

State Prize

# Architecture and Sustainability 2012

Organisation  
Austrian Society for Environment and Technology

Responsible for the State Prize  
Roland Grotzer – Linz University of Art

Awarding authority:  
Ministry for Agriculture, Forestry,  
Environment and Water Management



lebensministerium.at

klima:aktiv

Promoter  
Austrian Federal Ministry of  
Agriculture, Forestry, Environment  
and Water Management,  
Div. Environmental Economics and  
Energy Policy



lebensministerium.at



State Prize Architecture  
and Sustainability 2012 –  
Brochure

Imprint

Publisher  
Austrian Federal Ministry of Agriculture,  
Forestry, Environment and  
Water Management, A-1010 Wien

Authors  
Elisabeth Bargmann, Margit Schön,  
Inge Schrattenecker

Translation into English  
Andrew Kilpatrick

Photographs  
Lukas Schaller  
(except where specified otherwise)

Layout  
grafisches Büro – Günter Eder,  
Roman Breier, Marcel Neundörfer

Copyright 2013

Organization and implementation  
ÖGUT GmbH – Austrian Society  
for Environment and Technology  
within the framework of  
klima:aktiv building and retrofitting



kunstuniversität linz  
die architektur



Sponsorship

**pro:Holz**





— My goal is energy self-sufficiency for Austria by 2050. An energy industry based on a maximum degree of self-sufficiency can be implemented only by way of a consistent switch to renewable energy sources, improving energy efficiency and making use of innovative green technologies.

We are in excellent shape for this: renewable energy sources are sufficiently available in Austria and our companies' know-how in the field of environmental and efficiency technologies is in great demand abroad. For example, Austrian passive-house windows, automated biomass heating systems and solar installations are export hits which secure numerous green jobs in our country. Austrian architects and specialist planners are employed in connection with sustainable building technologies worldwide.

Where and how we live and work is among the key factors determining our quality of life. Low-resource-use, high-quality building which harmonizes economic and ecological, social and aesthetic aspects is absolutely essential for this.

The Ministry for the Environment grants the State Prize Architecture and Sustainability for those projects which achieve the most impressive combinations of environmental awareness in action and aesthetics. There is great potential for increased efficiency in the building sector: one third of the energy consumed in Austria is used for heating or cooling buildings and supplying hot water. This clearly shows the importance of sustainable building and renovation.

If you are interested in sustainable building technologies, I invite you to take advantage of Austrian know-how. In this field Austria has a dense network of specialized companies and research facilities.

Niki Berlakovich  
Minister for the Environment

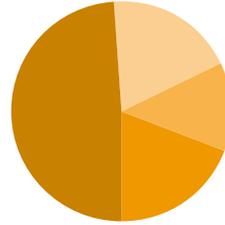
## Content

04	State Prize Architecture and Sustainability
05 – 09	State Prize Winner
10 – 11	Nominated projects
12 – 13	klima:aktiv Building Standard – Quality Benchmark for the State Prize
14 – 15	Sustainable building technologies “Made in Austria”

State Prize

# Architecture and Sustainability 2012

## Submissions - Type of buildings



49 % nonresidential buildings  
19 % apartment blocks  
13 % detached houses  
19 % kindergarten and schools

## Development

In 2012/13 the Austrian Ministry for the Environment awarded the State Prize for Architecture and Sustainability for the third time to projects distinguished equally by their architectural value and by their quality with respect to ecology, energy use, social and economic sustainability. The invitation to submit projects was extended within the framework of the climate protection initiative klima:aktiv. The buildings were graded/classified according to the klima:aktiv building standard (see p. 12).

Energy-efficient buildings play an essential role in climate and energy policies. All in all the large number of submissions for the State Prize illustrate the positive development in the area of sustainable architecture in Austria. Those buildings

which attract interest by being nominated for or winning the State Prize are a source of inspiration and count as showcase projects in both fields: architecture and sustainability.

The increase in submissions goes hand in hand with a growing number of competent and promising architectural partnerships and building services consultancies working on these issues. Some years ago only a small circle of dedicated pioneers were involved, while these days the majority of Austria's best architects are on the list of applicants.

## Jury

The jury consists of the following members: Hannelore Deubzer, Technical University Munich, Faculty of Architecture; Roland Gnaiger (State Prize

representative of the Ministry for the Environment), University of Art and Design Linz, Department "the architecture programme"; Otto Kapfinger, architect and author, Vienna; Helmut Krapmeier, Energy Institute Vorarlberg, Dornbirn; Robert Lechner, Austrian Ecology Institute, Vienna.

## Submissions

A total of 99 project presentations were submitted to the jury, who assessed them as a whole and with respect to aesthetic, functional, ecological, social and economic aspects. The procedure called for considerable commitment on the part of participants. The projects had to be presented not only as architecture but also from the point of view of their sustainability performance.

Access to a terrace from any room and plenty of green in the heart of the city. What sounds like a dream was actually implemented by a dedicated promoter and creative architects.

# Residential building U31, Vienna

New build: apartment block (46 units) to passive-house standard



**Address:** 1200 Wien, Universumstraße 31  
**Promoter:** Heindl Holding GmbH  
**Architecture:** querkraft Architekten ZT GmbH  
**Planning:** Schöberl & Pöll GmbH (building physics), BPS Engineering (building services)

#### Type of building

→ non-frame construction to passive-house standard, 46 flats, plus offices on ground and first floors

#### Date completed

→ 2010

#### Energy consumption rating

→ heating energy demand 6.00 kWh/m<sup>2</sup>a (energy certificate), 14.2 kWh/m<sup>2</sup>a (PHPP)

#### Building services

→ The residual heat input needed is supplied through district heating and a heat pump using water, backed up by ample heat storage tank capacity. The building is ventilated by a central unit with controlled heat recovery.

During the summer months a basic level of cooling is provided via heating/ cooling panels; the cooling water needed for this comes from the building's own groundwater well via heat exchangers.

— This residential building in the heart of Vienna's 20th district scores particularly on the quality of life it offers to residents. The slightly jagged exterior of the building provides every flat with ample free space in the shape of a rhombus just outside. Thus the residents can actively participate in shaping the look of the exterior by growing plants. On the south side there is a gap between the block of flats and the next building to let some sunlight through to the flats facing east inside the

courtyard even in winter. For shared activities there are a communal room and a large roof-top terrace (partially roofed over). The inner-city location and full access to public transport are additional advantages of this building.

To build a new office building to accommodate several government agencies in the highly segmented old part of town is a challenge in itself. But when the highest ecological demands are made, the result is a showcase project.

# Administration building Niederösterreich Haus, Krems

New build: offices with 10,000 m<sup>2</sup> of usable floor area



— The Niederösterreichhaus building complex in Krems captivates with its masterly balancing of the new and the historical. The three buildings match their small-scale surroundings on the edge of the old town of Krems, but function as a single entity through the connecting bridge components. The passive house idea was interpreted as holistic concept covering both low resource consumption during construction and energy efficient operation in future. Particular attention was paid to

selecting optimal materials and providing high-grade user comfort. The new building houses several government agencies in one location, which makes both intra-administration communication and citizens' lives easier.

**Address:** 3500 Krems, Ringstraße 14–16, Drinkweldergasse 14–20, Niederösterreich

**Promoter:** NÖ Landesimmobilien GmbH

**Architecture:** AllesWirdGut Architektur ZT GmbH, feld72 Architekten ZT GmbH, FCP – Fritsch, Chiari & Partner ZT GmbH

**Planning:** DI Walter Prause (building physics), TB ZFG-Projekt GmbH (building services), bauXund Forschung und Beratung GmbH (building ecology)

## Type of building

→ non-frame building to passive house standard with nearly 10,000 m<sup>2</sup> of usable space

## Date completed

→ 2011

## Energy consumption rating

→ heating energy demand 2.6 kWh/m<sup>2</sup>a (energy certificate)

## Building services

→ The entire office block has controlled (bidirectional) ventilation. District heating supplies residual heating energy. Photovoltaic panels and a heat pump are also on hand. In summer "relief cooling" is in operation (using air chilled in an underground collector).

State Prize  
Winner

Instead of being demolished, the fifty-year-old school building was adapted and expanded to comply with state-of-the-art educational requirements and employ resources in an exemplary way. It just shows what quality is achievable even with a tight budget.

# Special-needs school no. 4, Linz

Renovating and adding storeys to a school

Picture: Michael Widmann



— In this renovation project a conception encompassing architecture, space, building and materials was successfully implemented, ranging from town planning to the treatment of open space, from building services to furniture. As a result, the functioning of the building was improved and complete accessibility achieved. To adapt the school to new educational elements such as supervision in the afternoons or progressive education, timber storeys were added to the building,

existing storeys restructured and access considerably improved. An innovative materials concept yielded excellent ecological results. The school now appears remarkably colourful and lively. It strikes one immediately that this is an unusual school and that teachers and pupils are comfortable there.

**Address:** 4040 Linz, Teistlergutstraße 23, Oberösterreich  
**Promoter:** Immobilien Linz GmbH & Co KG  
**Architecture:** grundstein Architektur  
**Planning:** IBO GmbH (building physics), Technisches Büro Ing. Grillenberger GmbH & Co KG (building services)

#### Type of building

→ non-frame construction to passive-house standard, 2,000 m<sup>2</sup> of usable floor area

#### Date completed

→ 2009

#### Energy consumption rating

→ heating energy demand 3.12 kWh/m<sup>2</sup>a (energy certificate)

#### Building services

→ District heating provides space heating. A solar thermal system integrated into the building envelope helps to provide hot water for the building (gross panel area 23.44 m<sup>2</sup>).

The classrooms are equipped with ventilation for comfort; the air flowrate can be adjusted. A sophisticated setup for night-time ventilation during the summer has been installed: natural airing operates through specially developed ventilation vanes at night by exploiting naturally occurring physical phenomena (chimney effect).

Social sustainability, ecologically sound energy systems and intelligent mobility – those are the targets selected by the promoter and architect for a residential complex focussed on diversity and built according to human measure.

# Messequartier housing complex, Graz

New build: housing complex with 195 flats and commercial space



Picture: Paul Ott

— The Messequartier residential project makes an important contribution to the issue of developing high-quality residential districts in a city centre. This large complex emphasizes interesting spaces and perspectives by means of the angled façade, and diversity by means of pronounced functional interleaving. It incorporates a wide range of differing types of flat, assisted living facilities, a student hostel, a kindergarten and commercial space. Halfway along their length the long, wavelike

structures are supported on stilts, so there is no barrier at ground level, but an uninterrupted green space. The housing complex is directly linked to the city's network of cycling routes, and is equipped with a fleet of hybrid and electric cars for car-sharing. The residents also have the use of a roof terrace garden with sauna and swimming pool.

**Address:** 8010 Graz, Klosterwiesgasse 101a/b, 103b, Münzgrabenstraße 84b/c, Steiermark

**Promoter:** ENW – Gemeinnützige Wohnungsgesellschaft mbH

**Architecture:** DI Markus Pernthaler Architekt ZT GmbH

**Planning:** Vatter & Partner ZT GmbH (building physics), RFG Engineering GmbH (building services), bauXund Forschung und Beratung GmbH (building ecology)

## Type of building

→ non-frame construction to passive-house standard, with 195 flats and commercial space

## Date completed

→ 2011

## Energy consumption rating

→ heating energy demand 9 kWh/2° a (energy certificate)

## Building services

→ The planning authority required the complex to be connected up to the district heating grid; to provide hot water and to back the heating system up in spring and autumn, more than 700 m<sup>2</sup> of thermal solar collectors plus the necessary hot-water storage tanks were installed. A heat pump makes use of the water table, particularly to cool the commercial space in summer; it is also used to prewarm the fresh air for ventilation in winter.

How should the sustainable agriculture of the future be structured, and what abilities are essential for farmers in future? One model for this is a school of agriculture that unites tradition with progress and is consistently ecological.

# AgrarBildungsZentrum Salzkammergut, Altmünster

New build/expansion of a school plus boarding home, making use of an existing wing

Picture: Walter Ebenhofer



— As a result of schools being merged, it was necessary to enlarge the existing school building (located above the west shore of Traunsee, away from other buildings) considerably. The existing structure has largely been integrated into the new building, which is reminiscent of a typical Upper Austrian Vierkanthof (quadrangular farmhouse), with a simple exterior which is very becoming. As the same kind of wood has been used for floors, walls, ceilings and interior fittings

throughout, the building has a peaceful, cosy atmosphere; it also provides spectacular views of the lake and the surrounding mountains. This “farmstead” contains an entire world: apart from the classrooms, there are workshops, kitchen, refectory, library, the boarding home and amply sized dayrooms. Special attention was given to using ecological building materials – along with untreated timber, cellulose and wool were selected for thermal insulation.

**Address:** 4813 Altmünster, Pichlhofstraße 62, Oberösterreich  
**Promoter:** Landes-Immobilien GmbH Oberösterreich  
**Architecture:** Fink Thurnher Architekten  
**Planning:** DI Dr. Lothar Künz ZT GmbH (building physics), Planungsteam E-Plus GmbH (building services)

#### Type of building

→ timber-frame school building to ultra-low-energy standard, with approx. 10,000 m<sup>2</sup> usable floor area

#### Date completed

→ 2011

#### Energy consumption rating

→ heating energy demand 3.7 kWh/m<sup>3</sup> a (energy certificate)

#### Building services

→ Heat is provided centrally by a boiler burning wood chips/biomass (400 kW). 79 m<sup>2</sup> of solar collectors on the roof help with supplying hot water and with space heating. Air is replaced by means of a controlled ventilation system with heat recovery.

73 m<sup>2</sup> of photovoltaic panels are in place on the roof. Air needed inside the building can be cooled in an ecologically sound way at low cost by means of a heat exchanger buried in the soil beneath the slab foundation of the new building.

# OeAD hostel, Vienna

New build: student hostel with 194 room, non-frame construction to passive-house standard



**Address:** 1150 Wien, Gaspargasse 2

**Promoter:** Heimbau – Gemeinnützige Bau-, Wohnungs- und Siedlungsgenossenschaft

**Architecture:** Martin Kohlbauer ZT GmbH

**Planning:** Vasko+Partner Ingenieure (structural engineering & building services), Schöberl & Pöll GmbH (building physics)

**Building:** high-quality accommodation, centrally located, for students from abroad.

The arcades on the north side act as a buffer zone vis-à-vis the adjoining railway tracks; the rooms face south.

**Energy consumption rating:**

HWB 5.9 kWh/m<sup>2</sup>a (EC),

HWB 12 kWh/m<sup>2</sup>a (PHPP)

**Building services:** district heating, controlled ventilation with heat recovery, photovoltaic equipment

# Block of flats Am Mühlgrund, Vienna

New build: residential building (53 flats) with a focus on accommodating several generations side by side, non-frame construction to passive-house standard



**Address:** 1220 Wien, Mühlgrundgasse 3

**Promoter:** BUWOG Bauen und Wohnen GmbH

**Architecture:** ARTEC Architekten  
**Planning:** Schöberl & Pöll GmbH (building physics), TB Käferhaus GmbH (building services), Atelier Auböck + Kárász (outdoors)

**Building:** block of flats on narrow plot of land next to elevated railway. The vertical garden screens the building off and brings greenery inside it.

**Energy consumption rating:**

HWB 4.84 kWh/m<sup>2</sup>a (EC),

HWB 12 kWh/m<sup>2</sup>a (PHPP)

**Building services:** ultra-efficient convenience ventilation with heat recovery, district heating, photovoltaic equipment, solar collectors to help with supplying hot water

# Detached house, Hard

Nominate  
project

New build: detached house, lightweight construction to passive-house standard



**Address:** 6971 Hard, Badgasse 10  
**Promoter:** Martin und Daniela Brunn  
**Architecture:** Martin Brunn und Gerhard Zweier  
**Planning:** Ender Klimatechnik GmbH (building services), automationNEXT GmbH (building automation)  
**Building:** detached house in centre of village, can be divided into three flats. Consistent use of ecologically sound building materials.  
**Energy consumption rating:** HWB 7.26 kWh/m<sup>2</sup>a (EC), HWB 14 kWh/m<sup>2</sup>a (PHPP)  
**Building services:** wall heating system with solar collector panels and wood gasification boiler. Convenience ventilation with heat recovery, photovoltaic equipment

Nominate  
project

# Primary school, Mäder

Renovating and adding a storey to a school, non-frame construction to passive-house standard



**Address:** 6841 Mäder, Brühl 4  
**Promoter:** Gemeinde Mäder  
**Architecture:** Fink Thurnher Architekten  
**Planning:** Spektrum – Zentrum für Umwelttechnik & -management GmbH (building physics), Öko-Plan Ing. Wilfried Begle (building services), Gemeindefinformatik GmbH (building ecology)  
**Building:** peaceful, well-lit rooms, fresh air and clear spatial structuring ensure the right climate for learning. Virtually all aspects of sustainable building are taken into account.  
**Energy consumption rating:** HWB\* 2.11 kWh/m<sup>3</sup>a (EC)  
**Building services:** district heating (central biomass facility), controlled ventilation with heat recovery, photovoltaic equipment

# klima:aktiv Building Standard – Quality Benchmark for the State Prize

## **Climate protection initiative klima:aktiv**

The main aim of the klima:aktiv climate protection initiative is to launch climate-friendly technologies and services in the market and to encourage their rapid proliferation. Moving our society in the direction of sustainability is a complex and dynamic social process which can succeed only if a growing number of agents actively participate in the change and make sure it is perceived as an opportunity and not just as a threat.

Through its extensive networks, klima:aktiv supports building up social capital for change toward a sustainable society. „Building and renovating“, „saving energy“, „renewable sources of energy“ and „mobility“ are the four areas where new solutions are explained, quality standards set, the agents' knowledge and competence advanced and advice provided to companies, local councils and households.

Energy-efficient building and renovation are supported by

klima:aktiv through tools such as lists of criteria, databases on construction materials and buildings, providing advice and information, plus a broad network of partners within the construction industry.

Qualified employees are essential where climate-friendly technologies are concerned. Green skills are in demand in the labour market. That is why klima:aktiv cooperates with the leading providers of training and vocational skills. Basic training and further education

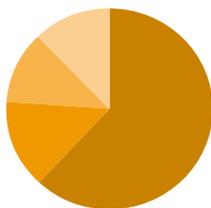
from klima:aktiv provide professionals such as planners and craftspeople with the necessary know-how for quality construction and renovation.

## The klima:aktiv Building Standard

klima:aktiv provides a compass in the shape of its quality standards, which makes long-term sense. The best example in this respect is klima:aktiv's building standard, which provides practical guidance to property developers, planners, construction engineers, housing suppliers, and to anyone building or renovating a house.

Energy-efficient construction and high-quality renovation are the key to climate protection with long-term effects. But klima:aktiv aims at more than just energy efficiency. The klima:aktiv building standard offers a neutral vantage point from which to assess and evaluate the quality of planning and implementation, of building materials and construction, as well as key aspects of user comfort and air quality indoors. The klima:aktiv building standard exists for residential buildings and various types of service industry building, covering the construction of new buildings and renovation.

The klima:aktiv criteria fall into four evaluation categories:



- A** planning and implementation (max. 130 P.)
- B** energy and supply (max. 60 P.)
- C** building materials and construction (max. 150 P.)
- D** comfort and indoor air quality (max. 120 P.)

### A. planning and implementation

Location and life cycle costs are of equal importance for planning and implementation, as are freedom from air leaks, minimizing thermal bridges, and making provisions for instruments to record energy consumption.

### B. energy and supply

Compared to average buildings, a considerably reduced energy consumption and fewer CO<sub>2</sub>

emissions are essential in order to achieve high-grade klima:aktiv quality. Numerical values may be calculated according to either OIB or PHPP.

### C. building materials and construction

Building materials particularly harmful to the climate are excluded. Using environmentally sound building materials is rewarded.

### D. comfort and indoor air quality

Summer climate-worthiness and low-emission interior building materials create comfortable conditions and good air quality indoors. Having a ventilation system with heat recovery is rewarded.

Austria was quick to recognize the opportunities available in environmental and energy technologies, and is now an international leader with a competitive edge in climate-friendly technologies. This has beneficial effects on the country's attractiveness to business, on economic growth and on employment.

# Sustainable building technologies “Made in Austria”



Picture: Karl Schwarz

An enormous potential for economic recovery and for green jobs rests with the increase in energy efficiency, energy saving, the consistent further development of renewable energy technologies and with investments in innovative environmental technologies.

With 31.0% of total energy consumption covered by renewable sources of energy in 2011, Austria is among the European leaders here. Renewable energy sources account for 64.6% of electricity consumption, which underlines the importance of eco-friendly energy production in Austria.

Austrian cutting-edge technology in the fields of solar energy (for hot water supply and backup heating, but also for environmentally sound refrigeration and the production of cold from heat), biomass (to generate electricity, and for heat and organic fuels) and ecological construction is used world-wide.

## **Passive-house technologies**

Overall, Austria has the highest per capita share of passive houses in the world (there are 2.5 times more passive house buildings per million inhabitants in Austria than in Germany); 45% of all passive houses in the EU are in Austria. In some provinces up to 60% of housing units are built to passive-house standard. Austria has a leading market position in passive-house technologies (e.g. heat pumps, windows).

## Solar energy

Austria ranks third by number of installed solar heating systems per head, behind Cyprus and Israel. Austrian suppliers of solar energy systems for hot water, space heating and cooling notch up high export figures; in 2011 78 % of solar collectors manufactured in Austria were exported. Almost a third of the solar collectors installed in the EU come from Austria. Turnover in solar equipment came to approx. 365 million Euro in 2011, a third of it in the fitting trade. Including servicing and replacing existing solar facilities, the solar field provides 3,600 jobs in Austria.

## — Almost a third of the solar collectors installed in the EU come from Austria.

In the field of photovoltaic follow-up technologies (inverters, power electronics) and in the photovoltaic supply industry (protective foil for solar modules) Austrian enterprises have established an international position.

## Automatic biomass heating systems

Austria has been working on producing heat from biomass efficiently for decades. Our biomass boiler producers' unparalleled know-how is internationally recognized and appreciated. Exports of wood-chip and pellet boilers make up nearly 70% of turnover.

The Austrian suppliers of biomass heating technologies currently achieve a turnover of approx. 1,000 million Euro per annum, increasing at 20 % annually. With 12.5 pellet heating systems per thousand inhabitants Austria tops the European charts, followed by Denmark (11.8), Sweden, (11.1), Finland (4.7) and Germany (2.3).



Picture: Hoval GmbH



Picture: Architekt Reinberg

## — Exports of wood-chip and pellet boilers make up nearly 70% of turnover.

### Further information:

Information about the wide range of Austrian products and systems solutions available in the fields of construction, energy, air, water/wastewater, noise, waste and soil: [www.ecolinx.at](http://www.ecolinx.at)

Data and facts, news items, interviews with experts and examples of good practice from the field of Austrian environmental technology: [www.umwelttechnik.at](http://www.umwelttechnik.at)

Platform for environmental technology, qualifications and professions: [www.greenjobsaustria.at](http://www.greenjobsaustria.at)

This State Prize is a motor and a reflector. It is to be hoped that it encourages and inspires the Austrian spirit of research and invention, and gives the incentives to business and culture that have already borne fruit in the award-winning examples.

Roland Gnaiger, State Prize representative  
of the Ministry for the Environment

**More Information on klima:aktiv  
building and refurbishment:**

[www.bauen-sanieren.klimaaktiv.at](http://www.bauen-sanieren.klimaaktiv.at)

**Examples of energy-efficient  
and environmentally  
sustainable buildings:**

[www.klimaaktiv-gebaut.at](http://www.klimaaktiv-gebaut.at)

**State Prize Tour**

An interactive architectural guide  
to the State Prize projects:  
[www.staatspreis.klimaaktiv.at](http://www.staatspreis.klimaaktiv.at)

**Strategic planning and  
coordination of klima:aktiv**

Austrian Federal Ministry of Agriculture,  
Forestry, Environment and  
Water Management, Div. Environmental  
Economics and Energy Policy

**Program management klima:aktiv  
building and refurbishment**

ÖGUT – Austrian Society  
for Environment and Technology  
E-Mail: [klimaaktiv@oegut.at](mailto:klimaaktiv@oegut.at)