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BIRA AWARDED DOE PARTNERSHIP

ConSol-led Building Industry Research Alliance (BIRA) was recently awarded one of fifteen U.S. Department of Energy research and deployment partnerships to help dramatically improve the energy efficiency of America's homes. These highly-qualified, multidisciplinary teams will receive a total of up to \$30 million for the initial eighteen months of the projects to research, develop, and demonstrate (RD&D) innovative energy efficiency technologies, systems and delivery strategies to the new and existing residential market and address barriers to bringing high-efficiency homes within reach for all Americans.

ConSol, headquartered in Stockton, California, and its BIRA team will focus on reduction of energy use and electricity peak-demand in homes by evaluating and demonstrating innovative technologies and market delivery approaches for neighborhood-scale implementation in new and retrofit implementations. The BIRA team has expanded its members beyond its prior 80 research organizations and building industry partners, to now also include: GE, MASCO; Pulte Group; ZETA Communities; Arizona State University; UC Davis; San Diego Gas & Electric; Arizona Public Service; Salt River Project; Ennovationz; Tendril; and Colorado Energy Group/U.S. Conference of Mayors.

Dr. Robert W. Hammon, ConSol principal, stated, "BIRA has provided a diverse research plan that will build and expand upon the successes of the BIRA team over the last seven-and-one-half-years. We have proposed new energy-efficiency research in both existing and new homes that will advance both market segments toward Department of Energy (DOE) Building America Program (BAP) goals. This includes research into "neighborhood" approaches in the retrofit market as well as research into design, construction, and market-sustaining practices for super-efficient communities that incorporate

both energy efficiency and local energy generation. Using current DOE BAP funding, BIRA is piloting its "neighborhood" approach for volume energy-efficiency retrofits with the Sacramento Municipal Utility District (SMUD) and the City of Anaheim. BIRA's RD&D for new construction will focus on cost-effectively improving efficiency in new homes and on research and development of utility impacts that should help make super-efficient communities more attractive to utilities, developers, builders and buyers."

"Energy efficiency can go hand-in-hand with peak reduction, as BIRA has demonstrated in several Building America prototype and community-scale projects. Based on this experience, the BIRA team will continue to work closely with utilities to determine the impacts of super-efficient communities on electricity demand during peak hours, as well as the value of this peak reduction," Hammon concluded.

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NV ENERGY LAUNCHES NEW ENERGY EFFICIENCY PROGRAM

NV Energy, an electrical utility company covering most of Las Vegas and Henderson, Nevada, is in the process of implementing their Advanced Building Techniques (ABT) efficiency program. ConSol, the program administrator, is creating building feature packages for the ABT program, which is targeted toward new construction residential builders who would like to incorporate innovative efficiency features, and build to a goal of a HERS 50 level combining energy efficient building practices and renewable energy sources. NV Energy is providing an incentive to the builders based on the electricity savings gained from these homes, where the target energy savings per home is roughly 9,000 kilowatt-hours per year.

As part of the program, ConSol will conduct training sessions aimed at acquiring interest from builders. The sessions will detail the modifications made to the 2009 International Energy Conservation Code (IECC), the ABT program, energy-efficient features that could be used in the packages, new and innovative efficiency features, the increased marketability of better performing homes, and the rebates available.



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SAN JOAQUIN VALLEY - NOW BUILDING GREEN

As a private, nonprofit housing agency, Visionary Home Builders (VHB) provides affordable housing for low income households throughout the San Joaquin Valley. To date, VHB has developed more than 1,000 units of rental housing and 500 single-family homes since it was founded in 1983.

In early 2009, BIRA met with VHB to discuss the use of funds received from San Joaquin County under the federal HOME Investment Partnership Program. The HOME program provides grants to local governments for use in developing affordable housing for low-income families. The County was allocated \$1,610,587 in HOME funds to be used in activities such as home rehabilitation, homebuyer assistance, and affordable housing construction. VBH was provided \$241,576 of the County's HOME funding for use in the financing of energy conservation enhancements in the development of a new net-zero energy community, *Tierra Del Sol*.

With the assistance of BIRA, VHB is currently developing the *Tierra Del Sol* community, a Building America community consisting of 22 single-family homes targeted to the low income population, with incomes at or below 80% of the Area Median Income level. The community will be geared towards reducing, if not eliminating, the homeowner's utility bill. The community will offer a sustain-

able, positive, healthy living environment with emphasis on energy efficient appliances, sustainable materials and environmentally-approved products, as well as solar energy. Building features will include manufactured envelopes with R-26 walls and R-49 ceilings, attic radiant barrier, low air infiltration rate (3.0 ACH₅₀), dual glazed low-e windows (0.31 U-value/ 0.23 SHGC), electric heat pump 9.5 HSPF/SEER 17, 4.0 kW-AC PVT system, ENERGY STAR® appliances, and 100% CFL lighting. ZETA Communities (see last page), a modular home manufacturer, and BIRA team member, will construct the homes.



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NEIGHBORHOOD RETROFIT PILOTS:

SAVE ENERGY! SAVE MONEY! SAVE THE ENVIRONMENT, ONE COMMUNITY AT A TIME!

As reported in the 1st Quarter BIRAmeter, ConSol is piloting a neighborhood retrofit program with Sacramento Municipal Utility District (SMUD) and Anaheim Public Utilities. The core concept of the neighborhood retrofit idea is that similar construction techniques and features imply many of a neighborhood's homes should benefit from similar energy retrofits. Audits of the selected homes help confirm the unique features and assist with constructing the most cost-effective packages of retrofit improvements. Participating homeowners select from three unique packages, according to energy and budgets needs. One contractor, who will be able to give "bulk" discounts because of the multiple participants, will be chosen to do the work based on required qualifications (i.e. BPI certified), work experience and capacity, references and pricing. Each homeowner will meet individually with the contractor who will visually assess actual home conditions (to confirm no major deviations from the 'typical' home), discuss the chosen package, provide a contract and schedule work implementation. The contractor will conduct all diagnostic testing of the home once the work begins and again when the work is completed to confirm work quality and assure the highest level of safety. Both utilities will be providing rebates to lower the cost to consumers.

SMUD

SMUD Home Performance Program: Neighborhoods was marketed at many levels: mailed fliers, articles in the Homeowner Association Newsletter, yard signs, booth attendance at the local park's "Movie Night at the Park" and "Concert in the Park", discussions at the homeowner association meetings, doorknob hangers touting the program and web presence on both the SMUD and ConSol website (www.Consol.ws/srud) were all factors that garnered letters of interest. Forty-four contractors attended the mandatory orientation meeting and are currently responding to the bid to do the work. The program goal was to enlist 25 homeowners from the neighborhood; however, contractor feedback suggested that the concept will be viable for a group larger than 10 participants. Once the contractor is selected, interested homeowners will be granted the opportunity to meet him/her at a "Meet the Contractor Night".

ANAHEIM PUBLIC UTILITIES

The work with Anaheim Public Utilities is just beginning for about 2,000 homes located in the specific zip code region that was selected by Anaheim Public Utilities. This decreases the marketing costs while adjustments are made to finesse the program. With

this pilot, a contractor has already been chosen; MASCO, who is well established in the weatherization market in Los Angeles and through Wellhome currently in states other than California, has accepted the contractor responsibilities graciously. One financing option being explored is through Bank of America. Marketing efforts are just beginning, but both BIRA and Anaheim Public Utilities are looking forward to implementing the project.

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BUILDING INDUSTRY RESEARCH ALLIANCE

The DOE's Building Industry Research Alliance (BIRA) helps improve neighborhood-scale new and retrofit homes.

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ZETA COMMUNITIES



ZETA delivers modular home to construction site

ZETA

For the successful development of a NZE community, it is critical to minimize the size of costly renewable energy (i.e. photovoltaic systems) by maximizing the energy efficiency of the building envelope

and HVAC systems. ZETA Communities (ZETA), a modular home manufacturer of affordable single- and multi-family housing and commercial structures which specializes in net-zero energy (NZE) buildings, will be used to construct all 22 homes for the upcoming NZE community, Tierra Del Sol.

ZETA's precision-built structures are built in their 91,000 square foot, state-of-the-art facility located in Sacramento, California. ZETA is able to complete projects that exceed the performance of site-built construction at no additional cost with 80% less waste, a minimum of 50% faster construction timeframes, with greater energy efficiency than conventional construction, and with indoor and outdoor environmental benefits.

ZETA uses fewer materials, produces less waste and reduces total development time – the construction of the foundation and the units occurs in parallel. There are also no weather delays, material shortfalls, worker downtimes, or unanticipated site issues. Reduced construction timeframes help minimize holding costs. This particular project will be completed in phases, with four to

six units completed each month to enable pre-sales of the project and optimize the project cash flow.

Using a whole-systems design approach, high performance materials, and an innovative mechanical core, ZETA homes require 40%-60% less energy for heating, cooling, and hot water than a comparable structure. The prefabricated and engineered core combines mechanical, plumbing and electrical systems into a unit that easily connects the sites' infrastructure systems during onsite installation. They add photovoltaic (PV) cells to supply energy that prevents the release of more than 14 tons of CO2 greenhouse gas emissions annually and a wastewater heat recovery system which preheats shower water contributing to more energy savings.

Since ZETA's structures are primarily completed in the factory, there is minimal site and neighborhood disruption during on-site construction. This means minimal dust, noise, and impact to the surrounding area. ZETA achieves EPA's highest indoor air quality ratings by integrating building methods and toxin-free materials such as mold resistant and dry lumber.

ZETA selects the company to deliver their products to the site and then provides on-site construction management for the installation process. ZETA will be working with a general contractor who will provide the on-site construction work including foundation, installation and finish work. Third-party inspectors evaluate and provide the seal of approval for off-site construction at ZETA's factory. Local building departments inspect and approve the on-site construction of the foundation, utility connections and the finished home.

ZETA's ability to incorporate advanced building features and QA/QC procedures has proved to be vital in the development of Visionary's Tierra Del Sol community as sustainable and energy-efficient housing.

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