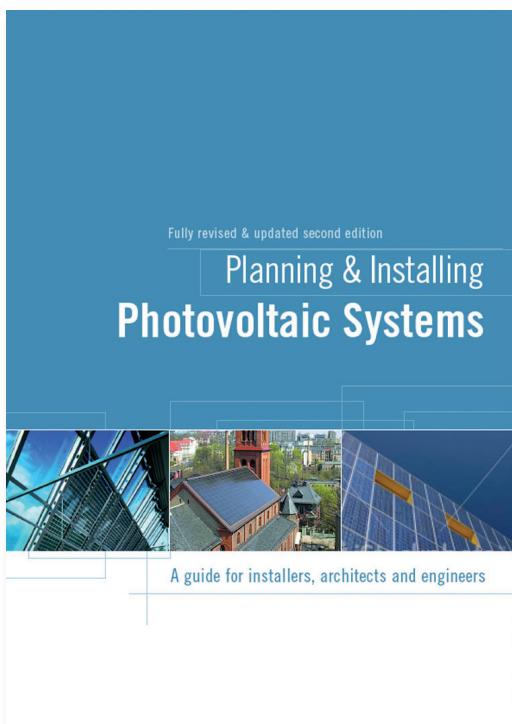


# Photovoltaic Systems

A guide for installers, architects and engineers



## Second edition based on the third German edition

Growth in photovoltaic (PV) manufacturing worldwide continues its upward trajectory. This bestselling guide has become the essential tool for installers, engineers and architects, detailing every subject necessary for successful project implementation, from the technical design to the legal and marketing issues of PV installation. Beginning with resource assessment and an outline of the core components, this guide comprehensively covers system design, economic analysis, installation, operation and maintenance of PV systems.

The second edition has been fully updated to reflect the state of the art in technology and concepts, including: new chapters on marketing and the history of PV; new information on the photovoltaic market; new material on lightning protection; a new section on building integrated systems; and new graphics, data and photos.

## Content

### Chapter 1: Solar Thermal Basics

#### Chapter 2: Components of ST modules

- Collectors
- Heat Stores
- Solar circuit
- Controller

### Chapter 1: Photovoltaic Basics

#### Chapter 2: Components of PV modules

- PV modules
- PV array junction boxes, string diodes and fuses grid-connected inverters
- Cabling, wiring and connection systems
- DC load switch (DC main switch)
- AC switch disconnecter

#### Chapter 3: Site surveys and shading analysis

- On-site visit and site survey
- Consulting with the customer
- Shadow types
- Shading analysis
- Shade analysis tool using software
- Shading, PV-array configuration and system concept
- Shading with free-standing/rack-mounted PV arrays
- Checklist for building survey

#### Chapter 4: Planning and sizing grid-connected PV systems

- System size and module choice
- System concepts
- Inverter installation site
- Selecting and sizing cables for grid-tied PV systems
- Selection and sizing of the PV array /junction box and the DC main disconnect/isolator switch
- Lightning protection, grounding and surge protection
- Yield forecast

#### Chapter 5: System sizing, design and simulation software

- Use of sizing, design and simulation programs
- Checking the simulation results
- Market overview and classification
- Programme description

#### Chapter 6: Mounting systems and building integration

- Roof basics
- Sloping, flat and glass roofs
- Façade basics
- Photovoltaic façades
- Solar protection devices
- Mounting systems for free-standing installations

#### Chapter 7: Installing, commissioning and operating grid-connected PV systems

- General installation notes
- Example installation of a grid-connected PV system
- Guarantee
- Breakdowns, typical faults and maintenance for PV systems
- Troubleshooting
- Monitoring operating data and presentation
- Long-term experience quality

#### Chapter 8: Stand-alone PV systems

- Modules and batteries in stand-alone PV systems
- Charge controllers
- Stand-alone inverters
- Planning and designing stand-alone systems
- Measuring electricity consumption
- Sizing the PV array
- Sizing of the cable cross sections
- Battery sizing
- Use of an inverter
- PV in decentral electricity grids/mini-grids

#### Chapter 9: Economics and environmental issues

- Cost and technological trends
- Environmental impact

#### Chapter 10: Marketing and promotion



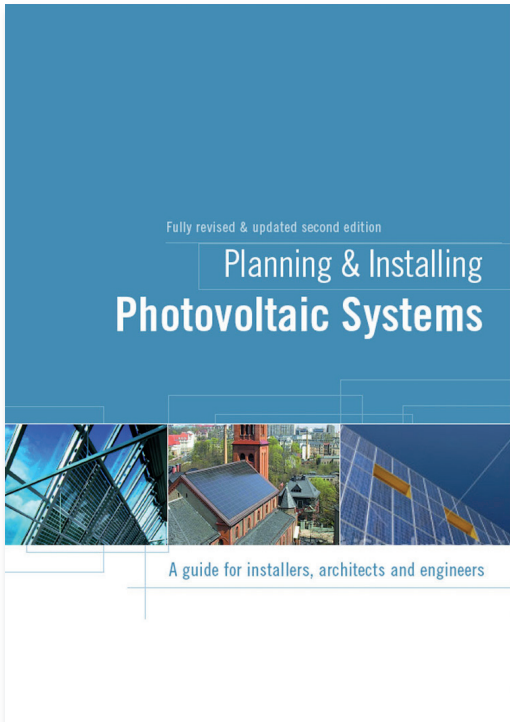


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### Planning & Installing

## Photovoltaic Systems

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