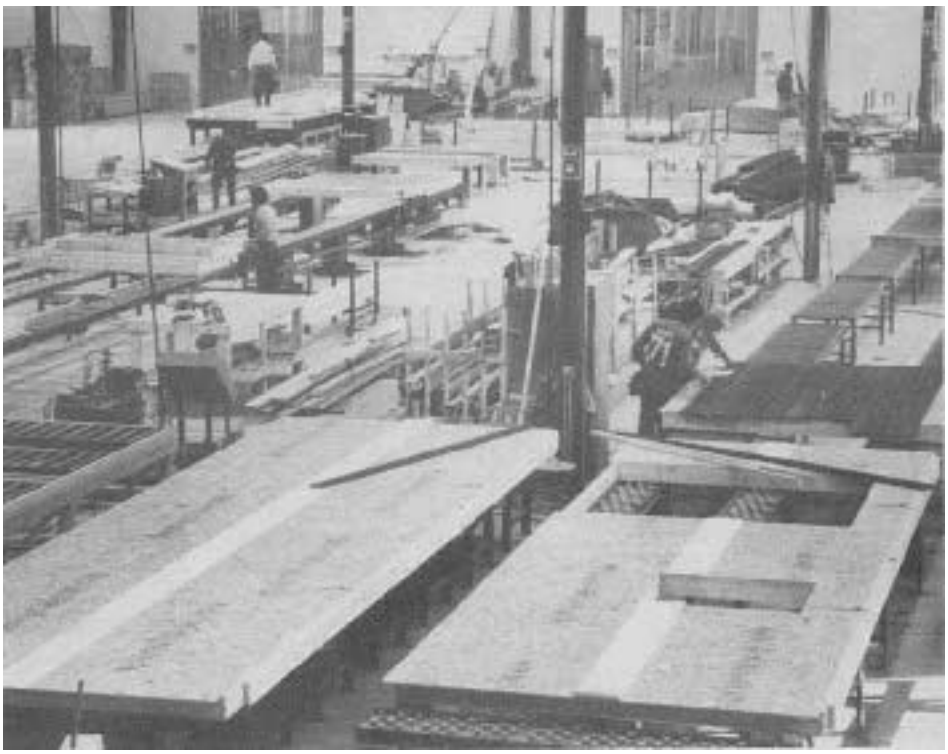
HOME-GROWN IMPORTS

by Kate O'Brien

Entrepreneurs are rushing to set up Scandinavian-style house production on U.S. soil



Advanced Building Systems (ABS) hopes to put out three houses a day from this 53,000 square-foot factory. As in any manufacturing venture, it's important to keep the factory busy to keep overhead down.

Ever since researchers noticed ten years ago that Swedish homes had dramatically low heating bills, U.S. builders have been trying to take advantage of Scandinavian technology. Some even imported whole buildings. In building magazines, we began to see reports of entire houses—down to the finish- being delivered to building sites, complete with Swedish carpenters to train U.S. carpentry crews. The buildings had a lot going for them—a modular design for quick erection, excellent craftsmanship, and a high level of tightness-but the cost of importing them has priced them out of most markets.

But what the Scandinavian building industry has to offer is not a few dozen building transplants dotting the U.S. countryside. According to Lawrence Horwitz (PHI Building Systems), it is the concept of "industrialized homes." What this means, he says, is that the houses are designed as systems by structural engineers. Horwitz says it's the difference between just building a house indoors, and building it indoors "in a way that creates the best product, most efficiently and most cost-effectively." He likened the U.S. panelized housing industry to date to the days when the clothing industry first brought workers and their sewing machines out of their homes and into a factory. It reaped some minimal savings in efficiency, but not much increase in quality. It wasn't until new technology improved the process that we started seeing real labor-savings, higher quality, and consistent quality control. With what he calls "value engineering," the same can be true for housing.

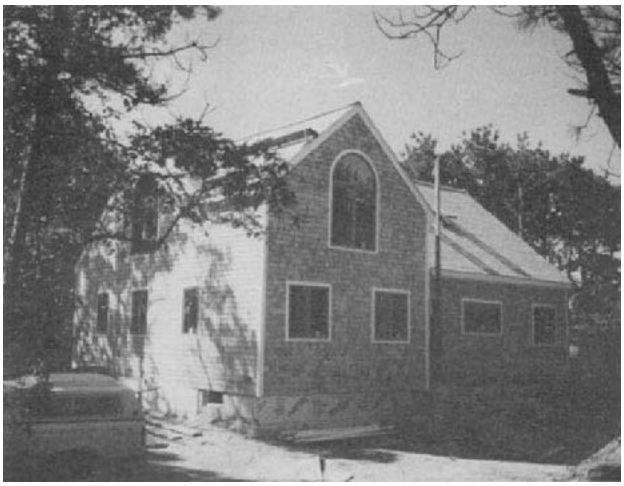
Horowitz's firm, PHI and several other U.S. firms are trying to import this concept and technology but leave the buildings and carpentry crews back in Scandinavia. Each company has a unique approach. What follows is a report on three companies that are taking this step.

Tribal Venture

PHI Building Systems, located in Portland, Maine, was established in 1986 by the Native American Passamaquoddy Tribe of Maine with assistance from Tribal Assets Management (an investment advisory firm). PHI employs 60 people, 75 percent of whom are tribal members. In addition to providing employment, the tribe hoped to fill housing needs, and find a good way to use its timber resources.

Although Swedish buildings were making the biggest splash in the U.S. press, PHI decided to import Finnish technology. PHI decided to take that route because it felt that the Finnish system offers far more flexibility. Using Finnish technology, PHI could offer as many as 50 different types of components. Windows could vary in height, width, and shape, for example. And the locations of the windows within a wall section could vary as well. Or windows could have a semi-circular top. According to W. Wright Alcorn, from PHI, "I don't know of any Swedish company that offers as many component choices as we can, using the Finnish technology."

Initially, PHI offered custom-building—working with the customer to tailor the building system to the customer's specific design. But in order to make the most of the plant's capacity and keep overhead down, the company has moved away from that, and now simply offers the "customizing" influence that the multiple components can provide. As part of this move toward standardization, PHI has developed ten basic designs. The designs are all quite modest, ranging from as little as 900 to 2,000 square feet. The basic unit in a PHI home is a 4x8-foot sandwich of sheathing, insulation, and foil facing, framed by 2x4s. Until recently, the company used isocyanurate as its insulation, but is moving away from it because of possible R-value deterioration, and



Initially, PHI Building Systems offered custom-building. This 2,000-plus-square-foot home is an example. However, in order to make the most of the plant's capacity, the company has moved toward standardization and now offers only ten designs, ranging from 900 to 2,000 square feet.

the fact that it's made with Freon, which could be harmful to the environment. So it has started using fiberglass batts for insulation. The company prides itself on offering a weathertight, highly energy-efficient shell, with R-values of up to R-26 in the walls. All windows use low-e glass.

PHI's 50,000 square-foot factory is located in Eastport, Maine, the easternmost point of the continental U.S., and employs 22 workers. Since it opened in May 1987, it has manufactured components for 180 units, including townhouses, single-families, condos, and even an inn. The plant has the capacity to produce 400 to 600 houses a year, and the hope is that the company will be getting multiple orders to make the most of that capacity. Although it depends on the size of the building, once plans are agreed on, it takes about six weeks for an order to be filled.

Affordability is an important theme at PHI. In late 1987, it's 1,500-plus square-foot prototype won an award for affordability from the Boston Society of Architects. The projected cost for the prototype shell alone was $18 per square foot. The projected cost for the site and finish was $36 per square foot, although this would vary a great deal with location. Also, PHI does not involve itself with the finish work. (PHI generally erects the shell with its own crews, but will occasionally train outside crews to do this.) The total projected cost was $54 a square foot. By switching from isocyanurate to lower-cost fiberglass insulation, PHI expects to get the square-foot cost of the shell down to $14, lowering the total projected cost to $50 per square foot.

All of the companies we contacted promise to save the builder time and labor. PHI crews usually take only five days to erect a weathertight shell at the site. PHI's first project really demonstrated this point. PHI "raised the roof' on a lobster pound located on a pier at Signal Point, Maine. A developer wanted to double the size of the building to include offices on the second floor. PHI came in with a crane, lifted the roof, erected a second story, and replaced the roof. The entire project took eight hours. And the lobster pound never closed for business.

There are other advantages to rapid erection of the shell. You can build in colder and wetter weather; and you are less susceptible to pilferage. But unless you're in the neighborhood, it's not likely that you'll ever benefit from PHI's expertise. They've limited their market to the Northern New England area.

Mobile Homes

On the other hand, there is a company offering Scandinavian technology that might come to you. Scan-American Enterprises of Denver, Colorado has been in the business of marketing high-technology, energy-efficient products since 1985. It got its start when company president Lars Iggsten was a contractor in southern California. He sent for a container of Swedish building materials one day, and started to use them in his buildings. Local contractors got wind of it, and asked Iggsten how they could do the same. Perceiving a market, Iggsten developed plans to establish a mobile factory that could set up shop where the market is. The company hopes to pack its plant into four semi-trucks and drive it to locations where it has negotiated contracts. According to Iggsten, the company needs to have a confirmation of 200 or more houses before they'll move a plant there. By May 1, it plans to be in production in Riverside, California, where it has a contract to build the walls for 240 houses.

Three ABS employees construct a building module which contains a Marvin window and Tyvek. Most of the materials ABS uses in building its components are standard U.S. fare, although it does import gaskets arid vapor barrier material from Sweden.

As novel as this sounds, the mobile-factory idea is based on the method Sweden used to rebuild itself after World War II. Plants were built in several locations throughout that country. Once the plant had constructed all the houses needed in an area, the building was converted to a store or other type of plant. Scan-American is already negotiating to sell its Riverside plant to a convenience store chain, once the plant has fulfilled its home-building mission in the area. But that may take awhile. The company is willing to truck (by semi) houses up to 150 miles from the plant site, and will be working to get more contracts in the area.

Although the Riverside contract is for walls only, that's only because the roofs and foundations were already specified. Iggsten hopes to "convert American architects" to the Swedish products that his company imports. He claims that they will cost no more than what is currently available on the U.S. market, and are higher-quality. The Swedish triple-glazed window that Iggsten hopes to sell has an R-value of 6. Although it depends a great deal on the building specifications, Iggsten projects that the shells will cost somewhere around $25 per square feet.

Scan-American's basic unit is 8x16 feet long, although panels up to 24 feet long can be manufactured, and the height can be adjusted up to 10 feet. The panel consists of an exterior finish, mineral-wool insulation, vapor barrier, and 5/8-inch unfinished drywall. The panels will be pre-wired, or provided with conduits for wiring. Three choices are available for the exterior—stucco, brick cladding, or wood siding. According to Iggsten, the panel has a value of R-36. None of the materials in the panel come from Scandinavia, but the mineral wool comes from Canada.

The 4,000 square-foot plant will be able to produce three complete 1,500-square-foot shells every 8-hour shift—nine houses a day. Although all the machinery is U.S. -made, it's been modified to "use the Swedish technology, exactly," he says. The plant will employ nine workers, including the truck-driver, and the crane operator. Scan-American is in the process of importing a Volvo truck from Sweden, equipped with a built-in crane. The crane will be used by a three-person crew (including two carpenters and the crane operator) to erect the shell. The company hopes to erect a complete shell in one day's time. This is far less time than it takes for PHI and Advanced Building Systems to provide a completed shell, and may be overly optimistic—especially since Scan-American will be leaving the design up to architects hired by the builder and developer. Scan-American does not now intend to offer standard designs.

Scan-American will set up a temporary plant anywhere in the U.S. where it has negotiated contracts for 200 houses or more. Scan-American house components were used to build this single-family development in Colorado.

Building Wholesaler

A traveling plant may be the answer for Scan-American, but a third company has decided to stay put. All manufacturing of Advanced Building Systems (ABS) will take place in a 53,000 square-foot factory located in Bennington, Vt. ABS will truck its house components as far as New Jersey, however, and is now in the market for dealerships throughout the Northeast. Swedish businessman Stig Albertson founded the company one and one-half years ago, and brought Swedish building technology with him. The Swedish influence can be felt in the factory—some of the machinery is imported, and so is the engineering foreman. But it is not overly evident in the finished product. According to Bill D'Antonio, "the house designs are purely American."

As in the other systems, the basic building unit consists of a panel, comprised of siding, sheathing, a vapor barrier, and fiberglass insulation. The framing is 2x6. Gaskets used to join panels are imported from Sweden, as is the vapor barrier. The rest of the panel is made from standard U.S. material, says D'Antonio. Windows used in wall sections are bought for their high-R value. The wall system is rated at R-22,

Scan-American hopes to erect a complete shell in one day's time-far less than it takes PHI or ABS. It may be overly optimistic.

according to the company.

ABS sells components for 10 designs, ranging from 1,300 to 3,000 square feet. Projections on cost for the 1,300-square-foot design range from $13 to $25 per square foot. The wide range depends a great deal on the type of window and other finish materials used.

The Bennington-based company does not supply a crew as do PHI and Scan-American, but arranges with a local framing contractor to erect its buildings. It does send a supervisor to the site, to make sure the building is constructed to their standards. Depending on the size of the building, a weathertight shell can be completed in about a week.

Can They Deliver?

None of the three companies discussed has a long track record. PHI and Advanced Building Systems each has less than two years under its belt, and Scan-American isn't even in production yet. What they promise, though, is to deliver well honed Scandinavian quality, with the convenience and cost-advantage of manufacture in the U.S. It's an idea that is still in its infancy. But if they can deliver on the promise, it could provide a major boost both to manufactured housing and to energy efficiency in housing. ■

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