



Naps Solar Roof systems offer a reliable and easy way to produce energy at your own home. Above: a 1.5 kWp, 3 kWp and 24 kWp systems on tile roofs.

Naps at Your service

Although the NSR system packages are as standardised as possible, the roof type has to be known in order to specify the roof attachments correctly, and there are some minor variations in the electrical equipment needed to conform to the regulations in different countries. Your local Naps contact will be able to finalise these details and arrange for installation by one of our specialist partners.

Naps Solar Roof (NSR) Systems

Naps Solar Roof (NSR) systems for houses are complete standardised systems in which the array and a single inverter are well-matched in characteristics. They are modular in that larger systems can be built up by using two or more standard systems.

NSR systems are cleaner technology than most silicon-based photovoltaics, since Naps solar modules have lower-than-normal carbon dioxide emissions associated with their manufacture.

They are designed for simple installation on most types of roof. Typical installation time is less than one day for the smaller systems, and no drilling of roof tiles is required.

These products, a result of Naps extensive expertise in solar electricity, are for the discerning customer who wants to take advantage of clean solar electricity in a simple package.

Installing a rooftop solar power generator can provide a household with a significant fraction of its annual electricity needs. In some countries any excess solar electricity can be sold to the electricity network at an attractive price, so users can obtain a financial pay pack in addition to saving on electricity purchases. In some other countries, a grant can be obtained for part of the cost of the system and its installation.

NSR systems are cleaner

The Naps Solar Roof generates clean electricity whenever there is daylight and feeds it into the home electricity supply.

Photovoltaics is unique in that it can be mounted on buildings to produce electricity at the point of demand without any adverse environmental effects (no noise, no moving parts, no exhaust gases and no dangerous by-products).

Our solar cells are made using either very energy-efficient or low carbon dioxide emission processes. This means that the time for Naps Solar Roof systems to displace as much carbon dioxide emission as went into their total manufacture is often considerably less than that for other silicon-based photovoltaic systems.

System components

The NSR system comprises the photovoltaic modules, Slide-In mounting structure, hooks or clamps for roof fixing, cables, dc connection box with lightning protection and circuit breaker(s) and an inverter to convert the dc solar electricity into ac electricity, which is fed into the house's standard electrical supply. The inverter can transmit data to a PC or data logger if the owner wants to monitor the performance of the solar roof.

Modular construction

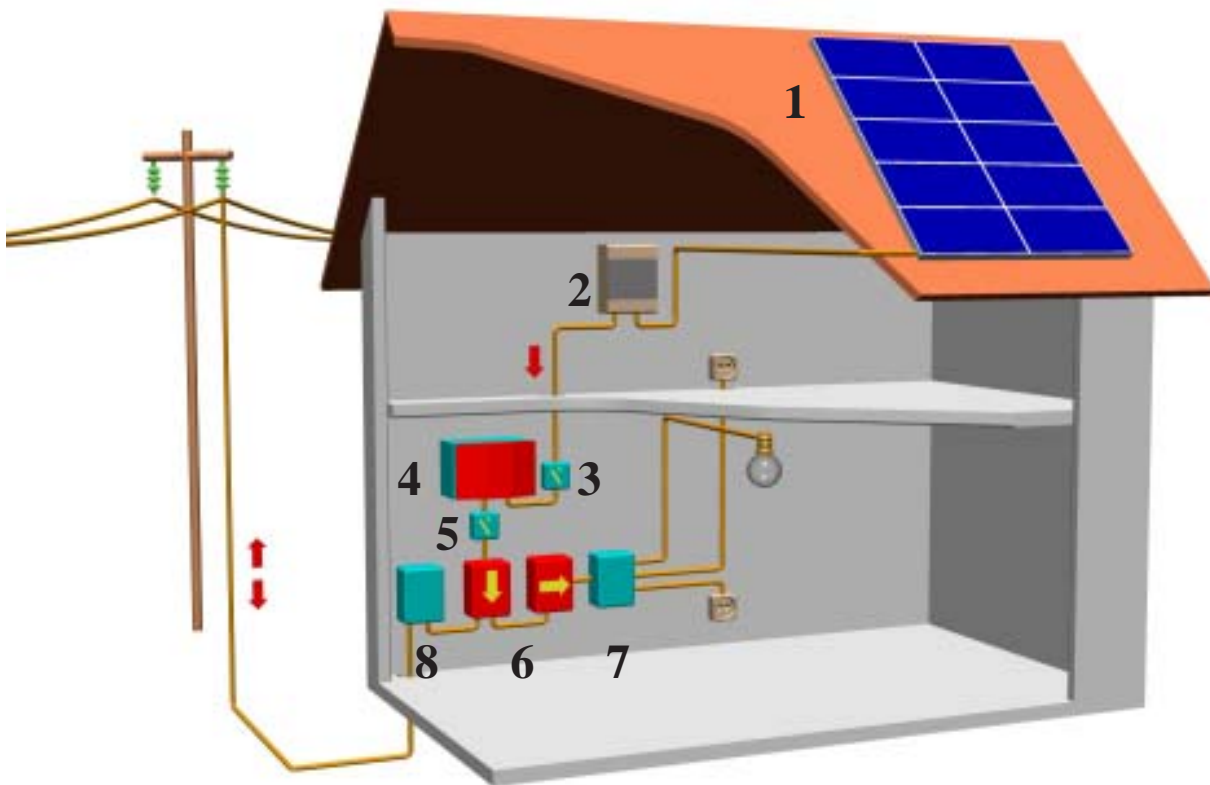
Larger rooftop installations can be built up from two or more solar roof systems which will feed into the ac electricity supply independently. Because of this modularity, NSR systems can be expanded at any time in the future, as long as there is sufficient roof space.

Simple and fast to install

Naps has a range of proven mounting methods to fit the solar modules to different types of roof. Naps Slide-In roof mounting system provides fast, efficient and low cost methods of fixing the modules on top of sloping roofs, requiring minimum disruption to the existing roof structure. A typical roof installation time is around half a day for a 1 kWp system.

Naps solar modules are made using the highest standards of construction and now carry a 25 year limited power warranty. Once installed, they will provide a reliable source of clean electricity for decades.

The Slide-In roof mounting system provides an air gap between the rear of the modules and the roof surface. This allows air cooling of the modules which increases the available power.



General schematic of a solar electric building systems and the main components :

(a.c. connection and metering details may vary slightly in different countries)

1 Solar array, 2 Array box (string fuses, blocking diodes, lightning protection), 3 DC switch (not needed in all countries), 4 Inverter, 5 a.c. switch (optional), 6 Energy counters, 7 House distribution box (with fuses), 8 House electricity supply.

Mounting method

Almost any type of roof can be fitted with the Slide-In roof mounting system. Using special hooks or clamps means no drilling of the roof surface is needed. Illustrated here are some of the most common roof fixings.

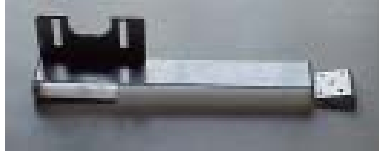
Other types of roof fixings can be provided for different roof constructions. Note that the full specification of the the roof type has to be known in order to specify the roof attachments correctly.



Standard hook for a tiled roof



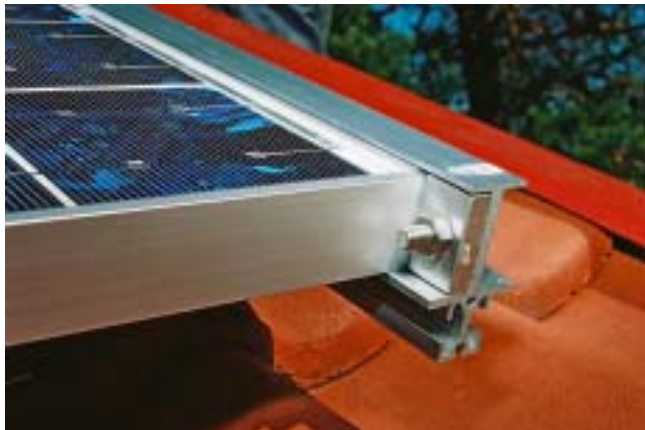
A clamp to fix to the ridge of a metal roof



Example of a special hook made for an old style UK tile roof



Naps Slide-In roof mounting range of hardware is designed for low-cost user-friendly installation of modules on house roofs. NSR systems use FF profile for standard framed modules. Other types of profile may be supplied for special projects.



Naps Slide-In roof mounting system is a reliable and flexible system that is adjustable in all directions to compensate for variations in roof surfaces. Special clamps connect the mounting profile and the roof fixing to horizontal support tubes.

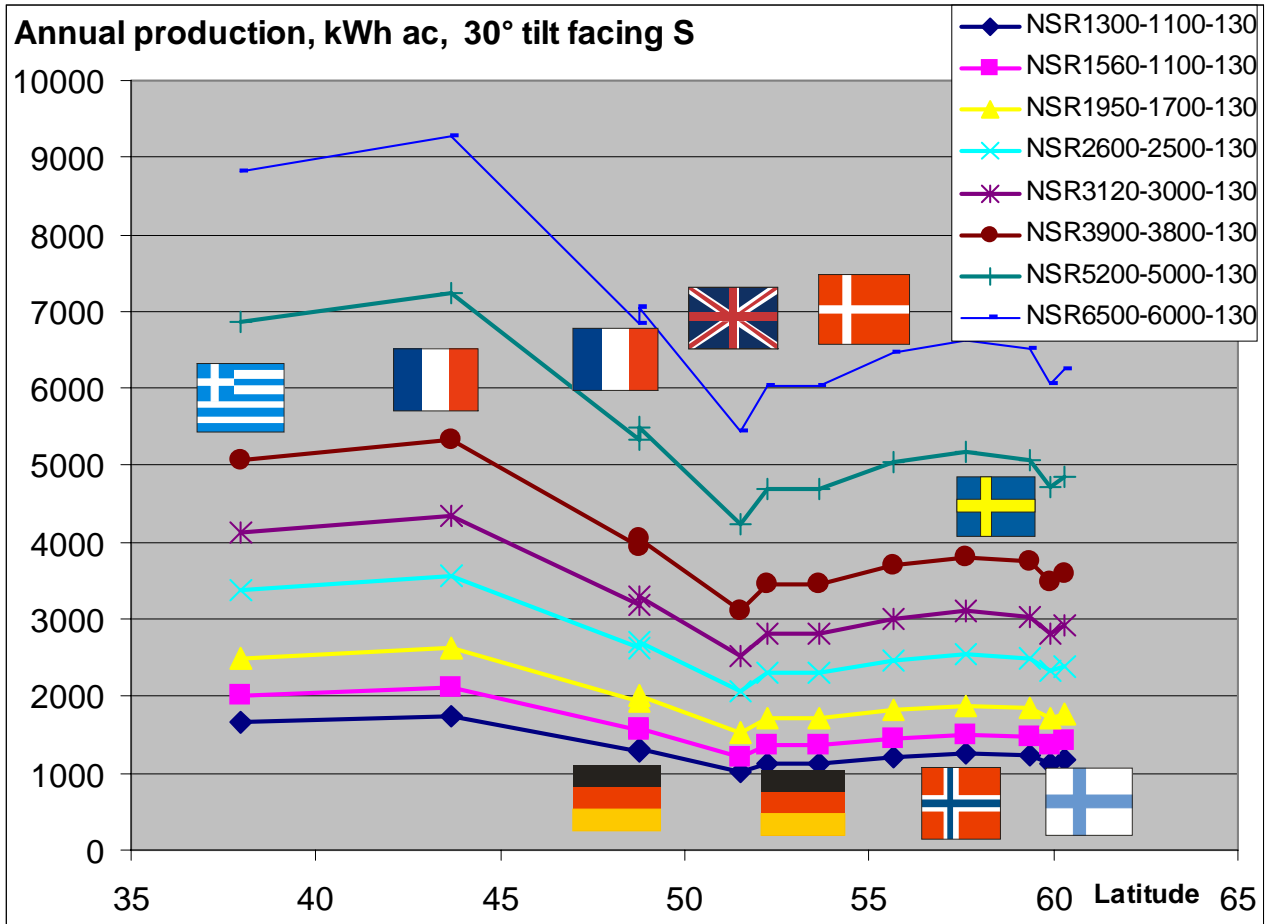
Standard system specifications

System	kWp	module	inverter W rated	modules high	modules wide	array height mm	array width mm	array area m ²
NSR1300-1100-130	1,3	KC130GHT-2	SB 1100	5	2	3300	2906	9,590
NSR1560-1700-130	1,56	KC130GHT-2	SB 1700	4	3	2650	4339	11,498
NSR1950-1700-130	1,95	KC130GHT-2	SB 1700	5	3	3300	4339	14,319
NSR2600-2500-130	2,6	KC130GHT-2	SB 2500	5	4	3300	5772	19,048
NSR3120-3000-130	3,12	KC130GHT-2	SB 3000	4	6	2650	8638	22,890
NSR3900-3800-130	3,9	KC130GHT-2	SB 3800	5	6	3300	8638	28,505
NSR5200-5000-130	5,2	KC130GHT-2	SB 5000 TL HC	5	8	3300	11504	37,963
NSR6500-6000-130	6,5	KC130GHT-2	SMC 6000 TL	5	10	3300	14370	47,421

Notes:

NSR 3120 and larger systems can also be supplied in half-width versions. Dimensions of these arrays are approximately half the width and double the height. Larger systems may be built up of two or more of the above building blocks. The minimum spacing between array blocks in larger systems is 30mm in the horizontal direction and 50mm in the vertical direction.

Typical system performance in Europe



These performance figures are carefully calculated for average sunlight availability in various typical locations in Greece, France, Germany, UK, Denmark and the southern parts of Sweden, Norway and Finland and are for a South-facing Solar Roof with a tilt angle of 30°.

South-facing Solar Roofs tilted at between 30° and 45° will give outputs within 3% of those shown here. Shadows and orientations other than due South will result in lower output than illustrated. An unshadowed Solar Roof with 30-45° tilt facing South-East or South-West will give 93-95% of the output of a Solar Roof facing due South.

These calculations include all losses due to operating temperature, inverter losses, etc, plus reasonable allowances for module soiling and module operating mismatch. Calculations do not include losses for below average sunshine, shadows or other factors.

Average annual performance range for the countries indicated

System	kWh AC	kWh/kWp	kWh/m ²
NSR1300-1100-130	1022-1745	786-1342	107-182
NSR1560-1700-130	1219-2105	781-1350	106-183
NSR1950-1700-130	1535-2631	787-1349	107-184
NSR2600-2500-130	2077-3566	799-1372	109-187
NSR3120-3000-130	2529-4345	811-1393	110-190
NSR3900-3800-130	3123-5336	801-1368	110-187
NSR5200-5000-130	4225-7238	813-1392	111-191
NSR6500-6000-130	5433-9281	836-1428	115-196

Avoided CO₂ emissions

for NSR systems in the above areas are in the range of 0.7 to 1.2 tonnes CO₂ equivalent per kWp per year, assuming that 'average emission' fossil fuel electricity is replaced. If 'world average electricity' is replaced, the above figures should be multiplied by approximately 70%.

The CO₂ payback time of the complete system is in the range 2 to 6 years, again assuming that fossil fuel electricity is replaced. The lowest figure is for the case where all the silicon refining and cutting processes use hydroelectricity and the system is installed in Southern Europe.