

A powerful aesthetic

Integrating solar into the facades of buildings opens up big opportunities to deploy more PV close to end users, and to cut their environmental footprint. In the Hague, Braaksma & Roos Architectenbureau recently completed the renovation of Titaan, a former tobacco warehouse, into a modern office space, complete with PV systems on the rooftop and integrated into the building's facade. Architect/engineer Allard de Goeij shares some of his experience from this project, working for the first time with building-integrated PV (BIPV) components.



Photo: Braaksma & Roos Architectenbureau

“You need a company that is willing to experiment”

Allard de Goeij

Can you tell us a bit about the Titaan project that you worked on and the PV system that was integrated into the building?

The building dates back to the early twentieth century. Next to it is the Caballero factory, which used to produce cigarettes, and this was their storage facility with a bridge connecting the two buildings.

The local government owned it and was looking to revive the whole area. With this building the goal was to create office space for local startups, so that they can stay in the Hague and maintain that connection when they grow bigger. This meant a lot of renovation and extension: We tore off the roof and added another floor, and we created an all-new façade – which is where the integrated solar components come in.

We designed façade elements with perforations, and took the image of a tobacco leaf. We wanted to represent the building's history, but also to make it visible that the building is producing its own solar electricity – looking to the future as well as the past. We placed the BIPV elements all around the building, including the north and north-east sides where they are not hugely productive, because we want the building to tell a story of sustainability and modernization to the inhabitants of the Hague and to anyone who passes by.

How easy was it to find this type of integrated solar panel that could be custom made with your image and dimensions to fit the project?

We came across Kameleon Solar, another Dutch company, at a trade show and found that their panels had superior quality compared to many on the market. We looked at some others, our contractor tried to plug their own suppliers as well, and we found that many did not have the required durability either as a solar panel or a construction element, and were also quite limited aesthetically in terms of the image and finish they could produce.

So we were glad that Kameleon Solar joined the project. They create the image on the front side, which gave a nice matt finish, instead of a very shiny plate with the image behind glass – this appearance was very important to us.

In general, what are your needs and what do you look for when choosing a BIPV component for a project?

You need a company that is willing to experiment and work with you to figure out what you need and what you are trying to achieve. And you have to have faith in each other. In the beginning, I think we really underestimated that: Choosing an image is only half the story.

We held several meetings with Kameleon, obviously they want to maximize the amount of power the panels can produce, and we had to figure out the balance between that and our needs with the appearance, color, et cetera. We wanted the image to be more like a schematic – visible, but not screaming. And we went through a few different samples to figure out the color, the size of the pixels, and the overall look. It's really a process of trial and error, but it worked out very well.

Having worked on this project for the Titaan building, what is your view of BIPV? Is it something you'll consider in future projects?

In the end I am very happy with the result. For the most part, we were able to use standard panel dimensions, with a few one off components to make it fit at the corners. It's

Photo: Kameleon Solar



Titaan, a former warehouse, was renovated into a 13,000 m² workspace for startups, as part of a project to revive the former industrial district of Binckhorst in the Hague.

useful to know from the start what kind of design tools you have to work with.

If you want to attract more designers to use these materials, this is something I think it's important to take into account. Because sure, you can say everything's possible with custom tiles and so on, but it's already a relatively expensive component, and the costs can rise very quickly if you don't take this into account. So from our side as architects, it's really nice to know what's possible, what might be more expensive, how can you solve corners, can you make curved elements, it's very helpful if the industry making these can give answers to these kinds of question.

Another consideration is how BIPV components can be dismantled without creating a lot of waste. Currently there is a lot of talk around circularity in building materials, and PV components raise a few questions here. If the industry can come up with a better answer to that, demand will really start to rise. **PV**

Interview by Mark Hutchins



Photo: Kameleon Solar

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The designers chose the image of a tobacco leaf for the solar panels to cover the facade, as a way to represent the building's history.