

Interview with Dr. Valérie Berryman-Bousquet, VP Engineering, Helio Display Materials

Spring 2024

Project Future Set-Up for Perovskite Production

Objectives Achieve fact-driven understanding of what it means financially and timewise to scale up the production of perovskites to prepare the next round of fundraising

Timeline February 2023 to December 2023

Team 3 members from Helio – 2 consultants from **artistratis**; 1 consultant from Chem2Go

How did you get in contact with artistratis?

When we were exploring the necessary investments for a industrial scale production of our unique perovskites we heard from artistratis as being a process industry and operations experienced consultancy. A first contact with Nils confirmed this view and we started our cooperation.

What was the objective of your cooperation?

In principle we needed to understand what it means financially and timewise to scale up the production of our unique product to an industrial scale to prepare the next round of fundraising.

How did you approach the question together with artistratis?

Artistratis proposed to first model the current lab process in a dynamic simulation tool to assure a full mass balance, full understanding of the process as well as necessary equipment and other resources, for example personnel. It was very helpful that artistratis comes with a broad process industry background and could therefore work with the existing operation procedures and batch protocols to set up the model. The necessary involvement of our team was very limited.

Nils then did a scale up exercise to meet the yearly demand that we have been anticipating in our business plan. As a result, we had a dynamic digital twin of our industrial production while still working on details in the lab.

How was the question of investments and specific full costs answered?

For this artistratis used its connection into the industry and got estimations for building construction, equipment etc. It was especially helpful to have Chem2b with its Managing Director Sven Gamert on board. Sven has excellent connections to raw material providers in Europe and Asia as well as CMOs specializing in high end chemicals. Chem2b was able to provide accurate estimations from solvents to special materials. All this data plus estimated costs for personnel, energy etc. were added to the digital twin and we were able to get a good estimation of the product full costs.

Besides this model, Sven proposed another scenario: To have our products contract manufactured. With its great global network of chemical companies, we defined the capabilities a contract manufacturer would need to fulfil in order to produce our products at commercial scale. This scenario would not only speed-up the time-to-market, but also use a lot of synergies in an existing production environment and therefore make the production cost cheaper with much lower capital investment needed. An approach we haven't thought about before and for us as a start-up company definitely of high interest, since we would also benefit from the experience of an established chemical company during scale-up of our products.

Was there a feedback and follow up on these results?

Yes, definitely. First, we realized where our actual cost drivers were and we looped this information back to the development team, that directly aimed at their reduction through process improvements. Secondly, we were able to check different possible locations worldwide for a potential production and could provide a really full view to our board and investors. Thirdly, with the option of contract manufacturing we could clearly see the advantages in cost and speed vs. an own production approach.

What will happen next?

Helio Display will, for the moment, continue to focus on first-class innovation and research given the current business environment, but we will definitely go back to chem2b and artistratis should we have questions about going large and industrial.