

LifeStyle Homes

The Capri
Melbourne, FL



BUILDER PROFILE

LifeStyle Homes, Melbourne, FL
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FEATURED HOME/DEVELOPMENT:

Project Data:

- Name: The Capri
- Location: Melbourne, FL
- Layout: 4 bdrm, 3 bath, 1 fl, 2,104 ft²
- Climate Zone: IECC 2A, hot-humid
- Completion: December 2015
- Category: custom spec

Modeled Performance Data:

- HERS Index: without PV 48, with PV -8
- Projected Annual Energy Costs: without PV \$1,122, with PV -\$170
- Projected Annual Energy Cost Savings (vs home built to 2012 IECC): without PV \$928, with PV \$2,220
- Projected Annual Energy Savings: without PV 7,139 kWh, 17,078 kWh
- Added Construction Cost: with PV \$9,630

Florida's Space Coast, the 72-mile stretch along the state's central Atlantic coastline is home to Cape Canaveral, the Kennedy Space Center, and now its first U.S. Department of Energy Zero Energy Ready certified home, according to builder LifeStyle Homes, which marketed the home as "the home of the future, today." The home is LifeStyle Home's first house certified to the DOE Zero Energy Ready Home program and earned the builder a DOE 2016 Housing Innovation Award. The home's design, the Capri model, has been a popular style since 2009 when LifeStyle used it to build its first DOE Builders Challenge home. (Builders Challenge was a precursor to the DOE Zero Energy Ready Home program.) However, the 6.84 kW of solar panels on the roof and the shiny new Tesla plugged into the electric car charging station that open-house visitors saw may have been a clue that there is something new going on here.

Thanks to a suite of energy-efficiency features inside plus the solar panels on top, the home achieves a remarkable Home Energy Rating System (HERS) score of minus 8. That means it produces more than enough electricity to meet all of the home's power needs over the course of a year. In fact, it should produce enough to power the car as well as the home, so the home owners will have zero electric and zero gasoline bills. Even without the PV panels, the home's efficiency measures yield a HERS score of 48, far below the 80 to 100 HERS score of typical code-built homes.

"There are a limited number of homes built to this caliber of energy-efficiency in the United States, so we are very gratified to have built the first one of its kind on the Space Coast, helping to keep our home town on the cutting edge of innovation," said Karen Kicinski, marketing director at LifeStyle Homes.



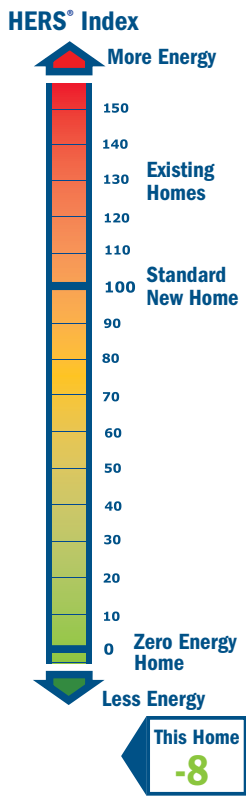
The U.S. Department of Energy invites home builders across the country to meet the extraordinary levels of excellence and quality specified in DOE's Zero Energy Ready Home program (formerly known as Challenge Home). Every DOE Zero Energy Ready Home starts with ENERGY STAR Certified Homes Version 3.0 for an energy-efficient home built on a solid foundation of building science research. Advanced technologies are designed in to give you superior construction, durability, and comfort; healthy indoor air; high-performance HVAC, lighting, and appliances; and solar-ready components for low or no utility bills in a quality home that will last for generations to come.

Lifestyle Homes built this 2,104-ft² home in Melbourne, Florida, to the performance criteria of the DOE Zero Energy Ready Home (ZERH) program. The home meets EPA Indoor airPLUS requirements, including the use of no- and low-VOC wood products, primer, paint, cabinets, and flooring.



What makes a home a DOE ZERO ENERGY READY HOME?

- 1 **BASELINE**
ENERGY STAR Certified Homes Version 3.0
- 2 **ENVELOPE**
meets or exceeds 2012 IECC levels
- 3 **DUCT SYSTEM**
located within the home's thermal boundary
- 4 **WATER EFFICIENCY**
meets or exceeds the EPA WaterSense Section 3.3 specs
- 5 **LIGHTING AND APPLIANCES**
ENERGY STAR qualified
- 6 **INDOOR AIR QUALITY**
meets or exceeds the EPA Indoor airPLUS Verification Checklist
- 7 **RENEWABLE READY**
meets EPA Renewable Energy-Ready Home.



To achieve this impressive performance, homes certified to the DOE Zero Energy Ready Home program must meet all of the requirements of ENERGY STAR Certified Homes Version 3.0 (3.1 in Florida) and the U.S. Environmental Protection Agency’s Indoor airPLUS program as well as the hot water distribution requirements of the EPA’s WaterSense program and the insulation requirements of the 2012 International Energy Conservation Code. In addition, homes are required to have solar electric panels installed or have the conduit and electrical panel space in place for future photovoltaic panel installation.

To meet the requirements, LifeStyle Homes started with a standard Florida construction type, concrete block walls with R-7 foil insulation and stucco siding over an uninsulated slab-on-grade foundation. The unvented roof was insulated along the underside of the roof decking with R-38 of open-cell spray foam providing a highly insulated and air-sealed space to house the HVAC system without exposing it to the high temperatures and humidity found in a typical Florida attic. The roof and attic design offered several advantages from a durability standpoint too. The low hip-roof design provides greater resistance to wind uplift than a gable roof design. The unvented soffits keep out insects and wind-driven rain. The entire roof deck was covered with peel-and-stick membrane to provide a continuous layer of protection against water intrusion as well as an air barrier for the conditioned attic space. The light-colored asphalt shingles reflect the sun’s rays to minimize solar heat gain.

The home’s double-pane, vinyl-framed windows had low-emissivity coatings, which consist of an ultra-thin transparent layer of silver metal that also helps to block out unwanted heat transfer.

The home’s solid building shell and properly flashed windows provided an airtight structure. When the home was tested for air leakage as part of the required assessment for the DOE certification, testing revealed whole-house air leakage of only 1.7 air changes per hour at 50 Pascals. That’s more than twice as tight as required by the newest energy code. (The 2015 International Energy Conservation Code requires 5 ACH 50 or less.)

To provide good ventilation for the home, run-time ventilation was installed consisting of a fresh air intake ducted to the HVAC system with an electric damper controlled by a run-time controller to provide a set amount of fresh air to the home each hour. ENERGY STAR exhaust fans provided exhaust ventilation from the kitchen and bathrooms.



For efficient and comfortable heating and cooling, all of the home's ductwork is located in the conditioned attic. The attic is insulated to an insulation value of R-38 with open-cell foam. The home's walls are insulated using a radiant barrier insulation that blocks heat from the sun and keeps it from entering the home.

The home was equipped with a high-efficiency air-source heat pump that provides cooling with a seasonal energy efficiency ratio of 15 SEER and heating with a heating season performance factor of 8.5 HSPF. The system is controlled by a programmable thermostat.

Hot water is provided by a heat pump water heater with a 50-gallon storage tank and an efficiency factor of 2.75. Low-flow plumbing fixtures reduce water usage.

Energy-efficient CFL lighting and ENERGY STAR appliances add to energy savings.

The builder met all of the requirements for EPA's Indoor airPLUS certification, including use of low-VOC paints, cabinets, and carpets and other steps that contribute to cleaner indoor air.

The house was built in LifeStyle's Pineda Springs subdivision, a nature-friendly community with multiple natural preserves and lakes as well as artificial swales added by the builder to manage water runoff and minimize pollutants on each property. LifeStyle chose the specific home site of the DOE Zero Energy Ready Home for its north-facing orientation with a south-facing rear roof for optimal solar exposure for the PV panels.

To ensure everyone was on board with the program requirements, LifeStyle Homes held four meetings over the two-year life of the project with construction team members, members of the Florida Solar Energy Center, the insulation vendor, and LifeStyle's RESNET energy rater. Several meetings took place on the construction site with the insulation, HVAC, and framing contractors, along with the builder and the rater. Details for meeting the DOE Zero Energy Ready Home requirements were given through e-mail correspondence. Building America fact sheets were provided on details such as advanced framing techniques. The superintendent on the job provided the leadership to ensure that the home was built according to the specifications provided through the meetings. The energy rater made five site visits as well.

"We worked closely with the building scientists at the Florida Solar Energy Center in Cocoa over several months to determine how to best achieve the program's stringent requirements," said Kicinski. "The result is a home that LifeStyle is extremely proud of, and one that is like no other in Brevard County. It adheres to numerous checkpoints to ensure superior levels of building products and services."

HOME CERTIFICATIONS

DOE Zero Energy Ready Home Program, 100% commitment

ENERGY STAR Certified Homes Version 3.1

EPA Indoor airPLUS



Every DOE Zero Energy Ready Home combines a building science baseline specified by ENERGY STAR Certified Homes with advanced technologies and practices from DOE's Building America research program.



The home's 6.84-kW photovoltaic power system provides enough energy to power the home and an electric car.

LifeStyle Homes used its corporate blog, which was then pushed through social media channels including Facebook and Twitter, to keep website visitors and followers up-to-date on the home's construction progress. Large signs at the construction site encouraged people to stop by and take a look. Upon completion, the home was featured in a two-page article in the December 2015 issue of *SpaceCoast Living* magazine under the title "Introducing the Home of the Future – Today."

In January 2016 an open house was held at the home. During this event, LifeStyle posted descriptions throughout the home that explained the energy-saving components of the home (including visible and "behind the walls" elements) and displayed the home's certifications. The RESNET energy-rater, Patrick Gillis, was on hand to speak with visitors about the home's construction.

After this first experience with the DOE Zero Energy Ready Home program, the builder praised the program as being easy to follow and forward thinking. "It helps the builder to remain ahead of the curve," said Kicinski. But, perhaps more than anything, it results in a home customers can be proud of. "Nothing feels better than hearing our home owners "bragging" about their low energy bills and home comfort!" said Kicinski.

Photos courtesy of LifeStyle Homes

KEY FEATURES

- **DOE Zero Energy Ready Home Path:** Performance.
- **Walls:** Concrete block walls with R-7-foil interior insulation, stucco siding.
- **Roof:** Peel-and-stick membrane over whole deck, asphalt shingles.
- **Attic:** R-38 open-cell foam on underside of roof deck.
- **Foundation:** Uninsulated slab-on-grade.
- **Windows:** Double-pane, low-e, vinyl-framed, U=0.33, SHGC=0.23.
- **Air Sealing:** 1.7 ACH 50.
- **Ventilation:** Whole-house ventilation, fresh air intake with run-time controller, ENERGY STAR exhaust fans.
- **HVAC:** Heat pump, 15 SEER, 8.5 HSPF.
- **Hot Water:** 50-gal heat pump water heater, 2.75 EF.
- **Lighting:** 100% CFL.
- **Appliances:** ENERGY STAR dishwasher, refrigerator.
- **Solar:** 6.84-kW PV.
- **Water Conservation:** Low-flush toilets.
- **Energy Management System:** Programmable thermostat.
- **Other:** All paints, cabinets, and carpet are low-VOC.