

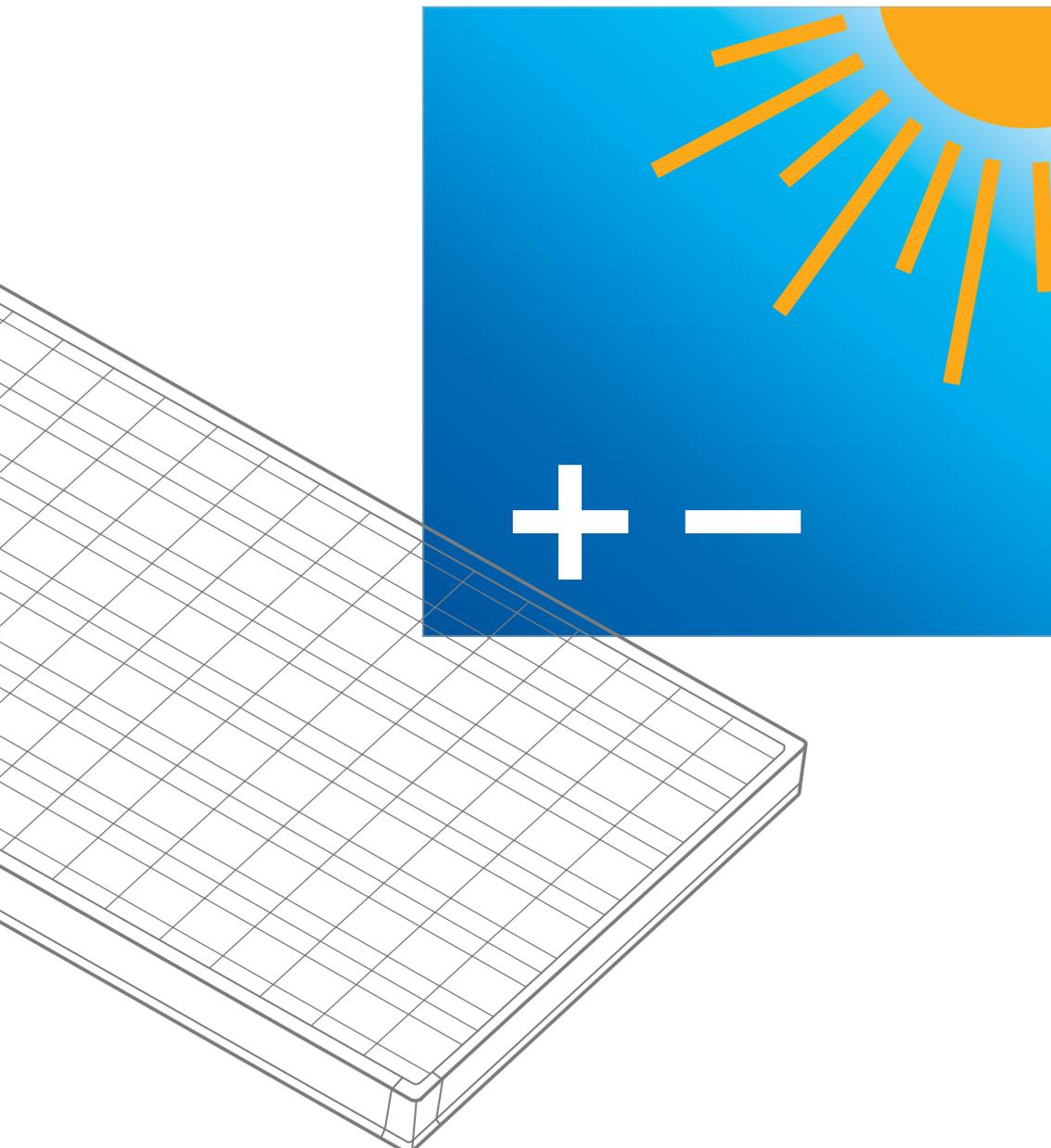
VITOVOLT

Photovoltaic systems

Vitovolt 100

Vitovolt 200

VIESSMANN





Vitovolt 200
Photovoltaic system

Using the sun to generate power

Solar energy source

Annually, the surface area of the Federal Republic of Germany is struck by solar energy that is the equivalent of approx. 80 times its total energy consumption. Consequently, our sun not only provides energy in abundance – it is also an environmentally responsible source of energy. Last not least, it is free.

Generating power and heat with Viessmann solar heating and power systems

Although Vitovolt, just like Vitosol solar heating systems, utilises solar irradiation to "harvest" solar energy, their technology and consequently their design and operation are quite different.

Whilst in solar heating systems, energy captured by the collectors is transferred hydraulically via a heat transfer medium to be used either for DHW heating or to backup a central heating system, photovoltaic panels create electrical energy directly inside the solar cell.

Installing a Vitovolt photovoltaic system on the roof turns every homeowner into a power generator: Fit photovoltaic panels onto the roof, plug leads together, connect an inverter, done!

Solar cell function

Vitovolt function explained

Basically, a mains-connected solar power system operates in three stages:

1. Harvesting energy

Electrons are released as soon as light strikes the photovoltaic panels. Positive or negative charge carriers collect at the electrical contacts, resulting in a DC current between the front and back of each cell.

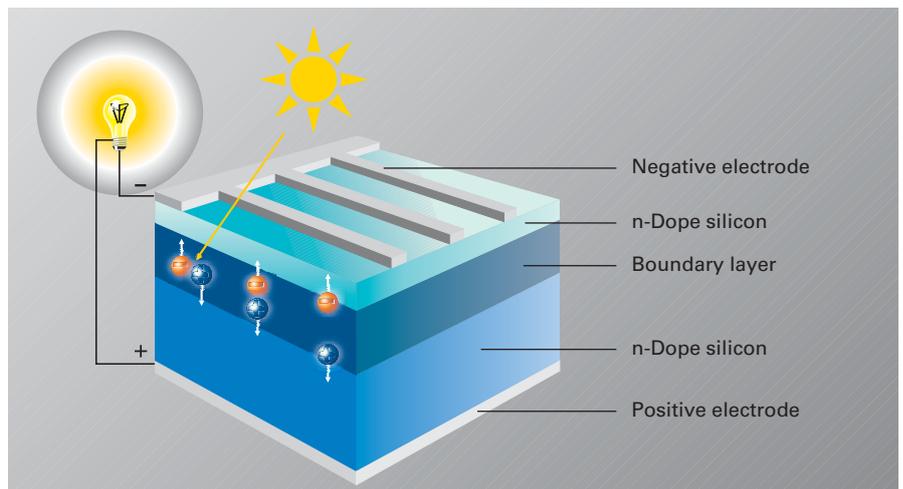


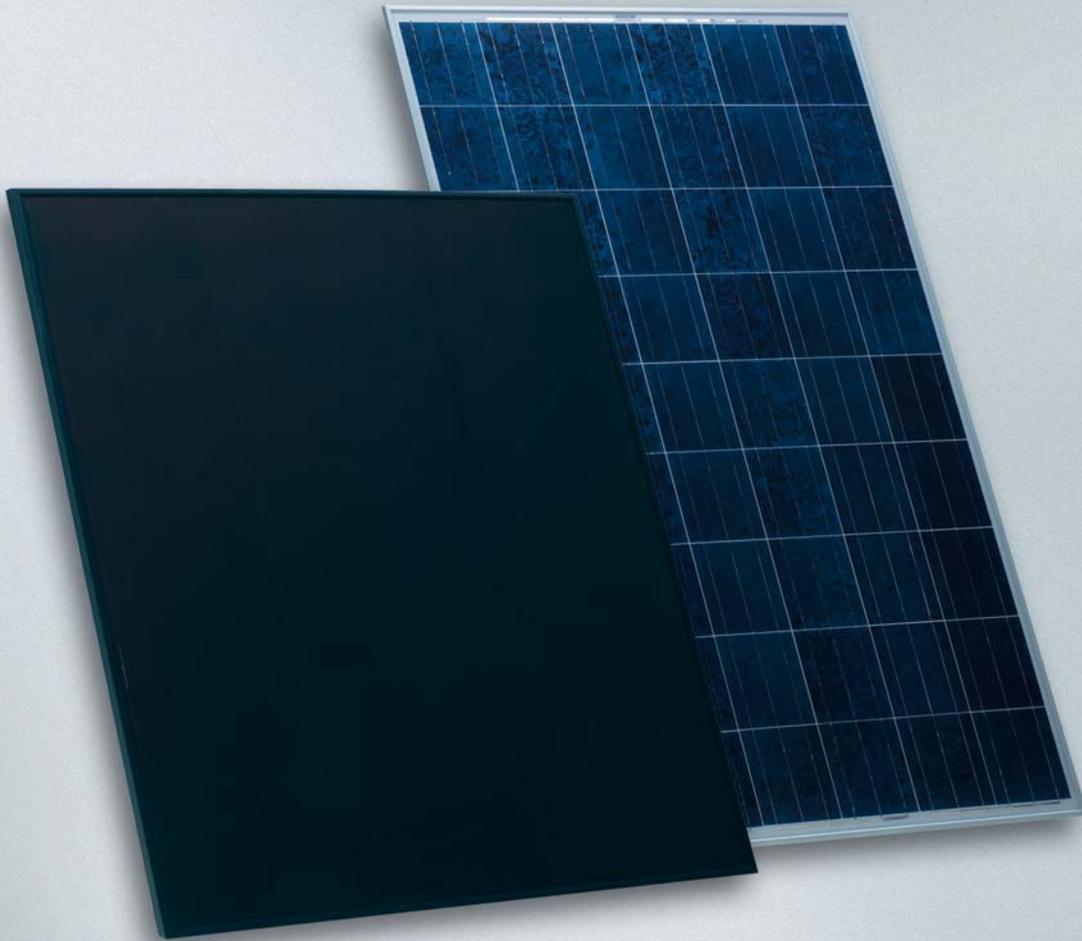
2. Power conversion

DC power generated by the solar generator is converted by the inverter (also referred to as mains feed-in device) into AC power, suitable for the power network (230 V AC at 50 Hz). Proven safety standards and fully developed processors, as well as cutting edge power electronics, ensure effective conversion of solar power.

3. Energy utilisation

Contrary to stand-alone systems where the solar power must be stored in rechargeable batteries, systems linked to the mains feed all harvested power directly into the public grid. A separate meter is installed which monitors the power fed into the mains system. The generated energy is reimbursed by the electricity supply company in accordance with the Renewable Energy Act (EEG) [Germany].





Vitovolt 100 and
Vitovolt 200
Photovoltaic systems

Power from your roof with Vitovolt 100 and 200

Vitovolt 100 Advanced thin-layer technology

Vitovolt 100 photovoltaic panels are based on amorphous silicon. Amorphous silicon is applied to a glass substrate in a special vapour disposition process. This results in the conventional layers being thinner by a factor of 100 compared to crystalline silicon, representing a substantial material saving.

The high absorption ability enables the Vitovolt 100 to achieve high yields, particularly when light is poor and/or there is partial shading. This makes the photovoltaic panel very interesting for flat roofs or other installation conditions where the orientation is less than ideal.

The integral series connection and the frames of the photovoltaic panels ensure an easy and quick installation.

Vitovolt 200 Single-glazed panel with an attractive price/performance ratio

Vitovolt 200 photovoltaic panels are available with monocrystalline and polycrystalline silicon cells.

The photovoltaic panels are designed as a glass laminate sandwich. The individual solar cells are embedded between two plastic films. The back cover is composed of a foil. Panes and foils are laminated together. This protects the cells against outside weather conditions.

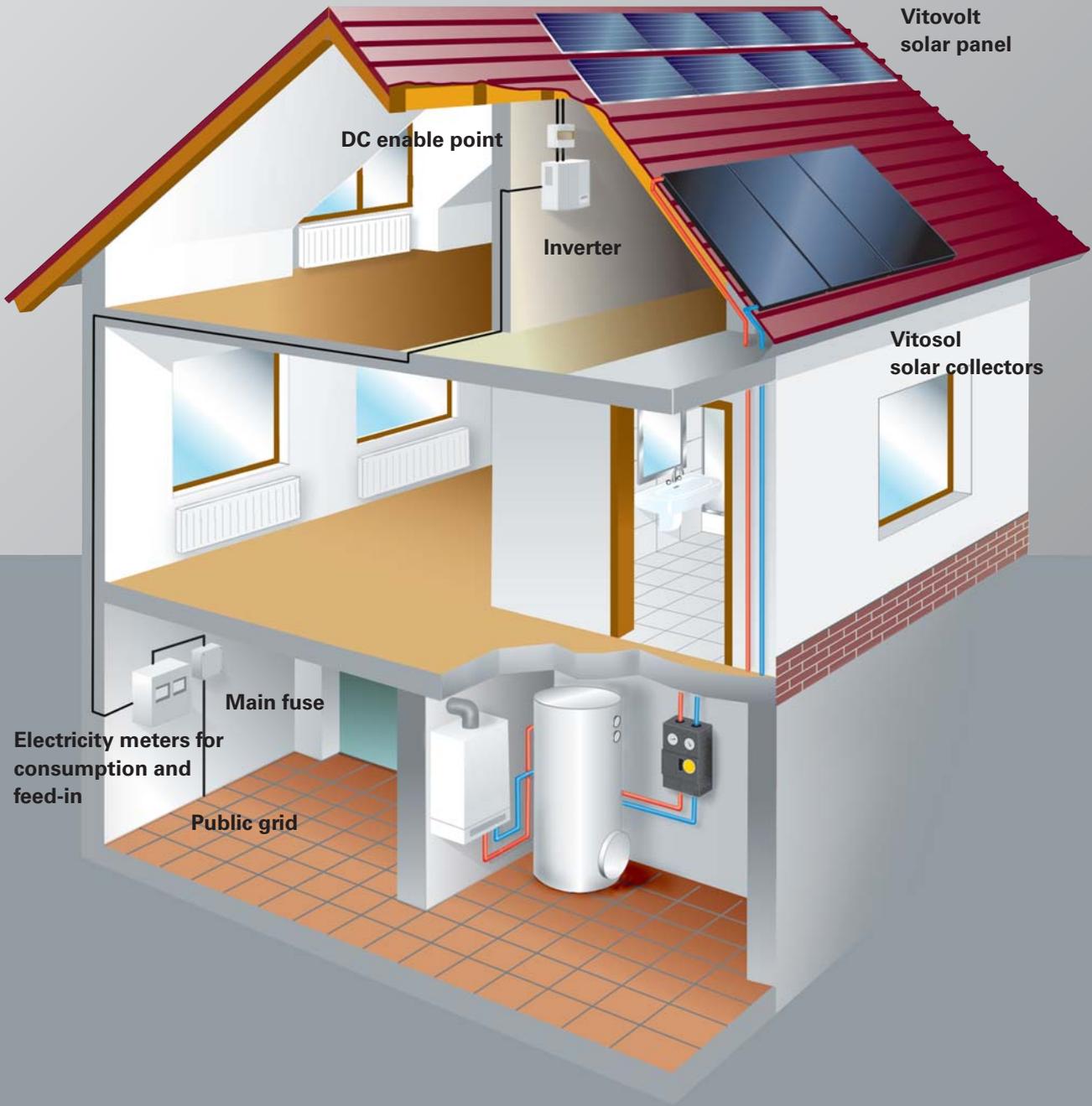
The fully wired panel is particularly easy to install on the roof thanks to its low weight and the standard Viessmann assembly kits.



Vitovolt inverter

Benefits of the Vitovolt photovoltaic panels at a glance:

- Assured performance for up to 25 years through the high quality standard applied to the selection of silicon cells and technologies
- All necessary components, such as interconnecting cables and the inverter of the photovoltaic system, are perfectly matched up
- Good inherent panel stability and easy system installation of the panels through a robust aluminium frame
- Quick installation through:
 - cables that easily plug together,
 - assembly sets for vertical and horizontal installation on roof tops
- Integral bypass diodes ensure high yields, even with partially shaded panels (avoiding hot spots)
- Low ferrous cover glass with high transmission values for optimum insolation results
- All panels are subject to constant quality control and are certified in accordance with IEC 61215 or 61646 and 61730 EEC 89/392, safety category II
- Fully wired, highly efficient inverter with integral information display – data capture and remote display as options



Viessmann solar heating and power systems

Energy from the sun

Feed-in remuneration [in Germany]

The remuneration for generated solar power is regulated by the EEG [Renewable Energy Act [Germany]]. This obliges the grid operator to pay remuneration rates that are guaranteed for 20 years, plus the remainder of the year of commissioning at the level set by law.

Power for your own consumption continues to be drawn from your local power supply company – at the current tariff. The difference between the feed-in remuneration for the environmentally friendly photovoltaic power and the tariff for the power you consume, plus public loans programs help finance the installation of photovoltaic systems. In addition, a number of regional grants/subsidies are available. For current information, see the subsidies database at www.viessmann.com.

Finance offered by UmweltBank AG

Viessmann, in co-operation with the UmweltBank AG, offers a simple and convenient solution for financing photovoltaic systems. For further details regarding current conditions, see www.viessmann.com.

Installation and system output	Year of commissioning 2008	Year of commissioning 2009*
Level of reimbursement per kWh in cents		
■ Roof up to 30 kWp	46.75	42.48
■ Roof above 30 kWp	44.48	40.36
■ Roof above 100 kWp	43.99	39.90
■ Roof above 1 MWp	—	34.48
■ Walls, etc. up to 30 kWp	51.75	47.48
■ Walls, etc. above 30 kWp	49.48	45.36
■ Walls, etc. above 100 kWp	48.99	44.90
■ At ground level (all sizes or open installations)	35.49	32.00

Period of remuneration: 20 years, plus the remainder of the year of commissioning
* Draft consultation regarding the EEG

Feed-in remuneration acc. to EEG

Easy installation

Vitovolt photovoltaic panels are as easy to install on your roof as Viessmann solar heating collectors, thanks to the assembly sets from Viessmann for vertical and horizontal rooftop installation. The fully wired connecting and interconnecting cables make the photovoltaic panels very quick to install.

The Vitovolt packs comprise all matching components required for a simple and quick installation of the photovoltaic panels.



Short installation times assured by a standard assembly system

Sizing photovoltaic systems

You never need to match the solar power generated to your individual power requirements. You can size the photovoltaic system entirely in accordance with your own preferences. In most cases, one of the essential criteria for sizing is either the available roof area or the budget.

Subject to location, orientation and inclination, a photovoltaic system with a rating of 5 kW_p generates approx. 4 000 to 5 000 kWh power p.a. This is equivalent to approx. 100% of the power requirement of an average 4-person household or an environmental benefit through reduced CO₂ emissions of approx. 2 200 kg/p.a. German power stations emit on average approx. 0.59 kg CO₂ greenhouse gas per generated kilowatt hour electrical power, compared to only 40 g/kWh generated by photovoltaic systems.



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For three generations, the Viessmann family business has been committed to generating heat conveniently, economically, with environmental responsibility and in accordance with the prevailing demand. With a large number of outstanding product developments and problem-solving solutions, Viessmann has created milestones which have frequently made them the pacemaker and trendsetter for their entire industry.

With the current comprehensive range, Viessmann offers its customers a series of multi-stage products with output from 1.5 kW to 20 000 kW: Freestanding and wall mounted boilers for oil and gas, either with conventional or condensing technology, plus systems using renewable energy, such as heat pumps, solar heating systems and boilers for sustainable fuel supplies. The product range further includes control technology and data communication, as well as all the entire system periphery, down to radiators and underfloor heating systems.

Viessmann's orientation is decidedly international – it maintains 12 factories in Germany, Austria, France, Canada, Poland and China, sales organisations in Germany and 35 other countries, plus 120 sales offices around the world.

Responsibility for the environment and society at large, fairness in dealing with business partners and employees, as well as striving for perfection and the highest efficiency in all business processes are core values for Viessmann. This applies to every individual employee and therefore to the whole company. With its multitude of products and associated services, Viessmann offers its customers the particular benefit and added value of a strong brand.



Energy sources:
 Oil, gas, solar, wood
 and natural heat



Output range:
 From 1.5 to 20 000 kW



Range categories:
 100: Plus
 200: Comfort
 300: Excellence



System solutions:
 Perfectly matching
 products

The Viessmann Group