

GO GREEN

STANDING OVATION FOR ROYAL OPERA HOUSE

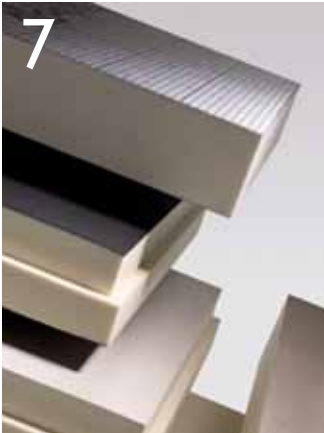
State-of-the-art Production Workshop wins awards across the boards. *page 20*

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Sustainability is key in the future of new and refurbishment construction projects

BAUDER

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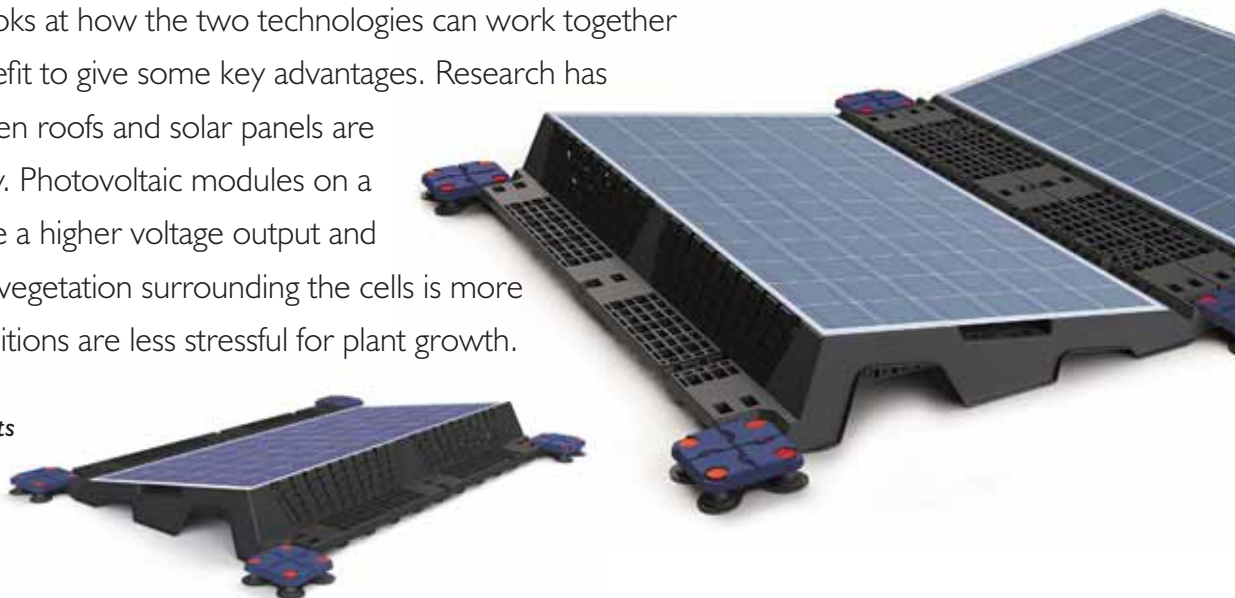
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Why have one when you can have both?

Tom Raftery looks at how the two technologies can work together for mutual benefit to give some key advantages. Research has shown that green roofs and solar panels are complementary. Photovoltaic modules on a green roof have a higher voltage output and the green roof vegetation surrounding the cells is more diverse as conditions are less stressful for plant growth.

Tom Raftery reports





Stamping out the Carbon Footprint - p19

In this issue



Andrew Mackenzie
Managing Director,
Bauder Ltd

As European market leaders of flat and green roof systems Bauder is fully aware of its environmental responsibilities. With turnover in excess of 500 million you can imagine that the complexity of our environmental dashboard matches that of the latest Boeing 747 Airbus - all the usual facets from carbon footprint and raw material consumption literally down to what secrets each manhole on every one of our 15 operating sites contains!

There is no doubt that our environmental credentials and performance are of increasing importance to our clients and we will continue to lead the way on ensuring we minimise impact on the environment through our business operations.

However, the stark reality is that the embodied energy of construction products accounts for less than 10% of the total energy that is required to build, operate and deconstruct a typical project. I am therefore pleased to introduce our latest publication that demonstrates where the team at Bauder is specifically focusing on is the environmental issues that you are being confronted with on a daily basis.

This issue begins with Tom Raftery taking a look at how two committed technologies, green roofs and photovoltaics, when delivered by one supplier can work in synergy to provide a broad environmental solution whereas previously they would have just competed for the same roof space!

Green roofs on their own are still providing new and innovative designs (p10-11 and p.20-12) and we have many examples where they have been retrofitted on to a current building with great success and such tangible environmental benefits (p.16-17).

But of course a flat roof is more than just what can go on top, it is also about what energy efficiencies it can deliver in itself, and here highly efficient insulation makes a real impact. The sustainable argument for PIR insulation is tackled by Paul Felgate (p.7) reporting on the facts about just how the evidences stack up.

Finally, it would be remiss not to mention the Government's Green Deal (p.18), as we all wait for this innovative funding mechanism with anticipation and wonder what the true impact will be for us all.

You may think that in times of economic downturn that the environmental agenda may be pushed to one side – from our experience this is far from the case. We are excited at all the new initiatives and innovations in the pipeline here at Bauder and look forward to bringing more and more exciting solutions that specifically help you deliver your environmental objectives.

green (grēn)

adjective

advocating protection of the environment; made with little environmental harm; produced in an environmentally and ecologically friendly way, e.g. by using renewable resources.



RETROFITTING GREEN ROOFS

A fitting use for current buildings and the perfect way to enhance their environmental credentials



GREEN DEAL

- ➔ Who?
- ➔ What?
- ➔ When?
- ➔ Why?
- ➔ How?

The Government's **Green Deal** is unravelled in to plain English - for the moment!



Green Roofs & Photovoltaics

Tom Raftery takes us through a match made in heaven



Tom Raftery
Product Manager BauderSOLAR

It doesn't seem all that long ago that flat roofs were largely disregarded and any encouragement to utilise the space positively could often be met with little more than a raised eyebrow.

Nowadays, things are significantly different in that flat roofs are not only considered for the installation of green roofs to benefit the environment and our living space, but are also an ideal location for the generation of renewable energy through solar power.

There is a perception that a building can either have green roofs or solar production at roof level but not both causing the two technologies to compete for the same roof space and leading to a debate over which would be preferable. However, it is possible to take a clearer approach and use both technologies in synergy for mutual benefit.



Improved Solar Panel Efficiency

Firstly, the cooling effect of the green roof preserves the ambient temperature around the photovoltaic (PV) array keeping the panels at their optimum efficiency. Studies in Germany have shown that when comparing solar panels situated on a green roof to that on a standard bitumen roof those situated with vegetation surrounding them are far more efficient, with figures quoted that PVs work best with an ambient air temperature of about 24 °C and that a PV panel can lose 0.5% efficiency per degree centigrade above 25 °C; this can mean that PVs on green roofs can be up to 16% more efficient, especially in the height of summer when the sun is at its peak in terms of the production of renewable energy.

Improved Energy Efficiency of the Building

Green roofs improve the buildings energy efficiency, especially in energy usage for heating and cooling, thus reducing the workload for the solar system.

The green roof can also be used as ballast for the PV support system, removing the need to penetrate the waterproofing and reducing the risk of leaks.

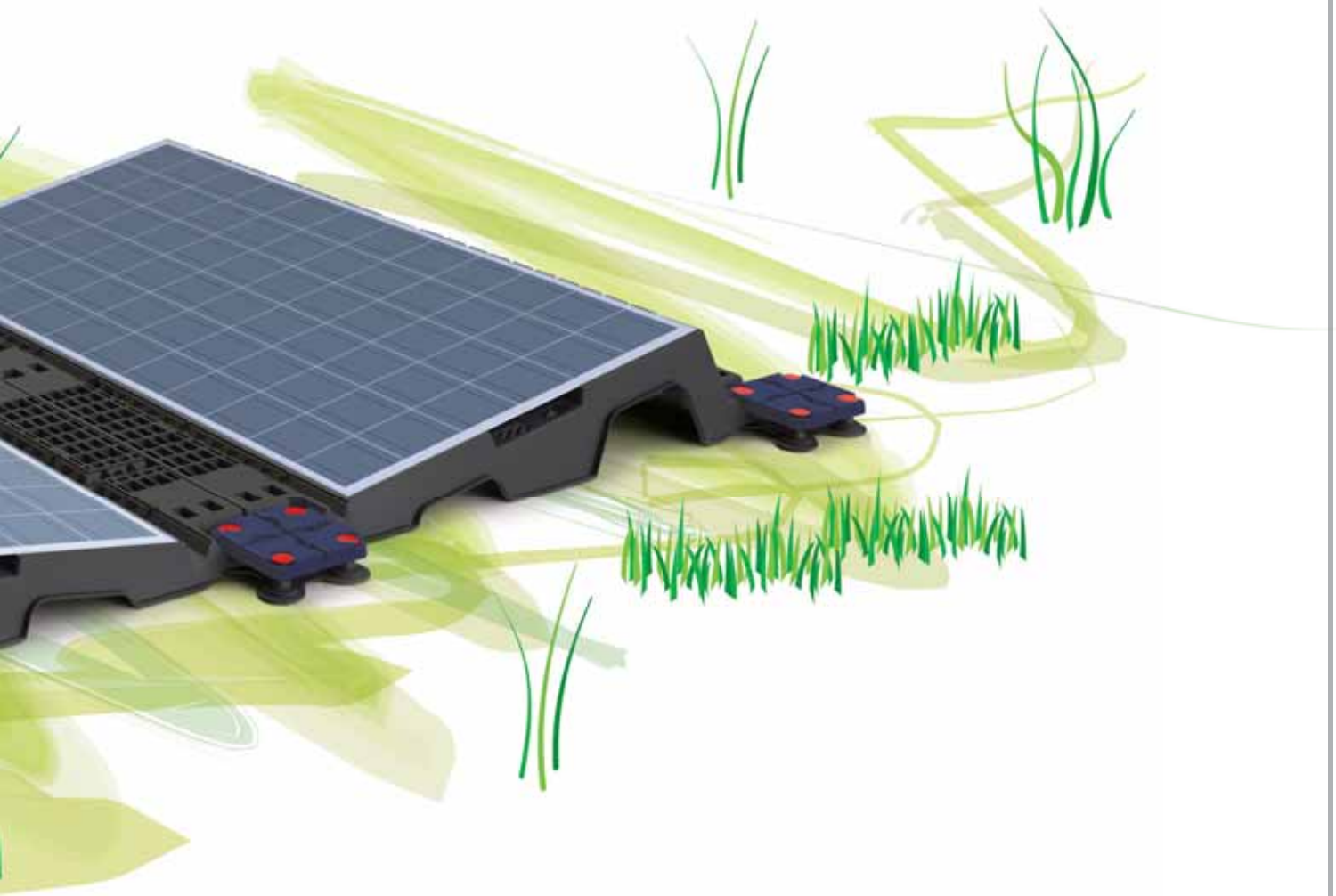
Varied Habitats for Flora and Fauna

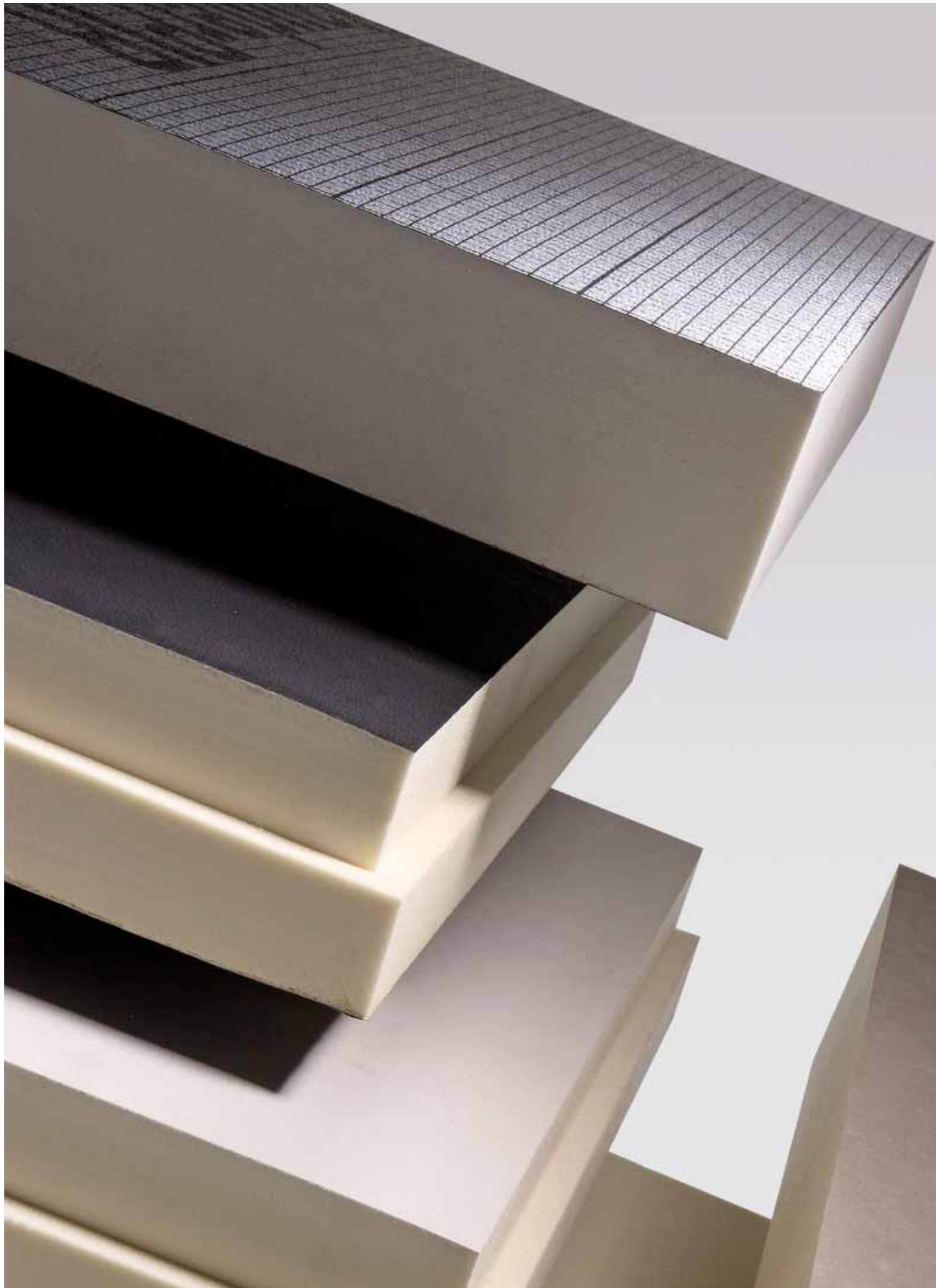
The PV array can also positively affect the green roof. The shading effect of the panels has been shown to create a more varied habitat for the green roof, this can actually increase the number of invertebrates inhabiting the roof and providing shelter for bird species, so improving biodiversity.

Integrated Design

It is important to remember that by designing this joint approach the two technologies need to be designed with the impacts of the other system in mind. There are a number of elements that should be considered such as the larger vegetation that can occur as a result of shading and water run off from the PV panels which in turn can lead to shading of the panels themselves and potentially a significant drop in efficiency. Also, as the panels will often be raised above the roof to allow clearance for the vegetation to establish this can lead to further considerations with regard to planning conditions etc.

With the number of combined schemes such as One Brighton (FCBs/Denne Construction) increasing all the time there is growing evidence of how simply these two 'competing' technologies can be designed together and how the benefits of each solution can be maximised through a pluralistic approach.





PIR INSULATION

The Government update of **Part L 2010** of the Building Regulations for England and Wales, and indeed the further improvements proposed for the revision in 2013, moves the construction industry closer towards achieving the ultimate goal in 2016 of zero carbon buildings, and sees the application of efficient insulation in the construction of a building one of the easiest and most cost-effective ways of enhancing energy-efficiency.



The Simple Solution for Sustainable Buildings

Paul Felgate

Technical Development Manager, Bauder Ltd

Reports on one of the most effective way of enhancing energy efficiency

Rigid urethane foam insulation is highly effective, thermally efficient, lightweight and delivers a high strength to weight ratio capacity. The term "rigid urethane foam" stands for a family of insulation materials that, in addition to polyurethane (PUR) also includes polyisocyanurate (PIR).

PUR is made by blending together a liquid polyol with Methylene Diphenol di-Isocyanurate (MDI) in the presence of a blowing agent. The heat generated during the reaction enables the blowing agent to evaporate and become trapped within cells delivering a closed-cell, low density, rigid thermosetting polymer which can be formed in to boards. The thermal properties are achieved because the gas trapped within the closed-cell structure has very low thermal conductivity so there is minimal thermal conduction through the solid cell walls.

PIR insulation contains an excess of MDI with a catalyst, which causes it to react with itself to form isocyanurate. As a result this product has greater heat stability, reduced combustibility and higher working temperature limits than PUR.

The high thermal efficiency of PIR insulation means that less needs to be used than other common insulating materials to achieve similar U values. To illustrate this, insulating a typical flat roof with a warm roof thermal design on a plywood deck to achieve a U-value of $0.16W/m^2K$ requires just a 140mm layer of foil-faced PIR, compared to 210mm of expanded polystyrene, and 220mm of extruded polystyrene or mineral wool.

This comparison proves that PIR insulation physically delivers benefits in that it easily satisfies

building regulations as well as saving construction costs through leaner depth of roof build-up. This is all well and good from a cost analysis perspective, but in today's construction ethos, what of the environmental credentials of rigid polyurethane insulation?

The net environmental impact of PIR/PUR insulation products is extremely positive. It is estimated that over a 50-year period these products will save at least over 1000 times more energy than embodied in the fossil fuel used to produce them in the first place.

The BRE Green Guide assesses building materials and components in terms of their environmental impact across their entire life cycle and rates them accordingly. These ratings are used when carrying out BREEAM assessments (BRE Environmental Assessment Method) an accredited environmental rating scheme for buildings.

The data in the Green Guide is set out as an A+ to E ranking system, where A+ represents the best environmental performance / least environmental impact, and E the worst environmental performance / most environmental impact. BRE has provided a summary environmental rating - Pentane blown rigid urethane, with a density of $32 kg/m^3$ has an "A" Green Guide Rating.

Today, the blowing agent used in the manufacture of PUR and PIR is mainly pentane and in BauderPIR, Cyclopentane is used which is CFC and CHFC free, has no ozone depletion potential (zero ODP) and a global warming potential (GWP) of just 3. The insulation is thus categorised as chemically inert and safe to handle as there are no loose fibres to dislodge.

With regard to moisture absorption, which would increase the thermal conductivity of an insulant and thereby reduce its efficiency, PIR does not absorb water from the air, nor does it transport water through its material as it does not permit capillary action. Under submersion tests the product has demonstrated a low absorption rate of just 2% vol at the surface.

BauderPIR has a high compressive strength, measured at a minimum of $0.12N/mm^2$ enabling it to withstand foot-traffic without depression, making it suitable for all kinds of load bearing decks, additionally it will not sag or slump or degrade over time, unlike some insulants which are then potentially limited in their energy efficiency and suffer a reduced lifespan.

Effectiveness of the insulation of a building envelope can be compromised by gaps resulting from shrinkage of individual panels. Manufacturing criteria requires that shrinkage be limited to less than 1% (previously 2%). Even when shrinkage is limited to substantially less than this limit, the resulting gaps around the perimeter of each panel can reduce insulation effectiveness. Bauder PIR insulation is manufactured with rebated edges which interlock to greatly reduce this problem.

The case for increasing insulation to create more energy-efficient buildings is clear enough, and PIR offers a robust argument for its inclusion with the combined benefits of significant thermal advantage, low environmental impact, moisture resistance, and structural strength throughout the lifetime of the building as well as being available in a wide range of product thicknesses and suitable for nearly all new construction or refurbishment building projects.



Wildflowers for **BREEAM** & Sustainable Homes Codes



Since the introduction of lightweight green roofs into the UK almost 30 years ago, sedums have been the most widely used type of vegetation in extensive installations, because of their ability to withstand the most severe weather conditions and their low maintenance needs.

Whilst this has proven to be a highly effective solution to the basic “greening” requirement on many projects, the influence of both BREEAM and Sustainable Homes codes is driving the need to find suitable alternative species that are both native to the British Isles and meet the requirement established by the project environmental consultant.

As the BREEAM and Sustainable Homes codes have become better understood by ecologists, so the specific vegetation requirements are growing more onerous, sometimes restricting the choice of species to a point where it is difficult to ensure a viable plant community. The problem hinges around the ecologist’s selection of species that are either local to the site, appear on the Local Biodiversity Action Plan or the National Red List. Unfortunately, whilst a plant community selected from these species will deliver an environmentally sound solution, some of the plants selected will not survive in the very hostile environment found on a green roof.

To help overcome this challenge, Bauder has introduced a range of native species vegetation all capable of surviving in an extensive green roof environment. The company offers two options which can be used in singularity or in combination depending on the green roof finish required.

Wildflower Blanket

The wildflower blanket incorporates 24 species of native wildflowers and herbs pre-cultivated on a unique carrier to provide an instant carpet of plant coverage. The plants have been specifically selected to provide a viable and vibrant plant community whilst also delivering a range of native species that will be present on most of the biodiversity action plan lists that project specific ecology reports now demand.

Nick Ridout, Bauder Green Roof Product Manager, commented: *“Following a successful trial at the Museum of London - our wildflower blanket responds to the demands of architects, developers and landscape consultants. It provides a plant community in all but the most extreme locations and, best of all, requires only a modest amount of maintenance.*

“The key benefit of using the XF118 Wildflower Blanket is its speedy establishment of a dense, vigorous and seasonally colourful vegetated sward across the roof, that will quickly attract a broad range of aphids and invertebrates which in turn will encourage the development of a sustainable ecology on the roof.”

The wildflower blanket utilises the technology and much of the experience Bauder has gained over the last 15 years of growing and installing sedum-vegetated blankets and as a result shares many of the benefits. The blanket carrier incorporates a polypropylene geotextile membrane, which ensures minimal compaction of the substrate whilst allowing for vigorous root growth of the wildflowers to quickly establish in to the substrate installed underneath.

UK Provenance Native Species Plug Plants

Plug plants allow for a greater variety of vegetation which can be pre-selected to suit specific sustainable criteria. Individual immature plants or ‘plugs’ are planted in to the substrate by hand which will then grow on to give good cover. Bauder has a substantial list of species to give a broad palette range from which the project ecologist can select, to secure the credits needed to meet the scheme requirement.

By allowing the ecologist the option to consider a proven range of vegetation for this type of application, Bauder is once again meeting the emerging needs of the green roof industry with solutions that are both practical and cost-effective.

When considering a native species/biodiverse installation, it is important to ensure that the initial establishment and ongoing maintenance requirement of the vegetation is not overlooked. It is also worth considering that the optimum number of BREEAM and Sustainable Homes Code points is usually achieved by the wide diversity of species selected and also the creation of a range of habitats for local wildlife. By working with Bauder, optimum solutions for all biodiverse green roof requirements are delivered, wherever they may be in the British Isles.



BAUDER

Cutting Edge

■ Sedum blanket ■ Biodiversity ■ Complex roof gardens ■ Terrace and podium landscaping

Simply let Bauder make your green roof top notch

With over 500,000m² of flourishing green roofs, a lot of people know Bauder is the team to talk to.

From the waterproofing, green roof components and substrate to the planting scheme, let us give you the best green roof with the best advice.

Reduce, Reuse, Recycle, Reclaim

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Bauder Total Roofing Solutions

Cradle-to-Cradle Environmental Certification

“We are delighted to have achieved C2C Certification for three of our green roof products, as no other supplier in our industry has achieved the same. It makes a very strong statement about our commitment to limiting, or completely eliminating, any processes or products that are potentially harmful to the environment. We seek to continually evolve our business and products to reflect our environmental and social responsibility.”

Nick Ridout
GREEN ROOF PRODUCT MANAGER AT BAUDER



The term 'C2C Certification' is a proprietary system of accreditation which takes a holistic approach to the economic, industrial and social design of systems or products that are not just efficient or environmentally supportive, but are essentially waste-free.

The Bauder Group, one of the roofing industry's largest and most respected organisations, has achieved a first in environmental certification for three of its green roof products; ahead of any other roofing company in the UK.

Three of the company's green roofing products, the Xero Flor XF300 and XF301 Sedum Blankets have been awarded Silver Certification under the Cradle to Cradle (C2C) Evaluation Protocol.

C2C Certification involves the rigorous review of both a company and its products by McDonough Braungart Design Chemistry (MBDC) consultants - a leader in the independent evaluation of how products contribute to the health and sustainability of our environment. MBDC evaluates how a business's products and processes adhere to the principles of the C2C concept; **“Remaking the way we make things”**.

The C2C philosophy moves the concept of recycling forward; calling for the recycling of a product to be considered at the design stage. It encourages the design, production and/or utilisation of safe and productive processes that complement nature's cyclic flow of metabolism, in that all things are created, used and reprocessed. It also observes whether a product's components can be designed for continuous recovery and reutilisation.

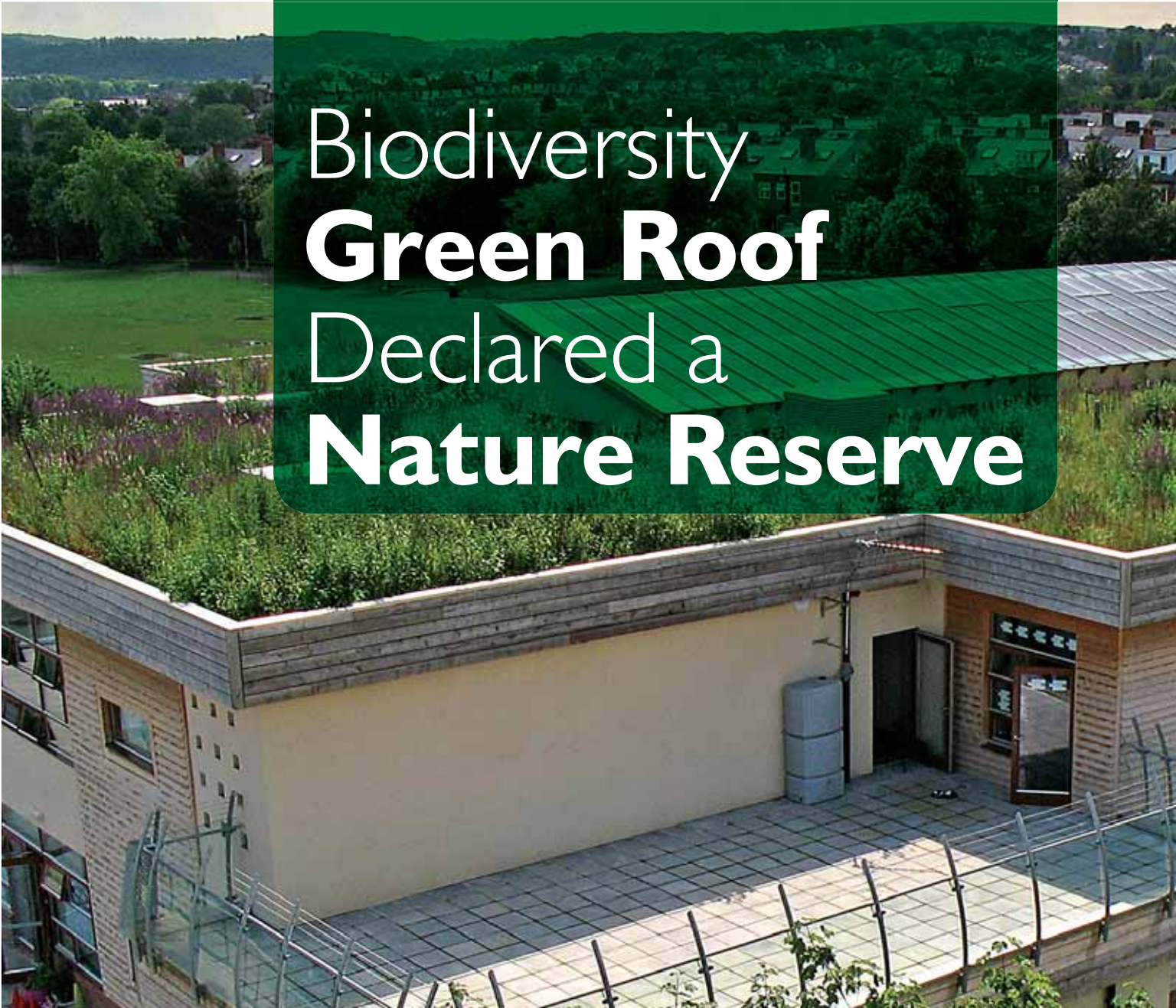
In its broadest sense, the C2C model is not limited to industrial design and manufacturing but can be applied to many different aspects of human civilisation, such as urban environments, buildings, economics and social systems.

In respect of industrial and commercial processes – such as metals, fibres and dyes – certification falls into one of two categories: 'Technical' or 'Biological'. Any 'Technical' products accredited are strictly limited to non-toxic, non-harmful synthetic materials. To achieve certification, a company must be able to demonstrate that its products have no negative effects on the natural environment and can be used in continuous cycles as the same product without losing their integrity or quality. The 'Biological' category relates to organic materials that once used, can be disposed of in any natural environment to decompose into the soil, providing food for small life forms without affecting the natural environment.

The phrase **'Cradle to Cradle'** itself was coined by Walter R. Stahel in the 1970s and the current model is based upon a system of lifecycle development initiated by Michael Braungart and his colleagues at the Environmental Protection Encouragement Agency.



Biodiversity Green Roof Declared a Nature Reserve



“ IN OUR CHANGING CLIMATE, WE NEED TO FIND NEW WAYS OF SUPPORTING OUR WILDLIFE AND MANAGING EXTREME WEATHER. ”

PETER NOTTAGE





The Bauder green roof on Sharrow Primary School in Sheffield was declared a Local Nature Reserve by Natural England in 2009 on the 60th anniversary of the National Parks Act which provided the legal framework for declaring nature reserves.

It is the first Nature Reserve in the country (probably even the first in the world) to be located on top of a building and was designated for its great ecological value and its importance to the local community. The biodiverse green roof helps reduce the impact of climate change by keeping the building cool in summer, soaking up heavy rainfall and absorbing carbon dioxide from the atmosphere.

Head teacher Lynne Ley said,

“The staff and pupils really value the green roof and it’s a great resource to get children out of the classroom to learn about wildlife and our local environment. They also learn how important it is to look after the environment, not just on our doorstep, but worldwide.”

Peter Nottage, Natural England’s regional director said,

“In our changing climate, we need to find new ways of supporting our wildlife and managing extreme weather something that residents and businesses in Sheffield are only too aware of. This is a superb example of how we can also involve our future generations in looking after our environment.”

Restricted ground space opened up the opportunity to create green roofs at three levels for play space, 44m² of outdoor classrooms and a 1200m² biodiversity roof designed to replicate a meadow. A fascinating array of plants and animals have made the roof their home since its creation in 2007. The vibrant mix of colourful wildflowers looks spectacular and attracts a variety of birds and insects, so the roof is always buzzing with life!

Cath Basilio from Sheffield City Council’s Design and Project Management Team said,

“Sharrow Primary is the city’s greenest school, with a heating system powered by warmth coming up from deep in the earth and toilets flushed by rainwater. The Bauder roof works on a technical level, sorting water run-off problems and assisting in the control of storm water, humidity, noise, heat and pollution. Additionally, the roofs incorporate a BREEAM A+ categorised Bauder waterproofing system with 120mm of PIR insulation to achieve a U value of 0.2W/m² constructed on a concrete deck.”

All in all, the Sharrow Primary School is a real testament to what can be achieved and is a landmark construction that raises the benchmark and when you look at the lush vegetation on the roof today, you can easily forget you’re on top of a building in the heart of the city! All in all, the Sharrow Primary School is a real testament to what can be achieved and is a landmark construction that raises the benchmark.

What are the FM Challenges of Maintaining a

Low Carbon Development

Tony Russell, Deputy Director of Estates at University Campus Suffolk (UCS) in Ipswich knows all too well about the challenges of making a green building work.

An iconic landmark in Ipswich, the £31m UCS Waterfront Building, completed in 2008, is crowned with a 1,400sq metre sloping Bauder sedum roof and a host of other sustainable features which achieved a **BREEM** 'excellent' rating.

What keeps you awake at night?

"In short - budgets, security and compliance. Like many others, my revenue budget is set 12 months in advance, but I have to apply for capital budget as and when. The main campus building is operational 24/7 so first-rate security is essential. Although some of the buildings I manage are new builds, others are older and require different levels of maintenance, mostly for things people can't see, such as heating and ventilation."

Is your job made more straightforward by having low carbon buildings?

"In the new buildings, which both have 'excellent' BREEAM ratings, I have a centrally controlled systems, so I can check various things from my PC, including the temperature of each area and where security has patrolled (by tracking their pass cards through doors). I don't think the newer buildings are easier, just different challenges, there's still regulations to adhere to, for example, workplace law and statutory testing. When it does become more of an issue, is during refurbishment, particularly around practicality and litigiousness."

How much of a difference do you think the green credentials make to your buildings?

"The jury is still out on the energy savings we've achieved at UCS, we need another two years' of bills to work out the savings. However, the green roof is certainly a talking point, as indeed the whole building is. The green roof is instantly recognisable and

a little bit of green goes a long way. Much of the Waterfront building internally is bare concrete, which has its own environmental properties and this is a stark contrast to the green roof.

Rob Woolston, Bauder Technical Manager, added: "The sedum used on the 20 degree sloping roof is a thick, fleshy, cactus-like plant which can withstand extreme hot and cold temperatures. It effectively doubles the life of the roofing membrane. **Sedum is cultivated in long lengths of blanket, on a moisture retention fleece before being harvested, delivered to site and lowered into place.** At UCS the sedum will attract small wildlife and help reduce rainwater run-off through absorption."

How seriously does your employer take sustainability?

"University Campus Suffolk, as a large and complex organisation, seeks to give sustainability a high priority. We have a Sustainability Strategy - 'The 4Cs', which provides a clear structure around Curriculum, Campus, Community and Culture. We aim to reduce our carbon usage by 30% 2015 and 40% by 2020 and we monitor several aspects of our operations including: energy, waste, water, purchasing, development, transport and regulations."

ESSENTIAL STATISTICS

GREEN ROOF:

The large, angled sedum roof is planted with up to 25 different varieties of succulents, moss and grasses. It provides excellent insulation and ameliorates the impact of storm water loads on local drainage systems, whilst actively encouraging biodiversity on what was once a bleak brownfield site.

INSULATION AND GLAZING:

High levels of wall and roof insulation enclose a high thermal mass structure. The structural concrete is designed to act as a thermal battery wrapped in the building's blanket of insulation, storing or absorbing heat as required. The high performance glazing design and specification reduces solar gain.

HEAT WHEEL VENTILATION:

There is no air conditioning in the UCS building. Extensive heat recovery systems use fresh air circulation, including a heat wheel. High efficiency heating and ventilation systems are controlled by computer and designed to respond quickly to the building's level of occupation.

WATER SAVING:

Water-saving systems and low-energy hand dryers are installed in washrooms.

CLIMATE ADAPTATION:

There is a flood mitigation system, recognising future contingencies. No electrical systems are within 900mm of ground level, and walls and floors designed to withstand flood damage.

CYCLE FACILITIES:

Extensive bicycle parking, with showers and changing facilities, encourage sustainable travel.

BUILDING MANAGEMENT SYSTEM:

An advanced building management system controls variable-speed ventilation and heating systems.

LIGHTING:

There is no incandescent lighting (except in the lifts!). Lighting is controlled by occupancy sensors in many areas.



THE WATERFRONT BUILDING
UNIVERSITY CAMPUS
SUFFOLK

CO₂





Retro-Fitting Green

Key Considerations for a Successful Project

The ecological appreciation of fitting a green roof to an existing building (retrofitting) is gaining momentum and is a way of tackling problems of storm water management, as well as improving the natural and built environment.

It is estimated that roofs account for 40-50% of impermeable urban areas and the numerous positive impacts that a green roof delivers certainly make them a focus for consideration when refurbishing a flat roof.

There are many advantages to retro-fitting a green roof. They benefit our changing environment by reducing energy consumption within the building because of their additional insulation potential, thus making cost savings on the heating and air conditioning for the building; the living plants also absorb carbon dioxide and give off oxygen.

The key criteria that need consideration from the outset are:

- The additional load that the roof structure will be able to support.
- If the system can work in harmony with the existing roof drainage system.
- Whether the slope of the roof structure might make installation and maintenance of the system impractical.



Once these issues have been resolved, consideration can then be given to prioritizing the key performance criteria, such as degree of biodiversity, visual appearance and storm water attenuation capacity, to enable the specification of the build-up to be developed to match the requirement.



Roofs

Generally, most retro-fit green roofs are lightweight 'extensive' systems which use plants that are self-sufficient and wind, frost and drought resistant. These are generally grasses, herbs, wildflowers and succulents such as sedums. An extensive green roof is not designed for recreational use and for a facilities manager it has the advantage that, if the roof is overlooked, the residents will have a much more desirable view that will require little maintenance because of the particular type of plants used.

Retro-fitting a lightweight extensive green roof has only minor restrictions to its installation compared to a roof garden requiring full access, where greater planning and in depth structural surveys are required to ensure that the anticipated additional high weight loadings are acceptable and do not destabilise or damage the integrity of the building.



There are three options for planting an extensive green roof:

■ **Vegetation Blanket:**

Where the plants are already established and grown in a 'turf' format to provide an instant greening. This is a fast and reliable solution. Sedum blankets will always be a popular choice because of their low maintenance requirements, nevertheless, drivers for greater biodiversity of plant species has seen native species wildflower blankets being made available and rising in popularity as developments strive to achieve BREEAM ratings for Buildings In Use.

■ **Seed Mixes:**

Where a special mixture of seeds is distributed onto a lightweight substrate. Plant establishment and coverage may take 24 months to achieve. This method is usually preferred on larger roofs and can also be specified in combination with plug-planting.

■ **Plug-planting:**

This is where individual plants such as sedums, grasses, herbs or native provenance wildflowers are grown in trays and planted into the growing substrate. The technique allows for individual choice of plant selection and lay out design. This method is generally used on small to medium sized roofs and will take 12-18 months to fully establish.

Reduce, Reuse, Recycle, Reclaim



RECYCLED CONTENT IN A GREEN ROOF SYSTEM

Working closely with suppliers and through extensive research, Bauder has steadily increased the recycled content of many of its products without any detrimental effect on their performance. Clients are able to specify Bauder membranes with recycled content of up to 25%.

Other key Bauder products consist of shredded car tyres, recycled clothing, polystyrene and hard core and even organic waste. This enables the company to offer complete green roof systems with 81% recycled content by volume.

The Green Deal in Plain English - Who? What? When? Why? How?

Who?

The Conservative/Liberal Democrat Coalition Government, formed in 2010, introduced the Energy Act 2011 in October which paves the way for secondary legislation to allow the Green Deal to be introduced in Autumn 2012.

What?

The new innovative Green Deal financial mechanism eliminates the need to pay upfront for energy efficiency measures and instead provides reassurances that the cost of the measures should be covered by savings on the electricity bill.

The Green Deal will be delivered under the Energy Act 2011 which provides the legal framework under which the Coalition Government can establish a revolutionary arrangement to enable private firms to offer consumers energy efficiency improvements to their homes and businesses.

The innovative feature of a Green Deal loan is that it is attached to the property and not the occupier.

When?

The Green Deal legislative timetable identifies that the detailed industry guidance will be prepared for Spring 2012, and this will begin to iron out some of the specifics as currently the issues of actual measurements that will qualify and the final shape of the regulations and the Code of Practice are yet to emerge.

By Autumn 2012 it is anticipated that the first Green Deals will begin to appear.

Why?

The Green Deal intends to reduce carbon emissions cost effectively by modernising the energy efficiency of British properties. Our homes are responsible for 26% of the UK's carbon emissions, with 45% of domestic heat escaping through the walls. Yet energy efficiency remains an uninspiring subject. Green Deal providers will need a powerful marketing tool to turn the heads of a nation more interested in talking about which mobile phone tariff they're on than the heat escaping their home.

Current estimates reveal that 20% of UK households live in fuel poverty (defined as being where more than 10% of household income spend is on energy consumption). The Government has a statutory target to eradicate fuel poverty in England by 2016 and the Green Deal is its tool to address this. It's going to be a tough sell.

How?

The Green Deal will not permit energy saving measures to be installed on properties that are leaking energy through their fabric. There's no point in installing solar water heaters / ground source heat pumps on properties if the green-generated heat is flying out of the walls

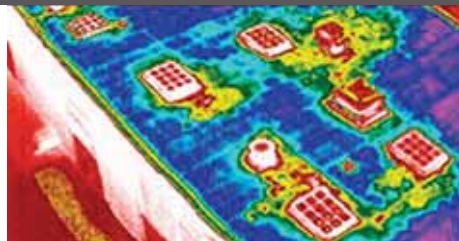


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THE THERMAL IMAGING / INFRARED SURVEY EXPERTS

Since 2002 IRT has provided professional impartial advice to building professionals, energy consultants and engineers alike. Qualified staff, the latest equipment and a strong customer focus have ensured our position as market leaders.



Competitive pricing and a 'can do' attitude has helped make us the fastest growing infrared company in Europe. With a growing franchise network, we are the lowest carbon footprint infrared surveyors you can appoint.

ENERGY

Reduce your energy bill and carbon footprint.

DEFECTS

Literally see problems quickly and easily.

PREDICTIVE MAINTENANCE

Fast and safe electrical and mechanical assessment.

CAMERAS & TRAINING

Reduce your energy bill and carbon footprint.

REFERENCES

DECC The Green Deal: Summary of the Government's Proposals 2010

http://www.decc.gov.uk/en/content/cms/legislation/energy_act2011/energy_act2011.aspx

http://www.decc.gov.uk/en/content/cms/tackling/green_deal/green_deal.aspx

<http://www.energysavingtrust.org.uk/>

and roof. In calculating which measures to install, the Green Deal Assessor must also ensure that the property meets the Golden Rule (i.e. the return on refurbishment investment through energy savings is reasonable when compared to the cost of the works).

Given the volumes and the scale of the task a reliable method of assessing the efficiency and quantifiably measuring the energy efficiency of a building is paramount. A proven method is already available to the industry - thermal imagery. There are plenty of companies who provide this service but one stands ahead of the rest, IRT Surveys have the patented technology to translate the images into terms that everyone understands:- This is how much it is costing me every year and with energy refurbishment measures these savings are possible.

IRT Surveys has a long track record of helping local authorities and housing associations identify the "heat offenders" in their housing and public building stock. This résumé puts them in the ideal position for supporting Green Deal delivery partners and visually presenting the findings to the building owner so that informed decisions can be made on which areas for improving energy efficiency will give the greatest savings and therefore reap the most benefit.

How will the Green Deal be financed?

A new Energy Company Obligation (ECO) will integrate with the Green Deal, allowing supplier subsidy and Green Deal Finance to come together into one seamless offer to the consumer.

A fundamental precept of the Green Deal is that repayments should be collected through energy bills. These repayments will appear on the customer's electricity bill as a separate charge. Customer protection will be vital to underpin the success of the Green Deal and ECO. This will be built into every stage of the

journey. The Green Deal is designed so that the estimated energy bill savings should not be less than the Green Deal Plan instalments, so there should be no reason for people to fall into arrears because of the Green Deal.

The electricity supplier will be collecting the Green Deal charge as agent and trustee of the Green Deal provider. On receiving the payment from the customer the Green Deal portion of the payment will be passed to the relevant Green Deal provider or nominated finance provider.

A lot about the Green Deal remains unclear, it is complex, has challenging targets, and there is still a huge amount of detail to be sorted out before it goes live, but the timetable has been published and the countdown to October 2012 has begun.

Tick tock, tick tock!

Niki Thomas

UK Franchise Manager

IRT Surveys

www.irtsurveys.co.uk



Stamping out the Carbon Footprint

In October 2009, The Department of Energy and Climate Change published a definition of carbon neutrality:

'Carbon neutral means that - through a transparent process of calculating emissions, reducing those emissions and offsetting residual emissions - net carbon emissions equal zero.'

The UK Government has set out an ambitious plan for all new homes to be zero carbon from 2016. This carbon neutrality refers to achieving net zero carbon emissions by balancing the amount of carbon released with an equivalent amount generated or obtained from renewable energy sources or buying enough carbon credits to make up the difference.

The first step towards carbon neutral status is to reduce and/or avoid carbon emissions so that only unavoidable emissions are offset. Secondly, the way forward with best practice is to balance the carbon dioxide released into the atmosphere from burning fossil fuels, with renewable energy that creates a similar amount of useful energy, so that the carbon emissions are compensated, or alternatively using only renewable energies that don't produce any carbon dioxide (this last is called a post-carbon economy). The practice of buying carbon credits through the planting of trees or funding 'carbon projects' has gained criticism for not actually tackling the issue of reducing emissions, but instead, masking the environmental impact created.

Being carbon neutral is increasingly seen as good corporate or social responsibility and a growing list of companies and organisations are actively working towards becoming fully neutral. Events such as the G8 Summit are using offset schemes to become carbon neutral.

The golden rule for achieving zero carbon should be to firstly reduce what you can, then offset the remainder.

Encore... Encore

Standing ovation for the
Royal Opera House



The state-of-the-art Bob and Tamar Manoukian Royal Opera House Production Workshop in Purfleet has won both the Project of the Year and Regeneration categories in the 2011 Royal Institution of Chartered Surveyors (RICS) East of England awards. It was also shortlisted in the 2011 New London Awards.

The £8.3m building, which was designed by Nicholas Hare Architects LLP and built by F K Construction Ltd, is used by the Royal Opera House to build scenery for its elaborate ballet and operatic performances in Covent Garden, London. The new workshop is located at the £60m

High House Production Park, which opened at the end of 2010, and boasts outstanding green credentials.

Stretching over 400 square metres, the workshop is faced in cedar wood and features a state-of-the-art extensive green roof supplied by industry experts, Bauder. The vast 3,200 square metre barrel vault roof is covered in sedum plants to soften the impact of the structure into the surrounding parkland and attract insects and native wildlife.

Overlooking the Queen Elizabeth II Bridge and the Thames, the workshop features a vaulted ceiling, which is 19

Workshop



metres at its highest point with hoist systems to accommodate the construction of full-scale scenery, as well as workshops for carpentry, metal and fibreglass, and studios for the painting of scenery, including a viewing gallery to allow the designers to see their work from above.

STRETCHING OVER 400 SQUARE METRES, THE WORKSHOP IS FACED IN CEDAR WOOD AND FEATURES A STATE-OF-THE-ART EXTENSIVE GREEN ROOF SUPPLIED BY INDUSTRY EXPERTS, BAUDER.

The workshop is the centrepiece of the 14-acre High House Production Park, which is also home to the National Skills Academy for Creative and Cultural Skills, which trains mostly 16-19 year-olds in technical craftsmanship.

The Production Park was a unique partnership between Arts Council England, Creative and Cultural Skills, the Royal Opera House, Thurrock Council, the Thurrock Thames Gateway Partnership and the now disbanded East of England Development Agency Corporation ●

FLAT ROOF TECHNOLOGY

Flat Roof Solutions



HIGH PERFORMANCE BITUMEN MEMBRANE SYSTEMS

Bauder manufactures a range of polymer modified bitumen membrane systems. These are selected on an individual client or project specific basis. The Plant E capping sheet, specifically for green roofs, is chemically treated to be root resistant and tested to FLL guidelines.

The system can be used under all green roof landscape applications.

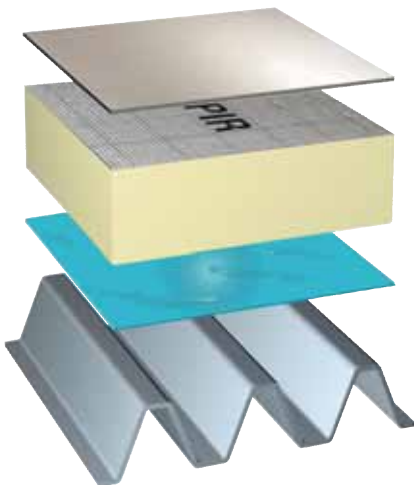
Guarantee: up to 20 years

(Subject to system selected)



Falmer Academy

The Falmer Academy is a new build secondary school replacing an existing school to sit with open green area just outside Brighton. The project has an 8000m² biodiverse green roof, with a planting regime designed by an ecologist from East Sussex County Council.



FPO or PVC SINGLE PLY MEMBRANES

Bauder manufactures two types of synthetic membranes; FPO and PVC. Both systems provide a lightweight solution that is quick and easy to install. Membrane application methods will vary dependant on project requirements.

Both systems can incorporate Bauder high performance insulation and are best suited to extensive green roof applications.

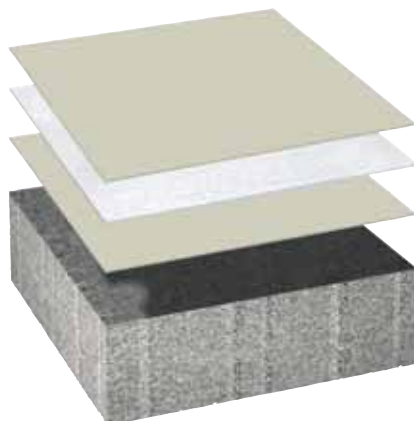
Guarantee: up to 20 years

(Subject to system selected)



Walnuts School
Milton Keynes

The Walnut's School, Milton Keynes, is a state of the art learning facility that incorporates a Bauder sedum green roof for a cost effective solution, whilst also promoting the schools forward thinking and environmental awareness.



COLD LIQUID APPLIED SYSTEMS

This form of waterproofing system is based on advanced resin technology which is fast curing, durable and easy to apply. It is a waterproofing solution that lends itself to overlaying a current roof which is reaching the end of its serviceable life.

The system can be used under all green roof landscape applications.

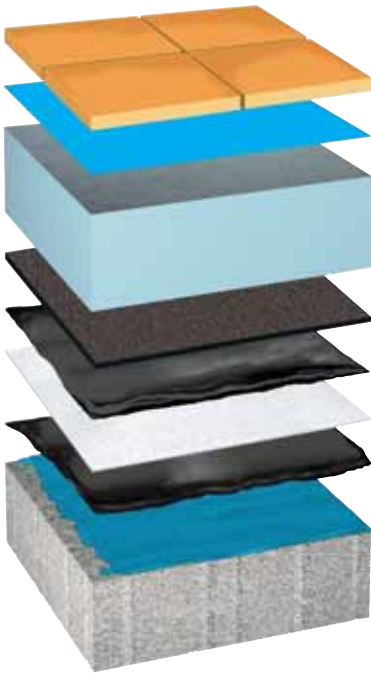
Guarantee: up to 20 years



The system can be used beneath all types of landscaping in either cold or inverted roof construction.

FLAT ROOF TECHNOLOGY

Flat Roof Solutions



HOT MELT WATERPROOFING

Bauder Bakor Hot Melt structural waterproofing provides a fully bonded monolithic membrane that is very tough, flexible, self-healing and ideally suited for a buried or inverted roof application.

The system can be used under all green roof landscape applications.

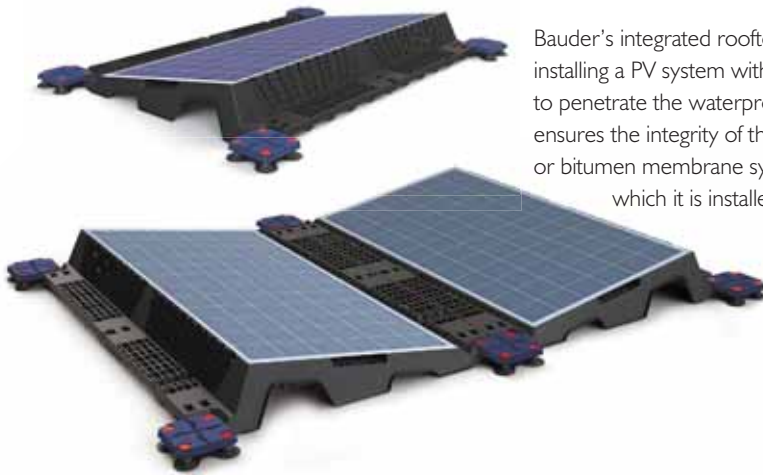
Guarantee: 20 years



Chelsea Academy

The building packs 11,000 square metres of school on to a highly constrained site exactly half that size. The roof extends the usable space and incorporates recreational areas with seating and planting.

PHOTOVOLTAIC ENERGY SOLUTIONS



Bauder's integrated rooftop solution for installing a PV system without the need to penetrate the waterproofing ensures the integrity of the single ply or bitumen membrane system on which it is installed.



One Brighton

One Brighton is a pioneering housing development where the whole issue of sustainability is tackled head-on. Cleverly integrating biodiverse green roofs with solar panels as well as incorporating allotment green roofs so that residents can grow their own fruit and vegetables.

GREEN ROOF COMPONENTS & SYSTEM ACCESSORIES



Bauder has a range of accessory products to complement all flat roof waterproofing solutions as well as a complete range of landscaping components for all types of green roofs including separation and protection layers, water storage and drainage components, filtration layers and lightweight substrates that, in the correct combination, will effectively replicate nature within the build up.



NEWS IN BRIEF

SNIPPETS • SNIPPETS • SNIPPETS



ON YOUR BIKE... DON'T MIND IF I DO!

Bauder has recently taken up the challenge to steer some get-up-and-go into its environmental policy by encouraging staff to reduce environmental pollution and promote healthier lifestyles by making cycling to work a cost effective option.

This is made possible by the Government's Green Transport Plan which allows staff to save up to 42% on the cost of a new bike and equipment. **Managing director, Andrew Mackenzie** is spearheading the initiative by joining the scheme and purchasing a new bike and said, *"The cycle to work scheme is a step towards giving our people the opportunity to reduce their personal carbon footprint as well as feeling great, saving money and helping to protect the environment"*



Bauder continues to drive its environmental policy forward by assessing the environmental impact of its operations from conception to conclusion so as to prevent pollution of the external environment and to commit to using recycled materials or those with low environmental impact. As a result of this focus, this magazine has been printed by The Colchester Print Group using vegetable based inks on alcohol free presses, they are ISO 14001 and FSC accredited.

Additionally, by working with the World Land Trust the paper used for this publication has been carbon balanced saving 598kgs of carbon and preserving 50 square metres of land.

THE SUNDAY TIMES

SUNDAY TIMES TOP 100

Each year The Sunday Times celebrates the best small, mid-size and big workplaces in the UK. In the 2012 listings, published on 26th February, Bauder Ltd was honoured with a place in the category for Small Companies and named as a three star company. This is the 12th year of the awards with over 1000 organisations taking part; and every year the prestige of this list builds as it becomes the last word in staff engagement and outstanding working practices.



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By Carbon Balancing this product we have saved:
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