



*MORE THAN
JUST A FACADE

MADE-TO-ORDER PHOTOVOLTAICS FOR
ARCHITECTURAL BUILDING INTEGRATION

solarnova*

* A FUSION OF AESTHETICS AND PERFORMANCE



“BIPV is the most visually appealing form of renewable energy. It creates living spaces – while at the same time protecting our climate“

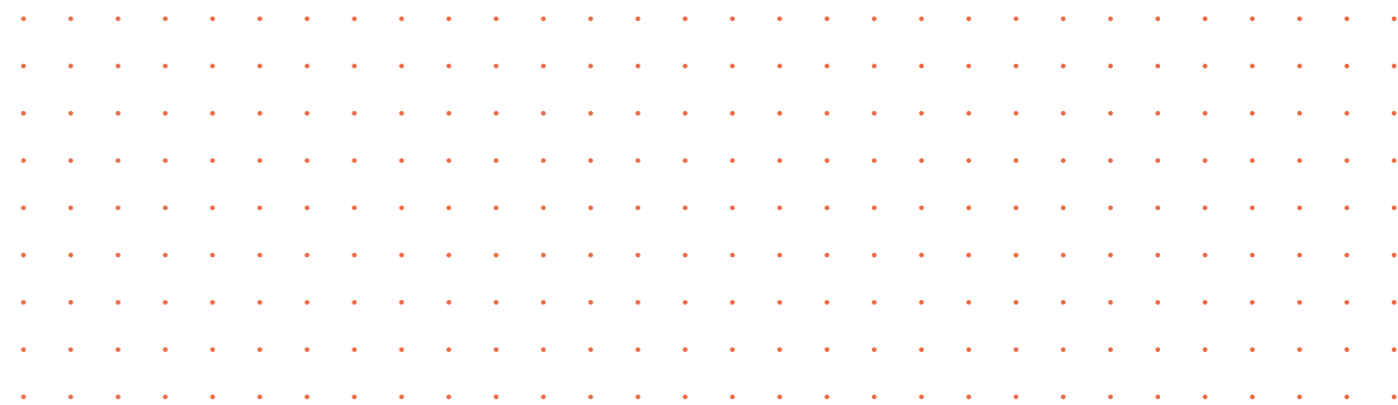
John von Frantzius, owner

SHAPING THE FUTURE - WE BRING YOUR IDEAS AND PROJECTS TO LIFE

Renewable energy has many faces – but photovoltaics from solarnova is unmistakable.

Experience, competency, and quality that can only be “Made in Germany” are what characterize our brand. From a provider of custom systems for niche markets, we have grown to become a strong global partner for all aspects of aesthetic energy production through the use of photovoltaics. Made-to-order is what we excel at – and architects, planners, developers and electricians all benefit from our expertise of 20 years.

Photovoltaics in architecture is not just a question of taste – it is a homage to our living environment.



SOLARNOVA - A YOUNG COMPANY WITH DECADES OF EXPERIENCE

solarnova's company founders come from AEG's solar technology division. In the Hamburg metropolitan region, the company set up one of the first ever PV production lines in the early eighties. Among other things, it manufactured specialized modules for applications in spaceflight and satellite technology. Experience and quality are what our company is built on: For over 20 years now, we have been providing aesthetic solarnova modules in custom-made solutions for facades, overhead glazing, and shade elements. Today, we customize building-integrated photovoltaic elements (BIPV) to satisfy the most extraordinary requirements and requests of our clients and project partners from all over the world.

BUILDING AESTHETICALLY - CHARGED WITH ENERGY

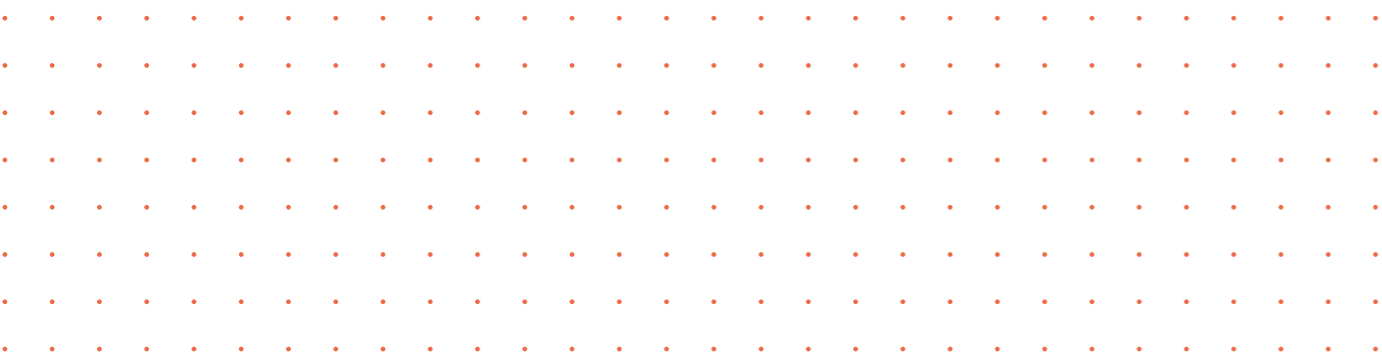
Our experience makes us a partner who is in demand around the world: For architectural projects that catch your eye, high-quality modules for classic installations, OEM partners, and the turnkey construction of entire production lines.

Our reputation is first class, and so are our reference projects: The EWE Arena in Oldenburg, Germany, the PUMA Plaza in Herzogenaurach, Germany, the Public Safety Building in Salt Lake City, USA, and the Active Townhouse (Aktiv-Stadhaus) in Frankfurt am Main, Germany – the first multi-story residential building in the whole of Europe that satisfies the Efficiency Plus standard.

BUSINESS SEGMENTS

<p>BIPV</p> <ul style="list-style-type: none"> * Made-to-order * Aesthetic * High-performance * Multi-functional * Sustainable 	<p>STANDARD PV</p> <ul style="list-style-type: none"> * High-performance, up to 290 Wp * Durable * Mono- and poly-crystalline cells 	<p>OEM</p> <ul style="list-style-type: none"> * A strong partner * Reliable manufacturing * Production in Germany 	<p>TURNKEY FAB</p> <p>Help and advice with</p> <ul style="list-style-type: none"> * Planning * Construction * Commissioning turnkey factories
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made in Germany



*BIPV – MORE THAN JUST A FACADE

ELEGANT CLIMATE PROTECTION IS MORE THAN JUST A FACADE

You sketch your ideas, and we implement them.



BIPV. UNMISTAKABLE

Building-integrated photovoltaics can be used to enhance just about any part of the building's exterior: Balcony parapets and railings, external facades and roof elements, conservatories, and carports. Upon request, our products can also be designed to be used as a privacy screen, or with weather- or noise-proofing features. We manufacture modules using both glass-glass composite and glass-film techniques, up to a size of 3,70 x 2,50 m and with a glass thickness of up to 2x 12 mm – with a level of quality that can only be "Made in Germany".

*Beddington Zero Energy Development (BedZED)
London, UK



*Efficiency Plus House
Riedberg district,
Frankfurt (Main),
Germany



*Pool roofing
León, Mexico



*Q-Cells
Thalheim district,
Bitterfeld-Wolfen,
Germany



Q-Cells photo: Colt International GmbH, Berlin
Efficiency Plus House photo credit: Constantin Meyer, Cologne, architect: HHS Planer + Architekten AG, Kassel



GLASS-FILM ELEMENTS

Our glass-film modules are made with a transparent, white, or black rear film. Thanks to their low weight, they are particularly suited for use in areas where the safety and reliability of composites is not necessary. Our standard modules come with 60 cells per unit, but we would be glad to provide different configurations for more or less transparency.



COLD FACADE

Our glass-glass modules are used in more critical areas such as facades, parapet elements or overhead glazing. They satisfy structural requirements for glass facades and can be combined with all common glass construction units, such as mullion/transom systems. It also helps to reach the LEED* certification.

*Leadership in Energy and Environmental Design



WARM FACADE

Glazed facades or the roof surfaces of heated spaces require PV elements with insulated glazing to be installed. In addition to energy generation, these modules also provide thermal and noise insulation, as well as protection from the weather. Furthermore, modules with triple glazing allow for compliance with the passive house standard.

*INTERPLAY OF LIGHT AND SHADOW

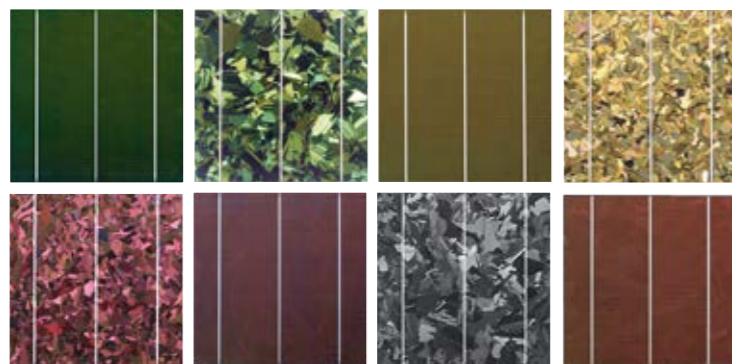
Custom-made photovoltaics not only generate energy – they also create interest and construct a unique atmosphere.

CREATING A UNIQUE ATMOSPHERE

“Solar painting” is what we call the interplay of light and shadow resulting from the cell density, i.e. the different spacing between the individual solar cells. This baptism chapel in Hägewiesen, Hanover, shows just how much architecture can touch the soul. Visitors who look towards the sky are greeted by an extraordinary sight: A roof made of photovoltaic glass elements has been integrated into the wooden structure of the ancillary church building. This technique, which is commonly known as overhead glazing, needs to satisfy stringent safety standards for BIPV. Then, looking down towards the natural stone floor of the chapel, we see the interplay of shapes and forms cast by the solar cells arranged in the form of the cross. This symbolism is the main contributing factor to the remarkable atmosphere in the chapel.

Our glass-glass modules are used around the world as stylistic elements for energy generation – at the Public Safety Building in Salt Lake City, USA, in the National Academy of Sciences in Washington, USA, at the DORM in Aarhus, Denmark, and at locations in Germany: Q-Cells, PUMA, the ADAC, and many other.

BLACK, RED, GREEN, OR GOLD?



Most of our European clients prefer black monocrystalline cells. On the international market, tastes vary greatly – one reason why our selection of cell colors is as wide as the possible applications of our products.



*Baptism chapel
Hanover, Germany



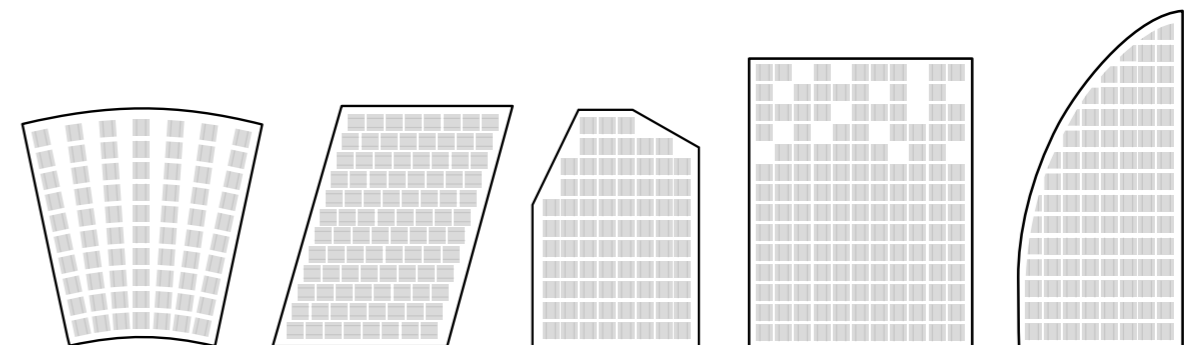
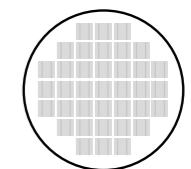
*National Academy of Sciences
Washington D.C., USA

LIMITLESS DESIGN

You sketch your plans – and we design just the right photovoltaic element for your needs. Naturally, you get to specify exactly what you want: cell density, transparency, colors and shapes will be adapted to your exact aesthetic and technical requirements. There are no limits to your creativity: The more unusual your request, the more important our experience becomes.

IN PERFECT FORM

We produce BIPV units in every conceivable shape and size. The layout of the individual cells in these units is also highly customizable, e.g. spaced closely or far apart. In order to achieve a look that is as sleek as possible, the glass can be given a coating on the back or printed on the front. solarnova also provides a wide range of colors and options in this respect.



* A COOL TURN OF EVENTS

MOBILE ENERGY WINNER: VISUALLY APPEALING CLIMATE PROTECTION

With BIPV, climate protection and aesthetics can go hand in hand. One gleaming example is the “small” EWE Arena in Oldenburg. This multi-purpose hall has a diameter of 70 meters and can house up to 4 000 visitors. Despite the glass facade, it always has the perfect interior climate: The mobile solar shade continuously tracks the sun in 7,5° steps and is outfitted with 72 vertical solarnova modules, each of which consists of 96 gray monocrystalline cells sandwiched between 8 mm of glass and an anthracite-colored rear film. These cells generate green power while at the same time reducing the amount of solar insolation – thereby significantly reducing the costs of air conditioning. This innovative design was awarded the first prize in the federal “Photovoltaics in Buildings” competition.



BIPV AS A CREATIVE CHALLENGE

New EU building guidelines require all public buildings to be realized as “nearly zero energy buildings” starting in 2019, and all new buildings in general will also need to fulfill this requirement from the year 2021. BIPV makes it possible to satisfy this requirement. In this respect, we offer the greatest degree of creative freedom. Today, solarnova modules on urban and communal buildings are already generating green power all over the world.



MAKING A VISIBLE AND TANGIBLE DIFFERENCE

TuTech Innovation GmbH, which promotes the transfer of technology and knowledge at the Hamburg University of Technology, combined the use of building-integrated and classic photovoltaics: Their solar system consists of 138 roof and 66 BIPV modules with a total output of 39 kWp. In addition to producing energy, the facade modules also provide shade for the offices located on the south-facing side of the building. With this design, TuTech no longer needed to retrofit external blinds.

“It was a wonderful feeling to see how this tangibly reduced power costs“

Thilo Jungnickel,
authorized representative,
TuTech Innovation GmbH

At the “Bella Donna House” in Bad Oldesloe, Schleswig-Holstein, BIPV was integrated as a warm facade. The 35 insulated glazing units generate around 1 500 kWh a year, which equals a quarter of the building’s own power consumption. With the proceeds from the feed-in of solar power, the building, which is run by “Bella Donna – Ein Haus von Frauen e.V.”, is able to pay for more than half of its power bill. But even without feed-in remuneration, solar power is also a worthy investment for public buildings – after all, it is produced exactly when it is needed.



* BIPV IN A PRIME DOWNTOWN LOCATION

MULTI-PURPOSE, MULTIPLE BENEFITS

It is very long, very narrow, and many considered it to be “practically unbuildable”. But now, one of the most innovative multi-story residential buildings in Europe which satisfies the Efficiency Plus standard stands on that site in Speicherstrasse in Frankfurt. The state-run housing society ABG realized the “Active Townhouse” based on a concept by the architect Manfred Hegger. Consisting of 74 residential units, it reportedly generates more energy with the use of photovoltaics than its inhabitants consume for electricity, hot water, heating, and transportation. In order to achieve this ambitious goal, 348 made-to-order glass-glass units were integrated into the building’s facade, in addition to a highly efficient rooftop system.

New EU building guidelines taking effect from the year 2021 will require all new buildings to be built as zero-energy structures. This will pose a great challenge for developers, architects, and planners. Using BIPV to generate energy would contribute greatly to satisfying these stringent requirements. Today, the Active Townhouse is a pioneering example of what is to come. solarnova recently received the European Intersolar AWARD for this BIPV project.

After all, building-integrated photovoltaics not only generate power – they make environmental consciousness and hence a sense of responsibility to our living environment visible. In other words: They make climate protection visually attractive.



*Active Townhouse
Frankfurt (Main), Germany

Active Townhouse photo credit: Forodesign Barbara Staubach, Frankfurt, architect: HHS Planer + Architekten AG, Kassel (also credited for cover photo)



*NEURONAL (Santa Fe Offices)
Mexico City, Mexico

BIPV PAYS

A BIPV installation has a decisive advantage over all other building materials and elements on and in the facade: It is able to generate power, and hence profits as well.

At “NEURONAL” in Mexico City, the BIPV facade is able to generate up to 44 000 kWh a year. At the same time, it also results in energy savings: By providing shade from the sun, it reduces air-conditioning costs by 25 to 30 %. It also reduces the amount of noise from the outside and protects the building from the wind and the weather. Furthermore, a curtain wall BIPV facade is also easier to construct, maintain, and service: There is no easier renovation option which is able to generate a comparable amount of savings.

The real estate of the future will be constructed as visually attractive small-scale power stations which drive the energy transition with their self-sufficiency. BIPV has great potential, and the architectural journey into the future has already begun. Are you ready for it? We would be glad to accompany you.

* **AESTHETICS**

- * Made-to-order
- * Futuristic
- * Lights up the inside
- * Green image on the outside

* **EFFICIENCY**

- * Free input, maximum output
- * Generate and save energy
- * Profitable

* **BENEFITS**

- * Shade from the sun
- * Protection from wind and weather
- * Noise protection
- * Climate protection



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