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Corus Building Systems

[www.kalzip.co.uk](http://www.kalzip.co.uk)

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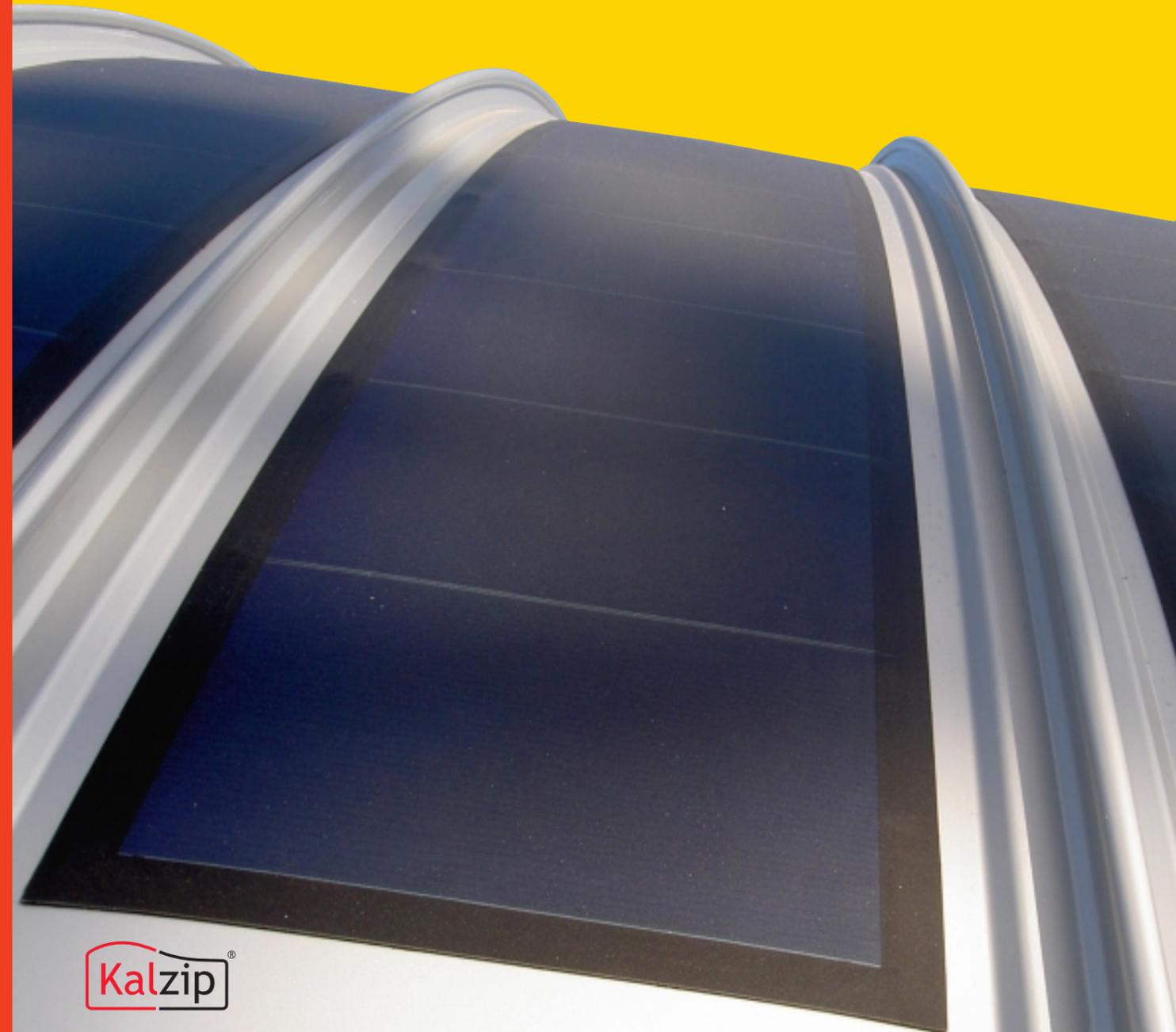
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English

# Kalzip - solar solutions

AluPlusSolar and Solar Panels





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# Kalzip solutions...



## Invest in the future

**Kalzip solar solutions  
a smart approach to  
renewable energy**

## A sustainable solution to building envelope design

The solar energy arriving at the Earth's surface each year is capable of providing 10,000 times our current power demand. So why don't we harness this huge source of free energy, instead of burning fossil fuels and creating toxic nuclear waste?

Even in Britain, not a place particularly well known for its sunny weather, we receive many, many times more solar energy than our annual electricity consumption. If we were to make use of all the buildings in the country, we could meet the UK's total electricity requirements with photovoltaics (PV) - solar panels.

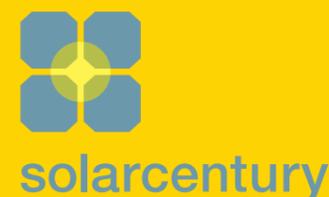
If we made full use of our homes, schools, offices and factories, total global demand could be met with the equivalent of one 10 x 10m array of solar panels per person.

According to European Photovoltaics Industry Association and Greenpeace, 26% of global energy could be met with PV by 2040. In doing so, this level of usage would bring power to the one billion people around the globe who do not currently have access to electricity and create two million new jobs by 2012.

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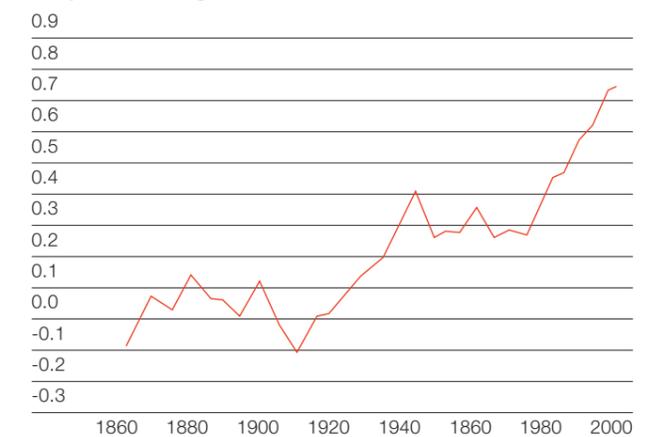
This brochure has been produced in conjunction with our specialist solar electrical design partner.



## The greenhouse effect

This graph shows the temperature change since 1860 and illustrates clearly how dramatically global warming is taking place. The increasing use of solar power will reduce carbon dioxide emissions and help to control climate change.

Temperature change °C



Source: Meteorological Office.



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sustainable products, we have introduced two technically advanced solar solutions in collaboration with our partner solarcentury. This combines our existing knowledge and expertise in delivering the longest-established and most commonly specified aluminium standing seam roof system with the specialist solar electric design and installation skills of solarcentury.



## Kalzip AluPlusSolar

Flexible PV laminate (PVL) is adhered to the surface of a specific Kalzip profiled standing seam roof, constructed in the normal manner and still retaining the full choice of structural decking, liner deck or tray.

## Good reasons to choose Kalzip solar solutions

Kalzip AluPlusSolar is a truly integrated PV building envelope solution, while Kalzip Solar Panels offer the option of PV panels being supplied as framed modules.

### Generate renewable energy

Selecting a PV solution produces free, clean and inflation-proof electricity. Kalzip solar solutions are easy to install, have no moving parts and are optimised for use in cloudy Britain.

### Increase the value of your development

As environmental education improves, consumers are becoming increasingly motivated by sustainable products and services. A solar installation on your property is highly desirable and will boost the rent potential of office space or the value of your home.

Laing Homes, Bloor Homes, The Peabody Trust, other leading property developers and housing associations have already incorporated solar roof into their developments. These homes sold faster and at a premium.

### Attract environmentally responsible customers

Investors are increasingly turning to innovation, social responsibility and environmental policy as a measure of investment potential. Solar buildings and products communicate a strong positive message that is vital in attracting the growing number of ethically motivated stakeholders.

### Reduce carbon dioxide emissions

Ten square metres of PV prevents around half-a-tonne of carbon dioxide emissions per year.

### Invest in our children's future

Whether your project is a new development or the refurbishment of an existing building, incorporating PV will make a crucial contribution to our communities. Every company leaves its footprint behind: the challenge is to make it as small as possible.

## AluPlusSolar in detail

With the correct selection of coated coil, the PVL can be blended into the roof profile becoming barely noticeable. Alternatively the PVL can be made into a design feature with contrasting colours. For a full selection of our finishes, please ask for a colour chart.

### Product information

Kalzip AluPlusSolar is a fully integrated PV envelope product, equally appropriate for commercial and residential applications. PV laminates (PVL) are factory-bonded directly to the outer surface of the exterior

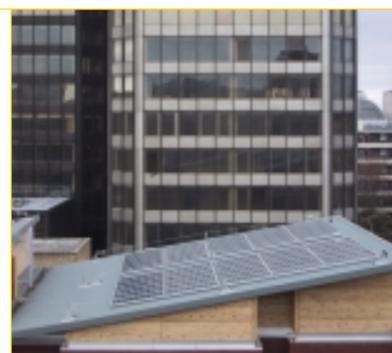
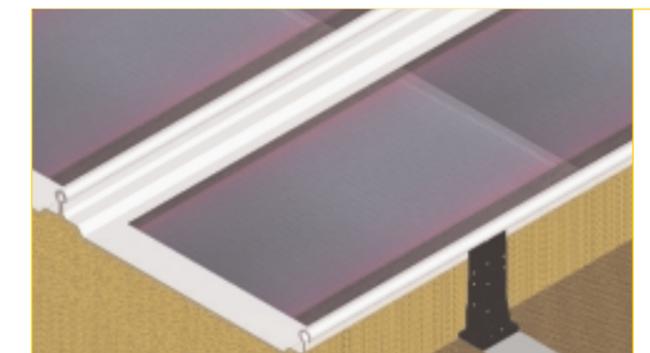
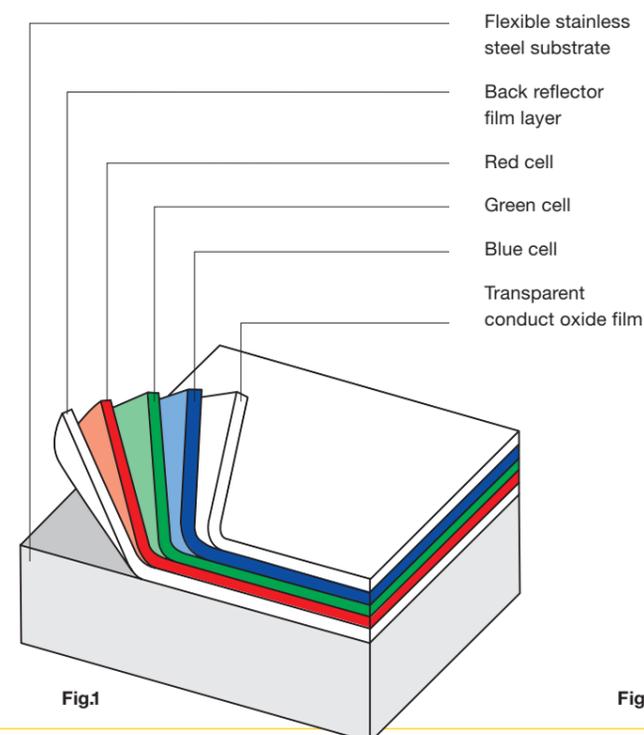
Kalzip sheets. The PVL consists of triple-junction thin-film silicon cells deposited onto a stainless steel foil and encapsulated in an ethane vinyl acetate (EVA) co-polymer protective envelope. Each of the three cells converts a different part of the visible spectrum, resulting in superior conversion efficiencies in overcast conditions

Fig. 1 shows the layered construction of the PVL.

The PVL can be bonded to polyvinylidene difluoride (PVdF) or polyester paint-coated all flat (AF) 65/537 aluminium profiles. The sheets are first cleaned with isopropanol. A polyethene/polypropene co-polymer self-adhesive back is revealed on the reverse of the PVL and applied to the flat portion of the profile. No penetrative fixings are required.

Fig. 2 shows a typical Kalzip built-up roof construction, see page 10 of this brochure for more detail.

### Layered construction of the PVL.





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## Kalzip Solar Panels

Flexibility of the support system allows Kalzip Solar Panels to be retro-fitted to any one of the numerous Kalzip profiles.

### A few parameters for guidance

AluPlusSolar can be installed at roof pitches between 3.5° and 60°. A hydrophobic layer on the EVA encapsulant enables the PVL to self-clean under moderate rainfall. Maximum energy efficiency is achieved facing south and at a pitch of 30° (see page 8 for further information). Barrel vault constructions can be achieved to a minimum radius of 15.2 metres.

### Installing Kalzip AluPlusSolar

To ensure the highest standards of workmanship, AluPlusSolar is installed only by specially trained and approved Kalzip Teamkal contractors working with our specialist sub-contracting partner solarcentury.



## Solar Panels in detail

The thin-film amorphous technology enables economies of scale to be achieved on large areas of new or existing building envelope. In sunny locations, solar panels can deliver higher currents than PVL. The solution can also be adapted to form rainscreen cladding if suspended from vertical Kalzip profiles.

Kalzip Solar Panels offer an alternative to AluPlusSolar. PV silicon cells are contained within an aluminium perimeter frame. They can be used on new builds or retro-fitted to existing Kalzip installations - both wall and roof.

The solar panels are a modular system allowing optimal positioning around the building envelope. The panels are retained by stainless steel clamps fixed to the standing seam. The non-penetrative approach allows panels to be relocated if required.

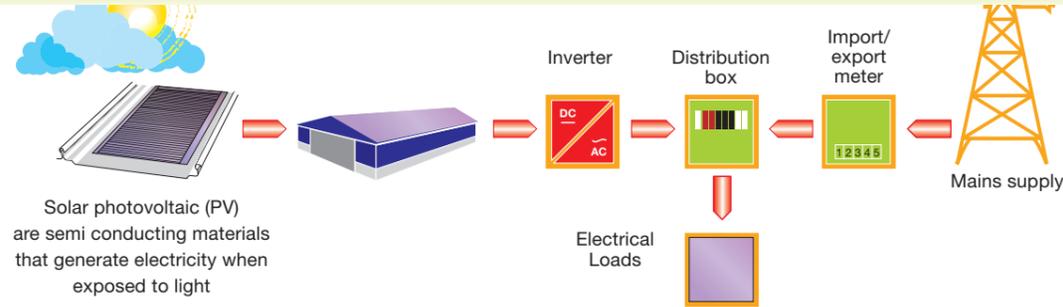
The system can be installed on flat roofs with the minimum 15 degree pitch being achieved by a supporting frame construction.

## A partnered approach



## Roofs provide ideal locations for PV solutions





## How does it work?

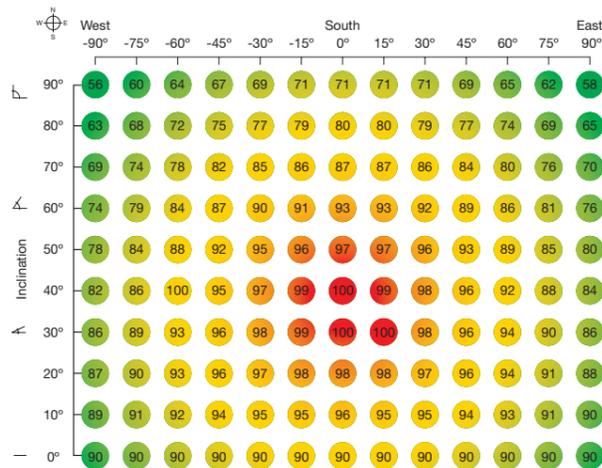
PV technology allows electricity to be generated from sunlight. PV cells are composed of layers of positively and negatively charged semi-conducting material in contact. When light shines on the semi-conductor, the electric field across the junction between these two layers causes electricity to flow - the greater the light intensity, the greater the electric current.

New triple junction technology used on Kalzip AluPlusSolar helps to maximise the electricity generated, even on cloudy days. The direct current from the PV cells is converted to alternating current so that it can be fed into the building's distribution board. The system works continuously, so any surplus electricity is sold back to your energy supplier.

At night, when the PV is not producing any electricity, your mains power is automatically supplied from the grid. Extra power is always available during times of high demand.

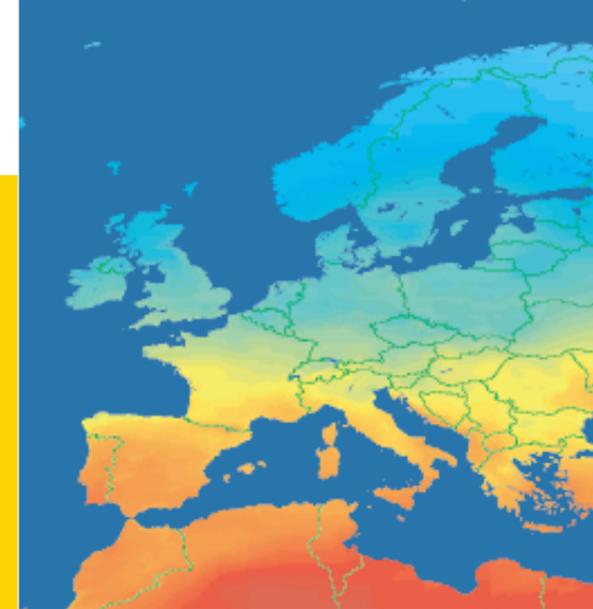
## Effects of building envelope orientation

The optimum orientation and inclination is dependent on the latitude, application and shading. For a grid connected system in the UK, the table below indicates the portion of the theoretical maximum which would be generated for various inclinations and orientations.



Solar sundial showing energy yield relative to the inclination and orientation of your roof.

During the design process, consideration should be given to avoid ventilation openings, air conditioning units and other obstructions which may shade the solar modules during the day. Our partner solarcentury are on-board to assist in the design of a properly balanced electrical system and PV layout to avoid any complications during the electrical design and installation.



## Solar radiation in Europe

The map shows the 'mean' annual irradiation throughout Europe.

## Legislation and initiatives

### Department of Trade and Industry Major Demonstration Programme

The three year PV programme seeks to make considerable headway in preparing a secure platform for long-term and sustained market growth.

Grants of between 40% and 65% are available towards the installation of a solar electricity system, whether you're a householder, business or social housing group.

### Building Regulations

Further revisions are due in 2005, they will again look at low and zero carbon emission buildings and could potentially be modified to include renewable energy technologies.

### Renewable obligation

The renewable obligation requires energy suppliers to derive a specified portion of the electricity they supply to their customers from renewable sources. This proportion is set to increase to 10% by 2010. Compliance with the obligation will be demonstrated by the electricity companies presenting a Renewable Obligation Certificate (ROC) to the Office of Gas and Electricity Markets Authority (OFGEM) each year.

### Suppliers can comply in a number of ways:

- Generating the specified proportion from their own renewable sources
- Buying ROCs from an accredited renewable generator
- Buying ROCs from other suppliers/traders who have bought more ROCs than they actually need
- Paying OFGEM the "buy out price" of around £30/MWh for each unit the supplier has defaulted on.

ROCs effectively double the value of the renewable energy generated by a development incorporating a PV system.

### Planning Approval

The Office of the Deputy Prime Minister has approved a scheme in the London Borough of Merton to ensure that projects of 1000m<sup>2</sup> or greater should include the provision of renewable energy production facilities to supply at least 10% of the building's energy needs.

### Specialist advice

Our partners solarcentury are able to provide specialist advice on all legislative, planning and funding issues.



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Kalzip can be curved, tapered and wave formed to accommodate even the most challenging architecture.

### Systemisation

We adopt a systemised approach utilising a diverse but coordinated range of materials and components.

Kalzip systems can both meet and exceed the current Building Regulations, the new 'E' type clip ensures no thermal bridge and that the entire system, irrespective of its components construction, is fully demountable and recyclable at 'end of life'.



### Finishes

Kalzip can be coated using colour, we additionally offer a series of finishes achieved by our patented 'Pegal' process which provides pure zinc and titanium surfaces. Stainless steel and copper material is also an option.

### Natural

Kalzip has also introduced Nature Roof. This living solution brings with it numerous benefits which include reduced rainwater run off, excellent acoustic performance and improved air quality whilst contributing to the balancing of carbon dioxide budgets. Combining Kalzip Nature Roof and Solar Solutions makes excellent sense.



## Kalzip solar accessories

To complement our standing seam envelope product we are also able to supply PV integrated with louvres, brise soleil and other customised fabrications to suit your individual project needs.

For a full range of our individual product brochures, including our specialist fabrication facilities which complement all of the above options please check our website or contact us as shown overleaf.



## Further information



Contact Corus Building Systems on 01925 825100 to request further information on:

- Roof system design
- Choice of Kalzip AluPlusSolar or Solar Panels
- Specification and detailing
- Approved network installer liaison
- Past installation of Kalzip systems
- Help to design a bespoke envelope solution
- Kalzip solar accessories

## Find us on-line

For information, please contact us on-line at:

[www.corusgroup.com](http://www.corusgroup.com), [www.kalzip.com](http://www.kalzip.com) [www.kalzip.co.uk](http://www.kalzip.co.uk) or [www.natureroof.com](http://www.natureroof.com)

Or visit solarcentury on-line at:

[www.solarcentury.co.uk](http://www.solarcentury.co.uk)



solarcentury

Contact solarcentury on 020 7803 0100 or email [enquiries@solarcentury.co.uk](mailto:enquiries@solarcentury.co.uk) to request further information on:

- Project feasibility
- PV system design
- Project financial assistance and partnerships
- Past installation of PV electrical systems

## New solar cell plant, Deutsche Shell AG

A case study is available on the new manufacturing facility for Shell which was completed in 1999 using 50m length stucco-embossed Kalzip sheets forming both the walls and roof. The Kalzip standing seams provide a secure base for the 100m<sup>2</sup> of solar panels without the need for any penetrative fixings. Kalzip and Solar Century can help to design customised solutions for bespoke projects.

