

# Energy Efficiency and Historic Buildings in Germany



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## Introduction

In the times of impending climate change and growing consciousness about sustainability and CO<sub>2</sub>-reduction the fields of heritage preservation and energy efficiency are touching each other more and more often. Restoration measures usually have a strong impact on authentic structures. People living in historic buildings have contemporary demands on comfort and energy use when it comes to questions about usage. On the other hand it is important to respect the interests and ideas of heritage preservation when thinking about improving energy efficiency in a historic building.

**The Venice Charter** sets the corner stones for any kinds of active restoration measures on historic building structures or works of art.

### INTERNATIONAL CHARTER FOR THE CONSERVATION AND RESTORATION OF MONUMENTS AND SITES

#### **Preface**

**“Imbued with a message from the past**, the historic monuments of generations of people remain to the present day as **living witnesses** of their **age-old traditions**.

People are becoming more and more conscious of the unity of human values and regard ancient monuments as a **common heritage**.

The common responsibility to **safeguard them for future generations** is recognized.

It is our duty to hand them on in **the full richness of their authenticity**“.

#### **Article 9**

**“The process of restoration is a highly specialized operation.**

Its aim is to preserve and reveal the aesthetic and historic value of the monument and is based on **respect for original material and authentic documents**.

It must stop at the point **where conjecture begins**, and in this case moreover any extra work which is indispensable must be distinct from the architectural composition and must bear a contemporary stamp”.

#### **Article 10**

**“Where traditional techniques prove inadequate, the consolidation of a monument can be achieved by the use of any modern technique for conservation and construction, the efficacy of which has been shown by scientific data and proved by experience”.**

## Heritage preservation theory vs. energy efficiency

Theory of heritage preservation has a long tradition in Germany. Important works have been written on the topic in the early 20<sup>th</sup> century by Georg Dehio and by Alois Riegl, e.g. The value of a historic monument is also described by Gottfried Kiesow in the following way:

### **Denkmalwert – The Value of a Historic Monument**

- I. Urbanistic Value** for a townscape (ensemble, street or place) or landscape
- II. Value for Settlement- or Social History** (e. g. position in the town layout)
- III. Artistic Quality of all Parts of the Architecture**  
Dimensions, building material and workmanship, ornamental design
- IV. Quality of the Interieur**  
Room proportions, sequence of rooms, lighting, decorations, colour
- V. Value as a Source for Heritage Science**  
e. g. construction, materiality of mortar, plaster, colours of the interior and exterior
- VI. Marks of History**  
Change of a building with all its different uses, fate of its Inhabitants, historic evidence → „Patina“

Source: Gottfried Kiesow: Eine Einführung in die Denkmalpflege, 1982

Regarding energy efficiency especially the values III. to VI. are of special interest. The artistic quality of all parts of the architecture also refers to craftsmanship when it comes to plaster or 3-dimensional ornaments like stucco of a building. Measures like insulation of exterior walls might also affect the quality of the Interieur, like interior decorations or the lighting. All authentic parts of a building that are irreversible destroyed of course also lead to a loss of value for heritage science. The marks of history, the “Patina”, will also be changed whenever active restoration measures on a façade are carried out.

These values have to be taken into account whenever addressing the issue of measures at a historic building.

## Positions on energy efficiency and heritage preservation in Germany

There are in general many different opinions regarding energy efficiency and its application / implementation in historic buildings in Germany, depending on regions, on profession and on the value of the buildings. While in some regions in Germany use of solar power is tolerated, in others it is absolutely out of question when it comes to listed buildings.

In general the heritage preservation authorities try to preserve buildings as good as possible in their authentic form and materiality. Individual solutions are wanted and individual energy consultancy is preferred to overall standards and regulations setting values for energy use in these buildings.

(see also article: Stehen Denkmalschutzaufgaben im Widerspruch zur Energieeffizienz? [Are the regulations in heritage preservation in contradiction to energy efficiency?], Dr.-Ing. Architektin Roswitha Kaiser, Leipzig 2008)

## Active institutions in Germany

The following list is given at the current state of knowledge and can not cover all active institutions. For comments or additions please write to [tor.brostrom@hgo.se](mailto:tor.brostrom@hgo.se)

- State Offices for preservation (VDL)
- Information Centres
- Crafts and Heritage Preservation
- Research funding
- Administration / State
- Research Institutes / Universities
- Foundations

### State offices for preservation (VDL)

#### **VDL AK Bautechnik (Working Group Building Construtions)**

The Vereinigung der Landesdenkmalpfleger (VDL) is a union of the different state administrations for monument preservation of the 16 Bundesländer (german federal states). The VDL AK Bautechnik (Working Group Building Construtions) is a joint initiative of representatives that focus their work rather on building issues than on historical ones. They meet regularly, organize conferences and take influence on legal questions like the building legislation where it concerns heritage preservation, e.g. there is an exception for historic, listed buildings in the German energy efficiency standards (EnEV).

<http://www.denkmalpflege-forum.de/>

## **bine**

BINE is a state funded information service for the field of energy research.

“BINE Information Service – putting energy research into practice

The BINE Information Service reports on energy research topics, such as new materials, systems and components, as well as innovative concepts and methods. The knowledge gained is incorporated into the implementation of new technologies in practice, because first-rate information provides a basis for pioneering decisions, whether in the planning of energy-optimised buildings, increasing the efficiency of industrial processes, or integrating renewable energy sources into existing systems.”

<http://www.bine.info>

<http://www.bine.info/en/topnavigation/bine/>

(English)

## **dena**

One main aspect of dena is dissemination on aspects of energy efficiency. dena also created a document on heritage preservation and energy efficiency.

“The Deutsche Energie-Agentur GmbH (dena) – the German Energy Agency – is a centre of expertise for energy efficiency and renewable energy sources. It focuses on the development of sustainable energy systems which make optimum use of energy and integrate renewable energy sources. dena’s mission is to generate economic growth and maintain prosperity with ever lower energy inputs.”

dena is working in the fields of:

- Energy-Efficient Buildings
- Renewable Energies
- Energy Systems and Energy Services
- Energy-Efficient Transport Systems
- International Cooperation

“dena was established in the autumn of 2000 with its head office in Berlin. Shareholders in dena are the Federal Republic of Germany, KfW Bankengruppe, Allianz SE, Deutsche Bank AG and DZ BANK AG. [...] It finances its projects primarily by means of Public Private Partnerships (PPP).”

<http://www.dena.de/en/infos/about-dena/>

Publications:

<http://www.dena.de/en/infos/publications/> (English)

<http://www.dena.de/de/infos/publikationen/> (German)

<http://www.zukunft-haus.info/en>

<http://www.zukunft-haus.info/de/projekte/niedrigenergiehaus-im-bestand/denkmalschutz-ausnahmen.html>

## **Denkmalpflegezentrum Benediktbeuern**

### **The European Competence Centre for Energy-saving Renovation of Old Buildings and the Preservation of Monuments at Benediktbeuern Monastery**

Since autumn 2009 the Fraunhofer Institute for Building Physics is establishing at Benediktbeuern a new and unique European Competence Centre for Energy-saving Renovation of Old Buildings and the Preservation of Monuments ([www.fraunhofer-denkmalpflege.de](http://www.fraunhofer-denkmalpflege.de)) in a baroque building of the monastery. The centre is especially aimed at disseminating knowledge about energy efficient restoration in the cultural building heritage sector. Research on existing solutions and new techniques will be done in the context of a real historic building regarding new and innovative technology, methods and products. This way new knowledge will find its way into the market much faster. The aim is to test new and improved solutions, materials and building components for restoration and improvement of energy efficiency at a real historic, listed building. New solutions will be simulated with building simulation tools before applying them in the historic building. All refurbishment measures will be implemented under the highest preservation standards and in close communication with the Bavarian State Office for Preservation of Historic Monuments. The centre is targeted at all groups working in the field of heritage preservation and energy efficiency, from architects, engineers and craftsmen who want to enhance their knowledge to be fit for the market but also at owners of buildings who want to refurbish their traditional buildings.

[www.denkmalpflege.fraunhofer.de](http://www.denkmalpflege.fraunhofer.de)

## **Fraunhofer Informationszentrum Raum und Bau IRB (Information Center for Planning and Building)**

Fraunhofer IRB provides specialised knowledge resources for all fields of planning and building: civil and structural engineering, building design, architecture and monument preservation, town, regional and spatial planning, building law and building industry. We provide reliable, comprehensive and up-to-date information base for research, professional practice and training in all these special areas.

Fraunhofer IRB specialist portals:

- Building research ([www.irb.fraunhofer.de/bauforschung](http://www.irb.fraunhofer.de/bauforschung))
- Building Expertise ([www.irb.fraunhofer.de/bausachverstand](http://www.irb.fraunhofer.de/bausachverstand))
- Monument Preservation ([www.irb.fraunhofer.de/denkmalpflege](http://www.irb.fraunhofer.de/denkmalpflege))
- Urban and territorial planning ([www.irb.fraunhofer.de/stadt-raumplanung](http://www.irb.fraunhofer.de/stadt-raumplanung))

[www.irb.fraunhofer.de](http://www.irb.fraunhofer.de)

## **WTA International**

**Wissenschaftlich-Technische Arbeitsgemeinschaft für Bauwerkserhaltung und Denkmalpflege**  
**International Association for Science and Technology of Building Maintenance and the Preservation of Monuments**

The WTA is an international association for knowledge exchange between building practitioners, experts and researchers. Among other dissemination activities it issues guidelines describing the state of the art in different field of restoration the so called "WTA-Merkblätter".

<http://www.wta.de/de/merkblaetter>

"The international association WTA e.V. has set itself the target of supporting research and its practical application in the field of building maintenance and monuments preservation. One of our most important assignments is to process practical experience and to make it useful, thus speeding up the application of new insights and modern technology. To achieve these objectives, we seek to establish an intensive dialogue between scientists and practitioners."

"The WTA [...] issues standards and regulations for the restoration of buildings and the refurbishment of historic structures. You will find here regulations and current information. Our events present you with the latest state of technology in the field of building maintenance."

<http://www.wta.de/>

Crafts and heritage preservation

### **Schloss Raesfeld – Akademie des Handwerks**

One example for further education for craftsmen and architects in the fields of building restoration is Schloss Raesfeld, offering courses on historic techniques for craftsmen, but also for young people interested in cultural heritage in the German country of Nordrhein-Westfalen.

<http://www.akademie-des-handwerks.de/>

### **Beratungsstelle für Handwerk und Denkmalpflege, Propstei Johannesberg Fulda**

This institution has a long tradition in further education and training especially for craftsmen in the field of old buildings restoration and heritage preservation in the German country of Hessen.

<http://www.denkmalpflegeberatung.de/>

### **DenkmalAkademie Görlitz**

The »DenkmalAkademie« (Monument Academy) is the training centre of the »Deutsche Stiftung Denkmalschutz« for craftsmen and architects.

"The »DenkmalAkademie« (Monument Academy) was established with the main purpose to educate craftsmen and architects in the highly specialized techniques needed for the preservation of building heritage.

The Academy also organizes seminars, tours and workshops for laymen in order to promote an understanding for monuments, architectural styles and history.

The concept of the Academy was created by the »Deutsche Stiftung Denkmalschutz«, a non-profit foundation with ideals comparable to the British National Trust or the American National Trust for Historic Preservation.”

<http://www.denkmalakademie.de/>

### **Deutsches Fachwerkzentrum Quedlinburg**

“The Deutsches Fachwerkzentrum (German Centre for Half Timbered Houses) Quedlinburg was founded on an initiative of the “Deutsche Stiftung Denkmalschutz” as well as federal and local authorities. Its aims are historic building research in the region, training also for young people and fostering ecologic and energy efficient building.“

<http://www.deutsches-fachwerkzentrum.de/>

Research project on energetic refurbishment of historic half timbered structures at the “Lange Gasse 7”, different systems for interior insulation used

<http://www.deutsches-fachwerkzentrum.de/lange.htm>

National research funding

### **Bundesministerium für Wirtschaft und Technologie (BMWiT) Federal Ministry of Economy and Technology**

“Economic efficiency, security of supply and environmental compatibility: these are the central aims of German energy policy. In Germany, the Federal Ministry of Economy and Technology has the lead responsibility for the formulation and implementation of energy policy.”

<http://www.bmwi.de/>

#### EnOB (Energie Optimiertes Bauen / EnSan / Enbau)

EnOB is the focus area for energy research for buildings in Germany. EnSan is an earlier focus area focussing on refurbishment, also including some historic / listed buildings.

<http://www.enob.info/>

Overview of different best practice examples and projects in EnSan:

<http://www.enob.info/de/forschungsfelder/ensan/>

Another relevant project for heritage preservation is MASEA (Materialdatensammlung für die energetische Altbausanierung), a database for material properties for simulation and planning of measures in old buildings:

[www.masea-ensan.com](http://www.masea-ensan.com)

(database)

## **Deutsche Bundesstiftung Umwelt**

The DBU is founding projects in the field of heritage preservation in connection to anthropogenic damages and recently also on heritage preservation and energy efficiency.

“The Deutsche Bundesstiftung Umwelt DBU is one of Europe’s largest foundations and promotes innovative and exemplary environmental projects. Since 1991, almost 7400 projects have received financial backing totalling about € 1,3 billion. The promotional activities concentrate on environmental technology and research, nature conservation, environmental communication and cultural assets.”

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

Project database:

<http://www.dbu.de/734.html> (English)

<http://www.dbu.de/341.html> (German)

Research institutes

## **Fraunhofer Institute for Building Physics**

The Fraunhofer-Gesellschaft is the leading organisation for applied research in Europe, undertaking contract research with industry, the service sector and the government.

The Fraunhofer-Institute for Building Physics, Holzkirchen (IBP) is known for its expertise on all aspects of the buildings physics, in particular for research and contributions to standards in the sector of energy efficiency of buildings and sustainability assessment. Another important focus is research on the thermal and hygric behaviour of building materials and building components. IBP is world wide known for the WUFI building simulation software which is used in numerous countries and was mainly involved in the development of the models on which the EU Directive on the ENERGY PERFORMANCE CERTIFICATE FOR BUILDINGS is based. IBP has participated in numerous national, European and international projects, and has thus has acquired extensive knowledge and experience in the field of hygrothermics, has participated in in-situ investigations, performed basic and applied tests on a diversity of building materials and has developed new or improved test and investigation methods. Furthermore the IBP is closely related to and involved in the research and standardisation procedures within the CEN, DIN and WTA e. V. (International Association for Science and Technology for Building Maintenance and Monuments Preservation).

In 2008 a new working group for “Heritage Preservation and Preventive Conservation” was founded that deals with all aspects of energy efficiency in historic buildings, sustainable restoration of museums and indoor environment and the preservation of works of art.

[www.ibp.fraunhofer.de](http://www.ibp.fraunhofer.de)

download of publications:

<http://www.ibp.fhg.de/literatur/index.html>

<http://www.ibp.fraunhofer.de/download/index.html>

## **IDK**

### **Institut für Diagnostik und Konservierung an Denkmälern in Sachsen und Sachsen-Anhalt e.V.**

“The Institut für Diagnostik und Konservierung an Denkmälern in Sachsen und Sachsen-Anhalt e.V. (IDK) which could be translated like “Institute for diagnosis and conservation on monuments in Saxony and Saxony-Anhalt” is a non profit society founded more than one decade ago in 1996. It is a cross national institution of the two federal states of Saxony and Saxony-Anhalt in Germany. The main objective is the bridging of natural science knowledge and expertise into monument conservation and vice versa to work on complex conservation problems preferably with natural science techniques. The IDK performs investigations rooted in natural sciences and technical engineering, has a consultant function in this field and coordinates scientific projects in cultural heritage preservation mainly on monuments.

Main competences lay on stone and mortar conservation, restoration of historic masonry and building climatic tasks. The IDK carries out projects with the monuments services as well as with free lance working architects and restorers.”

<http://www.idk-info.de>

Funding of restoration measures

### **KfW Bankengruppe**

The KfW Bankengruppe is responsible for giving credits and grant for energetic refurbishment of buildings in general among a much wider environmental engagement.

“KfW Bankengruppe gives impetus to economic, social and ecological development worldwide. As a promotional bank under the ownership of the Federal Republic and the Länder (federal states), it offers support to encourage sustainable improvement in economic, social, ecological living and business conditions, among others in the areas of small and medium-sized enterprise, entrepreneurship, environmental protection, housing, infrastructure, education finance, project and export finance, and development cooperation.”

[http://www.kfw.de/EN\\_Home/KfW\\_Bankengruppe/index.jsp](http://www.kfw.de/EN_Home/KfW_Bankengruppe/index.jsp)

### **Deutsche Stiftung Denkmalschutz**

The German Foundation for Monument Protection is financing projects for the most endangered historic properties especially in eastern Germany during the last two decades. It also promotes heritage preservation.

“The German Foundation for Monument Protection has [...] set itself two goals: to preserve endangered cultural monuments and promote all aspects of monument protection. We hope to animate as many citizens as possible to become involved in this task.

Since its foundation in 1985 the German Foundation for Monument Protection, the largest private historical-preservation initiative in Germany, has helped to preserve over 3,000 monuments nationwide, investing 390 million Euros. Contributions have been raised from more than 180,000 private sponsors and companies, fine allocations and proceeds from the Glücks Spirale lottery. Our patron is the Federal President, Horst Köhler.”

<http://www.denkmalschutz.de/>

## Universities

### **University of Bamberg – Heritage Studies**

Heritage Science

<http://www.uni-bamberg.de/iadk/denkmalpflege/>

Building History

[http://www.uni-bamberg.de/iadk/bauforschung\\_und\\_baugeschichte/](http://www.uni-bamberg.de/iadk/bauforschung_und_baugeschichte/)

Conservation Science

<http://www.uni-bamberg.de/iadk/restaurierungswissenschaften/>

Masterstudiengang Denkmalpflege - Heritage Conservation

<http://www.uni-bamberg.de/iadk/denkmalpflege/leistungen/studium/masterstudiengang/>

### **Technische Universität München**

Institute of Building Physics

“The Institute of Building Physics at Technische Universität München acts as a research institution for national and international standardization committees and gives advice to Germany’s Federal Ministry of Transportation, Building and Urban Development; for instance, for the implementation of the EU Directive “Energy Performance of Buildings”. Issues of sustainability and climate protection such as reducing CO<sub>2</sub>-emissions of buildings are already part of current directives, for which Prof. Dr.-Ing. Gerd Hauser is a leading researcher.

Investigations and applied science in the realm of building physics are conducted in close cooperation with Fraunhofer institute for Building Physics with its locations in Stuttgart, Holzkirchen (near Munich) and Kassel. Students get the opportunity to participate in practical laboratory courses when choosing corresponding elective courses at the university. Manifold technical equipment and facilities can be utilized by bachelor and master graduates, as well as Ph.D. students.

For ongoing research activities in the field of sustainable buildings, an extra group was established to consult the industry for both new construction and refurbishment. The Institute of Building Physics is an original member of the German Association for Sustainable Building (DGNB, Deutsche Gesellschaft für Nachhaltiges Bauen), is engaged in developing a new German certification system, and will issue those certificates.”

<http://www.bp.bv.tum.de/>

Institute of Conservation, technology of art and conservation science

<http://www.rkk.arch.tu-muenchen.de/>

### **University of Stuttgart**

<http://www.lbp.uni-stuttgart.de>

<http://www.master-bauphysik.de>

### **Technical University Dresden**

Masterstudiengang Denkmalpflege und Stadtentwicklung

[http://tu-dresden.de/die\\_tu\\_dresden/fakultaeten/fakultaet\\_architektur/ibad/master](http://tu-dresden.de/die_tu_dresden/fakultaeten/fakultaet_architektur/ibad/master)

Institute of Building Climatology

<http://www.bauklimatik.de/>

### **TU Darmstadt**

Institut für Massivbau, Fachgebiet Werkstoffe im Bauwesen

<http://www.wib-tud.de/>

### **Bauhaus Universität Weimar**

Professur für Denkmalpflege und Baugeschichte

<http://www.uni-weimar.de/cms/architektur/dmbg/professur.html>

Professur für Bauklimatik

<http://www.uni-weimar.de/architektur/bauklimatik/index.html>

## Sustainability certification

### **DGNB**

#### **Deutsche Gesellschaft für Nachhaltiges Bauen German Sustainable Building Council**

“The task of the German Sustainable Building Council is to point out and advance paths and solutions for sustainable building. This includes the planning of buildings, but also their construction and operation. The DGNB considers itself to be the central German organization for exchange of knowledge, professional training, and for a raising public awareness for this future-oriented part of the building sector. The focus of the DGNB is on awarding the certification for sustainable building. The first time the Sustainable Building Certification was awarded was at the BAU 2009 in Munich. Initially, it was awarded for the system variation “New Construction Office and Administration, Version 2008”.

Sustainable building means to build intelligently: The focus is on a comprehensive quality concept that serves the building and real estate sectors, as well as society in general. Sustainable properties are beneficial to the environment, conserve resources, comfortable and healthy for their users, and fit optimally into their socio-cultural surroundings. In the same way, they stand for economic efficiency and long-term value-retention. Sustainable properties are cost effective due to their lower operation and maintenance costs. The manageable additional planning and construction costs will usually amortize in a few years.”

#### DGNB Certification System

“For planning and evaluation of buildings, there is a new and clearly structured tool: The German Sustainable Building Certification. As meritocratic rating system, it covers all relevant topics of sustainable construction. Outstanding buildings are awarded the categories bronze, silver, or gold.”

## **Summaries**

Vortrag auf dem Kongress „Herausforderung Energieeffizienz für Denkmalschutz und Stadtumbau“, veranstaltet vom Bundesministerium für Verkehr, Bau und Stadtentwicklung anlässlich der Denkmalmesse Leipzig am 20. November 2008

### **Stehen Denkmalschutzaufgaben im Widerspruch zur Energieeffizienz?**

**[Are the regulations in heritage preservation in contradiction to energy efficiency?]**

#### **Dr.-Ing. Architektin Roswitha Kaiser**

AG Bautechnik der Vereinigung der Landesdenkmalpfleger

(Working Group Building Technology of the German federation of state heritage preservationists)

Antwort: NEIN! Dazu 10 STANDPUNKTE:

The answer is NO! 10 fundamental positions on the issue:

1. Der Umweltschutz ist eine wesentliche Wurzel des Denkmalschutzes.  
1. Saving the environment is a fundamental root of heritage preservation
2. Denkmalschutz geschieht auf der Grundlage gesetzlicher Bestimmungen  
2. Heritage preservation happens on the basis of legal regulations
3. Bei Denkmälern erfordern Maßnahmen zur Energieeffizienz besondere Rücksichtnahme  
3. In monumental, listed buildings measures to increase energy efficiency need to especially respect the authentic material and construction
4. Energieberatung statt Energieausweis für Denkmäler!  
4. Do energy consulting instead of energy rating in listed buildings!
5. Denkmalpflegerisches Ziel im Einzelfall ist der Kompromiss- auch in Fragen der Energieeffizienz.  
5. In heritage preservation the aim in single cases is often to find compromises – also in questions of energy efficiency
6. Denkmalschutz steht für Ressourcenschonung. Nachhaltigkeit erfordert Langzeiterfahrung.  
6. Heritage preservation stands for saving of resources. Sustainability demands long term experience [regarding new materials, constructions, etc.]
7. Gefragt ist das sinnvolle Maß der Energieeffizienz beim Denkmal.  
7. For monumental, listed buildings the amount of energy efficiency should be chosen with special respect

8. Der gesetzliche Auftrag der Denkmalpflege beinhaltet die sinnvolle Nutzung.  
8. The legal mission of heritage preservation includes a fitting use
9. Städtebau und städtebaulicher Denkmalschutz sind nicht im Fokus der EnEV.  
9. Urban architecture and urban heritage preservation are not in the focus of the german energy regulations (EnEV)
10. Denkmalschutz sollte mit der Frage nach dem Einsatz erneuerbarer Energien verknüpft werden.  
10. Heritage preservation should be connected with questions of renewable energies

Vortrag auf der Fachtagung der Arbeitsgemeinschaften Historische Stadt- & Ortskerne in NRW am 05. November 2009 in Monschau

### **Roswitha Kaiser**

**„Monschauer 9 + 1 Appelle zur Energieeffizienz bei Kulturdenkmalen“ vom 5. November 2009: Praktische Erläuterungen zu 10 Grundsatzthesen  
[“Monschau 9 + 1 requirements for energy efficiency in historic buildings”]**

Appell

There is a requirement:

- zur Vernetzung  
(Denkmalschutzbehörden, Spezialisten, Forschungseinrichtungen, Industrie, Handwerkerschaft, Verwaltungsrichter)
- for networking (among state daministration for heritage preservation, specialists, research institutions, industry, craftsmen, administrative courts)
- zum politischen Dialog (Schnittmenge Denkmalschutz und Klimaschutz)
- for political dialogue (overlap between heritage preservation and CO<sub>2</sub> reduction)
- zur Verweigerung fauler Kompromisse (sind verpackte Denkmäler noch Denkmäler?)
- to say no to foul compromises (are tightly packed [thermally insulated] monuments still monuments?)
- zur Integration des Leitbildes „Energieeffizienz“ in den städtebaulichen Denkmalschutz
- for integration of a general concept „energy efficiency“ in urban heritage preservation
- zur Einflussnahme auf die Harmonisierung der Förderprogrammme
- for influencing funding schemes in regard to harmonisation
- zu einem Curriculum Energieberatung bei Baudenkmalern
- for a curriculum for trained energy consultants for listed / historic monumental buildings
- zur Erprobung von Kompensationsmodellen Einsatz erneuerbarer Energien und intelligente Anlagentechnik beim Baudenkmal
- to try out models for compensation when renewable energy and intelligent HVAC systems are introduced in a heritage building

- zu einer öffentlichen Debatte um Ressourcenschonung und Nachhaltigkeit
- for a public debate on saving of resources and sustainability
  
- zur Einmischung auf europäischer Ebene zum Thema Energieeffizienz und Denkmalschutz
- for being active in european level regarding the topic energy efficiency and heritage buildings
  
- zur Selbstkritik (Berechenbarkeit denkmalfachlicher Entscheidungen bei der energetischen Ertüchtigung/ bei der Einbindung erneuerbarer Energien in den Baubestand; Prioritätensetzung in der Denkmalpflege unter veränderten gesellschaftlichen und globalen Rahmenbedingungen.
- for critical reflection (decision making in heritage preservation regarding energy efficiency improvements / regarding inclusion of renewable energies in listed buildings; define priorities in heritage preservation in respect of a changing world and society)

## Annex 2 - Demonstration objects

Sanierung Gründerzeithaus mit interessanten Detaillösungen

<http://www.enob.info/de/sanierung/projekt/details/sanierung-gruenderzeithaus-mit-interessanten-detailloesungen/>

For English version see also:

Building refurbishment – Gründerzeit houses

<http://www.bine.info/en/hauptnavigation/topics/buildings/residential-buildings/publikation/gebaeude-sanieren-gruenderzeithaeuser/>

Research project on energetic refurbishment of historic half timbered structures at the “Lange Gasse 7”, different systems for interior insulation used

<http://www.deutsches-fachwerkzentrum.de/lange.htm>

## Annex 3 - References

Gottfried Kiesow: Eine Einführung in die Denkmalpflege, 1982

Alois Riegl: Der moderne Denkmalkultus. Sein Wesen und seine Entstehung, 1903

The Venice Charter, IInd International Congress of Architects and Technicians of Historic Monuments, Venice, 1964, Adopted by ICOMOS in 1965

[http://www.icomos.org/venice\\_charter.html](http://www.icomos.org/venice_charter.html)