

# In Beijing, Made in Montana

Three local companies cooperate on a green housing project — in China

BY NICOLE ROSENLEAF RITTER | PHOTOGRAPHY BY THOMAS LEE



Local workers in Beijing, China, assemble Future House USA, made with panel sections designed and pre-constructed in Belgrade and Bozeman.

America's Olympic athletes may be on their way home from China, but a little bit of the United States, and Montana, is staying behind in Beijing.

Future House USA — a two-story, 3,200-S.F. home that represents the American contribution to Future House, a sustainable home building project commissioned by the Chinese Ministry of Construction to coincide with the Beijing Olympics — will remain on display until 2014. It's estimated that more than five million people will tour the home during that time.

What those visitors might not know is that the home's structural/thermal envelope — the zone of a building that separates the indoors from the outdoors and keeps the interior space clement throughout

a variety of weather conditions — came almost exclusively from southwest Montana. The project represented a cooperative effort involving Big Sky Insulations, Inc. (BSI) of Belgrade and two Bozeman companies, structural engineering firm Nishkian Monks, PLLC and Simkins-Hallin Lumber Company.

The Future House organizers called on 10 countries — the United States, Germany, Japan, Spain, Sweden, South Korea, England, Italy, Norway and China — to showcase the best of their sustainable residential building technologies in an effort to accommodate the massive home construction anticipated in China within the next decade. China is expected to need 100 million additional homes within that span, and the country's Ministry of Construction is hoping to make at least some of those homes part of



A rendering of Future House USA shows off how all the "Made in Montana" products will come together.

a green revolution.

"The demand for better-quality, upgraded (homes) is there, and the demand is going to be to build, come hell or high water," noted Mike Tobin, president of AFM, a Minnesota-based research and development company for R-Control Structural Insulated Panels (SIPs), who brought BSI on board. "But the Chinese government wanted to make sure that the best energy-efficient technology from around the world was going to be presented to a broad and wide audience, to focus the attention of not only their country, but the world."

## 'SIPS' OF GREEN

For most of the countries represented, showcasing the best technologies meant that the governments of those countries would take the lead in the planning and construction of the project. That was not the case for the United States. The U.S. home was undertaken not by any government agency but by a grass roots consortium made up of the Learn Green Foundation, the Future House Real Estate Company and Florida International University.

"The organization that accepted the invitation to showcase the best of American technology at Future House was aware of SIPs, and they asked us if we would be interested in helping them," Tobin said.

The Structural Insulated Panel Association (SIPA) describes SIPs as "high-performance building panels used in exterior walls, roofs and floors for residential and light commercial construction." The panels are constructed by "sandwiching a core of rigid foam insulation between two skins of wood structural panels." SIP technology saves builders time and money, while also producing energy-efficient "green" buildings.

Of the 19 companies around the country that manufacture R-Control SIPs — a proprietary brand of SIPs under the AFM umbrella — AFM chose Big Sky Insulations of Belgrade to complete the project.

"BSI has been manufacturing R-Control SIPs since 1983-84 on a continuous basis," Tobin said by way of explanation. "Big Sky R-Control (the division of BSI that produces SIPs) has been right

in the forefront of developing this as a commercial product. It's one of the pioneers within our R-Control systems."

The advantage of SIPs, according to Tobin, is that they build in efficiencies. "Big Sky R-Controls builds the panel sections, engineers where each section goes, and pre-cuts each of these to build the structure with the size, the height, the window outs, the door outs, the union of where the roof panels come, and ridges and hips — all on very sophisticated computers and equipment. All the builder has to do is concentrate on assembly," he said.

Beyond efficiency of construction — which also creates far less job site waste and energy use than traditional building methods, Tobin explained — home energy efficiency is also emphasized.

"Once the (SIPs) envelope is built, you have this inherent ability to reduce energy consumption not just today or tomorrow or the next day, but for the whole lifetime of the structure," he said.

Through the use of SIPs and other "green" technology, Future House USA was able to build a self-sustainable "zero net-energy house" with no carbon footprint, the Future House USA website notes.

## MAKING IT PERFECT

BSI was asked to design and manufacture the panels and ready them for shipping and construction. To do that, they needed help with design and logistics. The company called on Nishkian Monks and Simkins-Hallin Lumber Company.

"The builder was looking for a turnkey solution," said Greg Werner, director of development for BSI. "(BSI's cooperation with Nishkian Monks and Simkins-Hallin) allowed them to get not only the manufacturing, but also the engineering in one spot."

One of the major logistical challenges for SIPs in designing the Future House USA was the necessity of building shippable components for assembly in China. Matt Miller, Nishkian Monks engineer of record for the project, *continued*

explained that the structural pieces of the house had to be small enough to fit inside a 40-foot long, by seven-and-a-half-foot tall, by seven-and-a-half-foot wide cargo container.

"I contacted Nick Schnabel at Simkins-Hallin Lumber Co. here in Bozeman to assist me in designing wood roof trusses to support the insulated panel roof," Miller said. "I laid out the roof trusses and their profile and then Nick designed them and made them to fit within the cargo container."

Everything had to be done with absolute precision, he added.

"We really had to have everything on this project perfect before it went overseas," Miller noted. "We had to make sure that nothing was missed during the design process, as any materials for Future House would have to be shipped over to Beijing, and would significantly delay the project."

As it was, the envelope of the house was constructed in Beijing in under two weeks. AFM sent one of its best SIPs contractors to China to oversee the construction. All of the laborers were local citizens, and none of them had ever worked with SIPs before.

"It's because of the technology that BSI employs at its plant in Belgrade that the crew was able to put together the home's shell in that amount of time," AFM's Tobin asserted.

"It was a very coordinated effort, and very successful," he said of the cooperation among BSI, Nishkian Monks and Simkins-Hallin. Feedback that the organizers have shared has been extremely positive, and the U.S. house has been one of the most popular in the Future House development, Tobin added.

"All of the SIPs came from Belgrade, the trusses came from the Simkins-Hallin truss plant, and they got the engineering locally," engineer Miller said. "It's almost like there's a 'Made in Montana' stamp on the structure of the house."

For more information about Future House USA, visit the organization's website at [www.futurehouseusa.org](http://www.futurehouseusa.org).

Nicole Rosenleaf Ritter is the managing editor of *Business to Business and At Home*.