

High Performance Builder Spotlight

Community Development Corporation of Utah



Energy efficient homes for low and middle income home buyers

Community Development Corporation of Utah aims to provide affordable housing to families around Salt Lake City, but they had never aimed for energy efficiency above code, until they linked up with Building America on three homes in Magna, Utah in 2004. One of these homes was a prototype. Now they are committed to building every home to at a minimum meet the state's ENERGY STAR standards.

“ We made a commitment to energy-efficient construction on all our new homes because we want to give our families a better product and because this is the trend in the Salt Lake City area. ”

JEFF HAYDEN - COMMUNITY DEVELOPMENT CORPORATION OF UTAH

Building America's Consortium for Advanced Residential Buildings (CARB) team encouraged CDCU to reach for savings of greater than 30% over the Building America benchmark in the prototype.

Innovations

Advanced framing was one of CDCU's biggest changes. CDCU switched from 2x4 16-inch on-center framing to a 24-inch grid layout for roof trusses, wall framing, and floor trusses with all members aligned for a direct load path from the roof to the foundation.

Double rim joists over the first-floor windows eliminated the need for window headers on the first floor. Header hanger mechanical fasteners were used to reduce the number of studs. Two-stud corners and ladders for intersecting walls also reduced lumber and increased the free wall area for insulation. Open web floor trusses were used to accommodate HVAC chases.

Other energy-efficiency features included low-emissivity windows, a compact duct design with central returns, properly sized HVAC equipment, power-vented mechanical equipment, and air sealing. The three prototypes also included half-height interior foundation insulation, spray foam insulation in the rim and band joists, blown-in wall and ceiling insulation, return air pathway transfer grilles, ductwork sealed with mastic, ECM furnace motors, a ventilation system capable of complying with ASHRAE Standard 62.2, compact fluorescent lighting, and ENERGY STAR-rated appliances.

CDCU and CARB experimented with different levels of wall insulation in the three prototypes and three different cooling systems. Unit 1 had an OASys Indirect-Direct Evaporative Cooler (IDEC) integrated with a Dynamic Ceiling System. One system accounted for space cooling savings of 68% over the benchmark. Space heating improvements accounted for 37% savings in the three prototypes combined.

BUILDER PROFILE

Community Development Corporation of Utah
www.utahcdc.com

Founded: 1991

Employees: 12

Energy Efficiency Commitment:
All ENERGY STAR as of 2006

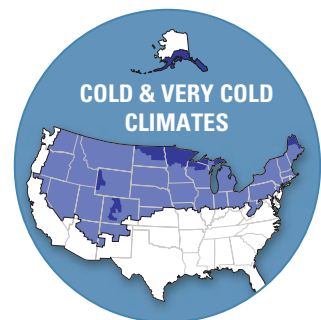
Development: Magna, Utah

Number of homes in Development: 3

Square footage: plan 1 - 1,540 sq ft;
plan 2 - 1,635 sq ft

Price Range: \$200,000

This builder will soon be described in Building America's Cold & Very Cold Best Practices.



U.S. Department of Energy
Energy Efficiency and Renewable Energy
Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable



Open web trusses provide convenient paths for duct chases between floors in conditioned space

KEY FEATURES

Foundation wall insulation 2-in. foil-faced polycyanurate (R-13), half-height

2x6 wall framing, 24 in. o.c. with R-23 blown-in fiberglass and poly vapor retarder on the interior

Open-web trusses in floors and R-19 batt insulation over garage

Rim/band joists insulated with two-component spray foam

Windows Low-e, double-pane, vinyl frame (U = 0.35, SHGC = 0.30)

Ceiling Insulation R-40 blown-in fiberglass

Engineered duct system, sealed with mastic

Return air pathway transfer grilles

Space Heating: 96% AFUE gas furnace, direct-vent, ECM motor, two-stage

Programmable thermostat

Water Heating: power-vented 50-gallon gas water heater, EF = 0.61

Lighting 70% compact fluorescent

ENERGY STAR dishwasher

Dollars and Sense

CARB calculated that the prototype used 5,841 kWh annually compared to 7,908 kWh used by a typical home by this builder or 9,105 kWh used by a Building America benchmark home. Thus, the prototype home achieved energy savings over benchmark of 32% and a cost savings of \$312 annually. The prototype home was so much more airtight that the builder downsized from a 4-ton air conditioner to a 2-ton unit.

The advanced framing saved 36% in framing lumber in two units and 21% in one. Materials reductions saved the builder money and resulted in less waste.

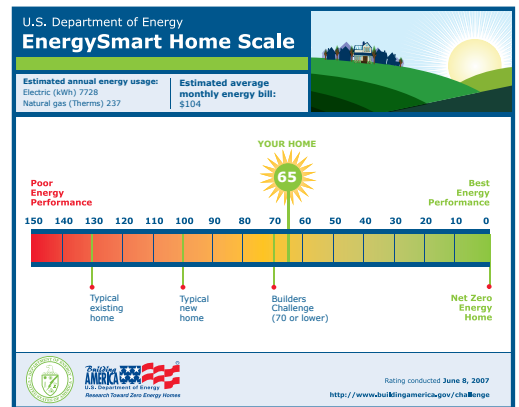
Hayden estimated that building the homes to be energy efficient added about \$3,000-\$5,000 to the construction cost of each home. However, despite the high-performance envelopes and upgraded mechanical equipment, the winning contractor's bid for construction still fell within the range of typical construction costs for past CDCU projects.

U.S. Department of Energy Builders Challenge

DOE has posed a challenge to the homebuilding industry—to build 220,000 high performance homes by 2012. Homes that qualify for this Builders Challenge must meet a 70 or better on the EnergySmart Home Scale (E-Scale). The E-scale allows homebuyers to understand—at a glance—how the energy performance of a particular home compares with others. Through the Builders Challenge, participating homebuilders will have an easy way to differentiate their best energy-performing homes from other products in the marketplace, and to make the benefits clear to buyers.

The figure to the right shows an E-Scale example. The E-scale is based on the well-established Home Energy Rating System (HERS) index, developed by the Residential Energy Services Network. To learn more about the index and HERS Raters visit www.natresnet.org.

To learn more about the Builders Challenge and find tools to help market your homes, visit www.buildingamerica.gov/challenge.



For more information visit www.buildingamerica.gov. The website contains expanded case studies, technical reports, and best practices descriptions.

The Building America Program

Building America is a private/public partnership sponsored by DOE that conducts systems research to improve overall housing performance, increase housing durability and comfort, reduce energy use, and increase energy security for America's homeowners. Building America teams construct test houses and community-scale projects that incorporate systems innovations. The teams design houses from the ground up, considering the interaction between the site, building envelope, mechanical systems, and other factors, and recognizing that features of one component in the house can greatly affect others. More than 40,000 energy-efficient houses have been built by the seven teams to date.