

# Sustainable and Energy Efficient Building in Germany

## New Standards for Federal Buildings

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Supported by:



on the basis of a decision  
by the German Bundestag

## Profile

### Research

- ▶ Development of Assessment System Sustainable Building (BNB)
- ▶ Research Projects acc. to Sustainable Building (LCA, LCC, tools, ...)



### Praxis

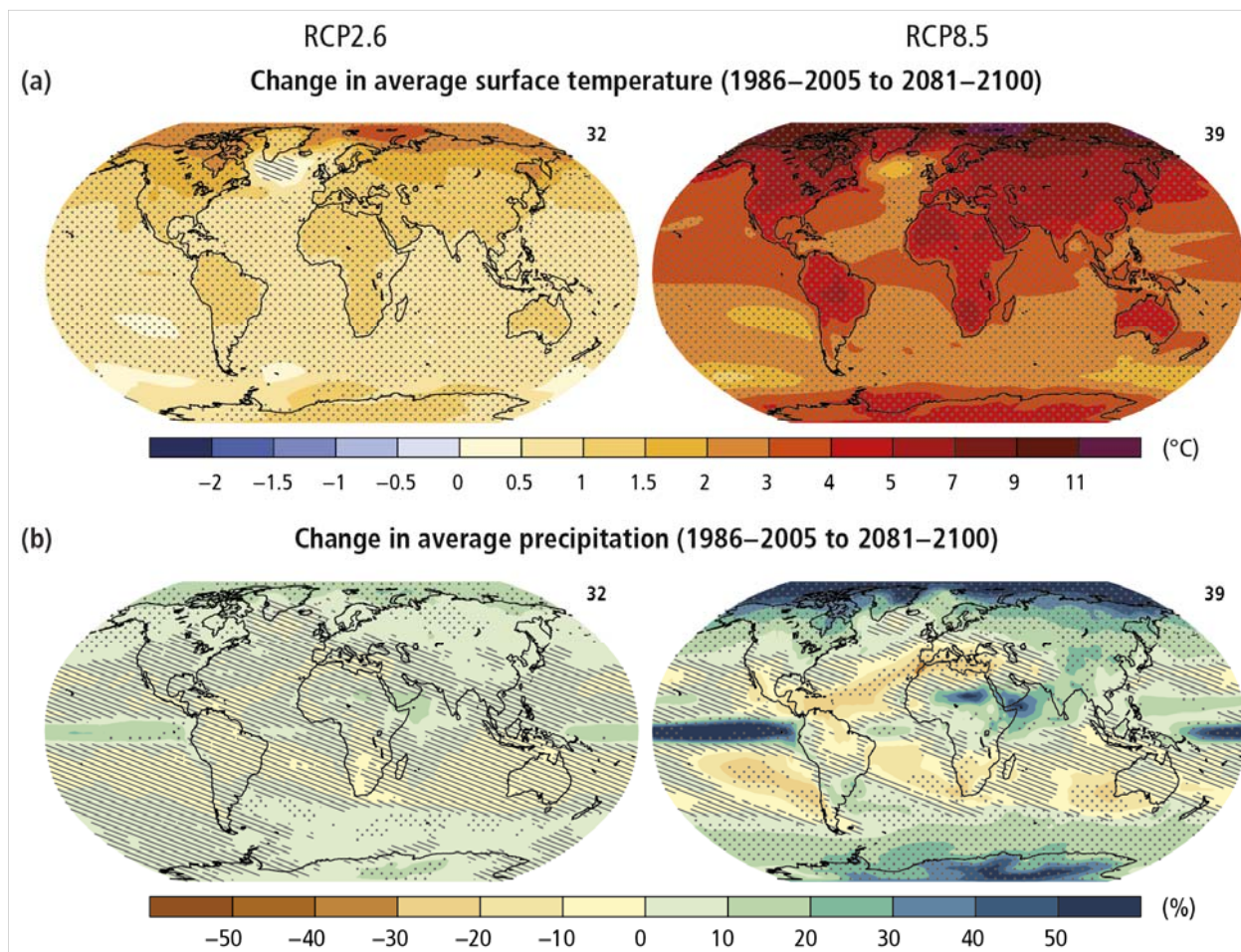
- ▶ Audits
- ▶ Consulting and Coordination for Federal Buildings
- ▶ Conformity Testings for Federal Buildings
- ▶ Surveyor for Sustainable Building in Planning Competitions



### Transfer of Knowledge

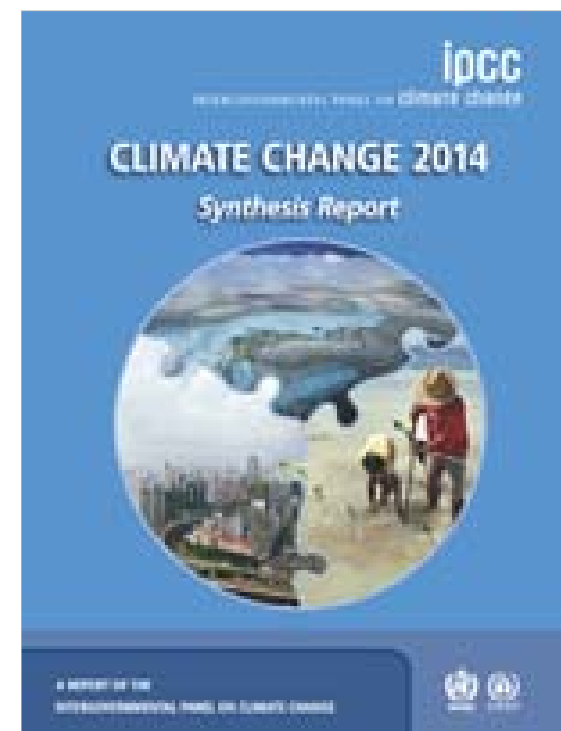
- ▶ Training Courses „Sustainable Building for Federal Administration“
- ▶ Training Courses “Sustainable Building for Architects and Engineers” (Chambers)
- ▶ Lectureship „Ecological Building“ at Beuth University Berlin

## Framework Conditions: Climate Change



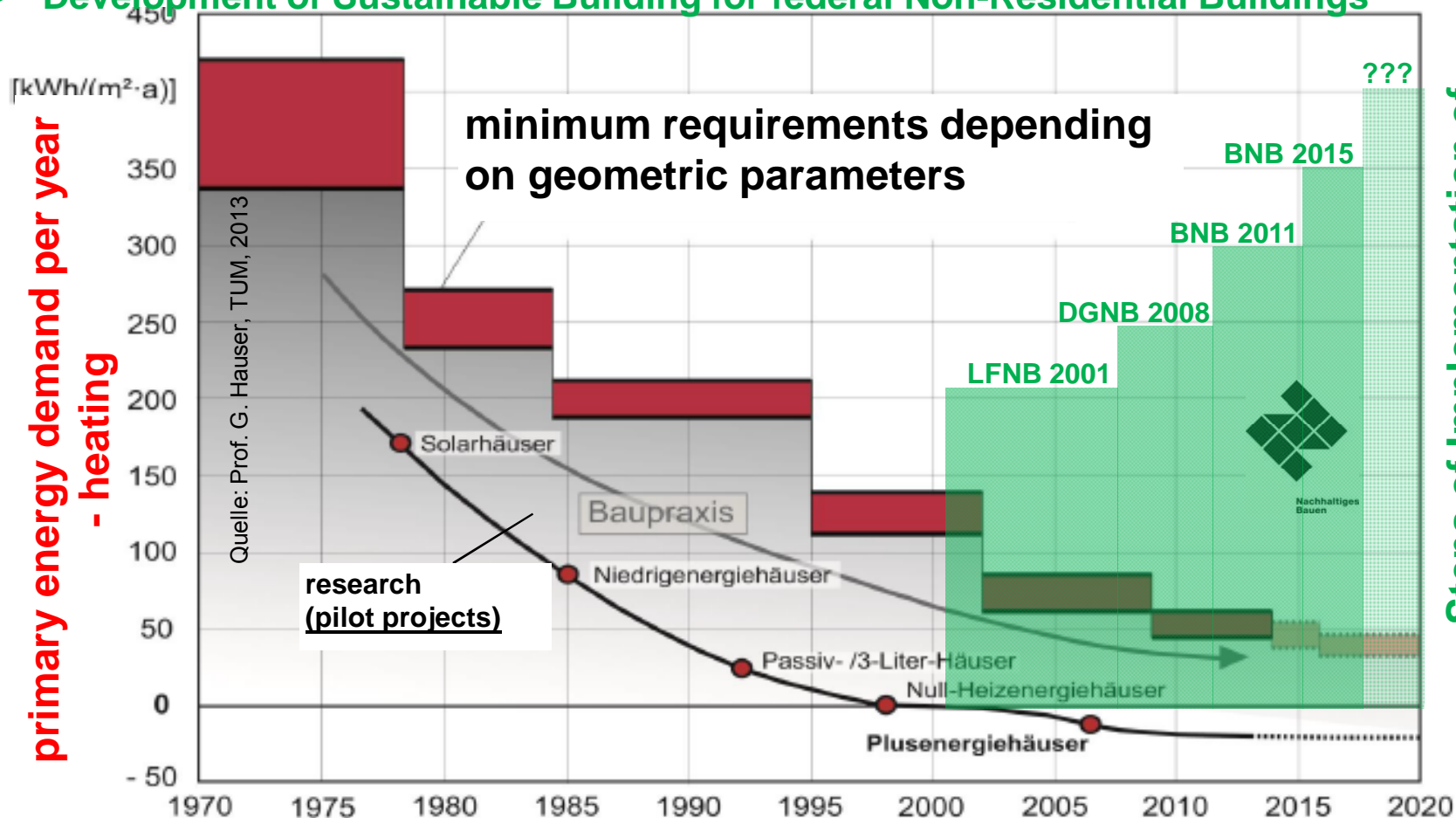
Intergovernmental Panel on Climate Change (IPCC)

[www.ipcc.de](http://www.ipcc.de)



# Sustainability Strategy of the Federal Government

- ▶ Development of Energy Efficient Building for Residential Buildings
- ▶ Development of Sustainable Building for federal Non-Residential Buildings



Steps of Implementation of Sustainable Requirements for Federal Projects

## „Efficiency House Plus“ Network of Pilot Projects in Germany





## Sustainability for Federal Buildings: New Edict acc. to the Implementation of BNB

### Basic Requirement

The Guideline Sustainable Building has to be considered in all federal building projects.



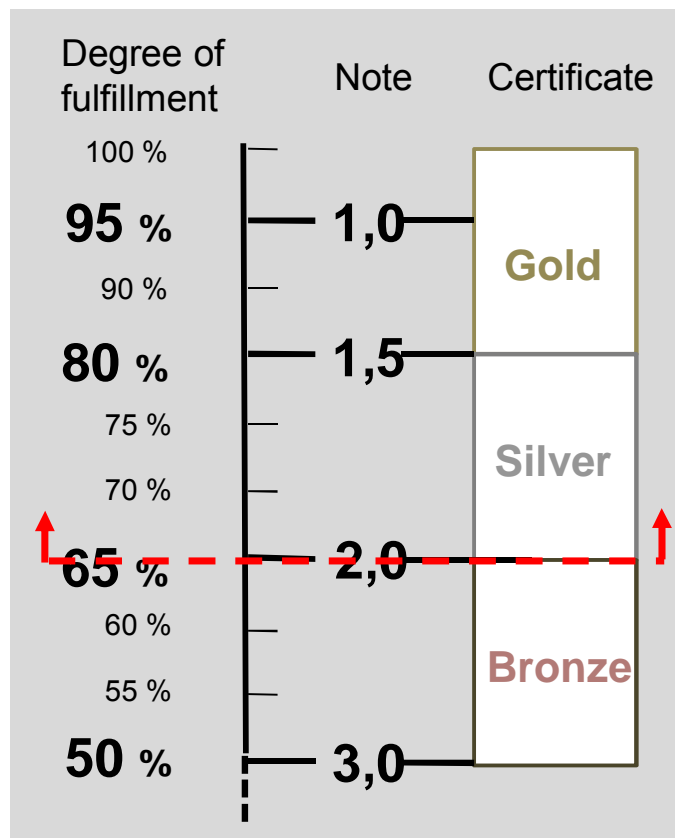
### Minimum Requirement „BNB-Silver“ for civil Building Projects

- |                                       |                  |              |
|---------------------------------------|------------------|--------------|
| ▶ Office and Administration Buildings | – New Building   | ( > 2 Mio €) |
| ▶ Office and Administration Buildings | – Reconstruction | ( > 2 Mio €) |
| ▶ Schools and Universities            | – New Building   | ( > 2 Mio €) |
| ▶ Laboratories and Research Buildings | – New Building   | ( > 2 Mio €) |
| ▶ Outdoor Facilities                  | – New Building   | ( > 250 T€)  |

### Minimum Requirement „Analogous Utilisation of BNB“ for

- ▶ all other Building Projects (civil)

## Sustainability for Federal Buildings: New Quality Standard for Federal Buildings



**in 2017: more than 330 BNB-Projects**



## BNB (Assessment System for Sustainable Building) Main Criteria Groups





## BNB Criteria and Indicators

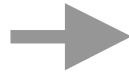
Ecological  
Quality



10 Criteria:

**Energy**, Ecobalance - LCA, Pollutants,  
**Water**, Terrain, **Wood**

Economical  
Quality



3 Criteria:

**Life Cycle Costs**,  
Space Efficiency, Adaptability

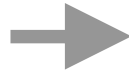
Sozio-cult. +  
funct. Quality



12 Criteria:

Building Physics, **Health (VOC)**, Acoustics,  
Daylight, **Accessibility**, Competitions

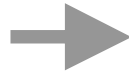
Technical  
Quality



6 Criteria:

Sound and Heat Insulation, **Cleaning**,  
**Recycling**

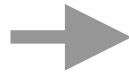
Process  
Quality



8 Criteria:

**Integral Planning**, Concepts,  
Quality Management, Documentation

Location  
Characteristics

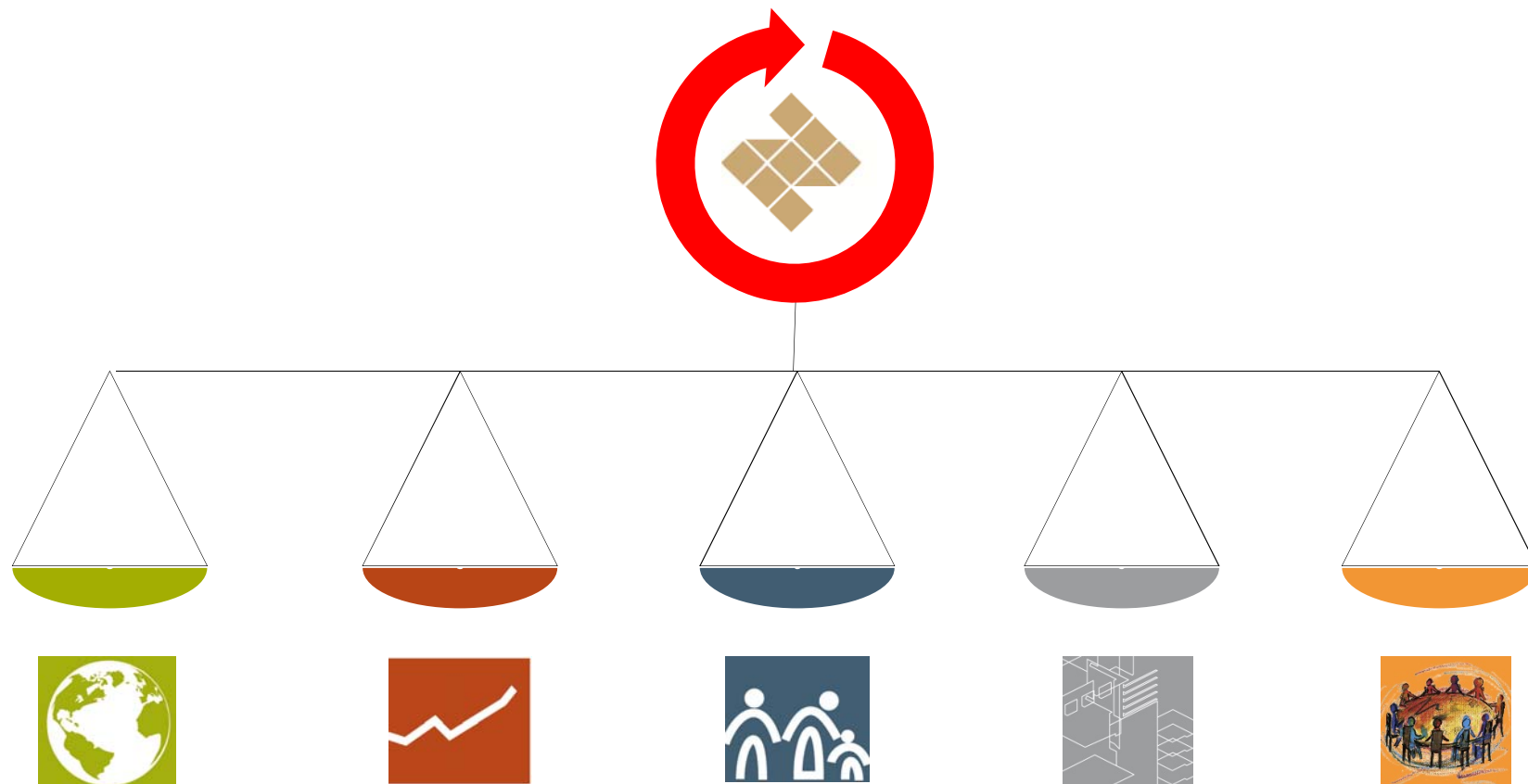


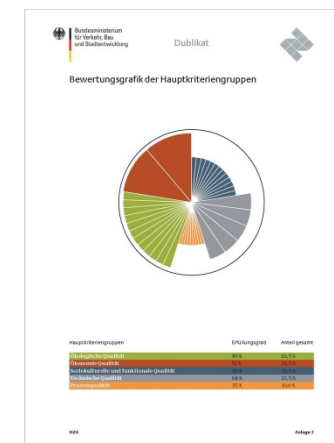
6 Criteria:

Risks and Qualities,  
Transport Connection, Utilities

# BNB

## Holistic Approach in Life Cycle





# Federal Ministry of Education and Research (BMBF) Berlin Innovative Energy Concept and „BNB-Gold“



source: Heinle, Wischer und Partner



## BMBF Berlin Energy Concept / Optimized Envelope / PV / Fuel Cell



## BMBF Berlin Comfort





## BMBF Berlin Accessibility



## Federal Environment Agency, Berlin (UBA\_2019) „Zero Energy Building“ and „BNB-Gold“



source: UBA

UBA\_2019

Pre-Fabrication: short Building Time, Ensuring high Quality

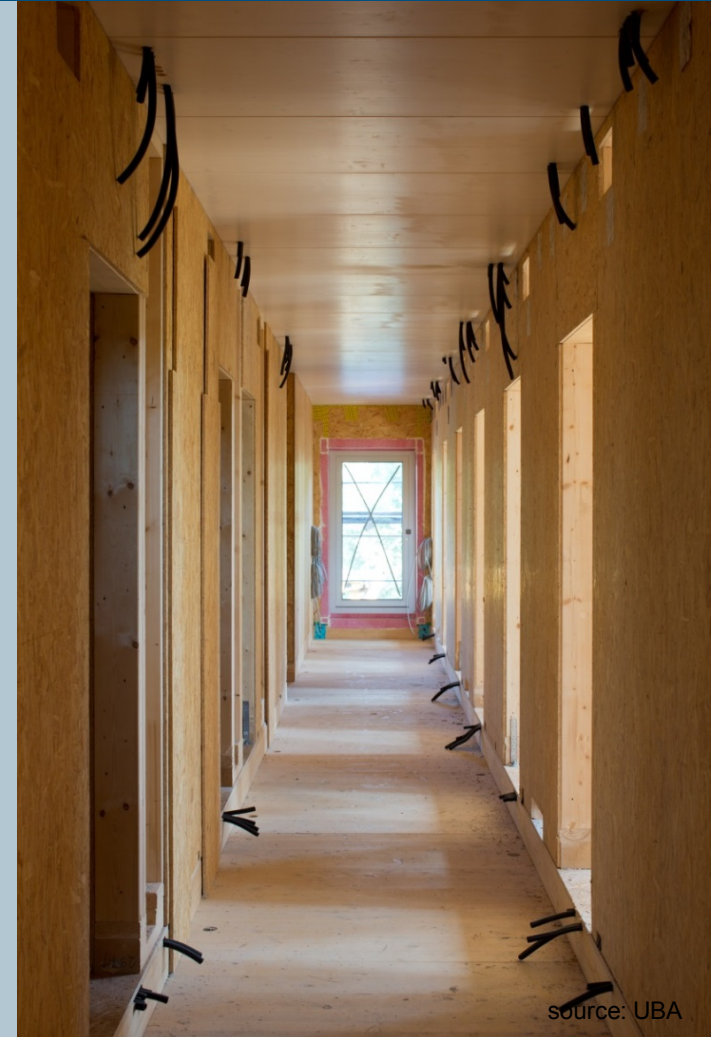
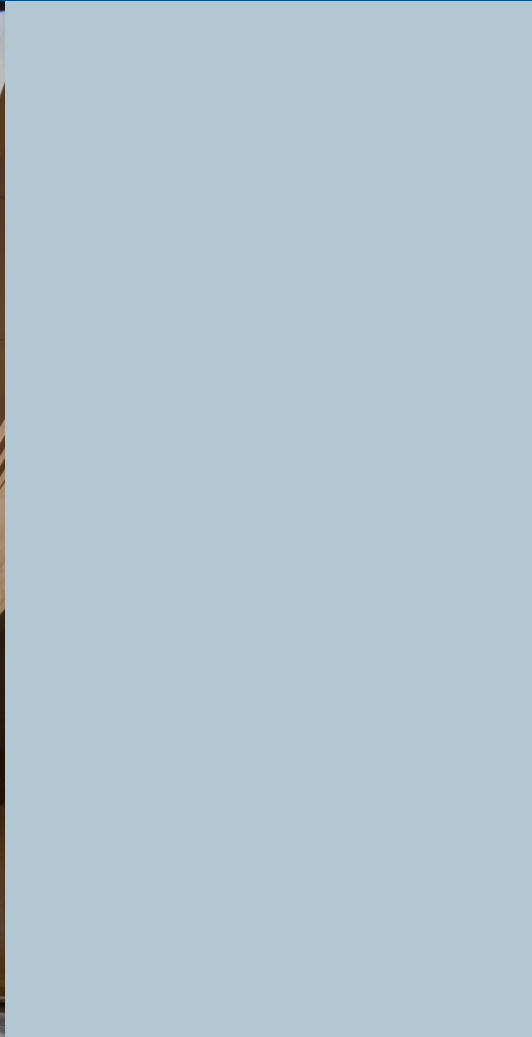


source: UBA



UBA\_2019

## Timber Construction: Renewable Resources, Optimization of LCA



source: UBA

UBA\_2019

## Energy Concept: Renewable Energy with PV



source: UBA

UBA\_2019

## Energy Concept: Groundwater Heat Pump for Heating + Cooling



source: Andreas Meichsner; BBR



## Using Energy Demand: 75,4 kWh/(m<sup>2</sup> a)

Category	Percentage
Photovoltaik	33 %
Büroausstattung	24 %
Beleuchtung	13 %
Lüftung	12 %
Heizung + WW	11 %
Hilfsstrom/zentrale Dienste	4 %
Kühlung	2 %

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## UBA Dessau “Zero-Energy-Building” with Aim “BNB-Gold”



source: Anderhalten Architekten



## Elementary School Hohen Neuendorf „Plus Energy Building“ and „BNB-Gold“





# „Futurium“ Berlin Innovative Energy Concept with Aim „BNB-Gold“



# UN Campus Bonn “Passivhaus” Building with Aim BNB-Gold



source: Presentation „Bürgerinformationsveranstaltung zum vorhabenbezogenen Bebauungsplan Nr. 6720-1, 04.06.2014 in Bonn; BBR, BlmA

## Support Programmes

[www.forschungsinitiative.de](http://www.forschungsinitiative.de) [www.kfw.de](http://www.kfw.de)

### Support Programme for Sustainable and Affordable Student Housing (120 Mio € in total)

- ▶ 70.000,- € for research and certification
- ▶ up to 500,- € / m<sup>2</sup> living space



### Support Programme for Plus Energy Schools

- ▶ up to 150,- € / m<sup>2</sup> for research, innovation and monitoring
- ▶ up to 100% for BNB-certification costs (blower door etc)



### Support Programme of KfW for Energy Efficient Refurbishment of Private Housing (Planning)

- ▶ subsidy for certification of sustainable building
- ▶ subsidy for energy-efficient planning





Thank you very much for your attention !

- ▶ **Guideline Sustainable Building**
- ▶ **Broschure Assessment System Sustainable Building**
- ▶ **Broschure Sustainable Building**
- ▶ **Guideline Accessibility in Building Design**
- ▶ **Energy Efficiency – Made in Germany**

[www.nachhaltigesbauen.de](http://www.nachhaltigesbauen.de)

parts in english

