



## LAMILUX CI ENERGY

CONSUMPTION-OPTIMIZED PHOTOVOLTAIC SOLUTIONS



COVER IMAGE: LAMILUX PHOTOVOLTAIC SYSTEM ON THE RIDGE OF A CI SYSTEM CONTINUOUS ROOFLIGHT

PRODUCE GREEN ENERGY ON YOUR OWN.  
REDUCE YOUR ELECTRICITY BILLS.

## CONSUMPTION-OPTIMIZED PHOTOVOLTAIC SOLUTIONS

Taking advantage of clean solar energy for your own internal consumption is more attractive than ever before! It effectively reduces your electricity expenses and makes you more independent of the energy market. Take your first step towards your own energy supply – and give your company planning security!

The benefits to you:

- Effective energy cost reduction
- Long-term planning security thanks to a stable energy price
- State-guaranteed remuneration for surplus power
- Take advantage of your existing roof space to produce your own power
- Enhance your image through sustainable energy management



### The LAMILUX CI Philosophy

Customer value is the reason for our existence and is the focus of our activities. This requires harmony, identity and a balance between customer value and company strategy.

These guiding ideas for our company's actions and our day-to-day relationship with our customers are described in LAMILUX's company philosophy:

#### Customized Intelligence - Serving the customer is our first priority:

This requires outstanding performance and leadership in all areas relevant to customers, particularly in the role of:

- Leader in quality – for the highest customer benefit
- Leader in innovation – for always being ahead in technology
- Leader in service – for fast, straightforward, reliable and friendly communication
- Leader in expertise – for the best technical and commercial advice on the market
- Leader in problem solving – for custom made solutions



CONSULTATION



DEVELOPMENT



MONITORING



PROJECT PLANNING



IMPLEMENTATION



MAINTENANCE / REPOWERING



TAKE THE ENERGY REVOLUTION INTO YOUR OWN HANDS.  
PRODUCE AND USE YOUR OWN ENERGY.

## HOW LAMILUX HELPS YOU

### PLANNING:

- A dependable analysis of your roof's solar usability
- Detailed pre-project planning and calculation of future energy yields
- A price listing of the initial costs, operating expenses and amortisation
- Tailor-made design and dimensioning of your PV system

### CONCLUSION:

- You save money
- You make yourself self-sufficient and independent
- You can sell your surplus energy to your regional energy suppliers
- You can refinance your PV system through your savings on energy expenses and by selling energy

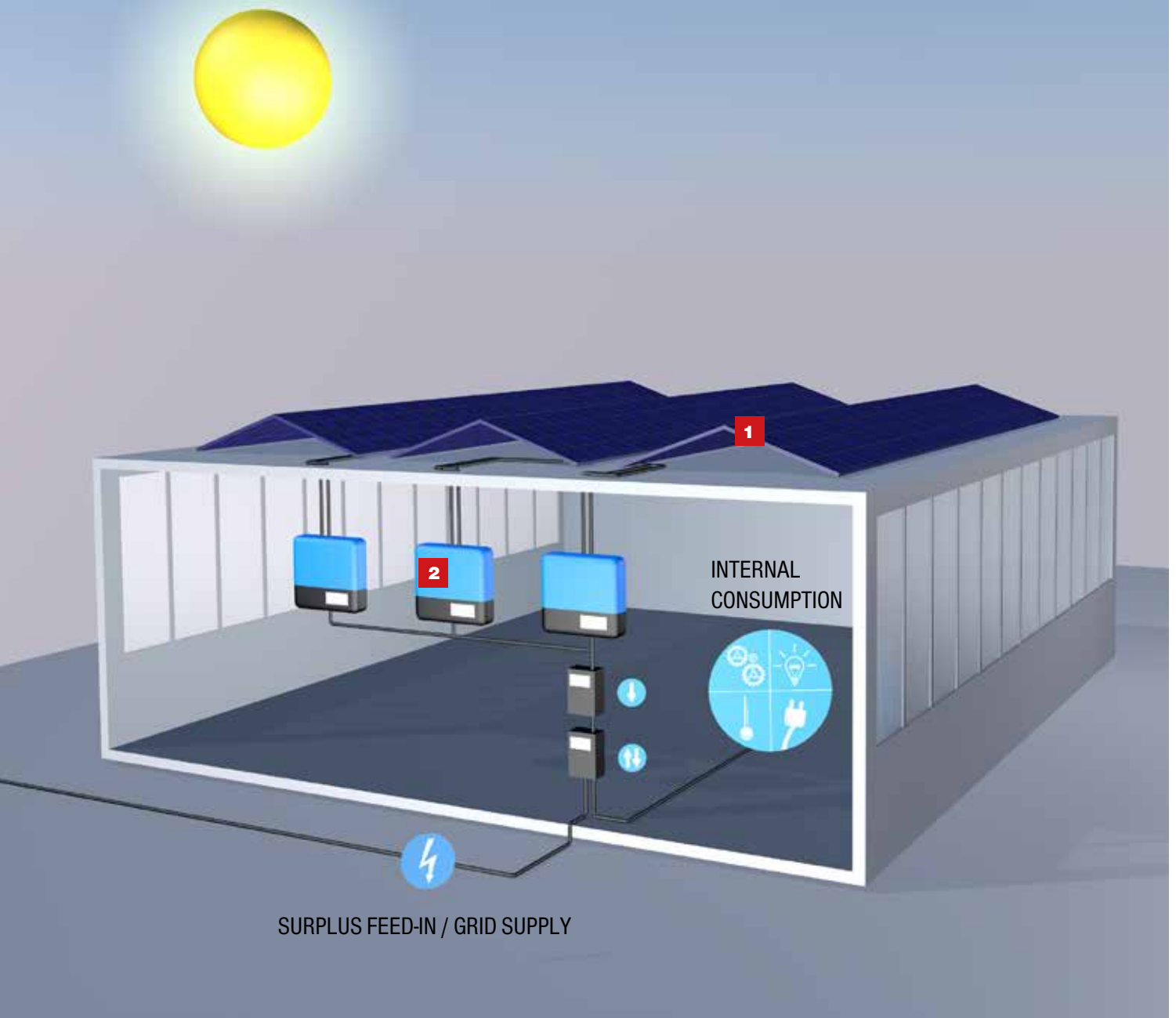
### EXECUTION:

- Delivery and assembly of all components
- Installation of the system in consideration and clarification of all interfaces to other facilities
- Acceptance and commissioning of the PV system

### SUPPORT:

- Maintenance for the entire system
- Permanent yield monitoring and analysis

- You have consistently inexpensive solar power, even if energy prices rise
- You won't need any equity capital and can take advantage of attractive special loans



## THE COMPONENTS OF A PV SYSTEM

### The photovoltaic modules (1)

The PV modules lay the foundation for environmentally friendly production of energy from sunlight. They come in many different sizes and can be mounted on all flat or steep roofs at an ideal inclination and orientation. They are very durable and require little maintenance. In particular, the new generation of modules provides practically consistent power yields over many years.

### The inverter (2)

The direct current coming from the PV modules has to be converted into alternating current to make it usable. This is the task of the inverter. Choosing the right one to fit the overall design of the system has a great effect on power yields. That makes this component a major part of a photovoltaic system which is ideally configured for the local conditions.





## CONSULTATION

Even the first time you contact us, you will already fully benefit from our expertise.

We focus on your requirements for

- The amount of power your company uses
- Your project-specific, local conditions
- Analysis of technical and business parameters
- Assessment of rooftops' usability for PV systems
- Creation of an individual, tailored solution
- Comprehensive information on other aspects such as lightning and surge protection and feeding energy into the grid

## PROJECT PLANNING

The most important factor in planning your photovoltaic system is your company's energy needs.

We develop a system concept that's thought out for your technological and business needs. This will enable you to permanently cover a large portion of your energy requirements through the regenerative production of your own solar power.

Our in-house specialists handle the entire project management for building your own PV system. This also includes the complete construction process – from registering the system to putting it into commission together with your energy supplier.

We provide you with a complete system concept which includes all the documents you need for your decision-making process:

- A detailed offer including all of the costs for "turnkey" installation
- Economic efficiency calculation
- Roof utilisation plan (CAD)
- System diagram (CAD)
- Data sheets



## IMPLEMENTATION

**Our experienced installation crew will quickly and dependably take care of the entire process of installing your PV system.**

You will benefit from our 60 years of experience in flat roofs.

- We take advantage of synergies with trade-spanning tasks over the course of the project
- We arrange interfaces between trades to ensure professional execution on schedule
- We deliver, assemble and install your entire PV system
- We handle the connection and registration with the energy supplier in charge
- We put your system into commission
- We compile system documentation in accordance with DIN EN 62446

## MONITORING

**LAMILUX monitors your photovoltaic system and provides you with maximum security over its entire service life.**

- Fully automated operational management and remote monitoring
- 24/7 remote system monitoring
- Continuous monitoring of the communication connection and system status
- Online provision of yield data
- Protocol data analysis
- Prevention of undetected system failures
- Yield monitoring
- Safety monitoring
- Personal customer login



## SERVICE/MAINTENANCE

Are your yields not matching your system? Is your system malfunctioning? As a specialised photovoltaics company, we focus on professional system installation and use our expertise to offer complete all-round service with maintenance and system inspections.

### Service:

- Initial inspection with defect report
- Direct trouble shooting and complaint handling

### Maintenance:

- Annual maintenance and inspection of all system components and installation system
- Maintenance every four years with inspections in accordance with DIN 62446 and VDE 0126-23

## REPOWERING

Would you like to optimise your existing plant by repowering it and bring your PV system up to a whole new level of performance?

Even just a few years ago, inverters had a much poorer performance ratio, so they do not make optimum use of the solar potential which is now possible with current technology. After a few years, some modules no longer yield the original performance, which was necessary to ensure economical operation of the system.

We will replace your old components and increase your power yield.





**ENERGY PRODUCTION  
ON FLAT ROOFS**

Palettenbau Baumann





## FRAME-MOUNTED SYSTEMS IN EAST-WEST AND SOUTHERN ORIENTATION

Turn your flat roofs into highly efficient energy useful surfaces for generating energy with tailor-made photovoltaic systems (PV). There are several possibilities for constructing the system: The PV modules can be mounted on a roof either flat or on stands. PV solutions can also be integrated into skylights and the roof structure.

### Module orientation to the south

A stand-mounted PV system facing south gives you the highest possible yields in relation to the PV system's performance. Rooftops which already have southern exposure are best suited for this purpose. The modules are mounted on stands at an angle of 10° to 30°.

### Module orientation to the east and west

The arrangement of opposing series of modules to the east and west allows you to make ideal use of the roof area available and ensures maximum system performance distributed across the day. At a 10° inclination, up to 90 percent of the roof area can be used.

### Maximum yields with high durability

- Stands allow installation without having to penetrate the roof
- Maximum system performance without superimposed loads
- Systems without additional ballast loads
- Individual system structural analysis for stability at high wind speeds



## SAW-TOOTH ROOF SOLUTIONS

LAMILUX offers you all solar advantages from a single source. And if you install your PV modules on a daylight system, you benefit twice as much – through high-yield energy production and cost-saving natural light.

### Advantages

- Inspected and extremely durable aluminium structures based on post-and-rail structure of the LAMILUX CI System Glass Architecture PR60
- A supporting structure for daylight system and PV system (cost reduction)
- A contact person for the cross-trade services for the daylight system, PV system and control units
- No visible wiring or system components
- No warranty interfaces

## INTEGRATED SYSTEMS

Energy production and solar protections in a highly aesthetically appealing form? We make this happen with photovoltaic modules integrated into the glass. This solution has become increasingly desirable in office buildings to put their classy glass architecture to use with efficient energy production.

- Individual, building-specific adaptation for control systems
- Costs specified in a detailed offer depicting the system
- Development of a control solution focused on cost effectiveness and sustainability

# MONITORING OF PV SYSTEMS

Data loggers are the modern communication centre for the photovoltaic system. They allow web-based monitoring over a secure internet portal. This means that the performance of the entire photovoltaic system and the performance of individual modules can be accessed at all times. Any malfunctions which may occur can be located and rectified this way.



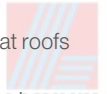
As a contractual partner for maintaining the functioning and security of SHEV, daylight and PV systems of flat roofs, LAMILUX handles the professional maintenance and monitoring of your photovoltaic systems...

... with competence:

- A great number of completed megawatt-scale PV projects
- A tight sales and service network
- Highly qualified service technicians

... with experience:

- Decades of experience with all structural requirements on flat roofs
- Maintenance for SHEV systems for over 50 years
- All maintenance for your SHEV, PV and building control systems from a single source



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## AMG-PESCH GMBH, COLOGNE

### Project:

AMG-PESCH GmbH built a new production hall and had an individual photovoltaic system installed on its flat roof. LAMILUX handled all of the planning, project engineering and installation work for the system.

### Systems:

- PV system with 240.1 kWp of output
- 980 modules with a rated output of 245 Wp each
- Complete system including grid connection

## PURIS BAD, BRILON

### Project:

The high-end bathroom furniture manufacturer Puris uses renewable energy and had a photovoltaic system installed on the flat roof of its newly built production hall. LAMILUX assumed the tasks of planning, project engineering and installation for the system.

### Systems:

- PV system with 1004.5 kWp of output
- 4100 modules with a rated output of 245 Wp each
- Complete system including grid connection
- Replacement of the existing transformer station with a 1000 kVA station



## ELEMENTARY SCHOOL/ DAY-CARE CENTER, COLOGNE

### Project:

The gravel roof of a new elementary school with a gymnasium and day-care centre in Cologne is to be used to produce solar energy. LAMILUX built a custom photovoltaic system and handled the planning, project engineering and installation of the system.

### Systems:

- PV system with 38.22 kWp of output
- 156 polycrystalline modules with an output of 245 Wp each
- Emergency shutdown system for PV and solar display for yield visualisation
- Innovative installation system for a PV system which reduces the added load on the roof

## ERBE GMBH, TÜBINGEN

### Project:

ERBE GmbH in Tübingen focused on a sustainable, energy efficient building concept when it renovated its production halls. In addition to all of the services concerning the PV system, LAMILUX provided the daylight systems and SHEV control technology.

### Systems:

- 89 kWp PV systems integrated into the daylight systems
- 712 PV modules
- 10 large sawtooth roof structures
- 77 flap systems for SHEV and ventilation function
- Complete system including grid connection and registration with grid operator





## ULM TRADE SCHOOL

### Project:

A new trade school was built in Ulm. LAMILUX built an individually designed photovoltaic system on the flat roof and handled the planning, project engineering and installation work.

### Systems:

- PV system with 80.75 kWp of output
- 323 modules with a rated output of 250 Wp each
- Complete system including grid connection

## GROSSHADERN O.R. CENTRE

### Project:

The University Hospital in Munich-Grosshadern uses green energy and had a PV system built on the roof of its O.R. centre. Here too, LAMILUX handled all of the planning, project engineering and installation work for the system.

### Systems:

- PV system with 51.84 kWp of output
- 216 modules with a rated output of 240 Wp each
- Complete system including grid connection





## RTWH, AACHEN

### Project:

RWTH Aachen is integrating renewable energy production into its building concepts. To accomplish this, they commissioned LAMILUX to plan, engineer and install a photovoltaic system on the flat roof of their sports hall.

### Systems:

- PV system with 93.60 kWp of output
- 390 polycrystalline modules with an output of 240 Wp each
- Complete system including grid connection
- Non-penetrative installation system for standing seam roofs

## LAMILUX PLANT 2, HALL 11

### Project:

LAMILUX has built a new production facility for its fibre-reinforced composites. A large number of LAMILUX daylight systems with integrated PV modules were installed on the flat roof.

### Systems:

- PV system with 147.5 kWp of output
- 624 modules with a rated output of 250 Wp each
- Complete system including grid connection



Scan this to discover more about  
LAMILUX daylight systems!



ROOFLIGHT DOME F100



ROOFLIGHT DOME F100 ROUND VERSION  
GLASS ELEMENT F100 ROUND VERSION



CONTINUOUS ROOFLIGHT B



GLASS ARCHITECTURE PR60



SMOKE AND HEAT EXHAUST  
VENTILATION SYSTEMS



BUILDING CONTROL SYSTEMS



GLASS ELEMENT F



CONTINUOUS ROOFLIGHT W|R



CONTINUOUS ROOFLIGHT S



RENOVATION



SMOKE LIFT TWIN



FIBRE-REINFORCED  
COMPOSITES

The technical data printed in this brochure was accurate when this brochure went to press and is subject to change without notice. Our technical specifications are based on calculations and supplier specifications, or have been determined by independent testing authorities within the scope of applicable standards.

Thermal transmission coefficients for our composite glazing were calculated using the finite element method with reference values in accordance with DIN EN 673 for insulated glass. Based on empirical values and specific characteristics of the plastics, a temperature vector of 15 K was defined as the vector between the outer surfaces of the material. Functional values refer to test specimens and the dimensions used in testing only. We cannot provide any further guarantees of technical values. This particularly applies to changes in installation locations, or if dimensions are re-measured on site.



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