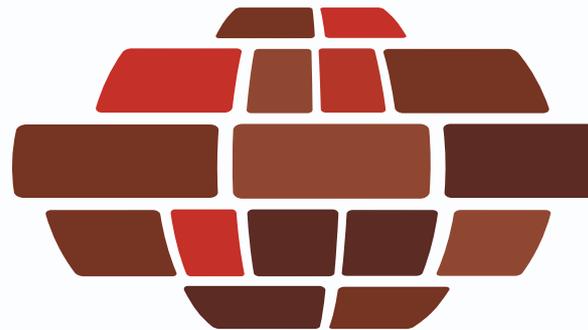




**Hinterlands International Missions**  
*Reaching the Unreached in a Holistic Way*



**DWELLEARTH**

LIVE ON IT, LIVE IN IT

[www.himissions.org/products](http://www.himissions.org/products)

Tel: +1240 422 9927, +1469 774 2821  
 Cameroon at +237 243 772 635,  
 Nigeria at +234 814 080 8331



# Impacting Energy Consumption Compressed Earth Blocks

Earth Blocks make a healthier home which has the lowest embodied energy and CO2 footprint of any building material while also creating a building that is 80% more energy efficient to operate.\*

The largest opportunity to conserve energy and create a gateway for renewable lies within the homes we construct. The answer is to make our new homes much more efficient using natural materials... The dirt under our feet.



\*<http://www.madehow.com/Volume-3/Rammed-Earth-Construction.html#ixzz3Op0nx91D>

## Compressed Earth Block Benefits

### Fireproof



An estimated \$11.5 billion in property damage occurred as a result of fire in 2013\*

### Soundproof



Sound insulation for a 40cm thick wall is 56dB.

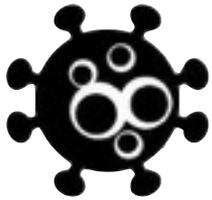
### Bulletproof



Earth Blocks receive and dissipate the bullets energy stopping it more rapidly than other masonry units.

## Compressed Earth Block Benefits

### Mold Proof



With a pH of 12.4, when stabilized with lime, mold is unable to grow.

### Bug Proof



Insects are discouraged because the walls are solid, very dense, and have no food value.

### Non Toxic



Materials are completely natural, non-toxic, synthetic chemical-free, and do not off-gas harmful chemicals.

## Compressed Earth Block Benefits

# Disaster Resistant

Design improvements and modernization to the earthen wall system has allowed for vertical and horizontal walls to be reinforced just like any other form of masonry construction giving design professionals the ability to design against disasters using well known and prescribed techniques.



Compressed Earth Block Benefits

# Regulates Humidity Breathable

Cut energy by reducing load on air-conditioning

Clay plasters on the interior and lime plasters on the exterior allow the walls to breathe. This is another way that the energy consumption of the structure is reduced. The regulation of humidity through the breathability of the walls reduces the need for air-conditioning systems.

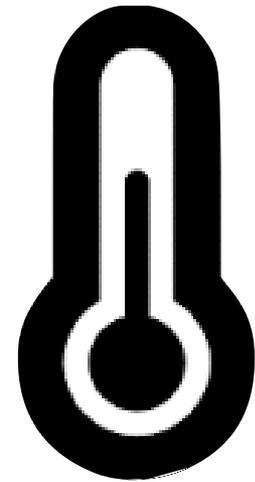
*\*[www.eia.gov/consumption/residential/](http://www.eia.gov/consumption/residential/)*



18% of household  
energy consumption  
in Texas is from air-  
conditioning units\*

## Compressed Earth Block Benefits

# Regulates Temperature



CEB has excellent thermal performance due to the thermal mass of the earth blocks, reducing heating and cooling costs.

Thermal testing: From May 31 to June 3, 2004, the Biology Dept. of Southwest Texas Junior College, Del Rio, Texas, conducted tests for thermal change on three structures: concrete block, adobe and compressed earth block.

Results indicate the interior temperature of the adobe and CEB modules were significantly lower than for concrete blocks.

With a maximum ambient temperature of 107 °F (42 °C), the interior temperatures were:

Concrete Module: 111 °F (44 °C) (4 degrees Fahrenheit above ambient)

Adobe Module: 95 °F (35 °C)

CEB Module: 91 °F (33 °C)

## Energy Savings

Designed and oriented to take the best advantage of solar energy, an earth house can be comfortable with up to 80% less energy consumption than a wood-frame house.\*\*

Compressed Earth Block Benefits

## Lowest Embodied Energy



Less energy over entire lifecycle

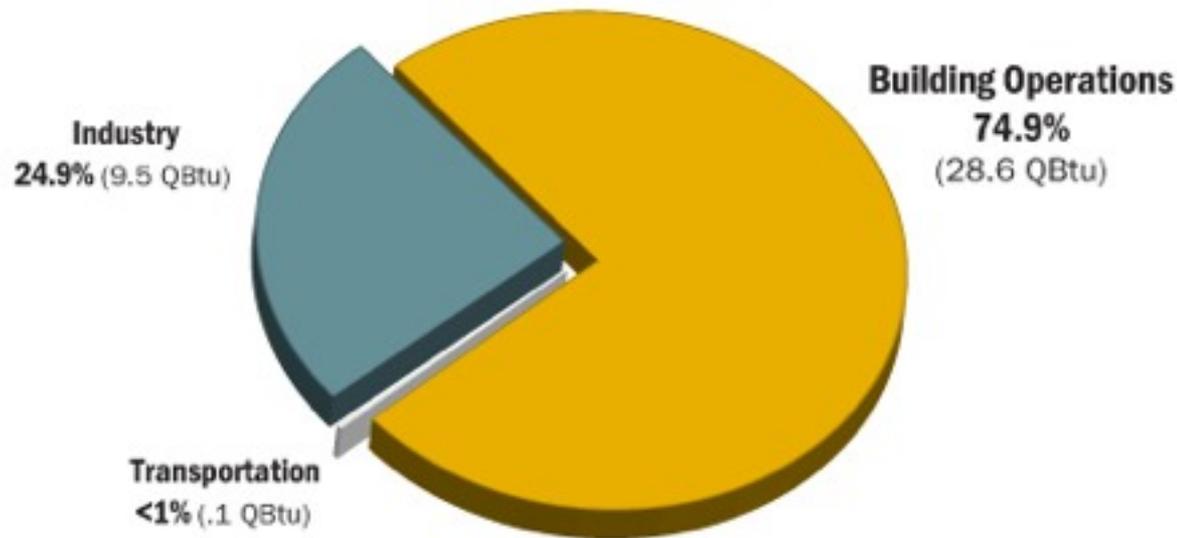
Compressed earth blocks not only help to reduce the amount of energy required for the structure to function effectively with comfortable inhabitants but they also require the least amount of embodied energy of any building material to produce.

INITIAL EMBODIED ENERGY PER M <sup>3</sup> OF WALL	POLLUTION EMISSION (Kg of CO <sub>2</sub> ) PER M <sup>3</sup> OF WALL
CSEB wall = 631 MJ / m <sup>3</sup>	CSEB wall = 56.79 Kg / m <sup>3</sup>
Kiln Fired Brick (KFB) = 2,356 MJ / m <sup>3</sup>	Kiln Fired Brick (KFB) = 230.06 Kg / m <sup>3</sup>
Country Fired Brick (CFB) = 6,358 MJ / m <sup>3</sup>	Country Fired Brick (CFB) = 547.30 Kg / m <sup>3</sup>

Compressed Earth Block Benefits

# Reduced Energy Consumption

Building with concrete and lumber has not been effective for energy efficient homes



## U.S. Electricity Consumption by Sector

Source: ©2013 2030, Inc. / Architecture 2030. All Rights Reserved.  
Data Source: U.S. Energy Information Administration (2012).

**Buildings are responsible for a staggering 74.9% of total U.S. electricity consumption.**

Compressed Earth Block Benefits

## Proven Technology

Earth is the oldest building material known to man.

Compressed Earth Blocks are essentially man made sedimentary rock. Rather than being compressed for thousands of years under deep layers of soil, it is formed in seconds by mechanically compacting properly prepared dirt.

Since the beginning of time people have been using the earth for building. Jericho, the earliest city recorded in history, was built of earth. Throughout history earth construction can be seen worldwide. The Egyptians, Mayan, Inca, Greeks, Romans, Chinese, and other European civilizations have long histories of earthen construction.



The Taos Pueblo in New Mexico is one of the oldest continually inhabited buildings in the world.

Built between  
1000 and 1450 CE\*

\*[http://en.wikipedia.org/wiki/List\\_of\\_the\\_oldest\\_buildings\\_in\\_the\\_United\\_States](http://en.wikipedia.org/wiki/List_of_the_oldest_buildings_in_the_United_States)

Compressed Earth Block Benefits

## Available Worldwide



Being able to find soil locally greatly reduces embodied energy of building materials through reduction of transport.

In the last 5 years Dwell Earth has set up projects all over the world. We have not yet been to an area and not found soil to make compressed earth blocks that are as strong or stronger than what was currently available locally.

Dwell Earth has projects in 16 countries around the world.

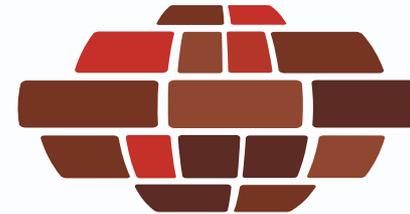
# Questions, Comments and More Info Please Contact

John Egyawan

[jegyawan@himissions.org](mailto:jegyawan@himissions.org)



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[www.himissions.org/products](http://www.himissions.org/products)

+1 (301)328-1591

[him@himissions.org](mailto:him@himissions.org)