

## Solar panel manufacturers

To determine what the needs of our direct customers are, we have developed a standardized survey that we have used to interview potential customers. Based on their opinions it is possible to design our final product in such a way that it meets their needs as well as possible. We have interviewed 4 solar panel manufacturers, respectively 3 German companies and 1 Dutch company.

We first asked the manufacturers some general questions about what important is for their company. Every of the four interviewees was asked, on a scale from 1 to 5, how important respectively the price, the quality and the efficiency of the solar panels for their company are. Furthermore, we asked them how important the environment, information provision and a fast delivery are for the company they are working.

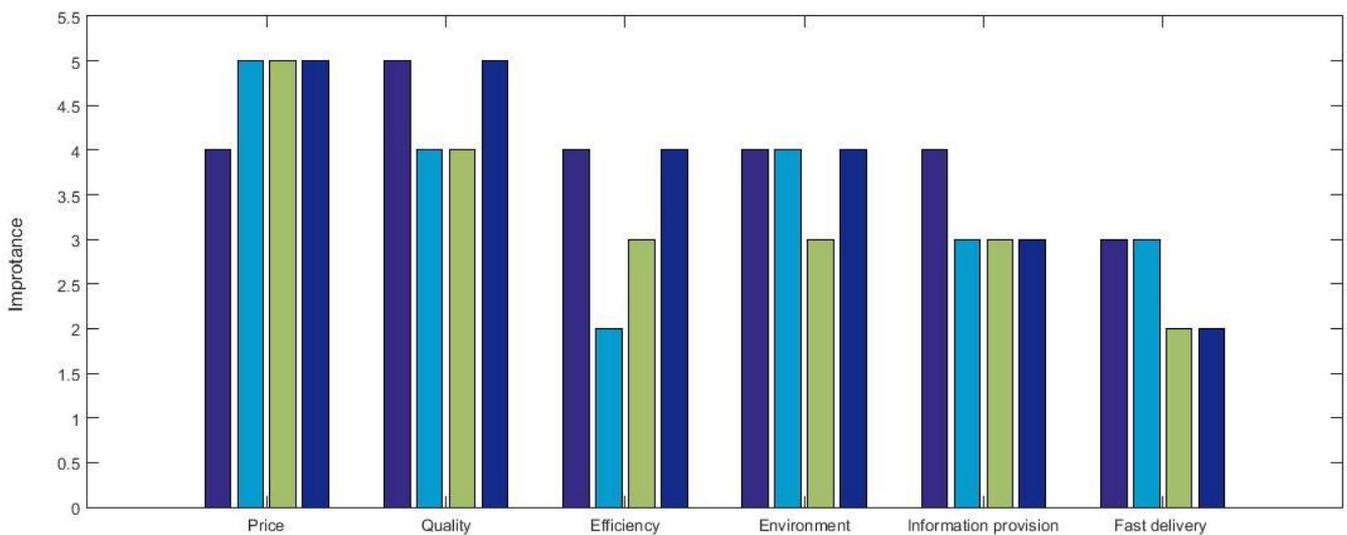


Figure 1: Importance of price, quality, efficiency, environment, information provision and a fast delivery. Scaled on a scale from 1 to 5.

Figure 1 shows that the efficiency is not necessarily the most important aspect of the solar panels for most of the interviewees. One of the interviewees explained to us that for most manufactures the absolute efficiency is not determinative. They are especially interested in the return on investment. Most manufactures strive for solar panels with a high return on investment and they are only willing to increase the required investment when this also the return on investment benefits.

Based on the interviews it appears that most solar panel manufacturers probably have never heard from micro lens arrays, because 3 out of 4 of the interviewees did not know what MLAs are. Therefore, it is important that we clearly communicate to the potential customers what the benefits of the MLAs for them could be.

After we have explained the idea of our product, all of the interviewees were enthusiastic about it and they were convinced that their company would be interested in our product. However, 3 out of 4 companies clearly stated that they expect that their customers probably are not willing to pay a higher price, purely because the MLAs are environmentally friendly produced. Therefore, it is important that our product is also competitive with for example, regular chemical produced MLAs.

One of the interviewees thought that the price, customers are willing to pay (extra) for environmental friendly production is really depending on the customer segment you are focusing on. "There are definitely customers that are willing to pay a higher price for the environment". However, he thought that most customers are not really think about the environmental aspect of the solar panels itself. In his opinion, marketing is required to make them aware of this.

Another interesting point is the fact that the quality is very important for most potential customers. When we asked them what they consider as possible risks, two of them mentioned that they were wondering if the encapsulation layer is strong enough. We have to take this into account. If for example, the encapsulation is not strong enough or the efficiency decreases to soon, this can be catastrophic for our company.

When we asked them whether they would prefer to buy the MLAs commercially or would prefer to get the possibility to produce it by themselves, they unanimously said that they are not willing to produce the MLAs by themselves because they do not have the right knowledge or because they do not want to change their production process completely. This means that we have to manufacture the MLAs or that we have to agree with an external party to do this.

Finally, we were interested in their opinion about the minimal requirements of the MLAs and our company to make the concept successful are. "They have to be strong enough, easy to implement in our production process and the efficiency improvement have to be large enough". This was an answer of one of interviewees that nicely illustrate most of the requirements that our product has to meet according to our potential customers. It is important that we make sure that we will make a qualitatively good product and adapt it to the preferences of our customers.

The main key points are:

- Micro lens arrays are new and revolutionary in the solar panel industry. Most manufacturers have never heard from them.
- Final customers are probably not willing to pay a higher price for environmental produced solar panels.
- The manufactures do not have the knowledge and the production facilities to produce the MLAs by themselves.
- The efficiency is not determinative for most solar panel manufactures. It is important that the return on investment and the eventual price are good.
- The quality of the solar panels is very important. The encapsulation layers have to be strong enough.

Based on the main key points we can conclude that there are opportunities to enter a totally new market with a revolutionary product. However, to make this a success, we have to meet many requirements. First of all, it is important that our product is strong enough. Furthermore, we have to make sure that the MLA encapsulation layer improves the return of investment of the solar panels and that the absolute price becomes not too high. It is expected that the final customers are not willing to pay more for the environmental aspects of our product.