

Regnier Traveling Fellowship

Monthly Report: October, 2006

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SUMMARY

October was another big travel month. I continued my trip through the Netherlands and Germany. I saw both individual buildings and neighborhoods designed with sustainability in mind and met more great people along the way. The cities I visited were Amsterdam, Rotterdam, Leiden, Etten-Leur, Duisburg, Düsseldorf, and Freiburg. Although I visited many projects throughout both countries, the best city for sustainable projects was the last one I visited: Freiburg, Germany. There were so many projects in this city that were pioneers in solar energy and passive design. During my last weekend of the trip, I went to see Geneva, Switzerland and during that trip made it out to Annecy, France, bringing the total to six countries visited for this northern run.

I was only in Barcelona for 2 days after the 40 day trip around Northern Europe before heading out again. This time back to Monterrey, Mexico for both the WorldGBC annual summit, and “Edificación Sustentable 2006 Congreso y Expo,” the green building conference I helped organize with Mexico GBC this summer. My return from Mexico completes 9 weeks of pretty constant travel and I’m now ready to settle into an apartment and get into a routine writing case studies and planning the next adventure.

THE CITIES

Amsterdam

This was the one city where it rained more than it was sunny. Nevertheless, I rented a bike and rode around the city. Part of the time spent in Amsterdam was working on case studies, since it was raining outside. However, I also had the chance to visit an apartment complex called GWL Terrein. This neighborhood has 600 mixed-level income apartments. There is a central cogeneration unit supplying the neighborhood with heat and electricity. There are also green roofs and rainwater collection for toilet flushing. On the social side, communal gardens are located in the area where people can work side by side planting and harvesting vegetables.



GWL Terrein Social Housing



View from a bridge



Buildings along a canal



More GWL Terrein

Leiden

I met with Mieke Wetering at the Bear Architecture sustainable townhouse project, Orangerie, that consists of 12 single family townhouse style apartments. Mieke is both a resident of and consultant for sustainable design and construction. This project has a solar roof that produces a total of 24,000 kWh/yr. It also uses collected rainwater for toilet flushing and site irrigation. Information is made available to residents on sustainable living practices and the community gardens are fed by composted food waste contributed by everyone. Green roofs cover all the garden sheds made available to each townhouse.



Orangerie: Photovoltaic Roof

Etten-Leur

This was another day trip out to a small town located half an hour south of Rotterdam by train. The walk from the train station to *de Keen*, the new part of town where much of the sustainable construction is happening takes another 1/2 hour. On the way there, I passed by a mix of old thatched roof houses and newly built solar panel clad homes.

I didn't have anyone to meet here, but Tjerk Reijenga, of Bear Architecture said the houses were standard on the inside. So I took pictures of the buildings from the outside. These are zero energy buildings built in the passive house design. They have a high level of insulation, are oriented for optimal sunlight and radiant heat gain, and have solar panels that provide all the energy needed in the houses.

The goal of these houses, when designed in 1999, was to demonstrate the possibility of building net zero energy homes. The electrical grid is still used to transfer energy. Solar energy produced during sunny days goes into the grid and energy used at night comes from the grid. This eliminates the need for batteries.

The building achieves zero emissions by having an energy requirement 50% lower than Dutch building codes prescribe. The rest of the energy is made up by the solar roof which provides 5400 kWh/yr. for each dwelling. Heat is provided by ground source heat pumps and heat recovery is used for retaining heat from outgoing air. No carbon based energy is required in the houses.



Pre-schoolers in Orangerie who baked cookies for everyone



Zero Energy Homes, Etten Leur



Thatched roof house in Etten-Leur

Rotterdam

Rotterdam was an interesting city to visit after Amsterdam. There is somewhat of a rivalry between the residents of the two cities. Rotterdam is a much more modern looking city. Similar to Phoenix, Rotterdam sprawls out in all directions. I walked for about an hour one night and couldn't find anything interesting around. To be fair, the city is decently connected by bus and tram. This is nothing special in Northern Europe, however, where public transportation is well developed in all big cities. This was the first city in which I actually would have liked to have a car.

I visited the archive building in Rotterdam that was a sustainable renovation of an old building. This included an extensive solar roof that was placed directly on the flat roof. The energy produced by this roof provides 10-16% of building energy usage, depending on the time of the year.

The building also uses underground hot and cold water storage tanks that provide the heating and cooling for the building via in floor pipes that circulate the water throughout the building, then return it to the tanks. The insulation provided by the underground location keeps the hot water hot and cold water cold.

The last feature of the building is a rain water collection system that filters rainwater and uses it in toilets as flush water. This is a very popular solution in toilet plumbing in sustainable buildings in Holland.

Mr. R.W. Spork, whom I spoke with about the building and who gave me a quick tour, commented that the costs for the building were very high as it was a sustainable construction pilot project. When the solar roof was constructed, the old roof wasn't rebuilt, it was just overlaid with a new layer of EPDM and the solar panels were laid on top. Now they are finding leaks and will need to pull up all the solar panels and rebuild the roof. He said the rainwater system and heating/cooling system both work great.



Downtown Rotterdam Skyline



The Tilted Dice



Gemeentearchief Rotterdam



Photovoltaic Roof

Duisburg

This is a very industrial city and the base for Thyssen Krupp Steel. Duisburg has an large urban renovation project happening on the waterfront of one of the largest interior harbors. The area is called Innenhafen or Inner Harbor.

Angel Alava-Pons, of the City of Duisburg, spent the entire morning showing me around the Inner Harbor and talking about the different projects that are being built. Although none are standout projects for sustainability, the neighborhoods are very pedestrian oriented, allow a lot of sunlight into the buildings and walkways, and have plenty of green space. The fact that they meet German building codes for energy makes them energy efficient compared with modern buildings in most other countries, as well.

At the end of the Inner Harbor, Norman Foster & Associates is designing a large mixed use complex that is planned to be a zero-emissions building. Budget may be the biggest threat to that plan. Angel showed me a few other buildings by Foster that had originally been designed to have the latest in sustainable technology applied to them but in the end many of the innovative ideas were scrapped because of their high initial costs. The buildings still retained passive ventilation means through operable windows on the facade and natural light entrance.

Angel then took me to the Fraunhofer school of Engineering where research is being done on sustainable fuel sources. We visited a hydrogen fuel cell development laboratory. Here I received information on the latest developments in fuel cells and why hydrogen still isn't a very efficient fuel to use because it is so expensive. So you either need a lot of space or a lot of energy to keep it super-cooled/hyper pressurized in a liquid form. They are exploring the use of natural gases and scrubbers to keep the energy produced emission free.



New buildings, Innenhafen, Duisburg



Residential area, Innenhafen



More Innenhafen development



Norman Foster Office Building, Duisburg



Another Norman Foster Building next door

Düsseldorf

I was here for the weekend only, so I didn't have a chance to meet with any building owners or architects. But I did get the opportunity to marvel at a threesome of Gehry buildings along the waterfront and get some pictures of the Stadttor designed by Petzinka, Pink & Partner.

The Gehry buildings were quite a sight. Kerstin, the girl I stayed with in Düsseldorf, told me that in summer, the titanium clad building in the middle reflects so much sunlight that it gets too hot to walk on the sidewalk next to the building.



Stadttor Building, Düsseldorf



Waterfront Gehry Buildings, Düsseldorf



Freiburg

From a sustainability standpoint, Freiburg was the best city of my trip by far. There is so much going on in Freiburg that a tour company has designed a tour focusing solely on sustainable projects. I was able to join the Futour group taking developers from Portland, OR to see 7 different projects ranging from sustainable residential neighborhoods to solar power research and training facilities to a zero emissions photovoltaic panel factory.

On my own and accompanied, I visited the Vauban district, a mixed-use neighborhood of over 5,000 residents. The district was within 15 minutes of my hostel by tram. The first time I went out there by myself. It wasn't hard to find examples of sustainability. There were solar thermal collectors and photovoltaic panels on many of the roofs. I saw a building called Heliotrop, designed and inhabited by architect Rolf Disch. The entire building rotates with the sun and its facade laden with solar thermal tubes and photovoltaic cells is an energy factory that produces more energy and hot water than it uses. So both of these resources are fed back into the grid.

The second time I visited the neighborhood, I went with a landscape architect who was staying in my hostel and told me how he had worked on the landscaping of the plus energy houses. So I went out to the site with Klaus and his companion, Heidi. We were invited by a resident to see the inside of her house. The woman said it had been tough working with the architect because he was very inflexible on many design issues that she as a resident considered important features, such as a mudroom for changing out of dirty boots. She said all the changes had high costs which was frustrating after the high cost of the townhouse itself.

On the last visit to Vauban, I met with Michaela of Meinhard Hansen Architecture firm, who explained the historical nature of this old French army base that was turned into a sustainable neighborhood after the French left the base in the mid 80's. She then showed me three of Hansen's Passivehaus apartment buildings. After the walk through the neighborhood, I met Meinhard Hansen in his flat, located in one of the buildings he designed.

Mr. Hansen described how the super insulated houses are able to achieve energy savings of up to 90% of what a traditional apartment uses. At the same time, the cost of construction over traditional is just 10-15% more. Like many other architects I've spoken with, Hansen said the way to sell these buildings is to make them look sexy and even downplay the energy savings achieved by the homes. The homes sell for their design and the incredible energy efficiency is just an added bonus for many of the purchasers.



Solar Electrician Technical Classroom



SolarFabrik Zero Emission Factory



Heliotrop



ISIS Passivehaus in Vauban

Other Places

Over the weekend, I visited my old roommate, Juan, in Switzerland. We spent one day in Annecy, France. Another day we walked around Geneva. I saw the United Nations building and a park with life size chess boards. I was also able to practice my French a little.

Back in Freiburg, I spent my last day there taking a hike around the Black Forest (Schwarzwald). After spending so much time in cities, visiting buildings, it was really nice to get out into nature and enjoy unbuilt, green forest space.

I returned to Barcelona for just 2 days before flying out to Mexico for the World Green Building Council Annual Summit and Sustainable Building Congress & Expo. This was an incredible event that I will cover in the November update.



Statue of Calvin & Co. in Geneva Park



Vauban Mixed-Use Buildings w/ Solar Roofs



Old Town Freiburg



Solargarage: Rooftop PV panels generate electricity for the grid in this Vauban neighborhood parking structure.



The Black Forest