2008 Fact Sheet

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GEOS NEIGHBORHOOD
Solar Energy and Geothermal Technology Fact Sheet

Significantly raising the bar for sustainable residential development, the Geos Neighborhood in Arvada, Colo., will be the nation's largest net-zero energy, master-planned community. Geos Neighborhood will generate enough renewable energy to offset the annual energy needs of the community's 250 planned homes.

The Neighborhood incorporates on-site solar and geothermal systems that are designed to supply 100 percent of the community's energy needs, and work in conjunction with energy consumption patterns that are markedly lower than those found in the nation's average homes.

Below are descriptions of some of the aggressive sustainable measures – among the most uncompromising nationwide – that Geos is taking to achieve a new standard for master-planned-community building in the 21st century.

MAXIMIZING SOLAR ENERGY:

Energy from the sun will provide a majority of the homes' daytime heating and electric energy through both active and passive solar energy collection.

In addition to state-of-the-art rooftop photovoltaic panels, passive solar heating will be accomplished through a number of innovative architectural and community design measures, including:

- Checkerboard (i.e., staggered) home placement to ensure most homes have complete access to sunlight throughout the year.
- Buildings stretched east-to-west to maximize south-facing exposure to the sun.
- Strategic placement and sizing of doors and windows on east-, south- and west-facing walls. There will be minimal use of windows and doors on colder, north-facing walls.
- Scientifically engineered awnings to shield the windows from the sun in summer, yet accommodate the lower angle of the sun in winter, allowing solar rays through the windows when they're most needed.

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GEOTHERMAL FOR 250 HOMES:

While the sun will provide the base load of the homes' heating needs, geothermal energy will be the heat source for overcast days and during the nights.

Underground geothermal exchange systems will capitalize on the earth's constantly moderate temperature, and utilize an underground loopfield to extract energy that will be used for domestic hot water, space heating in the winter and space cooling in the summer.

MINIMIZING AIR LEAKAGE:

A leaky home compromises even the most energy-efficient heating and cooling systems. The homes' airtight construction will achieve a low 0.1 natural air changes per hour. By contrast, the majority of U.S. homes currently being built average between 0.5 and 0.7, according to the Energy Star* program, letting more hot air out and cold air in.

Heat recovery ventilators (HRV) will make the homes' heating systems even more energy efficient. This innovative system will transfer 75 percent or more of the heat from air exiting the home to the fresh, filtered air entering the home.

*From www.energystar.gov: ENERGY STAR is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy, helping us all save money and protect the environment through energy-efficient products and practices.

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