



**OPVIUS GMBH**

*Project Guide for Designers*





*OPVIUS Installation at the German Pavilion, 2015*

## PROJECT GUIDE FOR DESIGNERS

This Project Guide for Designers describes the way OPVIUS GmbH works and interacts with potential customers. As we do not supply standard products, and therefore do not have a price list or a catalogue, we thought this may help create a better understanding of the endless possibilities that our technology offers.

These guidelines are meant to be used in conjunction with Building Integrated Solar Projects, and therefore pay a lot of attention to design and expanding a unit cell (like a module shape) to large-scale solutions that can cover many square-meters.

We hope that this Guide will be helpful and lead to a fruitful follow up discussion about your project. If not, please let us know!

### General

OPVIUS GmbH manufactures customized OPV modules as semi-finished goods for individual projects. Working together with our partner companies, these modules are then integrated into your construction material of choice to form an integrated energy harvesting surface for construction projects. Due to the integrated nature of the final OPV products, it is important to understand that they cannot be evaluated in the same way as standard module-based PV technology.

### The first challenge

It is important to note that OPV is not a standard PV technology, and therefore cannot be compared to standard PV products using traditional key performance indicators such as cost, performance etc.

Asking “how much does an OPV product cost, and what is its performance?” is like asking your car dealer “what does a car cost, and how fast is it?”. The response will obviously be: “well, what kind of car are you looking for? They are all different...” In order to determine cost and performance, you need to choose between different designs, colors, usage profile, engine performance / speed, and so on.

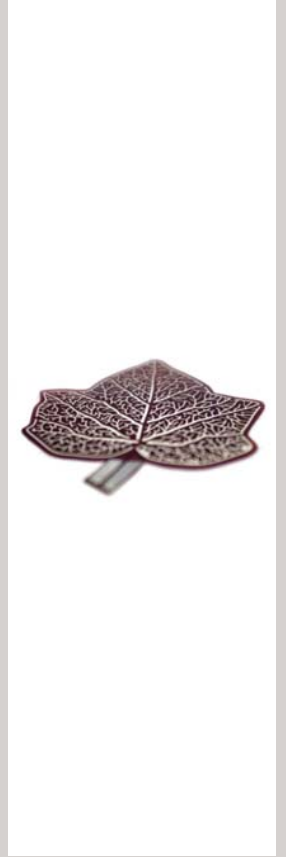
### It is important to understand that the same is true of OPV technology.

This is different for classical PV modules, which can be compared to the Ford T: they are all roughly the same, so you can easily compare them using a couple of standard indicators... but this is not the case for OPV products as they provide a much larger range of possibilities!

We need information about your project and your intentions before we are able to provide any numbers. We appreciate that this requires an effort on your part (and also on our side), but any numbers that we could state upfront would be mere conjecture, and in the worst case scenario, entirely wrong.

However, by working together with you in the early stages, we can explore the endless possibilities of OPV technology, and create a unique solution tailored to your wishes. If you want to have top-notch technology with the best possible combination of aesthetics and performance, this is the way to go.

**The starting point: What should the underlying OPV module(s) look like?**



*Freeform OPV module in the shape of a leaf with patterning*



OPVIUS Installation at the German Pavilion, 2015

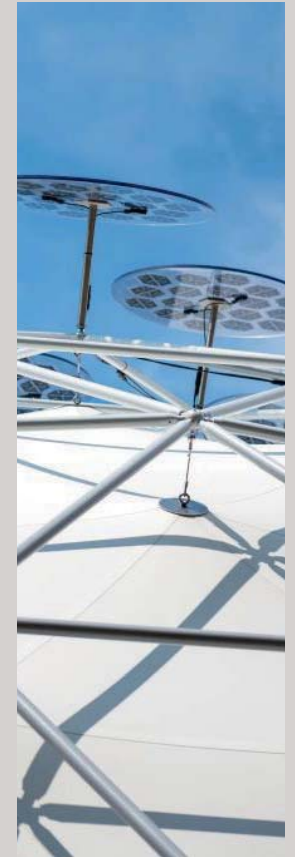
The first technical question to answer is what your modules should look like. OPV installations are typically an arrangement of individual modules. These modules can all be identical, or they can be different. It is, however, advised not to use too many different modules as this increases the cost. Most installations that we have done so far use either 1 module type or a kind of family concept (e.g. different sizes of the same pattern), with a maximum of 5 different modules types.

The modules themselves can vary in size from extremely small to endlessly big. This might not make a big difference to you once they are integrated into or onto the carrier material, however it may increase the complexity of the system, as a large number of modules require a large number of electrical connections, and very large individual modules can get too big for easy handling during assembly. We therefore recommend that individual modules range between 10 and 100 cm in length. We can then explore ways to combine several modules to cover your desired surface space.

By way of example, please see the picture of the installation at the German Pavilion of the World EXPO 2015 in Milan, Italy. We have used two "unit cells", 20 cm and 90 cm in diameter, and for the larger package we used different OPV inlays. The whole installation was made using a steel rope net, installing the OPV modules in the open meshes of the net. That allowed us to span a large area, reducing wind and snow load, and even creating a system that can be easily maintained from an operational viewpoint.

**In line with the above, here is a breakdown of the various details that would help us determine your needs:**

1. What do you want your module look like? Please let us know:
  - 1.1. The outer shape(s) of your desired module(s), i.e. circular, rectangular, oval. Please note that we are able to produce any shape, including freeform. We can, for example, create modules that resemble your company's logo, or perhaps an icon for a particular project.
  - 1.2. The ideal size(s) for your desired module(s). Ideally, please provide us with a rough sketch of the shape(s) and size(s) of your desired module(s).
  - 1.3. What color you would like your module to be. We can produce modules in blue, green, gray (or red). Please let us know your preference.



OPV module array laminated in Polycarbonate sheets to create round solar umbrellas



OPV module array laminated in glass façade. Please note that each module array is different

- 1.4. Whether or not you would like the modules to be transparent. Please note that most of our devices are transparent.
- 1.5. Would you like a pattern to be printed on the modules? Our modules are printed in a way that leaves open the possibility of integrating certain patterns. The possibilities range from regular patterns to integrated prints of special patterns or logos.

2. What type of construction material would you like your modules to be integrated into?

We offer several different ways of integrating OPV modules into construction materials. Most customers want us to integrate the modules into either laminated glass or flexible films.

Depending on the material you require, we will choose one of our partners to complete the integration. This partner company will afterwards be your main point of contact for the whole system.

3. Tell us about your project.

All information that you can share will help us form a general impression of your project as a whole. It is important for us to understand the scale of your project, and how the OPV products fit into it.

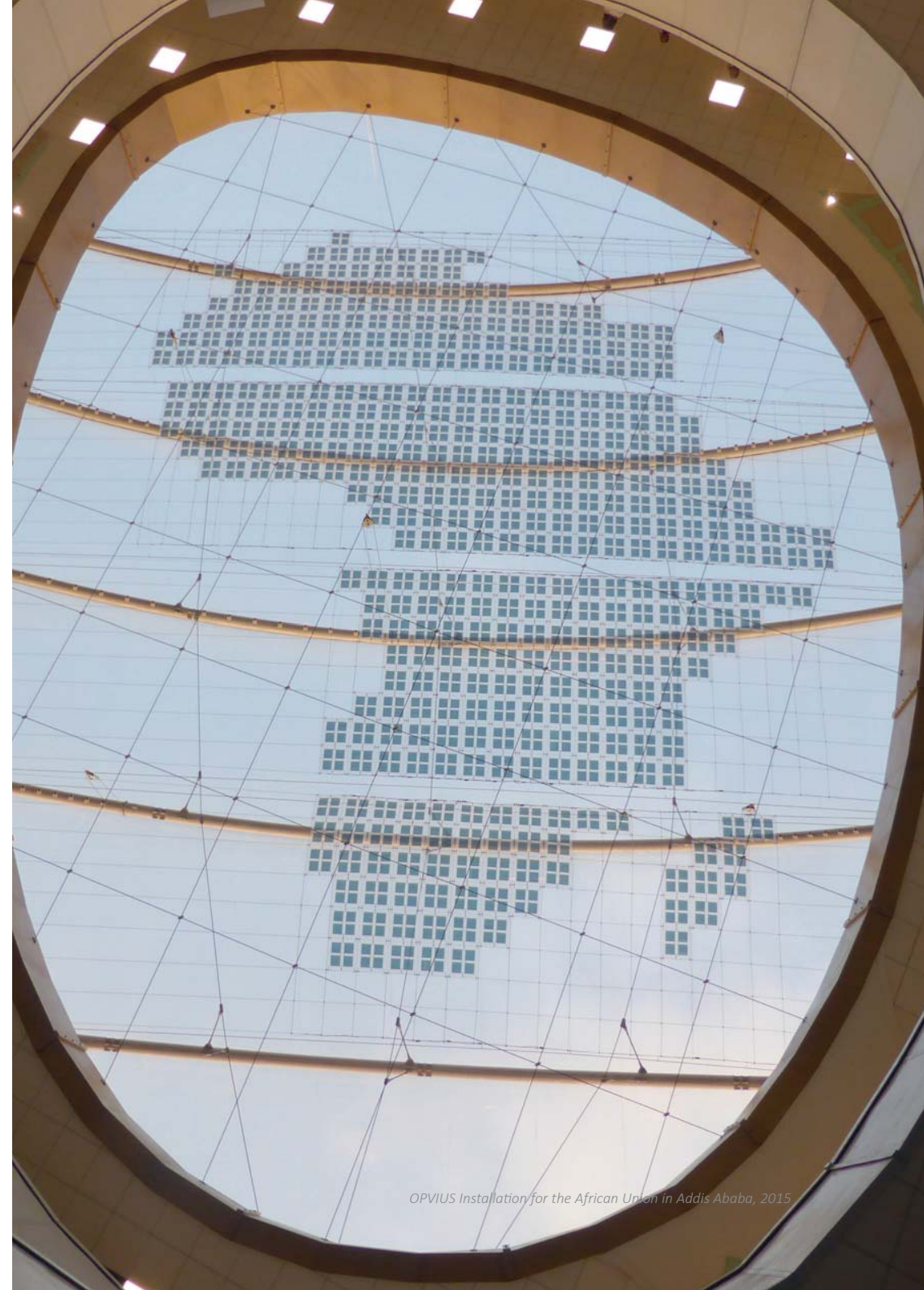
4. What are the external conditions of your project?

- 4.1 What is the intended use for the power generated by the modules? Are you planning a grid connection, a storage system, or something else?
- 4.2 Why have you chosen to use solar active materials? Are you aiming for an energy efficiency certificate like LEED, or just to generate the power for feed-in-tariff?

#### The next step

Based on the information that you provide us and the material that you have selected, we will contact our partners and start working on a first set of numbers for you.

Sounds complicated? Perhaps, but by working with us you will get an **aesthetically pleasing solution instead of a standard plain PV panel.**



OPVIUS Installation for the African Union in Addis Ababa, 2015

## CONTACT INFORMATION

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*Semi-transparent OPV module with  
freeform print*