



CONNECTICUT  
CLEAN ENERGY FUND

## Connecticut Zero Energy Challenge 2009-2010

### Purpose of the Challenge:

To identify, encourage and promote builders and developers of super high efficiency (near *zero energy*) homes in Connecticut in order to demonstrate that building to this level of efficiency is achievable today and to become better informed about what it takes to get there.

### Challenge Summary:

The Zero Energy Challenge will be a design and build competition for single and multi-family homes in Connecticut completed between April 17, 2009 and December 1, 2010. Homes will be rated based on RESNET Rating Standards and receive a HERS Index (i.e. a performance score). Since the HERS Index is based on the presence of energy-efficient features that curb overall energy use, the home(s) with the lowest HERS Index will determine the participants and winner(s) of the competition. Participants will be competing for cash prizes. Additional benefits for challenge participants will include peer recognition, exposure to media and other promotional opportunities, and various forms of technical assistance provided by the challenge sponsors. A website will be designed to highlight and promote the participating projects. This challenge is based in large part on a similar competition currently underway in Massachusetts. Information on the Massachusetts program can be found at <http://www.zechallenge.com/>

### Program Sponsors:

- Connecticut Energy Efficiency Fund. Participating utilities include:
  - Connecticut Light and Power
  - The United Illuminating Company
  - Yankee Gas Services Company
  - Connecticut Natural Gas Corporation
  - The Southern Connecticut Gas Company
- Connecticut Clean Energy Fund



Connecticut  
Light & Power

The Northeast Utilities System



The United Illuminating Company



The Northeast Utilities System

Connecticut's Energy Efficiency Programs are funded by a Charge on Customer energy bills.  
The Programs are designed to help customers manage their energy usage and cost.

Paid for by CL&P, UI, CNG, SCG and Yankee Gas Customers

### **Program Partners:**

- Home Energy Rating System (HERS) providers
- Insulation Contractors
- AIA/Design Professionals
- Connecticut Heating and Cooling Contractors Association (CHCC)
- Home Building Organizations (HBAs)
- Northeast Sustainable Energy Association (NESEA)
- Energy Conservation Management Board (ECMB)
- Department of Public Utility Control (DPUC)

### **Timeline:**

<b>Week</b>	<b>Activity</b>
March 4 <sup>th</sup>	Program formally announced via rollout meeting and directly to Program Partners
March 9 <sup>th</sup>	Application process begins
May 1 <sup>st</sup>	Applications are due
May 15 <sup>th</sup>	Short-list (i.e. finalists) is announced. MOUs are signed.
December 1, 2010	Due date for completion, final inspection and final HERS Index due
December 8, 2010	Winner(s) announced
TBD	Award Ceremony

### **Qualifying Homes:**

- Any market rate or low income home or unit in the process of or about to be in the process of development in Connecticut that falls under “Residential” designation by the Connecticut state building code. This may include single-family attached and detached homes, multi-family homes, condos and townhouses. Multi-family attached projects must be  $\leq 3$  stories to be considered “Residential” and therefore eligible.
- For multi-family attached projects, only one unit per project will be eligible, and the HERS Index for the selected unit will be the average of all neighboring units for the given project.
- The home must be built in the service territory of one of the participating utilities and must be a customer of that utility.
- A HERS Index less than or equal to 50 on the preliminary application (based on plans), prior to inclusion of any renewable energy sources.
- Since incentives for PV systems may be limited, the HERS Index for homes without a PV system will include a “to-be-installed” PV system. It will be assumed that this system will be mounted flat on a roof and will incorporate the current site conditions, including orientation and shading, into the modeling. The size of this system will be 1 kWh per 1000 square feet of living space. For homes with a PV system installed, the actual PV system will be incorporated into the HERS modeling.
- The home must be a new residential project or a complete gut rehab – modifications to pre-existing homes will not be eligible.
- Total home size must not exceed 5,000 square feet of conditioned living space. To encourage and reward homes that make maximum use of their living space, homes under 3,000 square feet will have the HERS Index adjusted based on the percentage that the home is below 3,000 square feet of living (heated) space. For example, if a 2,500 square foot home has a HERS Index of 30, the adjusted HERS Index will be  $(2500/3000) \times 30 = 25$ . In this situation, the adjusted HERS index of 25 will be used to qualify the home for inclusion in the program and to determine the winner(s) of the Challenge. Homes that are above 3,000 square feet will not receive any type of HERS Index adjustment.

- Home plans must be analyzed and scored by a certified HERS rater prior to construction and tested and scored by a HERS rater post-construction. Electronic REM Rate files will be submitted to the Sponsors and will be reviewed and validated by the participating Sponsors.
- Up to ten finalists will be selected to compete in the Challenge based on the preliminary HERS Index. If possible, the utility company Challenge sponsors will select at least one home representing each of the sponsors' service territories. Finalists will be given an additional \$500 incentive to help defray the cost of the HERS Rating.
- Builders may submit applications for more than one project, but a maximum of one project per builder may be selected for the Challenge.
- The Challenge sponsors will judge the homes and will determine the participants and the winner(s). In the situation in which a dispute arises or in situations when the HERS Indices are "too close to call", the Challenge sponsors will hire an independent HERS rater to determine the winner(s).
- It is expected that the "typical" home in the Challenge will greatly exceed minimum code standards and will incorporate advanced design and construction techniques. A "typical" home in the Challenge may include some (or all) of the following elements:
  - Advanced insulation materials (i.e. SIPs, ICFs, and/or high R-value "advanced" insulation packages. Efficient use of building materials.)
  - Balanced mechanical ventilation systems
  - Super high efficiency HVAC systems including inverter driven or geothermal heat pump technology.
  - High efficiency water heating.
  - Properly sized HVAC systems, including carefully designed ducts.
  - Tight construction (i.e. less than 0.3 cfm50/square foot)
  - Optimal solar orientation with advanced glazing based on orientation.
  - Solar thermal water and /or photovoltaic (PV) systems.
  - Low heat loss on the order of 10 MBtu per square foot of conditioned space.

#### **Additional Requirements/Activities:**

- Throughout the process, each builder must agree to occasional inspections, status reports, and monitoring and evaluation on behalf of the appropriate service provider in order to ensure rules compliance and capture best practices related to cost-benefit information, technology, and overall energy efficiency pathways. Methods may include:
  - Walkthroughs during and post construction, including QC by program Sponsors or partners
  - Digital image/video capture
  - Other monitoring of technologies in the homes where feasible
  - Other meetings as necessary
- Participants must also agree to take part in promotional activities including media events, open houses (possibly pre, during, and post-construction), best practices reports/publications, and a final awards ceremony.

#### **Benefits and Awards:**

Monetary awards: (subject to change)

- Grand prize: \$15,000
- Second prize: \$10,000
- Third prize: \$5,000

Peer recognition and project promotion:

- Competition participants will be prominently featured on the program's website, including descriptions of, and statistics related to, their projects.
- Potential exposure on other related websites.
- Participants will periodically receive media coverage related to the competition. Winners will receive additional media coverage as a result of the awards ceremony, best practices information sharing, newspaper and magazine articles, and open houses to showcase high efficiency and high performance measures taken.
- Higher retail value of the unit entered in the competition.

Technical assistance:

- Challenge sponsors and select partners will periodically provide technical assistance to participants on technologies and practices associated with building efficient, high performance homes.

### **Application Procedure:**

#### **Applications must be submitted on or before May 1, 2009**

Interested applicants will be responsible for submitting the following documents prior to the May 1<sup>st</sup> application deadline:

- A one-page summary description of the home, including location, size, type of project (single family, multi-family, etc.), materials being used, expected energy performance, and specific measures being taken related to energy efficient practices and technologies.
- Building plans, manufacturer cut sheets, receipts or invoices of materials or equipment already purchased related to energy efficient technologies or measures, or other similar information.
- Initial verification summary report issued by a HERS rater submitted electronically (a REM Rate file).
  - If no rating has been performed, sufficient data about the home for The Companies to calculate a preliminary HERS Index.
- (Optional) One-page summary description of the builder's experience in home-building, highlighting specific details related to energy efficient construction or technology. Additional information about the builder's company, certifications (e.g. ENERGY STAR partner, NAHB Green Professional, etc.), accolades, letters of reference, or other related materials may also be included in an appendix.

#### **Please send application documentation to:**

Homes built in CL&P or Yankee Gas territory:

**Justin Lindenmayer**  
 Zero Energy Challenge  
 66 Curtis St.  
 New Britain, CT 06052  
 Email: lindej@nu.com  
 Phone: 860-832-4915  
 Fax: 860-832-4700

Homes built in UI territory:

**Diane Damino**  
 Zero Energy Challenge  
 157 Church Street MS 1-6B  
 New Haven, CT 06510  
 Email: diane.damino@uinet.com  
 Phone: 203-499-2843  
 Fax: 203-499-2800

Questions regarding the Zero Energy Challenge should be submitted via email or phone to either of the contacts listed above, depending on service territory.

## 2009 Zero Energy Challenge Frequently Asked Questions

**Question:** What is required for mechanical ventilation?

**Answer:** It can be as simple as a quiet (1 sone or less) bath fan that is on an automatic timer, or as advanced as a Heat Recovery or Energy Recovery Ventilator. The system should be verified by your HERS rater if the home is being Energy Star certified.

**Question:** How long do I have to complete the project?

**Answer:** Projects must be completed and ready for inspection by December 1, 2010.

**Question:** What will be done in the case of a tie?

**Answer:** In the case of a tie, we will calculate the lowest combined heating, cooling, and water heating costs at the current utility rates for the applicable homes and compare the totals. The lowest combined cost will be the winner.

**Question:** Can a house greater than 5000 sq ft participate?

**Answer:** No. Smaller homes consume less energy than larger homes (all things being equal). Additionally, the HERS Index is "biased" towards larger homes. In order to encourage efficiently sized (i.e. smaller) homes, we have capped the size at 5000 sq ft and have also created a point system that rewards homes for being under 3000 sq ft.

**Question:** Are insulated basements to be counted in the home's total square footage?

**Answer:** The square footage should include any heated/conditioned "livable" space. If the basement falls into this category, then it should be included. All square footages will be carefully reviewed via the RemRate file and the building plans by Challenge staff during the selection and final scoring process.

**Question:** Can attached single-family homes participate?

**Answer:** Yes they can, but the score of the specified unit will be an average of all similar units in the same building. Builders should also keep in mind that attached units tend to score lower on the HERS Index than do detached (stand alone) units, and therefore these units would be at a disadvantage. The averaging of the units is, in part, to help mitigate this handicap.

**Question:** Can a builder submit more than one project?

**Answer:** Yes, a builder may submit multiple entries, but a maximum of one project will be selected from the same builder. We are seeking a wide variety of project types, including builder, location, service territory, building design, market rate/limited income, etc.

**Question:** Are recently or already completed homes eligible?

**Answer:** No. Only homes that are currently being built are eligible. Homes that are substantially completed at this time may potentially be eligible, depending on their ability to meet the inspection, marketing, and other requirements that the Challenge stipulates.

**Question:** Must the home include renewables?

**Answer:** Due to current funding constraints, the home need not have renewables installed at the end of the competition, but it must be designed to be renewable "ready". This means that the home must be oriented and designed so that solar PV or solar thermal systems could eventually be installed. These homes will be scored as though the system was installed, accounting for current site conditions such as shading, orientation, and roof pitch. The size of the imaginary system will be 1kWh per 1000 square feet of living space. For homes with renewables already installed, the actual system will be incorporated into the HERS modeling.

**Question:** Will there be monetary incentives for renewables any time soon?

**Answer:** Currently there are no solar PV incentives available through the Connecticut Clean Energy Fund. There may, however, be rebates/assistance for PV and solar thermal before the competition is over. Please contact CCEF for further information.

**Question:** Can projects be submitted for which the builder has not yet been selected?

**Answer:** Yes, as long as enough information is provided in the initial application package about the home to meet the participation requirements, including sufficient data to determine its initial HERS score.

**Question:** How detailed must the plans be?

**Answer:** Detailed enough so that an initial HERS rating can be calculated, either by a certified HERS rater or by a program sponsor. Therefore, the thermal specifications (R-values), the mechanical specifications, and the orientation of the home are necessary.

**Question:** How do I select which HERS rater to use?

**Answer:** This is up to each individual applicant. We will accept a rating from any certified HERS rater. The rating will be confirmed by the sponsors to ensure its accuracy prior to both preliminary and final selection stages.

**Question:** Are non-electric or non-natural gas-heated homes eligible to participate?

**Answer:** Yes, as long as the home will be a customer of one of the participating utilities (CL&P, UI, CNG, SCG, Yankee Gas).

**Question:** What if I have additional questions?

**Answer:** You can contact Justin Lindenmayer at CL&P (860-832-4915, Lindejm@NU.com) or Diane Damino at UI (203-499-2843, Diane.Damino@uinet.com).

**Question:** Will homes qualify for rebates under the New Construction Program?

**Answer:** CL&P's electric programs are currently on hold. Therefore, electric rebates on homes built in CL&P's territory are currently not available (with the exception of the \$500 HVAC rebate). However, if and when the programs are opened, these homes will qualify for incentives. If a project was already enrolled in CL&P's program, all rebates will be honored. **Natural gas-heated homes and homes built in UI territory are still eligible for all New Construction rebates.**