

Sustainable Buildings

1. Introduction
2. The German approach
3. The assessment procedure for construction products

Dr.-Ing. Doris Kirchner

1. Introduction

Conference in Rio de Janeiro: Agenda 21



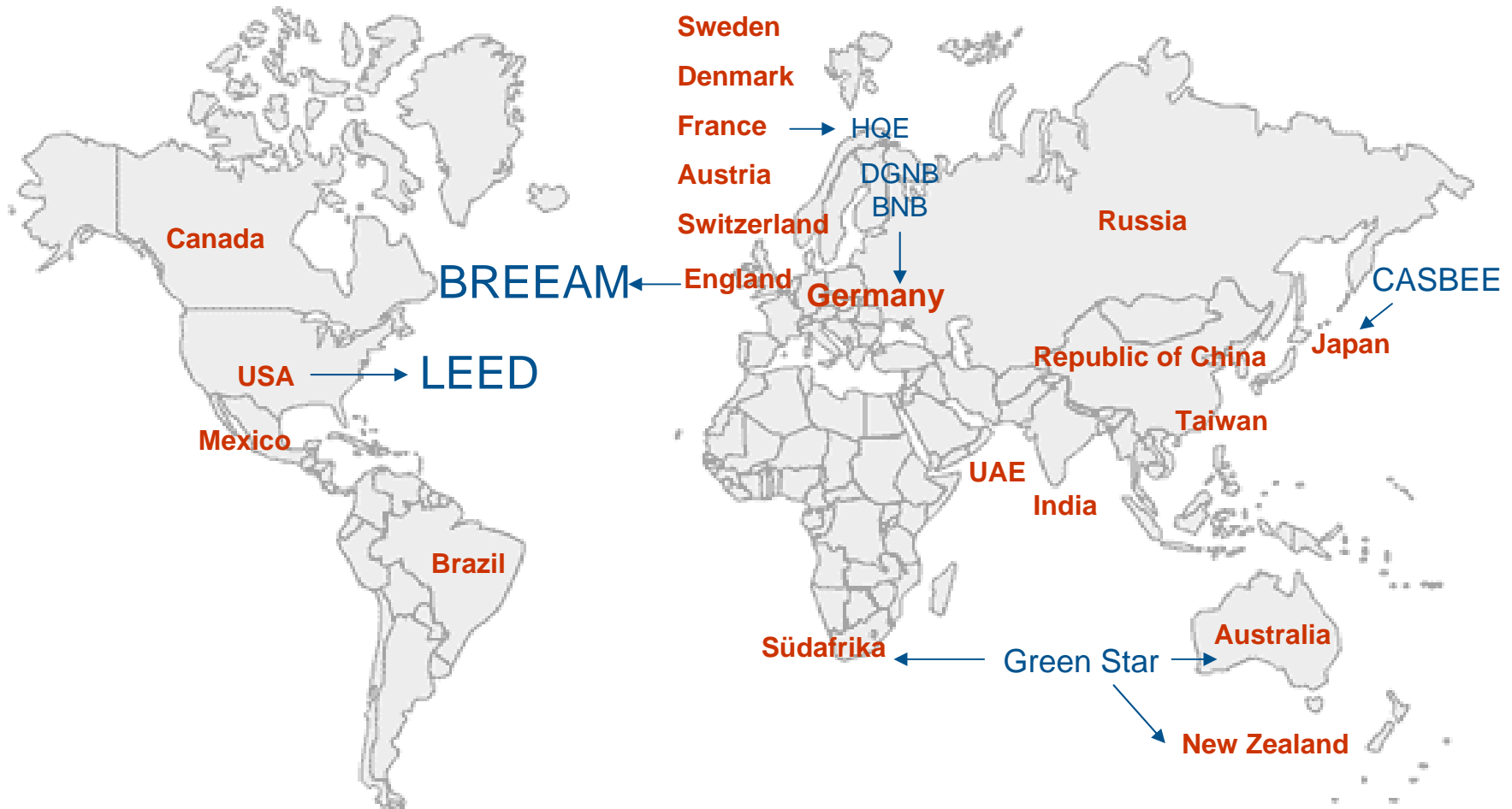
1. Introduction

Why it is important to devote the sustainability in the field of construction works?

- Buildings account for the largest share of the total energy consumption (42%).
- Buildings produce about 35% of all greenhouse emissions.

1. Introduction

Assessment and certification systems worldwide



Sustainable Buildings

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2. The German approach

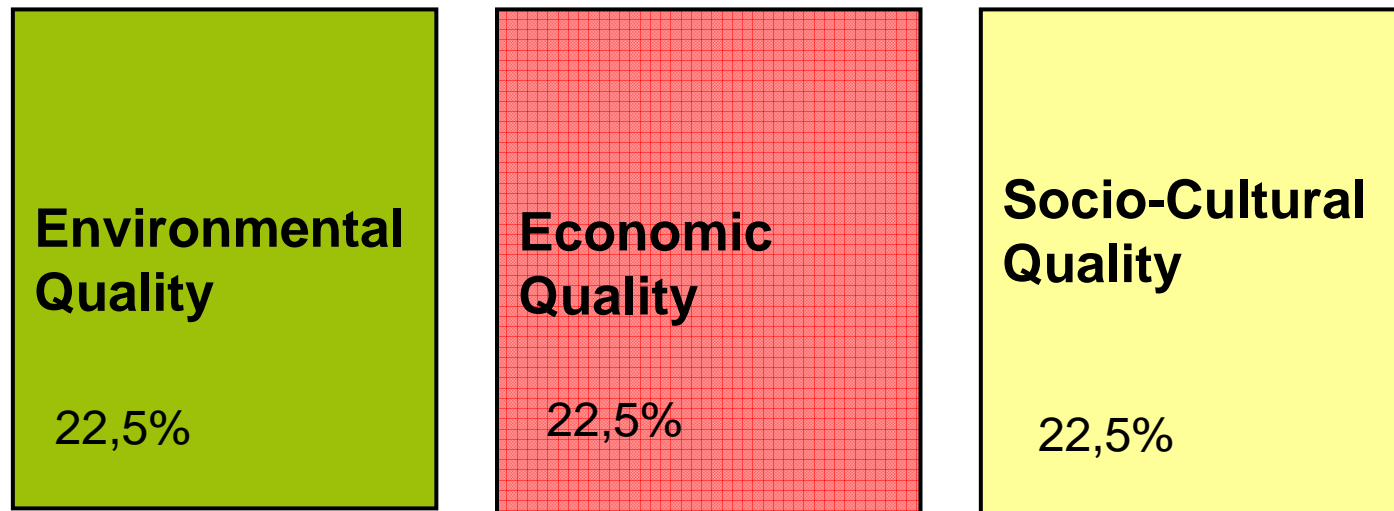
Developing an assessment and a certification system in Germany:

- Ministry of Transport, Building and Urban Development
- DGNB –
Deutsche Gesellschaft Nachhaltiges Bauen =
German Sustainable Building Council



2. The German approach

Principles of the assessment and certification system:



Technical quality 22,5%

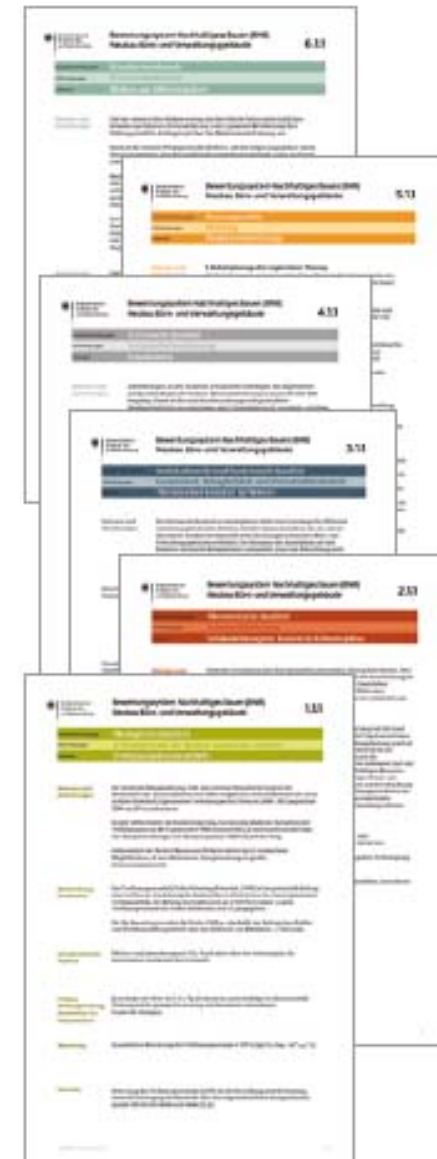
Process quality 10,0%

Location

2. The German approach

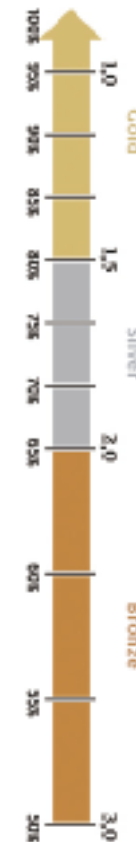
Criteria documents:

- Environmental Quality: 11
- Economic Quality: 2
- Social Quality: 15
- Technical Quality: 6
- Process Quality: 5
- Location: 6
- In total: **46***



2. The German approach

Performance based scoring



2. The German approach

Awarded buildings



Building of the
Federal Agency for
the Environment
in Dessau



„Paul-Wunderlich-Haus“
Administration of the city Eberswalde



Deutsches
Institut
für
Bautechnik

DIBt

Retailing building
in Berlin

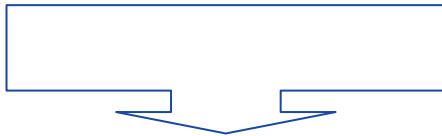


„Deutsche Bank“ in
Frankfurt/a.M.



„Thyssen Krupp“ - Headquarter in Essen

2. The German approach



Nachhaltiges
Bauen

only for governmental buildings

www.nachhaltigesbauen.de

Deutsches
Institut
für
Bautechnik

DIBt



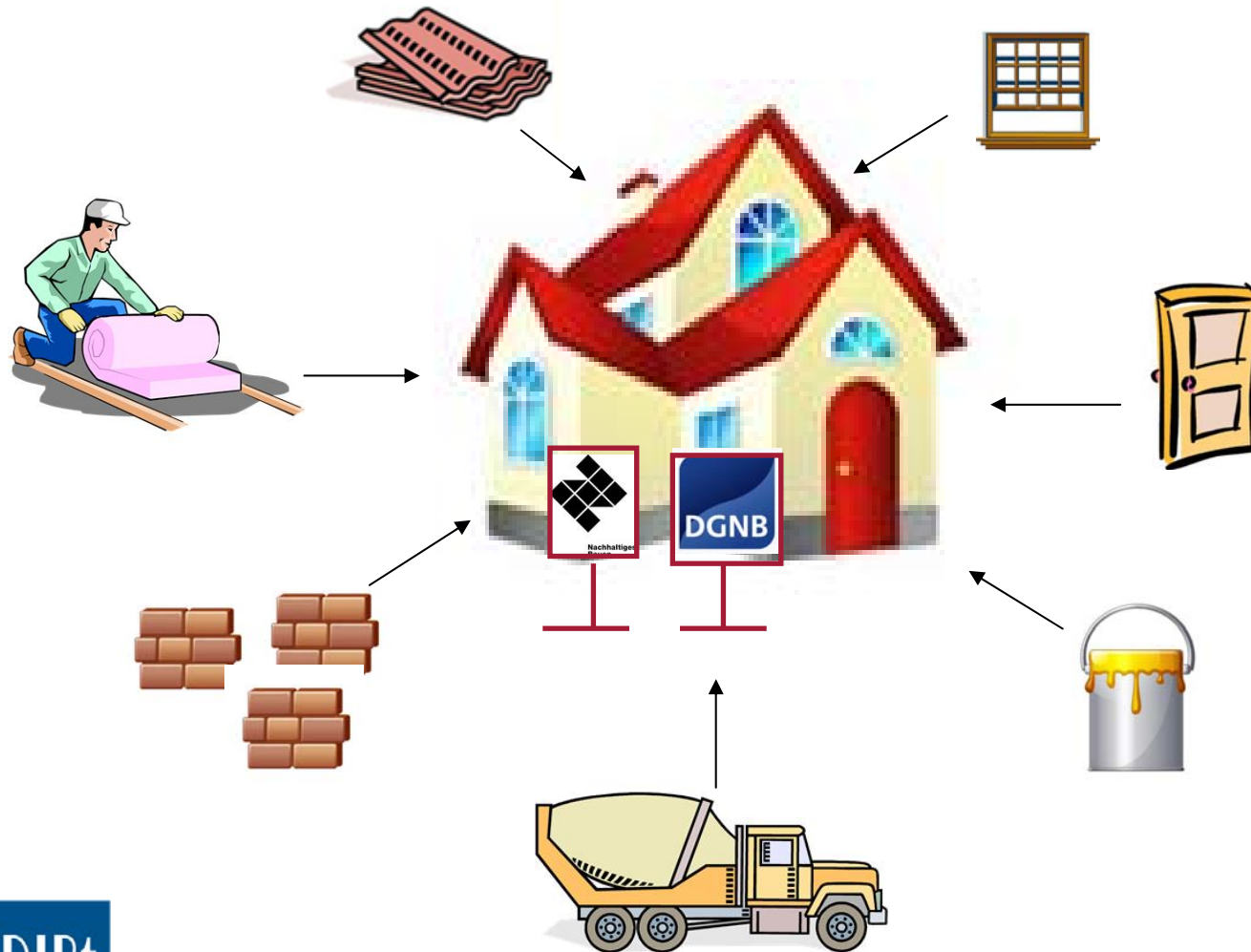
for all buildings

www.dgnb.de

Sustainable Buildings

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3. The assessment procedure for construction products

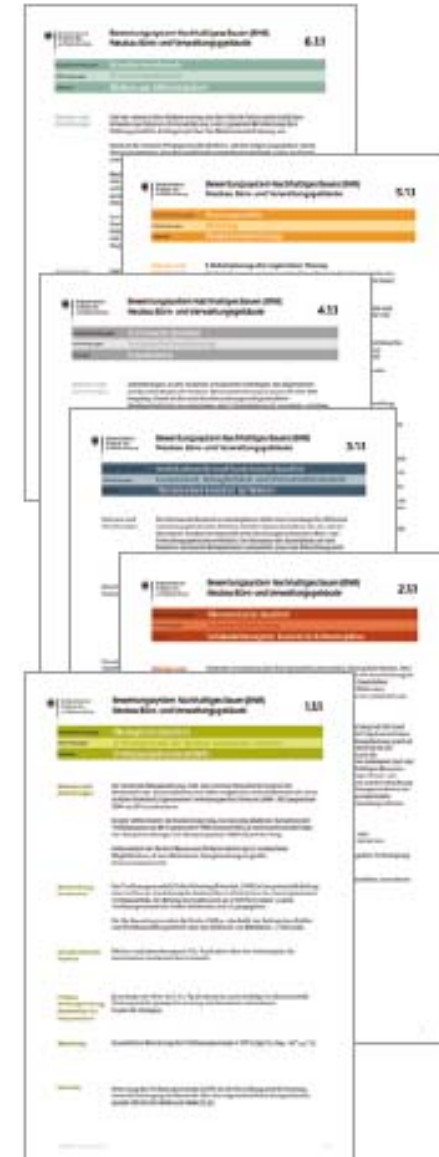


3. The assessment procedure for construction products

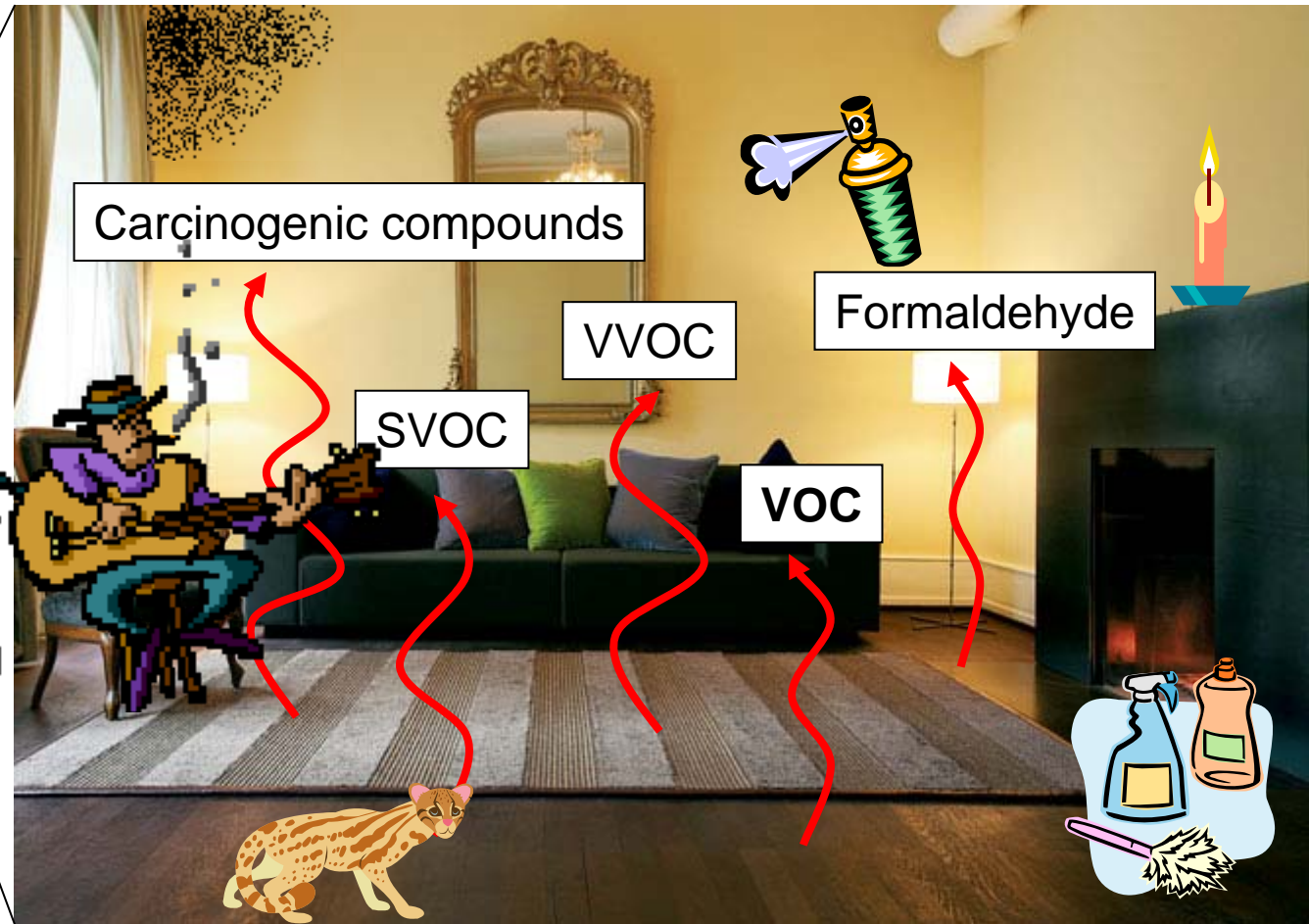
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Good indoor air quality!



3. The assessment procedure for construction products



3. The assessment procedure for construction products

Indoor air pollution leads to health consequences

- Asthma and allergies
- Respiratory disease
- Irritation
- Reproductive defects
- Neurological disease
- Cardiovascular disease
-



Photo: A healthier home – but how? Brochure of the “Umweltbundesamt”, Berlin 2005

3. The assessment procedure for construction products



Source: Frank Kuebart, eco, Köln



Dimensions:

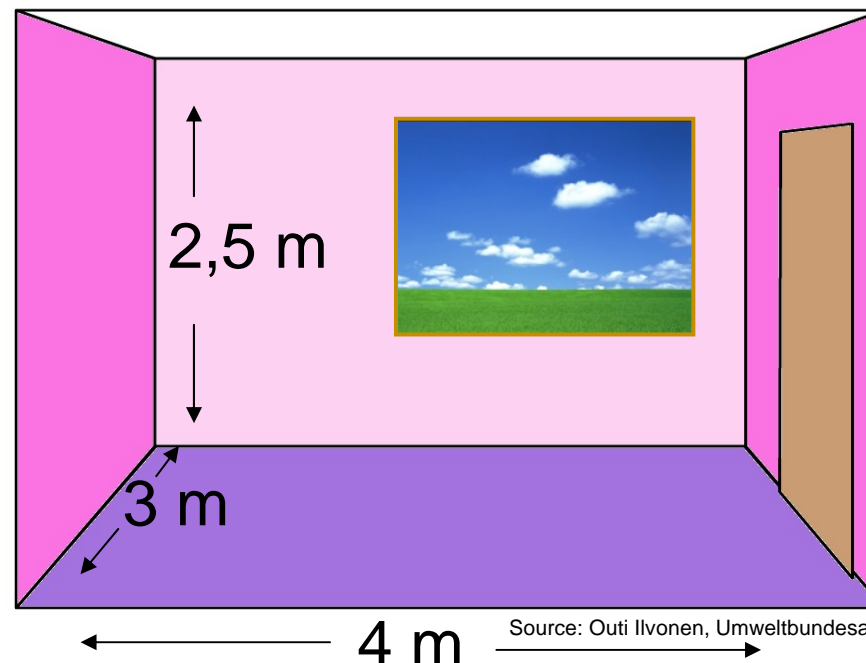
floor: 12 m²

ceiling: 12 m²

walls: 31,4 m²

1 door – 1,6 m²

1 window – 2 m²



Volume:

30 m³

Ventilation rate:

0,5 h⁻¹

Temperature:

23° C

Humidity:

50%

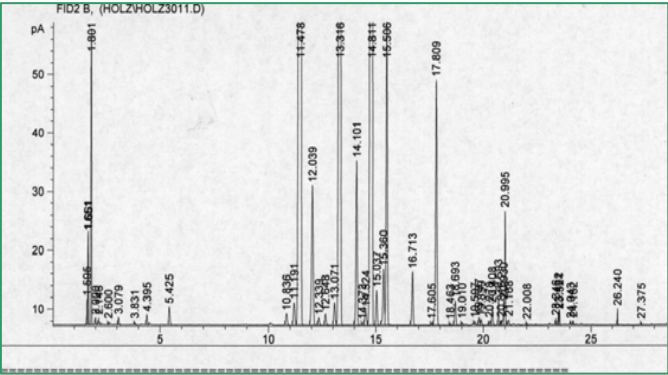
Carcinogenic compounds

Formaldehyde

VVOC

SVOC

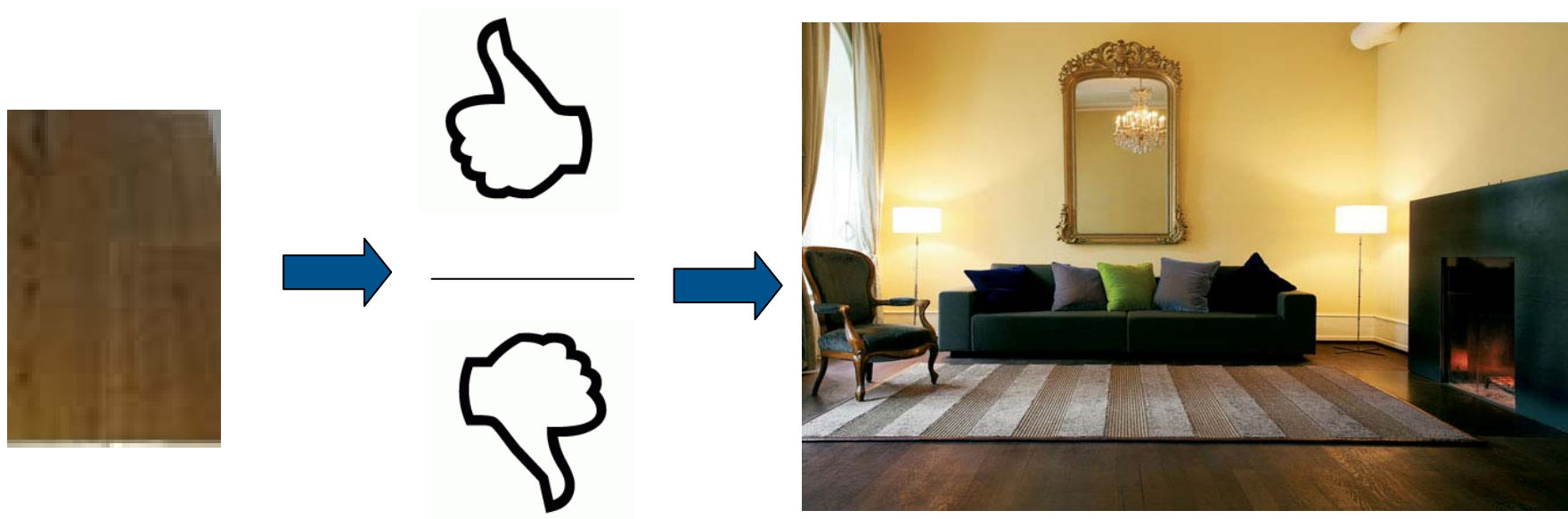
VOC



Assessment



3. The assessment procedure for construction products



3. The assessment procedure for construction products

- Only those construction products are allowed to be used in sustainable buildings which have been tested and assessed on VOC emissions.
- That means that the architect has to design the building with low emitting construction products.
- In the frame of the German system it is regulated that a control measurement has to be carried out.

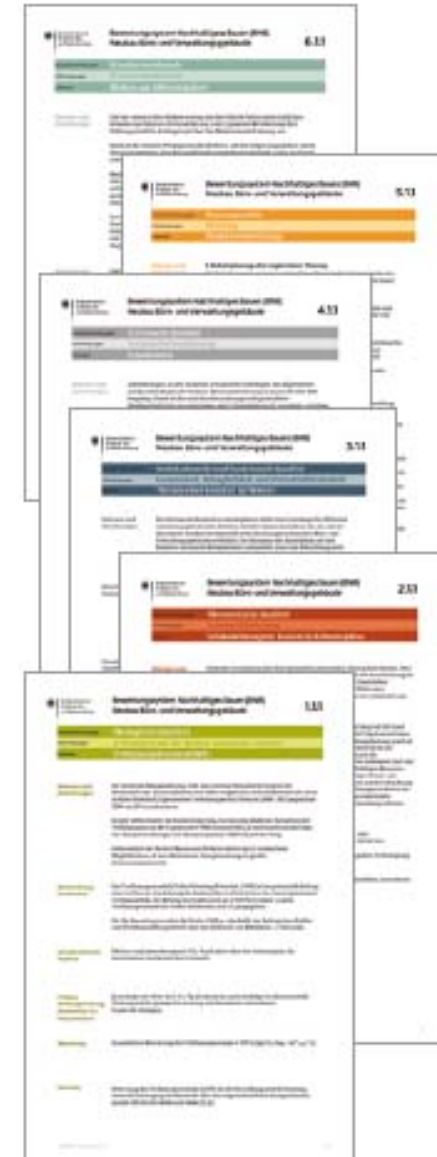


Photo: Bremer Umweltinstitut

3. The assessment procedure for construction products

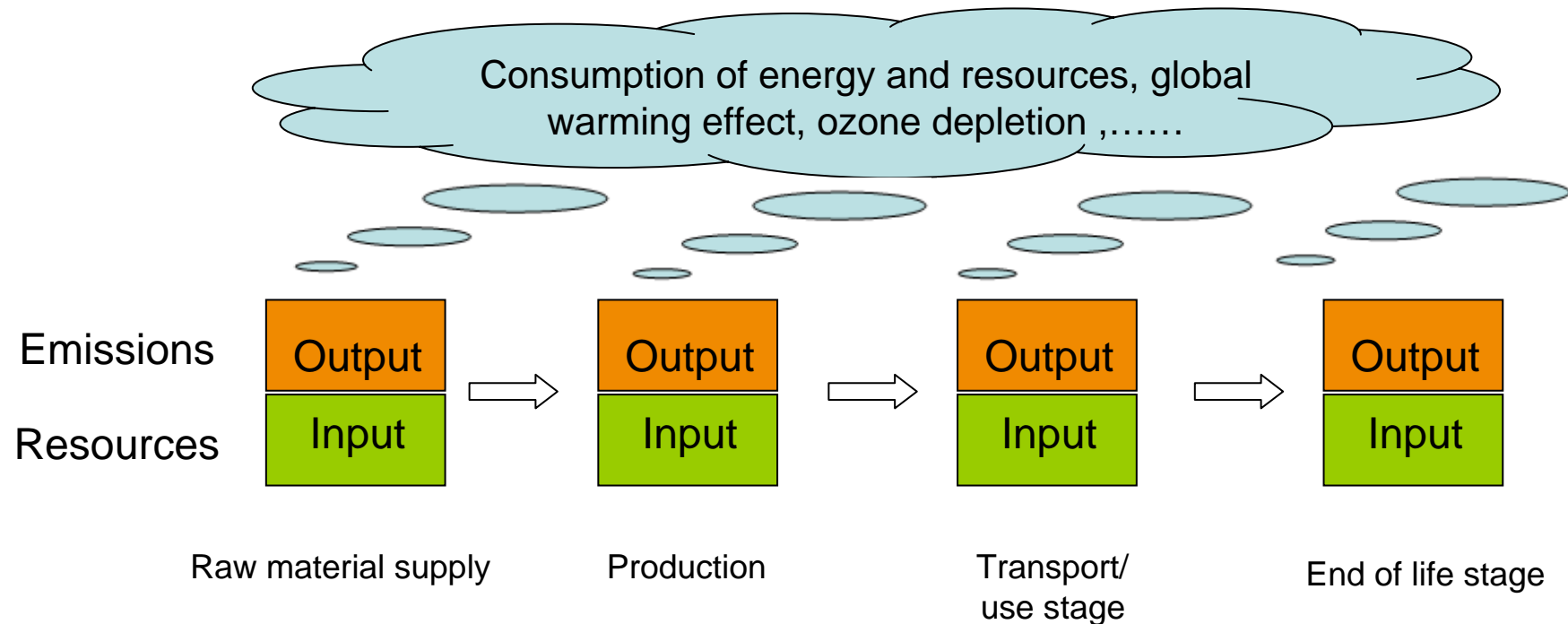
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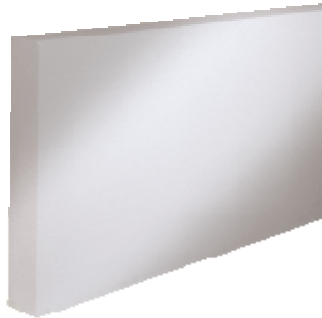
3. The assessment procedure for construction products

Life cycle analyse



From cradle to grave

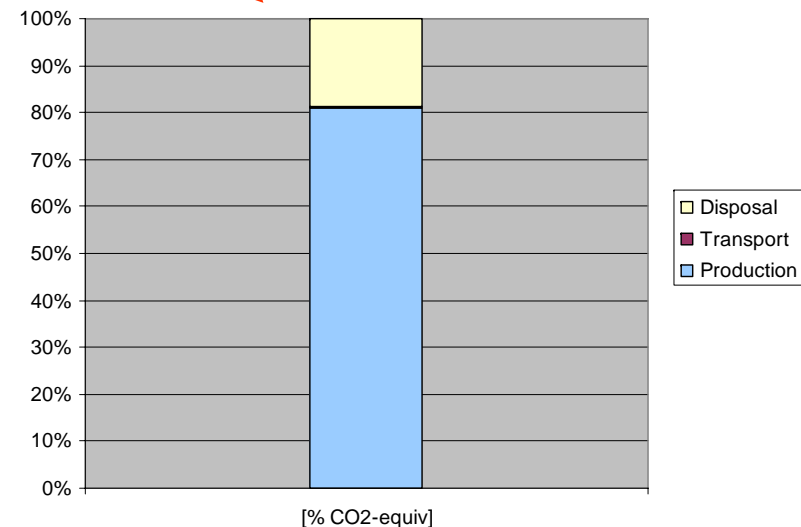
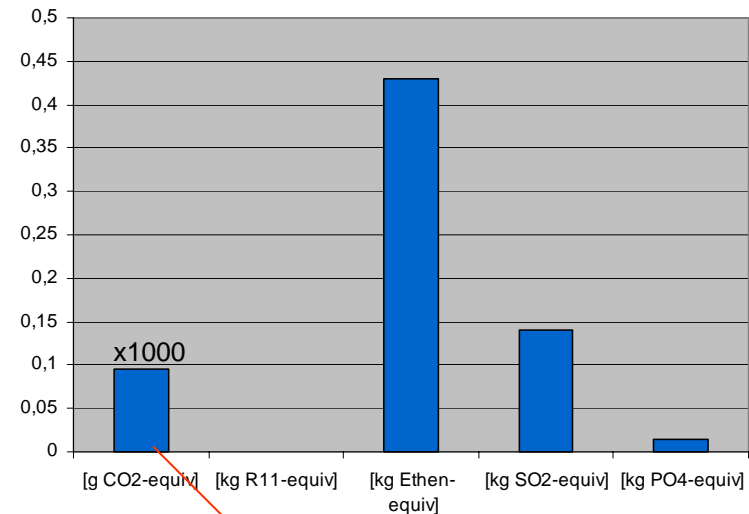
3. The assessment procedure for construction products



1 m³ Polystyrene insulation material

	Unit	Total
Global warming potential	[kg CO ₂ -equiv]	96
Ozone depletion potential	[kg R11- equiv]	0,000001
Photochemical ozone creation potential	[kg Ethen- equiv]	0,43
Acidification potential	[kg SO ₂ -equiv]	0,14
Eutrophication potential	[kg PO ₄ -equiv]	0,014
Primary energy requirements, not renewable	[MJ/m ³]	1829,3
Primary energy requirements, renewable	[MJ/m ³]	7,2

Data in accordance to an EPD, issued by Institut Bauen und Umwelt (IBU), Königswinter



3. The assessment procedure for construction products

- Only those products should be used which have a low impact on the environment, e.g. low emission of greenhouse gases.
- Regarding energy efficiency the construction product (in this case: the insulation material)



Photo: Umweltbundesamt Dessau

- should have a low heat conductivity (U-value) in parallel.
- The architect has to find the right balance between environmental, economic, technical demands and social aspects.

Thank you very much
for your attention!



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