

Solar electric systems for buildings





More than an energy system



Solar electric systems are clean, maintenance free and long-lasting energy producers. Traditional building materials can be replaced by electricity-generating elements in almost any kind of new building, often without much increased investment.

There is a wide selection of solar modules for many differing applications - roofs, facades, canopies, shading devices etc. Not only do these offer interesting design options, but by reducing the building's daytime electricity demand, they also reduce the emissions of greenhouse and air-polluting gases.

Naps system solutions do not limit the innovative ways of incorporating the solar electricity generation into the building skin.

Long term added value to buildings

Solar modules lend themselves to many uses where they can replace more expensive building surfaces and even offer additional benefits. For example, in facades they can easily substitute for expensive glass or stone elements while at the same time generating electricity. In some cases, they can even perform additional functions, such as providing shading in louvres or as partly semitransparent facade glazing.

In commercial buildings it is possible to cut the peak power demand effectively with a solar electric system. The daily peak in production from a solar electric system matches the maximum power demand for ventilation, cooling and office equipment.

Our solar electric solutions not only allow on-the-spot energy generation for the needs of the building, but also, in many countries, give an opportunity to sell any surplus electricity to the electricity company.





Commercial building roof-tops and façades provide an ideal mounting for large areas of solar modules, which can act both as electricity generators and as decorative elements. Outside and inside view of an entrance hall's glass roof that also serves as a sun protection glass reducing overheating.

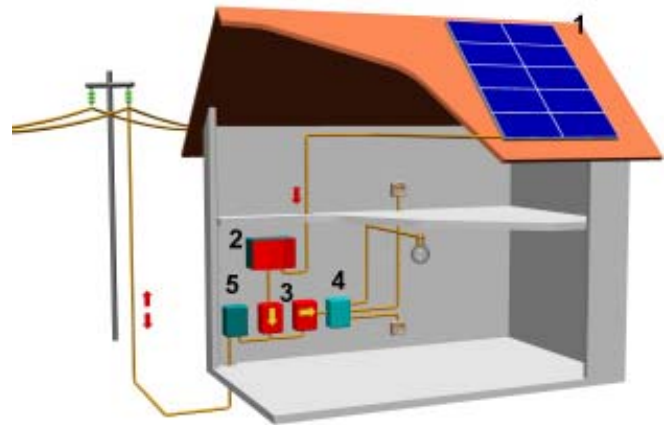


System - this is how simple it is

The solar modules capture the rays of the sun, turning them into d.c. electricity. One or more inverters convert the direct current produced by groups of solar modules into alternating current compatible with the building's main electricity supply.

The solar electricity is used directly in the building and any excess electricity is fed into the grid. At night-time or at other times when the demand in the building exceeds the production capacity of the solar electric system, power is drawn from the local grid.

Apart from the capability of a solar electric system to even out variations in consumption, it will also cut electricity costs.



This is how simple it is! Main components of a grid connected solar electric system: 1. Solar panels, 2. Inverter, 3. kWh counters, 4. Main electric cabinet, 5. Grid connection box.



Solar modules were mounted on a residential apartment's building gable in a renovation project.

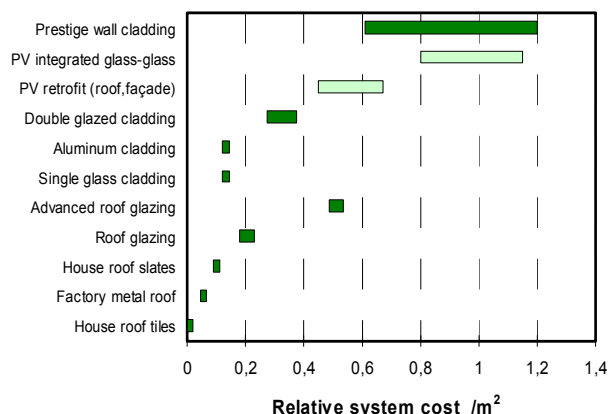
Design and performance go hand in hand

The electrical power output of solar modules is almost directly proportional to the amount of sunlight falling on their surface. Therefore, the energy production of the system depends on the location and, the tilt angle, and orientation of the modules.

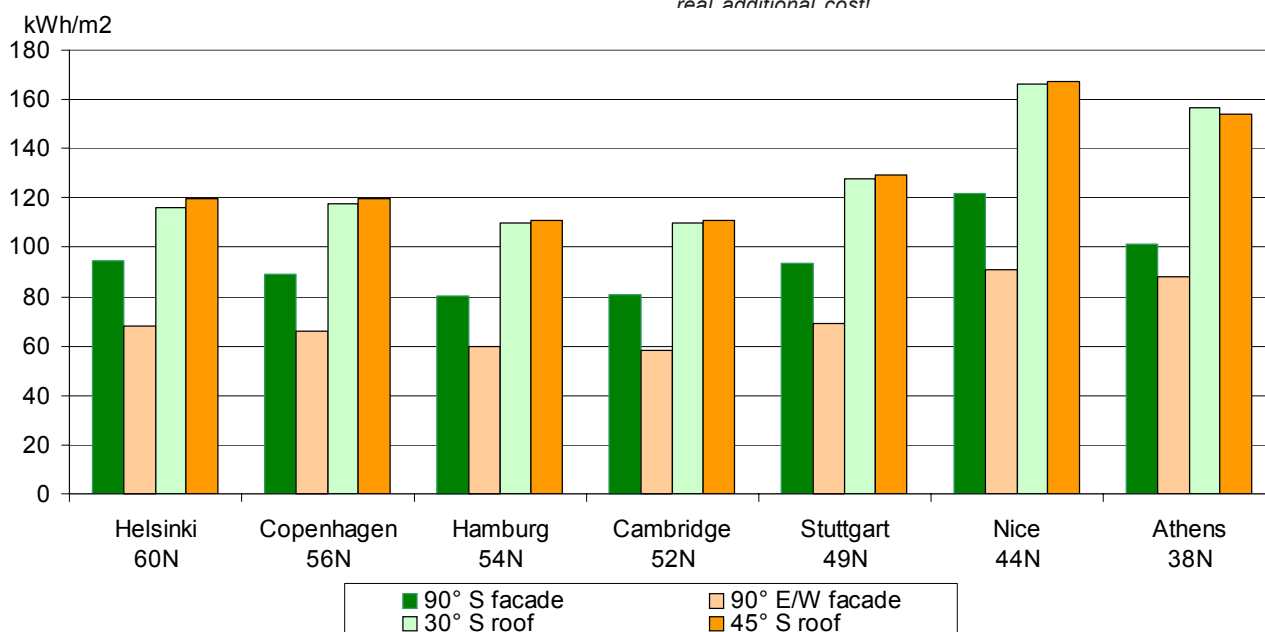
Naps has computer design tools to estimate accurately the solar electric system performance for any type of system and location individually. This makes it possible to define the optimum system concept early in the design phase.

A vertical facade facing the equator will produce around 65 – 110 kWh/m² per year, depending on its location, whilst a roof system facing the equator at a tilt angle of 30° - 45° can produce 100 – 170 kWh/m² per year. Often only small losses (less than 10%) from these figures apply if the orientation is within 45° of the optimum, and 70 - 80 % of the optimum production can be obtained if the system faces east or west. The figures stated above can be reduced by shadowing from nearby buildings, trees, and other obstacles. All these possibilities will be taken into account in detailed system designs.

In building-integrated solar electric applications, the cost per unit area of the solar electric elements is of great importance, since these materials can act as substitute for other building materials. The effective additional cost per unit area of the building integrated solar electric elements is the difference between the price of the solar electric elements and that of the material it can replace.



Relative prices for the some types of building materials in the Europe. Sometimes active solar electricity generating elements can replace normal facade materials without any real additional cost!



Average annual output a.c. kWh/m² of vertical and tilted Naps solar electricity systems in some locations.



A variety of possibilities



Our systems can also be furnished with display and data logging for remote use. The outdoor display can be used to show the public that the building produces environmentally-friendly solar energy.



As part of their environmental program, this supermarket uses solar modules to produce part of the total electricity.



Large uniform solar array installed with a retro-fit mounting system over an old roofing.



Solar modules can also be used as window shades, combining functional use with electricity production.



Solar power improves the quality and appearance of the buildings.



In this building in Copenhagen the solar modules have been fully integrated into the facade and they are directly connected to ventilation fans.



Solar modules can replace conventional building materials and be true parts of the building structure. In this renovation project, part of the balcony wall is covered with solar modules.



Solar modules can easily be retrofitted over existing roof in a cost-effective way.



Modules retrofitted as cladding elements over the wall.



Low energy private house uses solar modules which are integrated into shading devices.



Naps has for over twenty years been in the forefront of delivering systems and technologies that take into account end-user values and needs along with environmental issues. We supply high-quality custom-designed solar electric solutions on a turn-key basis - from design and engineering to after-sales services.

Think how you could make solar electricity work to your advantage. Then contact us to create your own success story. We will be delighted to provide you with more information.



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