



ESBG 2015

EUROPEAN STRAWBALE GATHERING MONTARGIS | PARIS



**How far do we reach
16 years of professional
strawbuilding in Austria**

ESBG Strawbale Event (header1)

Straw in Austria

In historic and prehistoric periods straw was used in the region of central Europe for multiple building purposes : as thatching of roofs, in mudwalls as binder and to make mudbricks lightweight and more insulating. Many rests can be found in old houses in wine-quarter Lower Austria and ealse with this heritage. Straw became banished in towns and cities as possible source of fire danger as well as wood was famed for same reasons.

It was not before 1997 that straw became again matter of interest in Austrian research.

Krotschek, R. Wimmer, M. Narodoslowsky: Stoffliche Nutzung
Nachwachsender Rohstoffe in Österreich, Graz 1997 (erhältlich im
bm:bwk, 17/97)

Since 1999 professional strawbuilding in Austria has been established by
strohtec

How did this influence Austrian research and how ist the impact on building
practice in Austria?

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Continuous research by GraT 2001-2008

S-House Planen und Bauen für die Zukunft
(5MB pdf-Datei)

Stroh als Baustoff - Zu schade zum Verheizen! Tagungsband zum Strohbausymposium vom 29. Juni 2001 in Illmitz (10MB pdf-Datei)

R. Wimmer, L. Janisch, H. Hohensinner, M. Drack: Wandsystem aus nachwachsenden Rohstoffen; Haus der Zukunft - Wirtschaftsbezogene Grundlagenforschung, Wien 2001 (erhältlich bei HdZ oder hier als pdf-Datei: Hauptteil und Anhang)

R. Wimmer, L. Janisch, H. Hohensinner, M. Drack: Erfolgsfaktoren für den Einsatz nachwachsender Rohstoffe im Bauwesen - Fördernde und hemmende Faktoren für den Einsatz nachwachsender Rohstoffe im Bauwesen; Haus der Zukunft - Grundlagenstudie, Wien 2001 (erhältlich bei HdZ oder hier als pdf-Datei)

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Continuous research by GraT 2001-2008

R.Wimmer, R.Bintinger (2008): Modular Straw Bale Building Prefabricated in a Virtual Factory, World Sustainable Building Conference 08, 21-25 September, Melbourne, Australia 2008

R.Wimmer, H.Hohensinner, T.Tengler, P.Petek (2008): Infopoint for NAWAROS and ecological materials, Internetplatform, Info- and Serviceoffers, Haus-der- Zukunft Transfermaßnahmen, BmVIT, Vienna 2008

R. Wimmer, H. Hohensinner, M. Drack, C. Kunze (2005):
S-HOUSE final report,
In realising S-HOUSE as demonstrationbuilding, a rolemodel for modern office. And housingbuildings was created. The Informationcentre shows the compatibility of traditional materials with modern architecture and innovative constructions.

ESBG Strawbale Event (header1)

Straw in the „house of future“ programm Bmvit



SOL4 Office- and seminar buildingblock „Eichkogel“

- Straw filled prefab elements, adobe partition walls
- Heat and cold supply by brine heatpump
- Electricity supplied by PV in annual average
- Socially matched utilisation concept, cooperating with a health centre

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Feasability research by ÖÖI Stroh:Kompakt

Leadpartner Austrian ecology Institute (ÖÖI) plus several institutions and enterprises took basic research on the feasibility of straw as building matter.

Agrar+, Haus der Baubiologie (BM Hegedys), Buhl Bau (Woddworks), IBO and ConsultS (Schwarz Müller) as well as the University of Vienna (Inst. für hygienic - mould testing) could proof usability, agricultural availability and feasible harvesting conditions as well as the building of 2 demonstration buildings. Result a two-storey passivhouse in Perchtoldsdorf with prefab elements filled with straw and rendered with mediumhard woodfibre boards. Burnability and other tests, done bei OFI, layed the base for a building, that well performed since then plus a refurbishment of a farmhouse to modern mansionhouse (2003)

These tests together with later tests by GrAT established fundamental guidelines for the use of straw in buildings. Many tests of building parts, bales where to follow since then.

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Capability for refurbishment



Leadpartner Global 2000, ConsultS (E. Schwarzmüller) plus the Czech NGO ECODUM started a search for pilotes in Lower Austria and South Maehren (CZ), to have 5 renovations with straw realised and thereby solving logistic and technical obstacles in the use straw as building matter.

It turned out to be easier realised in Czech Republic than in Austria, because of lower wages there and the work intense solutions that had to be met.

Also some unrealistic expectations of the clients, that straw as building matter should decrease the buildings price led to consultation and visitation of 15 objects, out of which 3 objects were realized in Austria and 2 objects in South Maehren (a four storey mill partially insulated in Kritiny near Brno plus the north wall of a one storey house directly plastered near Budvar).

2003-2004 final report 2005



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GrAT S-House

GrAT achieved a 100% funding of s-house as demonstration building for a factor 10 building practice for the future.

It could prove that more than 90% of primary energy for the production of the building could be saved as well as energy for heating and cooling. It serves as seminar and workshop room and houses offices for NAWARO research.

Two years monitoring aproved the calculated values.



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Pilote Buildings „House of Future“ Program (Bmvit)



Passivhaus-Kindergarten Ziersdorf



- 🏠 **Frage: interne Wärmegewinne, Aufheizverhalten**
- 🏠 **Einsatz von Holz, Lehm und Stroh**
- 🏠 **Südwand: Strohballendämmung 47 cm**
- 🏠 **Berichte aus Energie- und Umweltforschung 8/2003**

ESBG Strawbale Event (header1)

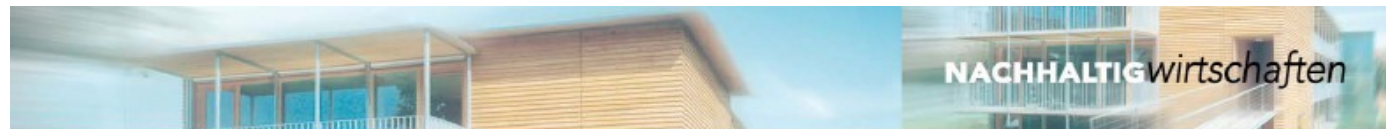
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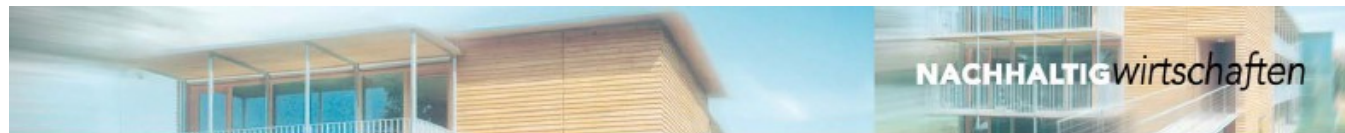


S-House - Büro- und Ausstellungsgebäude



- ☞ Ressourceneffizienz: Faktor 10
- ☞ Holzständerkonstruktion mit Strohballendämmung in Passivhausqualität
- ☞ Messtechnische Überprüfung der Langzeitfunktionalität der innovativen Konstruktionen
- ☞ Informationszentrum mit Dauerausstellung für NAWARO
- ☞ Berichte aus Energie- und Umweltforschung 2/2005

Pilote Buildings „House of Future“ Program (Bmvit)

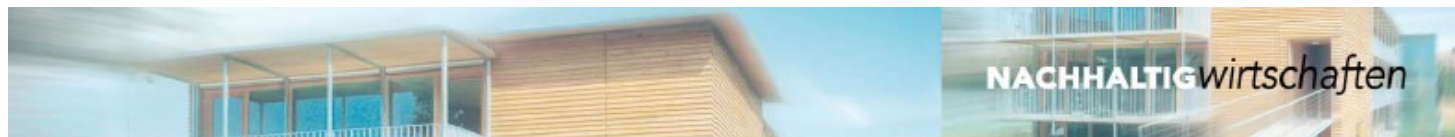


Lehm-Passiv Bürohaus Tattendorf



- ☞ Grasdach: Versuchsfläche für die Anlage sekundärer, artenreicher Trockenrasenbiotope
- ☞ Lehmfasertechnik anstelle üblicher technischer Dampfbremsfolien
- ☞ hoch wärmegedämmter Holzleichtbau (mit Stroh-Flachs-Dämmkern)
- ☞ Lehm als Speichermasse
- ☞ abfallfreie Bautechnik
- ☞ Berichte aus Energie- und Umweltforschung 29/2005

Pilote Buildings „House of Future“ Program (Bmvit)



Neubau Biohof Achleitner



- ☒ Vermarktungs-, Lager- und Verarbeitungszentrale in Passivhausbauweise
- ☒ Ausführung der Halle als Holzsonderkonstruktion mit Strohdämmung für Dach und Wände
- ☒ Raumklimatisierung mit Hilfe von Pflanzen

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Asbn virtual building site

In 2008 asbn's project was accepted as demonstration and proliferation project for building with straw.

House of future program funded Transferproject: Professional strawbale building - "Virtual building-site", provides exhibition and instruction material

Strawbale-workshops are considered as the best way to inseminate this ecological building-technique. The "virtual building site" has some decisive advantages over the common situation: it does not depend on the weather, allows the comparative study of different constructing methods and can, as a permanent installation, be used as an exhibition.

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Qualifizierungsnetzwerk Stroheinsatz im Bauwesen

To boost the knowledge harvested in the last years in different research projects the qualifying network „straw as building matter“ was introduced including four university institutes plus eleven enterprises and networking organisations. Strawbuilding can sustain priority goals in building branche such as dramatically reduced primary energy demand for the production of buildings, cascadic use of local available ressources, reduced ecological footprint, minimized CO2 output or even CO2 storage in buildings, cradle2cradle ability reducing deponies.

Against a broad application of straw in building scene in Austria stood and stands the lack of education of planers plus handcrafts in strawbuilding techiques, missing knowledge of the legistic status of straw construction and admissions plus certificates that are not available to the majority of builders.

Goal was the share of knowledge of experienced strawbuilders with three Universties (BOKU Wien, TU Wien, Uni Innsbruck from them 4 institutes plus interested enterprises.

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Research done by enterprises

In the last 15 years diverse enterprise triggered research was done on straw use as building matter:

A cooperative project funded by the Lower Austrian economic department realised the first European admission for bales as building matter in 2010. In the project involved Atelier Schmelz, Kreativer Holzbau Kastner and Waldland as well as the BEUC (E. Schwarzmüller) and consultant H. Gruber.

Christoph Kastner created in a cooperative project a systemhouse built with straw filled elements www.kreativerholzbau.at

LOPAS research ended with a patent on infill of strawchaff by blowing into hollow building elements. [Www.lopas.ag](http://www.lopas.ag)

Buildingmaster Höller researched on several items: Straw as plastered insulation on massive walls, 2 storey loadbearing strawhouse all built as passivehouse standard.

Virko Kade Stroh & Lehm did first loadbearing houses on professional base [Www.strohundlehm.at](http://www.strohundlehm.at)

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Potential versus Realisation

Straw resources: Lower Austria solitary produces yearly >800.000 tons of wheat straw. A drawing of less than 10 % could provide 800.000 m³ building straw, which could provide 8.000 – 14.000 housing units per year and thus save exhaust of more than 300.000 tons CO₂ and an equivalent of 3.000.000 kWh primary energy.

Agraric straw stays partially unused, and is artificially reduced by chemical treatment haulms are shortened to 1,5 to straw per/ha, in traditional agriculture 10 bis 15 to straw /ha were harvested with lengths 0,6-1,5m.

The recent demand of straw houses cannot be complied with because many planners plus professionals don't know how to deal with and refuse to build strawhouses for their clients.

Until now approximately 300 housing units equivalent have been realised in the last 10 years, that makes about 1:1000 of the Austrian building market.

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Measures and tasks for more strawbuilding in Austria

Publish straw building rules for straw valid in Austria
Better transmission of research results to commercial use

Produce natural resources as straw at a fair and reasonable price needs a CUAP regulation at OIB likewise other building matters.

Establish professional strawbuilding education that is respected by the chambers of commerce or integrate chambers in straw education.

Establish political support for straw and other naturally based materials, for their multiple positive effects on society and ecology. Straw by now produces the best life cycle performance of all building systems (with exception of natives housings like Iglus or bushhuts):

- More workplaces: strawbuilding is more than 1,5 fold labour intense than conventional industrial building
- Less consumption of energy and resource by factors >10, no CO2 output
- Less dependency of energy and resources imports
- More resilience in housing, public and commercial buildings
- Cradle 2 cradle ability reduces amount of waste disposal

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Wellcome to

Thanks for Your Attention

Erwin Schwarzmüller

Working for social and ecological balance
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Www.stroh-web.at
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