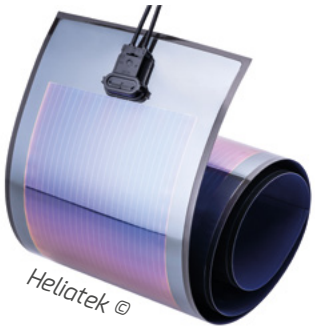
SOLAR SOLUTIONS

_PS&AM_ caught up with James Bulley, Co-founder and Chief Executive at Trivandi Ltd and Jo Parker-Swift, CEO and Founder of Solivus, to talk about their new partnership and innovative, lightweight solar solutions.

Jo, can you please give our readers an overview of your company, Solivus?

Solivus brings solar solutions to the commercial sector with flexible thin-film solar technologies, addressing applications where conventional solar is not favourable due to its weight, shape, design, heat, CO^2 footprint or roof warranty related limitations.

We secure exclusive partnerships with innovative suppliers of the cleanest, most sustainable, high quality technologies. Our point of difference is a one-stop-shop service combing solutions for energy generation, storage and EV charging on a commercial scale. We are also developing a trading tool to optimise energy usage onsite or to export through third party sales to local micro-grids.



You've recently signed a contract with Heliatek to distribute OPV solar technology to global stadia and arenas.

Yes, our relationship with Heliatek has been developed over the past three years and has culminated in the recent award of exclusive global distribution rights for Heliatek's OPV products into the stadia and arena sector. Heliatek has identified that our highly innovative approach to their products together with our relationship with Trivandi is a winning formula.

What are the key properties of the solar films that Heliatek produce and why do you feel they are a perfect fit for Stadium and Arena projects? What advantages do they offer over PV panels?

The key properties of Heliatek's products are simple to identify. The modules are exceptionally light being less than 2kg/m² in weight making them a perfect fit for stadium and arena projects where long span, lightweight structures are prevalent. Likewise, due to their flexibility, they can be used on curved surfaces, maintaining the original architectural design features of a development. Conventional PV panels are rigid and heavy, being around 10x the weight of Heliatek's panels per m², so it is often simply not possible to put such modules on this type of roof structure due to the additional loading. Furthermore, the modules look great – they will certainly not detract from the architect's original concept if added to a structure.

Heliatek's modules are OPV – organic photovoltaics – meaning they are made with organic 'ingredients' which are abundantly available and with no rare-earth minerals. The manufacturing process for the modules differs substantially to that of conventional PV in that low heat is used. This results in a total life carbon footprint of between 3 and 9gCO^2/kWh, on par with hydroelectric as being the most efficient renewable energy source in carbon terms. By comparison, conventional PV is up to 100gCO^2/kWh. The Heliatek modules can be completely recycled or easily disposed of at the end of their economic life. These highly sustainable credentials are important to sports stadiums and their fans. For Solivus, our core focus is on those innovations that are truly sustainable – the Stadium and Arena sector enables owners to literally shout from the rooftop their environmental credentials to the world.

Heliatek's modules also have a unique characteristic – they have a positive thermal coefficient. Simply, this means that as the module heats up, its performance is not affected. This is the opposite of conventional PV where energy generation drops off as the surface temperature of the modules increases and this is even a problem for the UK! For example, with an air temperature of 25o, the module surface temperature could be as high as 50o so a positive thermal coefficient can very positively contribute to additional relative energy generation.

As a further benefit, the modules are quick and easy to install and use off-the-shelf inverter hardware. As with conventional PV modules, Heliatek's products come with 20 year performance guarantees.

Can you explain how Trivandi have come on board to collaborate on growing this business in the Stadia sector?

Trivandi has unrivalled experience in the Stadia sector. Due to their experience in project managing large scale, complex developments, we had already selected Trivandi to oversee major installations on other commercial buildings, and importantly, to enable rigorous quality and technical assurance of those installations. It was, therefore, a very straightforward opportunity for both companies to extend that collaboration with us tapping into their exceptional contact base and Trivandi is able to offer its own clients additional value-

RWE installs organic solar film from Heliatek on Biogas Plant
RWE ©

add services to generate energy which hadn't been previously possible, and to meet those clients' ESG targets.

The solutions Solivus are able to offer are a complete gamechanger in the industry. Stadia and arenas have been looking into renewable energy for years and if you think about long span roofs, the steelwork has to support heavy lighting, sound systems and video boards. The addition of traditional glass PV solar panels on the roof means that the extra roof steelwork required to support the weight of the panels outweighs the cost benefit of introducing solar. We are really excited to be able to offer this solution to our clients and extended network to help them achieve their sustainability agendas as stadia move to net zero carbon targets.

James, many of our readers will know you well from your experience in the delivery and operation of many high-profile major sporting events, can you give us a few personal project highlights?

Well London 2012 was a tough act to follow, but over the last seven years, our amazing team in Trivandi have delivered over 75 projects in 22 countries. Every one of those projects have been special and it's hard to pick out one or two. Here are two that stand out; firstly, leading the operation of the first multi-sport mega-event held in Central Asia, the Asian Indoor and Martial Arts Games in Turkmenistan, a country which very few people have ever set foot in, let alone mobilised a team of over 700 staff to deliver it, has to rank up there as one of the most extraordinary experiences. Secondly being invited, as a bunch of Brits, to support the operational planning and delivery of the Super Bowl City, the 50th Super Bowl in San Francisco, has to be a highlight. Keith Bruce, the CEO of of Super Bowl 50, said to me, "it has to be the best ever", and that was a clear, simple and ambitious mission, which he and his brilliant team absolutely delivered.

Looking ahead, how will this extensive project delivery knowledge help you grow the Stadia customer base for Solivus?

Trivandi took a decision a year ago to invest in becoming leaders in helping venues achieve their sustainability targets and to get to net zero carbon. We developed a database of over 1,000 stadia, arenas and exhibition centres

around the world, and our researchers have google mapped these venues and their suitability for solar installations. We have spent nine months undertaking technical research and feasibility studies on a number of venues and one by one we have knocked over the challenges in delivering Solivus' solar energy installations.

Our sustainability experts have reviewed environmental assessment methods such as BREEAM, LEED and MEES and how to achieve sustainability objectives supported by the solar solutions being brought forward by Solivus. Importantly, we bring expertise and guidance on feasibility and seamless project planning for end-to-end delivery of solar installations. Working closely with the Solivus team, we aim to make the process as smooth, beneficial and effective as possible for Stadia owners.

These days sports venue architects, developers, owners and operators are increasingly aware of the need to become as environmentally sustainable as possible, with renewable energy being a key part of that. When it comes to stadia roofs, how can the application of these solar films help them achieve these goals?

You are quite right. We are seeing all sectors wanting to prove their environmentally sustainable credentials, whether this is owner/developer or tenant/occupier driven. The majority of roofs across the world, whether in the Stadia sector or elsewhere, remain grossly underutilised. The introduction to the market of Heliatek's new lightweight, flexible PV modules now means that these roofs can be retrofitted where the original design would not allow conventional PV, or integrated as a BIPV into the design of new building structures. So Heliatek's modules can be used or adapted for new structures and existing ones alike.

There is no other PV module that can generate as much energy with such little embedded carbon – the impact on the environment in its manufacture through to its disposal by recycling is minimal. This is something we are seeing more and more clients being much more concerned about and which is very exciting for us as it meets our own company ethos of promoting the most environmentally sustainable products.

This is a really exciting opportunity for global stadia, many of which weren't able to consider solar solutions previously, and we very much hope that we can help venues deliver against an increasing requirement for sustainable design solutions. Solivus offer a full framework of products which would allow venues to generate solar energy from their roofs or car ports in their expansive car parks, store the energy and reutilise it not only for the Stadium's needs but also for the local community. This is a huge opportunity for Stadia to help support and give back to surrounding communities while also helping to create 'green' venues.

Many modern Stadium and Arena designs are increasingly complex with curves often a notable feature. Do the solar films still perform even when there is shading above the roof surface?

The flexibility of the modules means they are very versatile and can fit in with complex architectural designs and shapes. One of the interesting characteristics of the OPV modules is that, unlike traditional PV, shading does not materially affect energy generation. This is particularly important in the stadium and arena sector where such buildings often have exoskeletons or sponsorship logos which can create substantial shading.

Are you already in discussions with any sports venues or clubs about using the product?

We are in advanced discussion with a number of major sports stadia and arenas, however, we are not currently in a position to say much more about that. Suffice to say that the respective owners of those buildings want to maximise on the considerable PR opportunities of the collaboration when it is appropriate. Watch this space!

The owners of some of the projects we are currently looking at are conscious of their position in the local environment, often situated in residential areas and considerably affecting local communities on match days, for instance. They are showing considerable interest in the 'community' potential of their investment in energy generated by solar, with the option for excess, clean energy to be exported into the local community or to provide competitive local car charging opportunities.

Is the solar film suitable to be used on both renovation and new build projects?

The OPV film can be used on renovation (retrofit) and new build projects. One of the reasons our relationship with Heliatek has culminated in exclusive distribution

rights for this market, is due to our interest in developing linked products that can extend the application of this material to as many different roof types as possible, and in as many different markets.

Are you also interested in working on Stadia projects outside of the UK?

Yes absolutely. We are already in discussions with Stadia who have approached us directly and are in the process of completing an expansive review of global stadia to work out viable opportunities and strategic targets. We're using Trivandi's global networks across 22 countries to start conversations in the respective territories.

Yes, as James says, we are most certainly interested in looking at projects outside the UK. Our relationship with Trivandi assists our ability to step into international markets twofold – their global market knowledge and relationships with global stadia owners and developers; their ability to resource and operate in any given market around the world. We, therefore, see our relationship as being mutually advantageous for many years.

Is your focus purely on the Stadia sector or are you also looking to increase the application of these solar films in other sectors which also have renewable energy supply requirements?

We initially focussed on the huge market in the commercial and industrial sector of large warehouse roofs where there is often a limitation in roof loading due to structural limitations. We are still selling into that market. However, with the global distribution rights for stadia and arena, there is the potential to keep us busy in that market alone for many years! This is hugely exciting for us as it will allow us to expand quickly providing much needed employment opportunities in these challenging times.

Our core markets are on any large roofs that have underlying structural constraints but that also have an increasing demand for energy, such demand that will only increase as transportation, heating and many other aspects of our lives become electrified. These are very exciting times for us and we hope we are able to make material changes to the sustainable generation of energy for all our clients in as many sectors as possible. ■

www.trivandi.com/solivus

www.solivus.com

For any enquiries, please contact enquiries@trivandi.com

ABOUT SOLIVUS

Solivus wants to make the world a better place. We are passionate about making a difference to the environment for our clients by creating truly sustainable, clean energy products. We help overcome the challenges of using traditional solar panels with our ultra-thin, ultra-lightweight and flexible film that has been designed for stadia and arena sectors, public buildings, residential, commercial and. We are committed to using the latest innovations in renewable energy and our solar film which is manufactured by Heliatek, a global leader in organic solar film won the 2020 Innovation Award at the World Energy Summit.

ABOUT TRIVANDI

Trivandi are global leaders in the delivery and operation of major events and venues.

The Trivandi executive were the senior leadership team of the London Organising Committee of the Olympic and Paralympic Games (LOCOG) that planned, delivered and operated the London 2012 Venues and Olympic Park.

In 2013, Trivandi was established to share their knowledge and expertise in venues and mega events, providing strategic consulting, assurance and implementation services. By building trust and leveraging great relationships, we have delivered memorable events and venues in over 22 countries around the world.

Trivandi's mission is to raise the bar in the delivery of venues and mega-events, creating spectacular visitor experiences.

ABOUT HELIATEK (HELIASOL®)

As the technology leader in organic photovoltaics, Heliatek develops, produces and distributes industrial-grade organic PV solar solutions for virtually any building surface (horizontal, vertical, curved, rigid, and flexible). Heliatek stands for energy solutions designed for various traditional and never been possible before applications based on its unique features – it is ultra-light, flexible, ultra-thin and truly green. HeliaSol® is a ready-to-use solution, ideal for retrofitting on existing building structures featuring unique specifications:

- First industrial grade available OPV solar film
- Ultra-light with less than 2 kg/m^2
- Flexible with minimum bending radius of 20 cm
- Ultra-thin: less than 2 mm thin solar film
- Easy to Install: attached to various surface with integrated backside adhesive, no mounting, no rooftop penetration
- Lowest carbon footprint of all solar technologies with less than 10 kg CO^2e/kWh
- Hassle-free and environmentally friendly disposal
- 5 year product warranty, 20 year performance warranty