Engineering Narrative

[ :00 Music under logo, continues down and under spoken script, as montage of students working on construction site plays.]

Spoken Script: Re-home was designed to be a net-zero energy usage home. It uses passive energy saving strategies, integrated with highly efficient and smart active systems. 9 teams of Illinois engineering students worked with the architecture team to make this possible.

[ :25 Dissolve to graphic of insulation.]

Spoken Script: With walls rated R45 and the roof and floor both rated R60, the Re-home is extremely well insulated.

[ :33 Dissolve to exterior animation.]

Spoken Script: The layout and orientation of the Re-home are core components of the passive design concept. In order to maximize solar gains, windows are placed mostly on the south façade. Shading devices are utilized to control daylight.

[ :46 Interior installing sensors. Exterior pump and water storage.]

Spoken Script: Re-Home has been engineered as a smart home. It is outfitted with over 100 sensors and dozens of embedded microcontrollers. This allows control and monitoring of everything from the power consumption of a single device plugged into an outlet, to water usage and grey water availability, to temperature, humidity and carbon dioxide levels.

[ 1:09 Engineer in lab.]

Spoken Script: A powerful controls system was required. This would give information and control to the user, in a single, unified space. The Engineering team developed the re-control user interface. This interface uses web technologies and the convenient iPad touchscreen.

[ 1:26 iPad portal page. Users’ hands show how to use interface.]

Spoken Script: A database logs all data displayed on the interface. The re-control portal gives the user useful at-a-glance data such as indoor and outdoor temperatures, a graph of overall home power consumption vs. production, and has links to other pages, which control various subsystems.

[ 1:49 Interior CERV construction and installation.]
Spoken Script: The heating, ventilating, and air conditioning system utilized in the Re-Home is a Conditioning Energy Recovery Ventilator or CERV. The CERV is an air-source heat pump specifically designed for well-insulated, airtight homes.

[2:06 iPad with HVAC page.]

Spoken Script: The re-control HVAC page gives the user access to the CERV controls and status information.

[2:14 Exterior rooftop photovoltaics.]

Spoken Script: The Re-home has been outfitted with a photo-voltaic array that provides 6.7 kilowatts during peak sun. The array utilizes 18.5 percent efficient crystalline panels. The panels collapse flat for transport.

[2:30 iPad solar monitoring page.]

Spoken Script: The solar monitoring page provides a user with valuable power production and consumption information.

[2:36 Interior LED lighted living room. Dissolve to iPad power monitoring system page.]

Spoken Script: Re-Home is equipped with a fully automated, power conserving, led-based lighting system, and a power monitoring system capable of recording the usage of each device in the home. Each region of the Re-Home floor plan may be clicked to retrieve usage information specific to that area of the home. Single devices are represented by globes on the floor plan. A lit globe shows that that device is consuming power. A user can select from specific categories; all lights, all appliances, or the entire home.

[3:15 Close up of iPad switch then cut to LED light turning off.]

To control the lights, the user can select the globe representing the light and then press the switch.

[3:20 Zoom in to iPad interface.]

The Re-home is engineered for optimum performance. The smart monitoring system allows the homeowners to regain control, over their investment, and their living environment.

[3:28 FADE OUT]