



*Straw-Bale Construction:
Harvesting Its Potential as an
Affordable, Energy-Efficient
Building Strategy*

Friday, June 20, 2008
10:00 a.m. - 11:30 a.m.
485 Russell Senate Office Building

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DCAT's Involvement with Straw Bale Building

The Development Center for Appropriate Technology (DCAT) is a non-profit organization actively involved in straw bale construction since 1991.

1993 - Helped plan and carry out the first straw bale construction structural testing program.

1993 - Began work on load-bearing straw bale building code.

1995 - Tucson & Pima County, AZ and the State of California adopt load-bearing straw bale codes.



Some of the Benefits

As we've heard today, Straw Bale Construction has become a viable building system for a wide range of applications. Among its many crosscutting benefits it is:

- *Abundant*
- *A low-embodied energy material*
- *Able to create highly energy-efficient buildings*
- *An added value market for farmers*
- *A vehicle for green tech job and business creation*
- *Ideal for affordable and self-help housing*
- *A contributor to energy security*
- *Climate-beneficial building system*
- *An affordable way to add beauty and customization*

The Opportunity and Challenge

- Straw bale construction is poised to make a significant contribution to solving some of the nation's most pressing problems.
- In spite of growing acceptance and success, gaining code approval, insurance, mortgages, and financing continue to be a challenge.
- Much more research and testing is needed. Since 1992, approximately \$400,000 of research and testing has been carried out in the U.S., with \$200,000 of that coming from the California Air Resources Board as part of their rice straw burning abatement strategy.

At the Heart of the Challenge

- Straw bale construction is a ***public domain*** building technology available to anyone—a great benefit which creates great challenges.
- As a ***non-proprietary*** and ***non-industrialized*** building system, there is ***little to patent, control or sell.***
- Thus there is *no large, consolidated industrial or financial interest* that could make enough money from it *to invest in the needed research, testing, development and deployment* necessary for it to make it into widespread mainstream use.

At the Heart of the Challenge

- Most public funding for research, testing, development, demonstration and deployment is designed for proprietary products, materials, or processes, rather than for developing, optimizing and making available approaches that reduce demand, resource through-put and impacts.
- Today, with climate change and energy, water and other critical resource issues facing us, we need solutions with lower ecological footprints.
- *We need public policies to help deliver them.*

At the Heart of the Challenge

- Straw bale is in a *class of valuable technologies and solutions* that have little opportunity, through conventional sources of funding and technical support, to be fully researched and, if viable, to be optimized and made available to the public.
- Other examples include passive solar and passive ventilation strategies (for both new and existing buildings), other ultra-low-impact building materials and systems, rainwater harvesting, greywater and other non-proprietary decentralized water and wastewater treatment systems.

Public Policy Solutions

■ Although this NRC study didn't focus on non-proprietary research, similar benefits would likely accrue from such research investments.

*A 2001 National Research Council (NRC) report found that every dollar invested in the 17 DOE energy-efficiency research and development (R&D) programs the NRC studied returned nearly \$20 to the U.S. economy in the form of new products, new jobs, and energy cost savings to American homes and businesses. **Environmental benefits were estimated to be of a similar magnitude.** Increasing current spending for buildings RDD&D could reduce annual energy use in 2020 by 1.47 quads.*

-Building On Success, Alliance to Save Energy, 2005

www.ase.org/content/article/detail/2329

Public Policy Solutions

■ Create a ***Public Benefit Innovation Research (PBIR) Grant*** program in the national laboratories modeled after Small Business Innovation Research (SBIR) Grants.

The FY 2008 Federal Budget allocates \$1.6 billion in SBIR Grants. These grants (they are not loans) are restricted to ***for-profit businesses**** with ***proprietary products, materials, systems or processes***, funding ***businesses to partner with national laboratories on research, testing and development of innovative technology.***

*The businesses can utilize non-profit research partners, but the grants must be to a business with a proprietary product or process.

Public Policy Solutions

- The nation needs a ***parallel program*** in the national laboratories to support the development of ***public domain, public benefit technologies and systems, open to non-profit, public benefit organizations.***
- These new grants should be for non-proprietary materials and methods, such as straw bale construction, as well as for optimizing design strategies and solutions that have potential for significant public benefit but have limited funding opportunities for research.

Public Policy Solutions

■ ***Create a National Laboratory dedicated to research, testing, development, demonstration and deployment of **sustainable and regenerative materials and systems**, similar to the USDA's Forest Products Laboratory. Alternatively, create a program with those goals in existing national laboratories.***

Public Policy Solutions

■ **Create incentives**—including tax, mortgage, insurance, and direct financial incentives, **tied to building envelope energy performance** - with **explicit credit for low embodied energy materials and passive solar design strategies and building components** (not just devices).

Energy efficiency is the fastest and most cost-effective way to reduce carbon emissions related to buildings.

Create incentives for efficient building shells and passive strategies to shift design and building practice. Incentives for passive and low-embodied energy solutions should parallel those for renewable energy systems, such as:

http://geology.utah.gov/SEP/incentives/re_taxcredit/pdf/retc_rules_pre07.pdf

Public Policy Solutions

■ ***Fund research, testing and monitoring of straw bale building and related materials and methods to enhance existing knowledge and to overcome regulatory barriers in building codes, insurance and mortgages and financing.***

Public Policy Solutions

■ ***Fund micro-enterprise development for natural and ultra-low impact building systems to create trained labor and a local material supply chain while stimulating local economic development*** through reduced utility costs of homeowners and renters.

Public Policy Solutions

■ ***Fund an independent study of the highest and best use of straw and other materials that were previously classified as waste and now are seen as resources.***

There are competing uses for many of these resources. Determining the best allocation for them will be critical to creating a sustainable resource economy.

Public Policy Solutions

■ ***Endorse and commit resources to develop Passive Survivability Design Guidelines for buildings***, followed by support for the process of incorporating them into building codes to reduce widespread risks and problems arising when buildings lose external power – as with August 2003 power blackout in the NE U.S., or following hurricanes Katrina and Rita.

www.buildinggreen.com/press/passive-survivability.cfm

www.buildinggreen.com/auth/article.cfm/ID/3206/

Thank You!

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