



Run by the Sun

Arranged and slotted together like a tidy row of Legos, the IJsselstein housing project reflects typical Dutch efficiency, “not just in terms of materials used,” notes architect Gregory Kiss, “but in terms of space as well.”

In the center of Holland, just a short drive from Amsterdam, sits the small town of IJsselstein. Railway tracks divide centuries-old stone edifices like the local castle, monastery, and moat from spiffy row houses and apartments recently constructed to assuage the ever-mounting need for housing in this high-density country. Far from feeling like a fractured set of subdivisions outside the urban area, the city is a well-planned and integrated whole, with no detail left to a developer's whims. As Dutch architect Han van Zwieten says, “In our new towns, the parking places, the parks, the banks, the trees—all of this is designed. In Holland, it looks like every piece of grass is designed.”

As part of this careful crafting of even the most minute of architectural details, sustainable concerns are taken into consideration. “General building practices in the Netherlands are well in advance of our own,” explains American architect Gregory Kiss of New York–based firm Kiss + Cathcart, who collaborated with van Zwieten on this housing project in IJsselstein. “The baseline requires

much more efficient buildings than we are used to, on all levels, from the choice of materials to the amount of insulation in the building envelope to the durability of the building system.” In fact, going green is the law; the government requires a certain level of energy efficiency in all new construction.

So when van Zwieten and Kiss approached their commission to create a relatively low-cost 14-unit housing development in IJsselstein, the question wasn't whether to incorporate sustainable elements, it was how. Both architects have a mission to build “solar energy projects in an elegant and charming way,” as van Zwieten puts it, so the decision to use photovoltaic panels in the IJsselstein project made perfect sense.

An entirely clean source of energy, and a renewable resource, solar panels are always a nice choice, but are often prohibitively expensive for budget-conscious projects. Traditional crystalline solar panels cost about \$50 a square foot—and are aesthetically reminiscent of NASA satellites, which works for some tastes but not for all. ▶

Kiss, however, has been working in the U.S. with thin film solar panels, a technology not yet readily available in the Netherlands.

Unlike crystalline panels, which are made with silicon wafers produced by the price-gouging tech industry, thin film panels are made by depositing a layer of semiconductor onto glass or a flexible polymer. A third of the price per square foot of crystalline panels, the black or dark purplish thin film panels “look more sophisticated and sexy,” says van Zwieten. The only downside of thin film, the same technology that fuels your trusty solar-powered calculator and digital watch, is that it’s about half as efficient as crystalline panels. Since thin film is so cheap, the easy solution is to use more panels to achieve the same energy output.

The result for the IJsselstein project is an attractive multilevel solarium on each unit that’s completely encased in photovoltaic panels—with the exception of a few windows that open to the outside—and provides over 30 percent of the total energy needs of each house. The glass cladding on the houses also helps the interior spaces feel larger than their 1,400 square feet; as Kiss explains, “The main living spaces were designed to be as open as possible, and we brought light from the solarium down the stairs.” Helga Dissel, a resident of one of the houses, feels that this goal was met in the design: “I like the house—it’s spacious.”

All in all, the project reflects the Dutch emphasis on conservation of space and resources—as well as innovative architecture. “In the United States, we have a culture that celebrates size and consumption for their own sakes—and on some level, the more resources we use, the more successful we feel. The lifestyle in Holland is a great counterpoint,” says Kiss. “As tight and as dense as it is, there’s a rich level of amenities and experience: You have your own system of bike paths, and the train and the shops are close by. It’s a very satisfying alternative to the way [Americans] live.” ■



The solarium (pictured above) was designed “to highlight the solar elements of these

buildings as an articulated object,” explains Kiss of the protruding glass rooms.



PV Made Easy

Photovoltaic (PV) panels have the potential to be easily and inexpensively incorporated into any house or building. As Kiss explains, “they’re an energy-generating technology that is a building material, too.” Costing about \$15 per square foot (about the same as standard cladding), thin film panels end up being a two-for-one deal: Buy attractive cladding, get sustainability for free.

In order to get the most bang for the energy buck, there are three types of solar collectors in each IJsselstein house: passive, electrical, and thermal. Passive collectors soak up the sun on the south and north sides of the

façades, lazily generating heat by doing relatively little. Also on the façades of the solariums, electric solar panels actively convert light into wattage, fueling appliances and lamps within the homes.

On the solariums and the rooftops sit solar thermal panels, which heat water for showering and dishes and fuel the radiant heating system that runs underneath the ground floor of each house. Since the houses are well insulated, heat has little chance to seep out through the walls. It all proves, van Zwieten says, “that you can combine nice housing and comfort with energy savings.” —A.H.