

# PerfectPartners

## Where no two days are the same: Engineering support at ETCA



In this issue, we focus on the contribution that [IPSS Engineering](#) makes to the smooth running of research and development facilities and projects at [Energy Transition Campus Amsterdam \(ETCA\)](#). Shell TechXplorer executive editor Evren Unsal (left) posed the questions, and Gerrit Gerritsen (right), Director, IPSS Engineering, explained what makes his work at ETCA so challenging and rewarding.

### *EU: What does IPSS do?*

**GG:** The vision of IPSS Engineering is to provide safe, sustainable and cost-effective solutions to the challenges faced by the process industry. With more than 15 years of experience, IPSS is specialised in engineering, procurement and construction (EPC) of first-of-their kind biobased, renewable energy based process installations. Our focus is on laboratory, prepilot and pilot-scale installations where we work with the scientists on critical design challenges and develop customised solutions. We turn theoretical ideas into safe working solutions. We understand the thought process of our partners and support them on the entire engineering trajectory through a multidisciplinary approach.

### *EU: How did IPSS become involved with ETCA?*

**GG:** In 2007, we were approached by Shell to help with the move into the new Shell Technology Centre Amsterdam building. At the time, Shell had a lot of small buildings spread across a four- or five-acre site in Amsterdam. We called that move the Blue Book project, and our role was to plan for the disassembly of old, as-built installations and their transfer to and installation in the new building. All of this was carried out under a strict work plan. We planned the engineering aspects

of the move and Shell managed the contractors who carried out the work.

After successful completion of the Blue Book project, we were given assignments for the new R&D installation in the new building. And from that we picked up the role of providing in-house engineering support for Shell, including helping with detailed engineering of experimental installations. We are proud to work with Shell and we were the first resident on the ETCA campus.

### *EU: What are the core skills that your team bring to the day-to-day operations at ETCA?*

**GG:** If you look at the engineering skills needed in this building, the key word is multidisciplinary. We have process engineers, mechanical engineers, electrical and instrumentation engineers, and automation engineers all working together. But perhaps more important than the type of engineer is the type of person you are. If you come to work for IPSS at ETCA you need three characteristics. First, you must be proactive. Second, you must be able and willing to communicate. Our engineers have to talk with a variety of stakeholders such as the scientists, the operators, the technologists and the mechanics, whether working on a management of change (MOC) procedure or building new installations; this is not an environment for people

**Perfect Partners** examines the emerging ecosystem for research and development collaboration that is bringing Shell and other organisations together to address the challenges of the energy transition.

who are introverted and prefer to work in isolation. And the last characteristic is creativity.

I think being creative is the most important thing because everything is new here. There are no standard solutions in research and development, and that means the engineers working here must have an open mindset and be able to think outside the box. If we encounter a challenge, for example, the need for a new type of three-way valve, we have to work out how to overcome that challenge – in this case, work out how to source the new valve. The valve we need may be so special that it is not available from commercial suppliers. Perhaps the material or specification or settings make it unique. If that is the case, we have to find a way to have it custom made. This kind of approach and way of thinking is very important here.

**EU:** *In research settings like ETCA engineers might be doing different things from week to week, month to month. Does that make ETCA a stimulating environment for engineers to work in?*

**GG:** Yes, it does, very much. In a big engineering company, engineers will typically spend the day doing much the same thing; they receive a work package, do their bit and then pass it on to another engineer. At ETCA, you are working as part of a problem-solving team that faces fresh challenges together. And, of course, the challenges at ETCA relate to new energy and energy transition projects where there are lots of new things to work on, such as solar panels, electrolysers and hydrogen. At ETCA, there is always something new: no two days are the same.

**EU:** *What are the biggest challenges?*

**GG:** A lot of what we do is helping to create model and prototype versions of equipment that are a fraction of the size of the final process plant. One of the key challenges arising from this is scaleup, because scaling up is not simply making things bigger. The reality is that materials of construction and process performance are influenced by the

scale of operations and can be very different at bench and pilot scales. Also, there are challenges relating to what equipment is available on the market, so in scaleup we have to be creative and open to trying new solutions.

A further challenge is working with the available space and the need to have all the equipment skid mounted. The skid-mounted approach requires less manual labour on-site for construction, enables better quality control and is more cost effective than the stick-build approach. All this makes scaleup very challenging, but that is the nice part of it.

**EU:** *Your early involvement at ETCA was offering support for Shell. How do you find working with the other campus residents?*

**GG:** Shell Technology Centre Amsterdam becoming ETCA has been a really positive story for us. IPSS Engineering worked with Shell and with other clients outside the building, but now we are also making good connections with companies inside the ETCA campus. There is a strong sense of having a technical community, and we are now working with Yokohama and Corvus Energy as part of the ETCA hydrogen team. >>>



Gerrit Gerritsen adds IPSS Engineering as the first resident at ETCA.

**EU: How do you see collaborations at ETCA developing?**

**FW:** The site team is excellent, and I think over time we will see more cooperation between residents that share similar research and development interests. Late last year, we had the first board meeting of all member companies, and it was a perfect opportunity for the residents to introduce themselves. The interactions made a lot of people think, "maybe we get we can get more out of this," and I think that was a very good starting point.

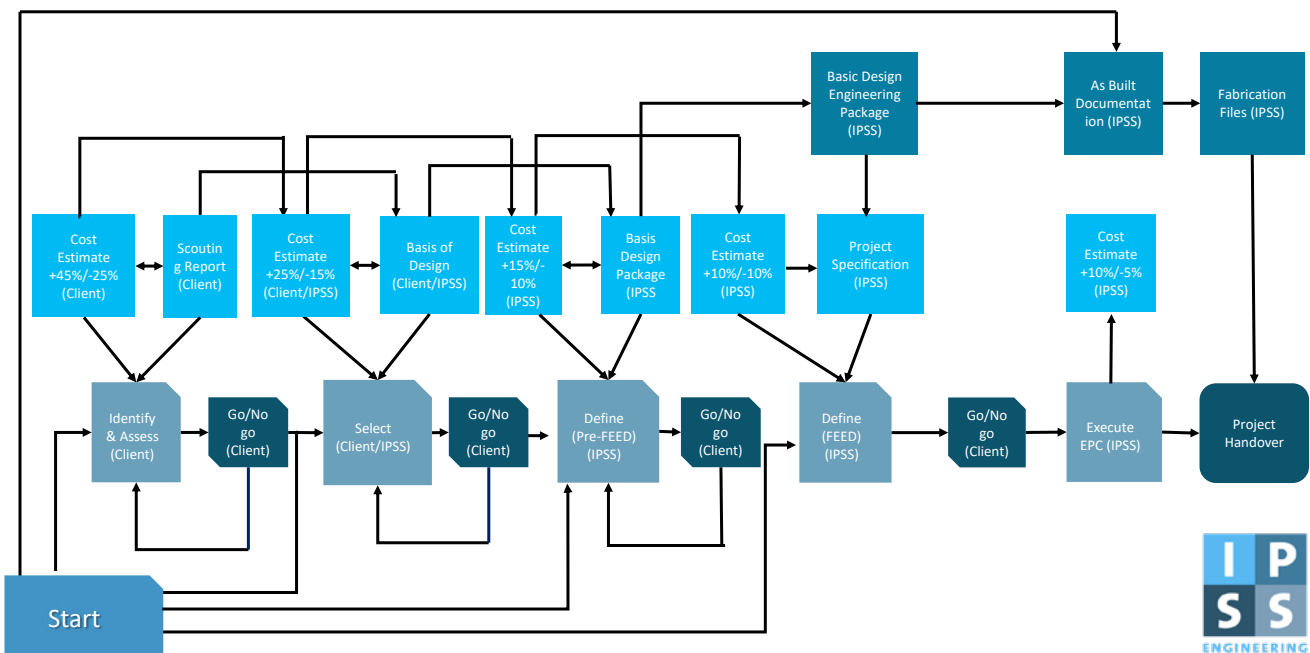
On Thursday 16 March, during the hydrogen production at ETCA theme weeks (20 February to 31 March), IPSS will present a workshop. As a theme for this workshop we have chosen "Engineer's eye on hydrogen production – Scale-up challenges & bottlenecks". During this workshop, residents will be able to have proactive discussions on the latest thinking in this area. In subsequent workshops, other members of ETCA will

present on digital technologies or electrification, and there will be opportunities for the ETCA residents to mingle with each other, to find expertise and perhaps find possibilities for collaboration that might not have arisen otherwise.

**EU: Are there any benefits with ETCA being a Shell setting?**

**GG:** I think it helps in areas like recruitment because Shell has a very good name for research, and, if you look at students graduating from universities in the Netherlands, you will find that many of them want to work over here. Why? Because they say, here you have high-level engineering. If you want to expand your knowledge and expand your way of thinking, you have to work at Shell Amsterdam because this is where exciting new things are created.

So, the Shell brand is still a strong and attractive one for engineering, even though the ETCA campus now has its own blue branding.



Typical routes to project delivery.

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**EU:** Can you give us some examples of collaborative projects IPSS Engineering has been involved in?

**GG:** One of the frustrating things about supporting projects at the frontiers of research and development is that we cannot discuss or describe the details of the work we are doing. Everything at ETCA is highly confidential, but I can give you some examples from other areas where there is no disclosure issue.

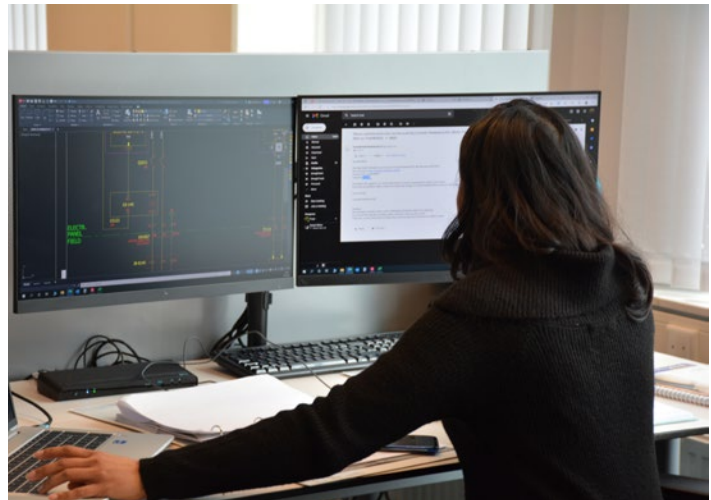
Researchers at Wageningen University & Research (WUR) in the Netherlands had devised a new sustainable and cost-effective way to crystallise sugars from sugar beet, and approached us to help develop the pilot installation that would be used to test this new approach. We were involved in that project from the start, beginning with the identify and assess phase all the way to the EPC phase. Our engineers discussed in detail with the scientists before we made our engineering and construction proposal.

We engineered and built the process installation, under ATEX conditions and according to the Pressure Equipment Directive Guidelines, according to the agreed plan. During testing of the pilot plant, we supported the WUR scientists with technical inputs and, when necessary, performed an MOC to upgrade the pilot plant. Furthermore, we helped conduct joint tests and followed the research programme right the way through to analysis of results.

So, while we cannot describe much of what we do at ETCA, the fact that we work with Shell and other major companies is enough for new clients to see that our engineering services are of a high quality.

**EU:** What about the future? How do you see relationships at ETCA developing?

**GG:** What I see in the future is what I have seen in the recent past. That is, more openness and



An IPSS engineer at work.

joint working between companies that are sharing a workspace.

When I first came to this building everything was closed up, with a huge emphasis on secrecy and everyone protecting the research that they were working on. But then someone in Shell thought there might be more to gain from some open collaboration in a joint campus where researchers were encouraged to mix and to discuss and collaborate on ideas that were not commercially sensitive. Some people, perhaps those who had been working within Shell for a long time, were not very keen on the idea to begin with, but I think the ETCA experience so far is that all of the residents gain much more from potential collaboration than they risk by being a little more open.

Companies can save a lot of time and effort in the technical development process if they are willing to share and look at what other residents are doing in the same areas. This community of cooperation is important, not just for commercial things but also for the ultimate goal of working towards a more sustainable future. By working together and focusing on a common goal, the power of collaboration can be unleashed. ■