

About: **SUSTAINABILITY and “Net-Plus Homes”**

“Michael Frerking and Living Systems Sustainable Architecture are designing and building homes that incorporate technology years beyond anything else that is commonly seen in the domestic home building market.”

(From **Green Building & Design** magazine, 2012. Click to **READ** article)

1. What do we mean by a “Net-Plus Home?”

LSSA’s goal is to enhance the natural habitat, not deplete it. Therefore, a “Net-Plus” home is one in which NO off-site energy is used to heat, cool, run appliances or provide lighting within the home. In fact, excess energy is often returned to the grid.

Net-Plus Poured Earth homes by LSSA offer the following:

- 1.Exceeds LEED standards and scores 0 on Energy Star (0 out of 100 is the best score possible).**
- 2. Makes use of site material for Poured Earth walls along with the use of MgO as binder thereby rendering it carbon minus in terms of carbon production. Whereas portland cement contributes 7% to global warming, MgO is a net minus CO2 producer making it the most likely contender to replace portland cement in the near future.**
- 3. Achieves extraordinarily high building envelope R-values; actually exceeds the International Energy Efficiency Code Standards for 2006 by 300%. Window and door R-values range from R-5–R-9; walls are R-35; roof is R-50.**
- 4. Naturally cools using high mass ventilation and night sky radiation (NSRC). Read below under Q2 as to how this is actually achieved.**
- 5.Heats and cools through the use of a hydronic radiant floor. Solar hot water heats the water during the day; night sky radiation cools the water during the evening.**

6. Net zero water use through a 15,000 gallon rain water harvesting system that can be integrated into the home.

7. Use of TRI-DOOR technology (developed by Michael Frerking) to increase door R values to R-9. (READ more about the benefits of "Tri-Doors" on PDF download)

2. What are some of the in-depth steps necessary to design a "net-plus" home:

The first step toward effectively reducing and/or eliminating heating and cooling loads requires that the building be properly oriented to the south so that the sun (or the cool of the evening) can passively heat or cool the high mass of the structure. (READ more about "High Mass Construction" and the role it plays in passive heating and cooling)

Second, LSSA must continue to reduce heating and cooling loads by 65% or more by substantially increasing all insulation points where heat loss and heat gain occur. One major factor in this process is the use of minimum R-5 windows as well as proper insulation techniques to completely seal the building envelope from air infiltration. The use of Tri-Doors – invented by Michael Frerking of LSSA – takes the R-5 door rating up to an R-9. (READ more about ...and see photos of Tri-Doors) A high efficiency heat recovery ventilator system is also added to provide fresh air without compromising building energy efficiency.

Third, "active" solar collectors are added to heat liquids thereby providing sun-heated hot water and in-floor heating. COOLING can also be achieved without energy use through the use of water tubes that run through the roof. The water is chilled by night sky radiation and then circulated through the same in-floor system as is used for heating. The floor then acts as a totally non-cost "air conditioner" throughout the day. LSSA is collaborating with Sol-Ice to achieve this breakthrough technology and it will be installed for the first time on the Tidwell-Teachy residence in Prescott, Arizona in the fall of 2012. (READ more....follow the construction of this home on "Projects In Progress" page)

Last, but not least, is the significant reduction of energy use through the selection of energy-efficient appliances, lighting and motor loads that can reduce electrical energy use by 50%.

At this point, you may choose to disconnect totally from the power grid by installing photovoltaic collectors that convert the sun's energy into electricity. However, if you do not choose to disconnect from the power grid, you can sell your excess power back to the public utilities company!!!