



# Fighting Koalas ZEH project

Brian Adams, Logan Cozad,  
Cody Houck, Shawn Norton  
10/15/10

---

# Overview

- Goals
  - Design a ZEH
  - Model said design
  - Research aspects of ZEH
- Key features
  - HVAC elements
  - Solar energy use
  - Aesthetics

Size	3300 sq. ft
floors	3
occupants	4
bedrooms	3
Heating system	Geothermal HP
Heating fuel	Natural gas
Size of Photovoltaic	
Solar water heater	yes

# Research

- Most crucial part of a ZEH is the incorporation of HVAC systems
- Availability of solar energy is also vital for sustainability of the house
- Average ZEH tends to be smaller and more open floor designed
- Commonly small nuclear family oriented

# Data Conclusions

- Most efficient form of heating is geothermal heat pump
- Solar energy most effective form of heating and lighting
- Small simple design= better efficiency
- Incorporation of high end aesthetics harms ZE design

# Key Decisions

- Appliances
  - Low capacity high efficiency washer
  - High efficiency tv and fridge
- Allow low energy consumption and modern conveniences
- Open first floor equals better efficiency
- Floor arrangement allows more better flow of heat to crucial areas

# HVAC

- Geothermal Heat Pump
  - High efficiency
  - Low impact
  - Low cost
  - Heating and Cooling
  - Low impact on aesthetics

# Solar

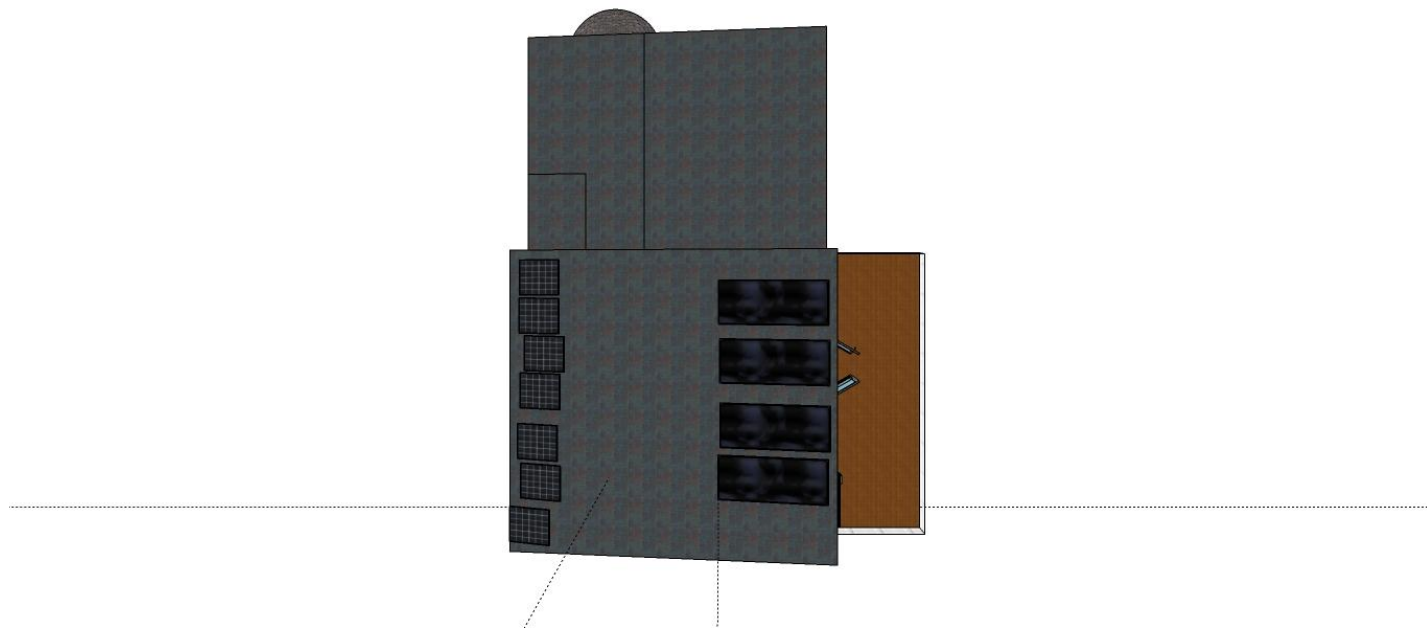
- Passive solar
  - Lighting to most rooms
  - Solar heat for the cold months blinds for warm months
- Solar array on room to produce electricity
- Solar water heating capabilities
- Reduce overall cost of living

# SketchUp model





# Top view



# Ground floor



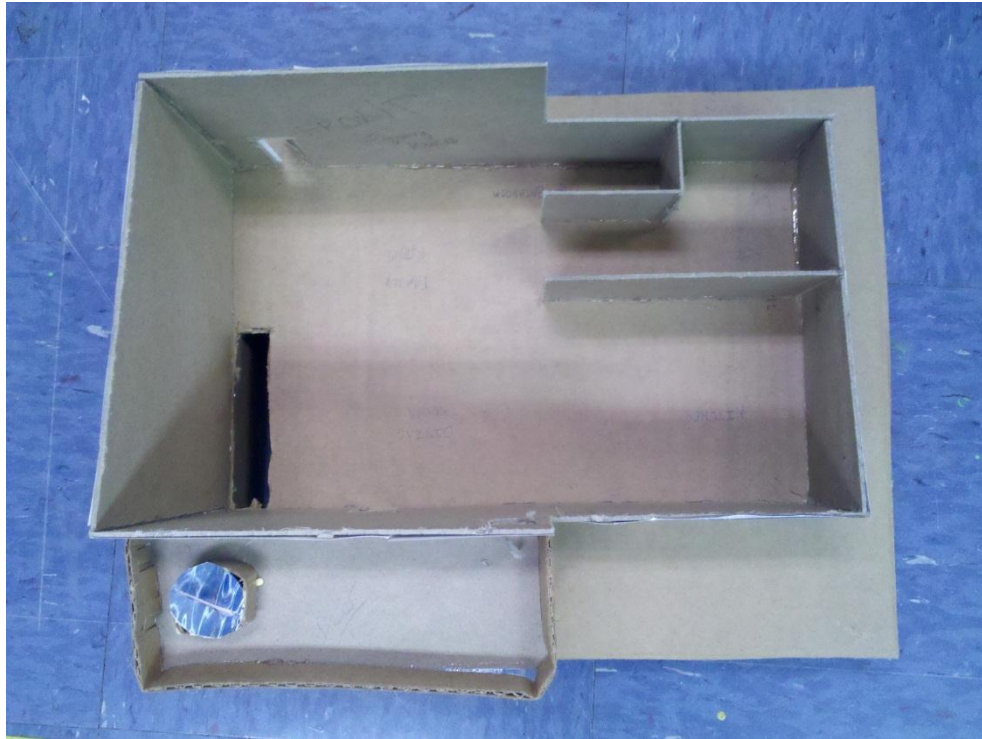
# Model Photos



# Top View



# Ground Floor



# Rear View





# In review

- ◉ During the process there were significant issues
  - ◉ First was determining the base design
  - ◉ Number of floors
  - ◉ How to distribute room space

# Important Aspects

- Solar energy capabilities
- HVAC method (geothermal)
- Floor plan layout
- Aesthetic incorporation



# Favorite feature HOT TUB



# Lessons Learned

- The most important thing our group learned was the difficulties of teams
- The basic elements of housing systems and how they are incorporated into a home
- How a ZEH is viable but hard to accomplish in most locations