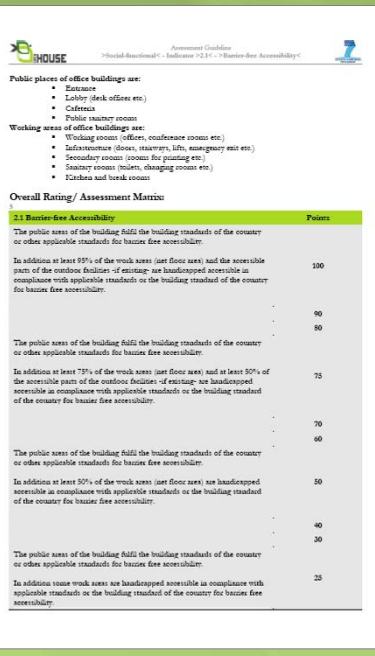
Therefore the assessment is based on the current building standards for barrierfree accessibility of the countries:

Germany
- DIN 18024-1: 1998-01: Barrierefreies Bauen - Teil 1: Straßen, Plätze, Wege, öffentliche Verkehrs- und Grünanlagen sowie Spielplätze; Planungsgrundlagen (zukünftig DIN 18070)
- DIN 18040-1: 2010-10: Barrierefreies Bauen - Teil 1: Öffentlich zugängliche Gebäude (Ersatz für DIN 18024-2: 1996-11: Öffentlich zugängige Gebäude und Arbeitsstätten)
- DIN 18041: 2004-05: Hörsamkeit in kleinen bis mittelgroßen Räumen

Austria
- ÖNORM B 1600:1994 Barrierefreies Bauen; Planungsgrundsätze.
- ÖNORM B 1601:1994 Spezielle Baulichkeiten für behinderte und alte Menschen; Planungsgrundsätze.

If there is no national building standard for barrier free accessibility the following definition of will be the basis for the evaluation.

A building is **basically handicapped accessible**:
- One entrance does not have a threshold and has a clearance width of at least 90cm.
- Operating information (entrance, elevator…) is offered in more than one sensory format (tactile, audible, tactile)
- Free space in front of the entrance (and all elevators) measures at least 150x150 cm.
- At least one bathroom is designed for use by persons with physical limitations



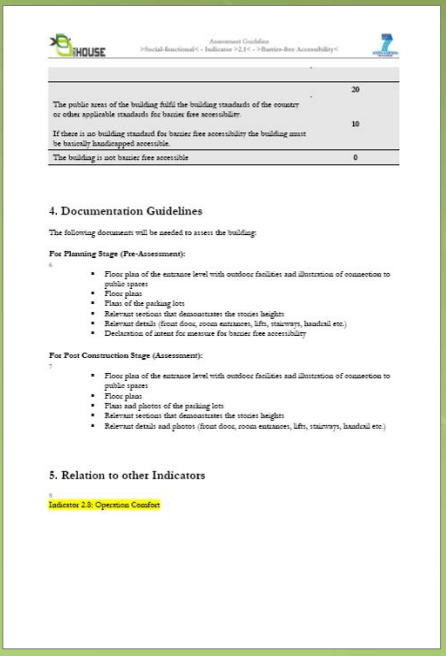
Public places of office buildings are:
- Entrance
- Lobby (desk officer etc.)
- Cafeteria
- Public sanitary rooms

Working areas of office buildings are:
- Working rooms (offices, conference rooms etc.)
- Infrastructure (doors, stairways, lifts, emergency exit etc.)
- Secondary rooms (rooms for printing etc.)
- Sanitary rooms (toilets, changing rooms etc.)
- Kitchen and break rooms

Overall Rating/ Assessment Matrix:

4

2.1 Barrier-free Accessibility	Points
The public areas of the building fulfil the building standards of the country or other applicable standards for barrier free accessibility.	
In addition at least 95% of the work areas (net floor area) and the accessible parts of the outdoor facilities -if existing- are handicapped accessible in compliance with applicable standards or the building standard of the country for barrier free accessibility.	100
	90
	80
The public areas of the building fulfil the building standards of the country or other applicable standards for barrier free accessibility.	
In addition at least 75% of the work areas (net floor area) and at least 50% of the accessible parts of the outdoor facilities -if existing- are handicapped accessible in compliance with applicable standards or the building standard of the country for barrier free accessibility.	75
	70
	60
The public areas of the building fulfil the building standards of the country or other applicable standards for barrier free accessibility.	
In addition at least 50% of the work areas (net floor area) are handicapped accessible in compliance with applicable standards or the building standard of the country for barrier free accessibility.	50
	40
	30
The public areas of the building fulfil the building standards of the country or other applicable standards for barrier free accessibility.	
In addition some work areas are handicapped accessible in compliance with applicable standards or the building standard of the country for barrier free accessibility.	25



	20
The public areas of the building fulfil the building standards of the country or other applicable standards for barrier free accessibility.	
	10
If there is no building standard for barrier free accessibility the building must be basically handicapped accessible.	
The building is not barrier free accessible	0

4. Documentation Guidelines

The following documents will be needed to assess the building:

For Planning Stage (Pre-Assessment):

6
- Floor plan of the entrance level with outdoor facilities and illustration of connection to public spaces
- Floor plans
- Plans of the parking lots
- Relevant sections that demonstrates the stories heights
- Relevant details (front door, room entrances, lifts, stairways, handrail etc.)
- Declaration of intent for measure for barrier free accessibility

For Post Construction Stage (Assessment):

7
- Floor plan of the entrance level with outdoor facilities and illustration of connection to public spaces
- Floor plans
- Plans and photos of the parking lots
- Relevant sections that demonstrates the stories heights
- Relevant details and photos (front door, room entrances, lifts, stairways, handrail etc.)

5. Relation to other Indicators

8
Indicator 2.3: Operation Comfort

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OPEN HOUSE Baseline (Pilot Version)

Manual for Documentation

Manual for Documentation

Case Study: Zentrum für Umweltbewusstes Bauen, ZUB Kassel

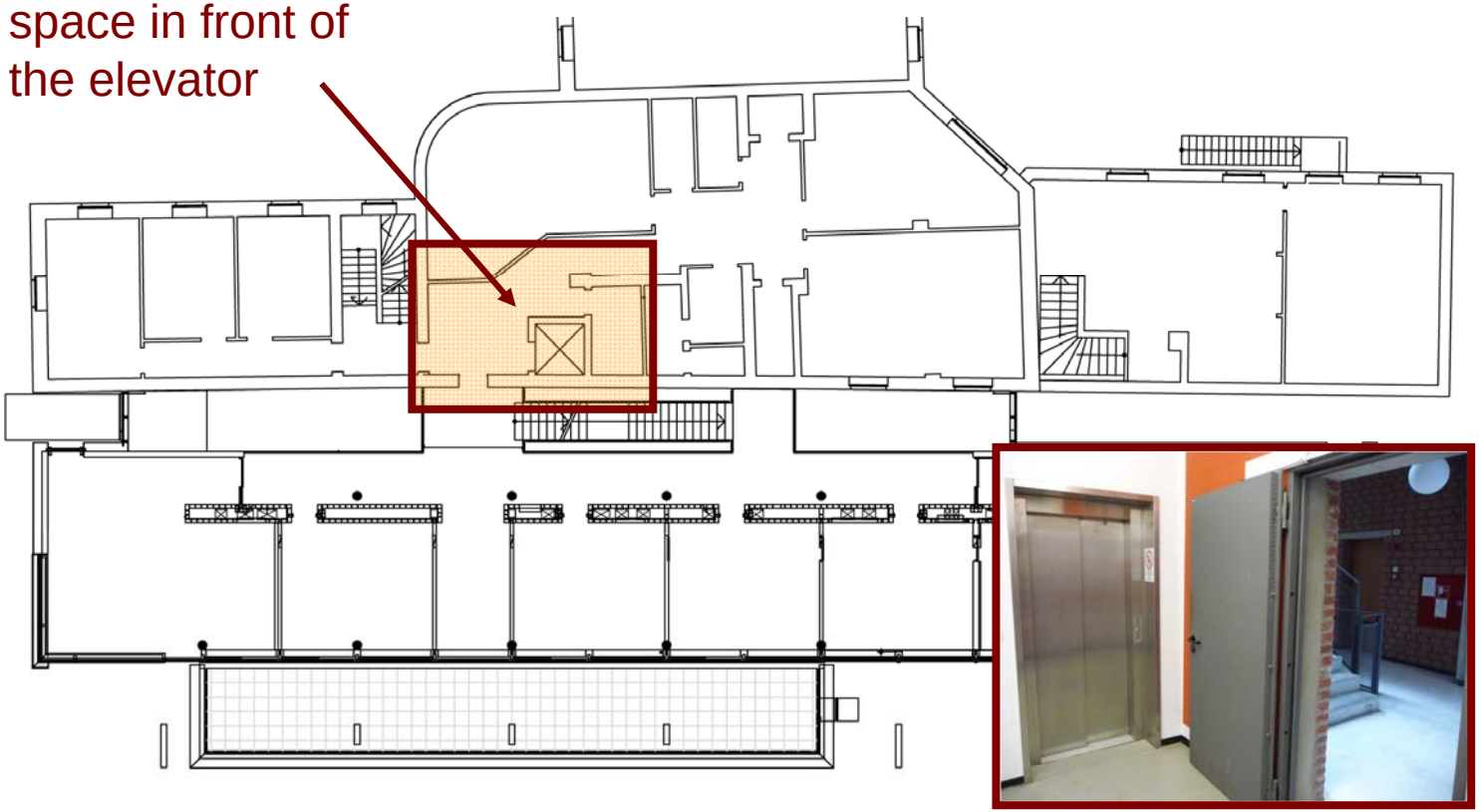
OPEN HOUSE Baseline (Pilot Version)

Manual for documentation

Example: Indicator „2.1 Barrier-free accessibility” (Social-functional Quality)

Documentation

more than 150*150 space in front of the elevator



OPEN HOUSE Baseline (Pilot Version)

Manual for documentation

Example: Indicator „2.1 Barrier-free accessibility" (Social-functional Quality)
Glossary

Glossary of terms:

- **barrier free:** barrierefrei
- **not barrier free:** nicht barrierefrei: gesamt: total
- **net floor area:** NGF
- **% accessible parts of the net floor area:** Anteil der barrierefreien Bereiche an NGF

Now we are ready for SUPER, PERFECT und OPEN buildings!

R 2.09	Halle	67,78	
barrierfrei gesamt:		1281,50	
nicht barrierefrei gesamt:			135,69

NGF 1732 m²

Anteil der barrierefreien Bereiche an NGF: 73,99%