

SEDA

Scottish Ecological Design Association

NPF4: planning for our future?



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Summer 2022

SEDA was formed in 1991. Our primary aim is to share knowledge, skills and experience of ecological design. SEDA is a network and links those seeking information and services with those providing them.

SEDA's membership comprises a large number of people involved, and with an interest in design, principally in Scotland. Members include academics, architects, artists, builders, planners, students, ecologists, landscape designers, materials suppliers, woodworkers, and many more whose work or interest involves design for a sustainable future.

SEDA is a charity and is run by a Board of Directors, who are elected at Annual General Meetings. The Board is advised by a voluntary Steering Group which meets 8 times a year for discussion and for planning the activities of the Association. All members are welcome to take part in these meetings. SEDA registered as a Company Limited by Guarantee in February 2011.

A SEDA membership is a great way to support ecological design in Scotland. As a member you will receive the SEDA Magazine for free, get discounted tickets to SEDA events, and have the opportunity to connect with a wide network of talented designers.

Editorial team

Nick Domminney, Viktoria Szilvas, Doug Tullie

With thanks to all our contributors, sponsors, and supporters.

What do you think of this SEDA magazine? Do you have any disagreements or something useful to add to the issues covered? Do you have an idea for an article? Drop us an email at magazine@seda.org

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Scottish Ecological Design Association

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Cover image: School pupils exploring climate adaptation - photo credit, PAS

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Editorial

Nick Domminney

The Scottish Government recently concluded consultation on the draft National Planning Framework 4 (NPF4). SEDA members expressed some concerns.

Some feel that the draft Framework lacks a meaningful route for community involvement in future local plans and their enactment. Also that there is insufficient emphasis on re-use and renovation, as against new build, controls of Embodied CO2 or a mechanism for Whole Life Carbon Accounting (already developed by [LETTI](#), amongst others). Others are concerned that the Framework's consideration of health and wellbeing is difficult to comprehend and, therefore, implement. The Framework also divides Scotland into different regions and then applies what should be national planning actions to only a few of them.

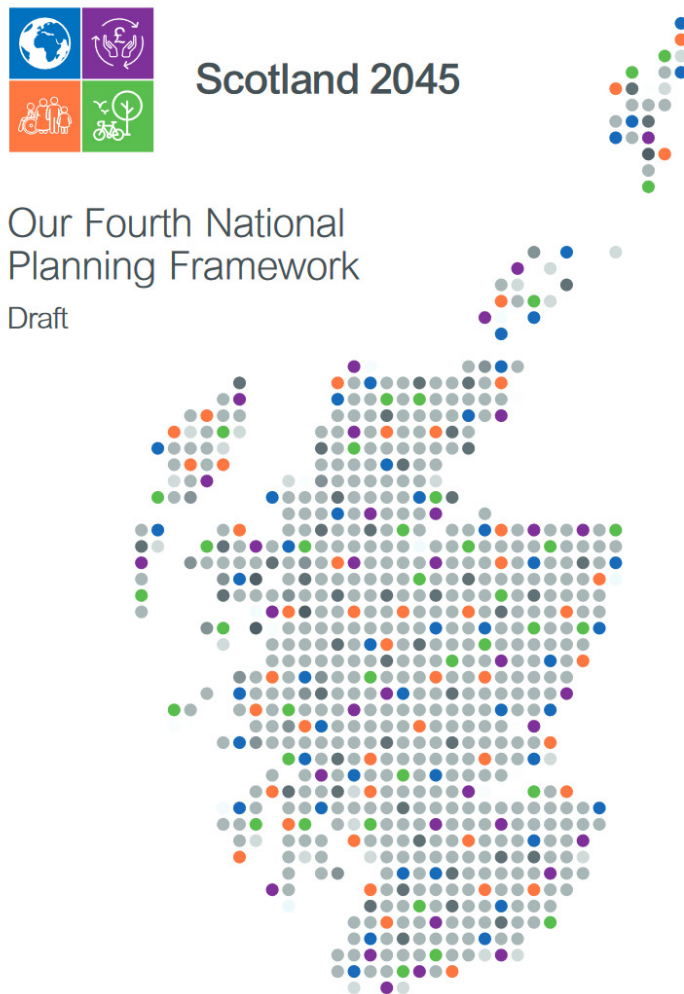
Zero Waste Scotland (ZWS) kindly agreed to include some of these concerns, along with their own, in the consultation submission to the Scottish Government. With this in mind, SEDA magazine team asked ZWSs Stephen Boyle to guest edit the cover issue, NPF4: planning for our future? Stephen gathered some eminent professionals in the field to explain NPF4 and tease out some of the issues.

Of course, this edition also has the features which you would expect from SEDA magazine, with reports from SEDA's Land and Solar, more about mass timber and an honest appraisal of the self-build project in Hull about which architect, Duncan Roberts, has regularly reported on these pages.

Finally, we asked you if magazine readers were happy with continuing to receive it online, rather than an increase in

subs to pay for p&p hard copies through your letter boxes. We have had no response at all so we will continue to send you our offering online. Remember, however, that you can order a lovely hard copy magazine via the SEDA website. If you have any comments, points, questions, of course, please email us. We are keen to hear from you. ■

Image:
NPF4 Cover, Scottish Government



Guest Editorial

Stephen Boyle: Manager Built Environment, Zero Waste Scotland

As we move towards a net zero carbon society the importance of consumption and the embodied carbon in the materials we use is becoming more widely recognised and understood.

Addressing embodied carbon requires developers and planners to think about how buildings can be designed differently, respecting the limits of our environment both in terms of the materials used and the construction process itself. It is a critical shift in the journey towards net-zero, as embodied carbon represents a substantial proportion of the total carbon emissions of a development over its lifetime.

We're now beginning to see a planning framework that takes this into account – and it's a stark reflection of the need for change. Put simply, developers and planners must consider embodied carbon in all projects if they're committed to a future in which we survive and thrive both as a sector and as a society.

From only one mention of sustainability in National Planning Framework 3, we now have the inclusion of sections and policies on zero waste, the circular economy and embodied carbon in the draft National Planning Framework 4. Another positive inclusion in the draft framework is National Development 5, an initiative to support greater reuse of construction materials in a circular economy.

These are all great strides when it comes to a more circular construction sector for Scotland – but as Built Environment Manager at Scotland's circular economy

leads I'm bound to say that!

This edition will explore in detail the potential impacts of the proposed NPF4, with five expert articles examining how the framework will impact on infrastructure, biodiversity, blue and green infrastructure, the circular economy, and the planning system in Scotland.

In my view, the transition to a circular economy will be critical in achieving sustainable places. Zero Waste Policy (20) goes some way to explore this, but the framework could go further and create a standalone Circular Economy Policy.

This would allow other aspects of a circular economy – such as the connections to employment, business models, communities, reprocessing and remanufacturing industries, product design, land use and the bioeconomy – to be explored more fully.

My own perspective aside however, there are those who believe that the adjustments to the planning framework do not go far enough. Indeed, there are opinions in the public domain that it is urban-centric and not linked closely enough with the new Human Rights Bill or Scotland's bioeconomy.

Whatever view you take, it is true that the new framework has huge potential to be a positive driver for change, embedding circular principles at the outset of a project (where it can be most effective) and sending a powerful market signal that the future of Scotland's construction sector is circular. ■



Images:
Zero Waste Scotland Logo & Promotional
Image, Stephen Boyle

Why the National Planning Framework Matters for Climate Change

Petra Biberbach, Chief Executive, PAS petra@pas.org.uk

Planning has always had a key role to play in addressing climate change but often without fanfare. In the words attributed to the founding father of modern town planning, Sir Patrick Geddes, "think global, act local". The forthcoming National Planning Framework 4 is very much on course to do just that and to significantly enhance the role of and requirement for the planning system to tackle climate change.

The consultation on the new draft National Planning Framework 4 (NPF4) closed at the end of March 2022. Following the consultation and the end of parliamentary scrutiny, the Scottish Government will produce a final document. What is clear already is that it will be a very different beast to its predecessors.

The National Planning Framework, as the name suggests, is Scotland's national framework that sets the direction for planning. The 2019 Planning (Scotland) Act made several changes to the format of the framework, raising its importance in the decision-making process.

One of the most important changes is that the NPF4 will be part of the Development Plan. Effectively this means that it will sit at the top of the hierarchy of plans and as such it will now have an elevated status compared to its predecessors.

NPF4 will set planning policy at the national level and this will cascade down to the local level. The idea is to address issues that are uniformly relevant across Scotland (such as climate change) at the national level, without having to replicate policies in every planning authority across the country. This will not preclude local planning authorities, from instances where a specific local approach may be needed, however, highlighting the importance of getting these planning policies right at the national level – especially the emerging policy on climate change.

Planning for climate change

Planning has always had a role to play in addressing climate change and has for a long time worked to support sustainable development. However, the changes to the forthcoming NPF4 really mark the first time that the planning system proposes to centre the climate emergency at the heart of its decision-making processes.

NPF4 will introduce new policy areas and new ways of thinking for planning: e.g., climate emergency, community wealth building, circular economy, human rights etc. The new framework is also required to meet targets for the reduction of greenhouse gases emissions and to support biodiversity.

There is a saying attributed to Sir Patrick Geddes, "Think globally, act locally". It's no surprise that much of Geddes' legacy as town planner (and much more) focuses on the importance of a holistic approach,

which is more relevant than ever with the climate emergency.

Scotland's climate is changing. It is becoming hotter, wetter and sea levels are rising. In the coming decades climate change will intensify and we are going to have to find a way to live with the impacts. Rather than seeing climate change as an 'extra' thing we have to do, we must build it into our standard practices when it comes to planning. One way to do so is to explore how implementing adaptation measures can bring multiple benefits to our communities, in a sense shifting the narrative from seeing climate adaptation as a burden to seeing it as an opportunity.

There are not only obvious environmental advantages to acting as early as possible - to prevent flooding, to mitigate the worst impacts of rising sea levels etc. - there are also economic advantages to Scotland acting early and taking a planned approach to climate change.



Image:
Graffiti, Rod Long on Unsplash

Decarbonising development

The Global Commission on Adaptation identifies a high overall rate of return on investment for climate adaptation, with cost-benefit ratios ranging from 2:1 to 10:1. In other words, a planned approach that recognises adaptation as an investment could reap economic, not only environmental, rewards.

NPF4 will be one of the most important ways that the planning system can respond to the climate emergency. The final framework must include policies and mechanisms that enable ‘climate ready’ investment to deliver long-term social, environmental and economic benefits.

There are four key pillars of national policy proposed in the new NPF4 and the theme of sustainability cuts across all of them. In particular, the proposed policy around sustainable places seeks to address the climate emergency by reducing carbon, moving towards net zero, supporting energy efficiency, reducing the need to travel unsustainably, and diversifying and expanding renewable energy generation.

The draft NPF4 proposes:

1. “When considering all development proposals significant weight should be given to the Global Climate Emergency.”

2. “All development should be designed to minimise emissions over its lifecycle in line with the decarbonisation pathways set out nationally.”

3. “Development proposals that will generate significant emissions, on their own or when combined with other proposals or when considered in combination with other proposals, allocations or consented development, should not be supported [...]”

4. “Development proposals for new, or alterations to, buildings, infrastructure and spaces should be designed to be adaptable to the future impacts of climate change.”

There is no doubt that the planning system is setting an ambitious role for itself with regard to climate change. Yet I’m optimistic about the direction of travel. The 2019 Planning (Scotland) Act also defined the overall purpose of the planning system: to manage the development and use of land “in the long-term public interest”. If the climate emergency is anything, it is surely that.

Biography

Petra is currently the Vice Chair of LINK Group and chairs LINK’s Sustainability Subcommittee. She is also a member of the Place Standard Implementation Group. Petra served on the Independent Review of the Scottish Planning System and was Convenor of Planning on the Loch Lomond and the Trossachs National Park Authority. In 1998, Petra founded and was chair of the Campaign for Borders Rail (CBR) which campaigned successfully for the reopening of the Borders Railway. ■

How could Scotland's planning system help us move towards a circular economy?

Cliff Hague, OBE, Emeritus Professor of Planning and Spatial Development at Heriot Watt University, freelance consultant and researcher

Strange bedfellows?

The Draft of National Planning Framework 4 (NPF4) broke new ground in declaring that it supports Scotland's transition to a circular economy. It stated, 'Our focus is on making productive use of existing buildings, places, infrastructure and services, locking in embedded carbon and minimising waste, and supporting Scotland's transition to a circular economy.'(p.10). As NPF4 aims to steer planning policy across Scottish Government and our 32 local authorities for the next decade and more, shaping decisions on what development takes place where, this is good news.

The Scottish Government committed to a circular economy back in 2016, but previously has made scant reference to the part that the planning system should play. Previous versions of the National Planning Framework had not engaged with the circular economy idea. Planning practice has been attuned to facilitating development, not the circular economy. However, the planning system should be seen as a key means of steering Scotland towards a CE, because:

- Planning is future-oriented;
- Planning is a means of stimulating and directing investment into a CE;
- Planning can regulate construction and development to prevent or reduce waste and to require recycling of materials;

- Planning can influence the use of land and water to protect natural ecosystems;

- Planning is place-based and cross-sectoral, addressing, e.g. transport, housing, climate change, economic development etc.

- Planning is a key interface between national policies and local implementation;

- Planning involves communities and so can educate, influence lifestyles and mobilise action.

It's not all rubbish

Circular economy waste management facilities are identified in NPF4 as one of the National Priorities. While recognising that storing, repurposing and reusing materials from demolition is important to help move the construction industry to zero waste, NPF4 is not clear at this stage about the range and scale of the facilities that will be required. This is something that needs to be worked upon now, if transition is to be smooth rather than screwed. There needs to be dialogues with the industry to identify current capacities and locations, and to quantify potential scenarios for the future.

Reclamation plants need economies of scale to be financially viable, and the lower the value of the materials, the greater the quantity that needs to be collected. Getting serious about recycling and reuse requires strategic spatial planning

decisions. Should there be a focus on the biggest cities, or a 'national' collection point with maximum accessibility, given Scotland's geography?

But a circular economy is about prevention of waste, not just recycling rubbish. This is where NPF4 is weaker. In growing market economies low value uses associated with recycling, for example, get squeezed out by speculative investment in land and property. Industrial properties and workshops are cleared for housing which brings a higher return. Thus, Scotland's spatial strategy should recognise that existing infrastructure and adaptation have key roles to play in Scotland's transition, and focus more strongly and analytically on them.

Accessibility matters for the growth of recycling, and so, therefore, does infrastructure. However, provision of new infrastructure rather contradicts the principles of a circular economy. We need to give more attention to the potential for development at existing hubs in transport networks – ports, airports, stations, motorway interchanges – and to inter-modal transport connections and logistics hubs.

We could learn from international practice. The port of Antwerp, for example, contains a major industrial cluster, waste-processing companies and logistics premises. It believes that there are numerous opportunities for a greater focus on circularity. One company's waste substance could form the raw



material for another. Along with seven chemical and energy companies, the Port is investigating the technological and economic feasibility of infrastructure to support Carbon Capture Utilisation & Storage applications. Antwerp also plans to make the 88-hectare site a hotspot for the circular economy, aimed at the sustainable processing and manufacturing industry. Circularity is the norm for the new NextGen District business park. In addition, the Port is exploring the economic and spatial potential for setting up a Recycling Hub with a view to closing the plastic circuit.

Waste is important, but it should not be the whole story. The Glossary in NPF4 defines a circular economy as follows: 'A circular economy is one that is designed

to reduce the demand for raw material in products; to encourage reuse, repair and manufacture by designing products and materials to last as long as possible in line with the waste hierarchy.' A diagram illustrates the waste hierarchy ('Prevent, Reuse, Recycle, Recover, Dispose').

There are numerous definitions of a circular economy, but narrowing it down to products and the waste hierarchy misses the more fundamental point. A harmonious relationship with natural ecosystems is fundamental to a circular economy. The planning system is directly involved in the use of land and water. It influences commuting, modes of travel and therefore air quality.

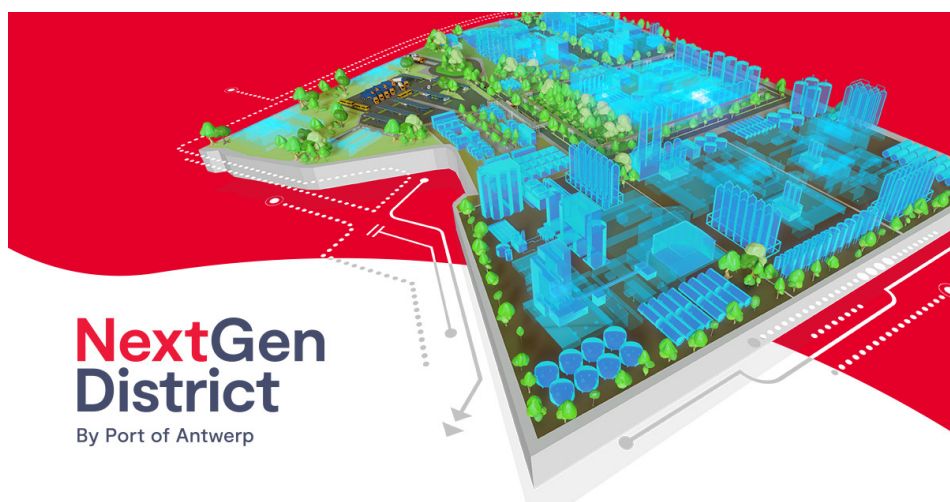
A new beginning?

Despite the ecologically based approach to planning of Scotland's Patrick Geddes a century ago, the planning system we have has been attuned to a linear model of growth. It is no surprise then to find that model still embedded in NPF4. The debate at Holyrood on 19 April on the Draft highlighted cross-party support for the general principles, which include net zero, nature restoration and recovery, clean air and water, active travel, sustainable design and use of resources. However, there was concern about the detail and the many loopholes that developers and their lawyers could capitalise upon, especially as councils' planning teams have suffered heavy cuts in the decade of austerity.

The Draft will now be revisited in the light of the debate and the responses to the public consultation. Over the next few months, a case needs to be made that the planning system can and should be aligned with the principles and practices of a circular economy. That really could be a new beginning. ■

Biography

Cliff is a past President of the Royal Town Planning Institute and of the Commonwealth Association of Planners, a past Chair of Built Environment Forum Scotland, and currently Chair of the Cockburn Association. His latest book *Programmes! Programmes! Football and Life from Wartime to Lockdown* was published by Pitch in 2021.



Images:
Overleaf: How planning can drive a circular economy graphic, Cliff Hague
Above: Next Gen District, Rood Tekst

NPF4 and Blue-Green Infrastructure - huge strides forward but the devil is in the detail

Deryck Irving: over 35 years' experience working on community regeneration, environment and placemaking across Scotland.

As someone who has been working on blue-green infrastructure and nature-based solutions for most of my career, the content and direction of the Fourth National Planning Framework (NPF4) is hugely encouraging. However, experience over many years leaves me concerned that the Framework, and the Scottish Planning Policy it contains, will not be enough to ensure the changes we need on the ground.

What are blue and green infrastructure (BGI)?

NPF4 defines blue infrastructure as:

Water environment features within the natural and built environments that provide a range of ecosystem services. Blue features include rivers, lochs, wetlands, canals, other water courses, ponds, coastal and marine areas including beaches, porous paving, sustainable urban drainage systems and raingardens.

and green infrastructure as:

Features or spaces within the natural and built environments that provide a range of ecosystem services.

In other forums, these are often referred to as nature-based solutions. Key to both terms is that we are talking about blue, green and natural spaces (or features such as Sustainable Drainage Systems, which are based on natural processes) which are designed and managed for a range of valuable functions.

Why do we need blue-green infrastructure?

Blue-green infrastructure (BGI) has a major part to play in climate action and ecological regeneration. It has the potential to make urban areas more sustainable and liveable – reducing the impacts of climate change, separating stormwater and rainfall from the combined sewer system, creating green active travel routes, improving air quality, reducing noise pollution, bringing nature closer to people, providing links in green networks and providing safe and healthy places for people to live, work and visit. In the wider countryside, BGI solutions can improve Scotland's carbon balance, contribute to net zero, reduce the impacts of extreme climate events and contribute to wider nature networks.

Examples

My images show different scales of blue-green infrastructure in Washington State, USA. Both spaces are designed to intercept water and to reduce pollutant runoff into the Puget Sound. One, in Seattle, is part of a major seafront regeneration; the other, in Friday Harbour, is part of local placemaking at a street-scale.

What does NPF4 say about BGI?

Compared to previous National Planning Frameworks, NPF4 is full of references to BGI. Across the Spatial Strategy, BGI is referred to at both a national and regional level (though not consistently across all regions). BGI is

also given a high profile in the Scottish Planning Policy. It is a recognised component of the revised 'Six Qualities of Successful Places'. Policy 12 relates directly to BGI (it is also referenced in Policy 11 Sustainable Transport, Policy 13 Flooding and Policy 29 Urban Edges and is implicit in Policy 32 Natural Places and Policy 34 Trees, Woodland and Forestry).

BGI also forms a significant component of several of the proposed National Developments (see below) – although it is notably absent from the National Walking, Cycling and Wheeling network. This is an important oversight since it appears to contradict the BGI statement in Policy 11 and there is significant discussion nationally in relation to active travel networks and BGI – both in terms of creating greener, more attractive and multifunctional routes (Green Active Travel) and in relation to the impact of routes on surface water management and the water system.

National Developments and BGI

Group 1 BGI is central to the National Development

- 1 Central Scotland Green Network
- 4 Urban Sustainable, Blue and Green Drainage Solutions

Group 2 BGI is an important component of the National Development

- 14 Clyde Mission

Group 3 BGI is referenced in the National Development priorities

8 Industrial Green Transition Zones

15 Aberdeen Harbour

16 Dundee Waterfront

17 Edinburgh Waterfront

How will the revised approach to Planning help?

For the first time, the National Planning Framework will be part of the statutory plan, which means that Planning Policy is now set nationally and interpreted locally. This means that we should see far greater consistency across Local Development Plans – providing greater confidence for communities and developers (who should experience a more level playing field).

The longer lifespan of the NPF and of Local Development Plans and the shift towards Planning being more focused on delivery, should see policies being put into practice more consistently and more rigorously than was often the case in the past. NPF4 also creates a much stronger role for communities – which can now develop Local Place Plans under the umbrella of the Local Development Plan.

So, what is still missing?

NPF4 provides a strong policy and strategic case for BGI and its use in creating a fairer, flourishing and resilient Scotland. It also presents a radically

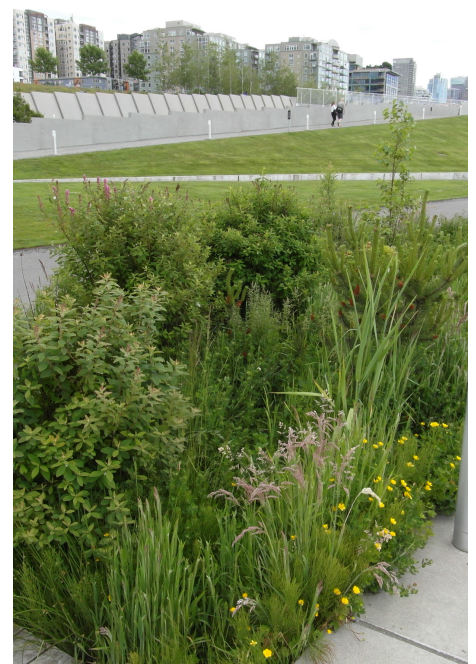
different approach to Planning in Scotland - one which should promote better, more holistic decisions and increase the scale and pace of delivering solutions. But the challenge is 'How?'

We have a framework which has most of the hooks we need (and which in final revision will hopefully be even better), but its success depends on how the Planning System is supported to shift to a new way of working. Planners, developers and communities will require guidance, support and skills development if they are to step up to this challenge. Recent years have seen Scottish Government step back from providing guidance in relation to Planning so they are also likely to need support and assistance to adopt a new way of working. I would argue that SEDA members have a role to play here – let's be ready to step up to the challenge.

Biography

Deryck was a member of the Director of Development at the Green Action Trust, the Vacant and Derelict Land Taskforce, Chair of the Coalfield Communities Landscape Partnership and a Director of Natural Capital Scotland Ltd. He is an Academician of the Academy of Urbanism and is currently leading on place-based innovation within the Hydro Nation Chair research and innovation programme based at the University of Stirling. ■

Images:
Top: Friday harbour, Deryck Irving
Bottom: Seattle, Deryck Irving



Giving Natural Infrastructure its place

Lynne Ward: Associate Director Scottish Futures Trust

Scotland's infrastructure has a leading role in our lives: from our homes and communities; our work and places of study and how we get there; to how we spend our leisure time, including the parks and other green spaces we have in abundance. What we invest in and where is therefore of relevance to all of us, requiring a robust decision-making approach. While Scotland has an extensive policy framework, two key policies are particularly relevant: the Infrastructure Investment Plan (IIP), Scotland's five-year capital investment plan which will run from 2021/22 to 2025/26; and Scotland's spatial strategy, the National Planning Framework 4 (NPF4), which is currently in draft and while reviewed every 5-years, takes a long-term look at priorities. Both the IIP and NPF4 signpost to each other; and together direct current and future infrastructure decisions, guiding on the why, what and where of infrastructure investment.

Scottish Government's infrastructure definition has historically acknowledged a broad spectrum of assets which interact for "... the economy to function and to enable, sustain or enhance societal living conditions". More recently in 2021, the breadth of assets included in the infrastructure definition was further extended to include natural infrastructure; at the time a bold and forward thinking action, as recommended by the Infrastructure Commission for Scotland. The IIP set out the basis for this expansion, identifying natural infrastructure as the ".....natural assets and networks that

supply ecosystem services and public services such as emergency services and resilience." This goes way beyond any narrow economic or social system, acknowledging the important role of natural infrastructure.

Infrastructure Investment Planning (IIP)

Within the IIP, natural infrastructure is captured within a system of three key thematic priorities:

1. Enabling Sustainable Places
2. Enabling the Transition to Net Zero Emissions & Environmental Sustainability
3. Driving Inclusive Economic Growth.

The three themes overlap. For example in the case of natural infrastructure, one measure of success is access to green space; and while it sits squarely within concerns covered by Net Zero Emissions & Environmental Sustainability, we would all recognise its role to support inclusion and place. Increasingly, as we pursue our net zero carbon ambitions, natural infrastructure can be seen to have a critical role; whether as a key tool to mitigate for carbon emissions or adaptation measures to address how natural infrastructure is being negatively affected by climate change, such as coastal erosion and biodiversity reduction. However in our daily lives it also enriches our experiences, giving us places to play as well as green

networks that take us out of the car and support our health.

The inclusion of natural infrastructure is therefore likely to have significant impact, both for policy but also in delivery. Further work to develop a comprehensive and evidence-based framework to inform investment prioritisation is underway and will inform the next IIP of 2025/6 onwards. Getting this right will require greater understanding of how infrastructure interacts, as well as what the people of Scotland see as the priorities in improving their lives.

National Planning Framework 4

The IIP however doesn't stand alone and is part of a suite of policy documents. For example the IIP doesn't focus as much on the spatial implications of these priorities and how investment will be distributed. Instead this is captured through the NPF4, which includes both spatial and thematic policies. As Scotland's statutory development plan, NPF4 will guide planning authorities on appropriate infrastructure investment in their locales. There are six themed policy areas in NPF4 with universal policies grouped within Sustainable Places, which identifies a focus on achieving a "... net zero, nature-positive Scotland", once more emphasising the role of NZ and natural infrastructure in Scottish policy. The other five thematic areas are:

- Liveable Places
- Productive Places
- Distinctive Places
- Natural Places
- Coasts.

Scottish Futures Trust

Scotland has an ambitious infrastructure policy framework, and the IIP and NPF4 are important parts of that system. Scottish Futures Trust, as Scotland's infrastructure centre of expertise, has an important role to support the delivery of policy ambitions, working with key partners across the public and private sector. We are collaborating with Scottish Government and stakeholders across Scotland in the development of the IIP route map that will guide future infrastructure investment; creating the evidence-base needed for transparent decision-making and delivery. We are also working with local authority and Scottish Government agencies, who are developing a range of infrastructure assets, working together to ensure we are doing the right thing in the right place for the right reasons. Clearly, physical infrastructure isn't the only thing that makes our places and lives full and vibrant, however it has a central role and with the inclusion of natural infrastructure, that role just got even more important.

Biography

Lynne currently leads Infrastructure Strategy within Scottish Futures Trust, Scotland's infrastructure centre of expertise. Her 25 year career spans infrastructure, employability, business interventions and related research across the public, private and third sectors, including the Infrastructure Commission for Scotland. Lynne is currently working closely with Scottish Government on implementing many of the Commission's recommendations. ■

Images:
Below: Melting iceberg, Melissa Bradley on Unsplash
Overleaf: Climate protest, Marcus Spiske on Unsplash





Valuing Scotland's biodiversity

Louise Walker BSc PhD CEnv CSci CWEM, Senior Research Manager, CIRIA

Scotland 2045, the fourth National Planning Framework draft (NPF4) is full of opportunities to improve Scotland's ecology. Responding to climate change and the ecological emergency, Scotland has set the target of net zero emissions by 2045 and developed an approach to planning and development that plays a critical role in supporting nature restoration and recovery.

This is hugely important for Scotland, as stated in the Scottish biodiversity strategy post 2020: "Scotland's rich natural resources and biodiversity are at the heart of our economy as well as being central to our environmental and social wellbeing".

NPF4 recognises that 'the purpose of planning is to manage the development and use of land in the long-term public interest' and that decisions made today will have implications for future generations. Delivery of this strategy requires the type of collaborative action that CIRIA wholeheartedly supports.

CIRIA

CIRIA is the UK's Construction Industry Research and Information Association, (www.ciria.org) We are an independent, not-for-profit and member-based organisation. Wherever there is a need for collaboration on an issue of shared interest, we act as the honest broker to help groups of organisations come together, reach consensus on the way forward and showcase good practice.

New development can significantly impact local biodiversity, and this is recognised within NPF4 which has clear policies of only supporting proposals that include appropriate measures for its enhancement (Policy 3 Nature Crisis). Securing positive effects for biodiversity is also evident in policies on Blue and Green Infrastructure (Policy 12); Natural Places (Policy 32); and Trees, Woodland and Forestry (Policy 34). Policy 12 requires the inclusion of blue and green infrastructure in development plans wherever possible, along with effective management and maintenance plans to ensure their long-term delivery. Policy 32 safeguards Scotland's natural assets and encourages connection between nature-rich areas to help protect and restore biodiversity. Policy 34 aims to expand woodland cover and protect existing wooded areas.

This embedding of biodiversity considerations within development proposals is essential to help reverse the decline in species numbers, and the creation of blue-green infrastructure will help communities to become more resilient to the impacts of climate change.

BGI

Applying these policies will require a shift in attitude toward development and creative consideration of how biodiversity can be included and enhanced both within and around it. Connected networks of biodiversity within the wider ecosystem will be important to maintain its resilience and help it thrive.

The timeline for delivery of the adjusted approach is relatively short, with significant progress expected by 2030. This means that all those involved in development, from investors to builders and those maintaining the development need to be supported in their efforts to deliver good practice. Ecosystems thinking within planning will enhance and accelerate the delivery of biodiversity net gain.

For any infrastructure project, whether new build or retrofit we need to make the business case in order to attract funding. This means being transparent about what investment achieves and how the beneficial returns will be distributed. However, the benefits of nature-based solutions are wide-ranging and sometimes not easy to quantify. It is difficult to put a monetary value to improved aesthetics for example, or to improved health and wellbeing of a community. Showing a return on investment on these types of benefits can be tricky.

Peer reviewed literature is available, which provides evidence that these types of intangible benefits bring value to society and the economy. There are also means to quantify and even monetise benefits, but this can be a long process. Without a standard way of approaching it who is to say how realistic the calculations would be? What value do we place on biodiversity now, and will future generations agree with our evaluations? A collaborative approach is needed to ensure transparency and common understanding.

Image:
Woodberry Down & Spring Park SuDS, Louise Walker





BEeST

CIRIA works to recognise where support for good practice is needed and has collaboratively developed practical support through initiatives such as its benefits estimation tool (BEeST), its work with CIEEM and IEMA on the 2019 publication 'Biodiversity net gain: good practice principles for development' (C776) and the new biodiversity community of practice – all of which aim to share knowledge and improve the delivery of good practice.

In order to meet the ambitions of NPF4 and deliver a greener, more biodiverse and resilient Scotland by 2045, it will be important to support all those involved. This will mean addressing concerns such as whether this changed approach will be more onerous to deliver and highlighting the wide range of benefits blue and green infrastructure can provide. Communication between planning and development will need to emphasise the importance of taking action to increase the quality and connectedness of biodiversity and to provide support on how this can be achieved.

The aims of NPF4 are logical and laudable. How they are reached in practice requires a careful, collaborative approach and no small amount of awareness raising. Great opportunities to improve our environment should not be missed due to lack of practical means to apply them.

Biography

Louise is an environmental scientist with over 15 years' experience of working with multidisciplinary and international teams within the academic, public and private sectors to develop practical support for more sustainable water management. She has worked within a number of national and international projects focusing on surface water management, climate change resilience, innovation and decision making and manages CIRIA's sustainable water team with collaborative projects focusing on blue and green infrastructure. ■

SEDA Assemble - in person

Chris Stewart, director Collective Architecture

The last time SEDA took a hard look at itself was 23 years ago, under the banner 'Whither SEDA'. Back then SEDA was but a young sapling at 8 years old, when 'whither are we bound' made some sense. These days we are more mature which often needs even more scrutiny. Assemble suggests a call to arms which after a global pandemic and two years of stagnation, the time does seem ripe.

COP26 has come and gone, and issues remain unchanged. SEDA likewise ploughs a similar field and continues to be dominated by all things built while we hanker after an elusive, rich holistic mix of design spheres. Flashes of inspiration such as SEDA Land, with its delightful combination of use, economy, health, and poetry point the way. What riches may we dig up this fine spring evening?

Sandy Halliday and Catherine Cosgrove set the scene for the workshop. Membership numbers are healthy, and our new Zoom world has contributed to greater numbers joining in. A positive outcome should be the reaction to this analysis, however, the feeling is that, although numbers are up, less people are getting really involved, less people are truly engaging. The work to keep SEDA ticking over is being carried on the shoulders of a small core who need help. If we are to expand our spheres of influence outwith our comfort zone, how then do we do it? One suggestion is to focus on key topics, but what are these? This was the crux of the Assembly.

It was refreshing to lose Zoom, lose virtual breakout rooms and thumbs up icons. In exchange, it was a welcome back to post it notes, round table discussions and felt pens. First up some key questions. Answers were scribbled onto colorful post it notes which were stuck onto big bits of white paper. Stand out results as follows:

What do you get from SEDA;

like-minded people, changing minds, awareness, inspiration.

What do you want from SEDA;

Wider reach, influence, help, knowledge.

What does SEDA do well;

Not give up, joining dots, fun, leading the way, give hope.

What does SEDA not do well;

spread its voice, outreach, influence, communicate.

An uplifting start; next step was to consider what issues should SEDA address? We were each given the opportunity to scribble down our top three onto some more post-it notes. These were collated and we settled for the following six issues: Education, Planning, Land Use & Biodiversity, Retrofit, Climate Change & Net Zero, Health & Well Being, Materials & Construction, and Degrowth. Six issues quickly became six groups of about 5 each. For practical reasons the online attendees took on Education, while the other groups

were filled up by a show of hands. I joined the Degrowth Group.

The groups hotly debated their issue in two halves. In the first half we explored the subject and it's potential. In the second we focused on what we could do about it. Degrowth on its own turned out to be a subject of considerable depth but I felt we did it justice. Likewise, the other groups delved deep and together we set up quite a wish list. There simply is not the space in this article to list all the points raised which is a bit double edged. These can be found via a link at the top right hand of the Members section page of the SEDA website. How on earth do we pare all these back to a series of focused issues? This will be a challenge.

The Assembly is a starting point and was followed up with a Greendrinks event where the actions raised at the Assembly were considered and some strategies developed. Our own Degrowth Group have kept in touch and a few ideas are being kicked about. I am fascinated to see how this develops and even more fascinated to see how we can energize ourselves. Please get involved and watch this space. ■

New charter launched to stamp out greenwashing in the built environment industry

Specialist communications agency, Gusto and the Alliance for Sustainable Building Products have partnered to launch the Anti-Greenwash Charter in response to the alarming finding by the Competitions and Markets Authority (CMA) that up to 40% of green claims made online in 2021 could be misleading.

Signing the Charter enables organisations from the sector to make a public commitment to uphold these standards and eradicate unsubstantiated 'green claims' from their marketing and communication campaigns, whilst also participating in a learning programme exploring how to promote their business more responsibly. Finally, to ensure the Charter's standards are upheld, signatories will be subject to independent, periodic reviews of their communication practices.

“The findings of the CMA’s report are shocking but not wholly surprising. Since our inception ASBP has campaigned against greenwashing and continues to make the case for transparent and accurate product marketing. We welcome the introduction of the new Green Claims Code and look forward to working with Gusto on the Anti-Greenwash Charter to provide best practice guidance to encourage responsible communications within the construction sector.” Richard Broad, Projects & Communications Manager, ASBP

Find out more at: <https://workwithgusto.co.uk/the-anti-greenwash-charter>.



Giroscope Reflection

Duncan Roberts, architect

It is now over six and a half years since Giroscope and I first made contact, at a Timber Frame Self Build Course at CAT in 2015. Giroscope is a registered charity, which buys and renovates empty properties in West Hull to provide affordable homes for those in housing need. The intervening years - of Brexit, Covid and an accelerating sense of global crisis - have not been uneventful so it has been quite comforting to revisit, for this article, the steady progress made in building a terrace of three houses in Hull during that period.

In 2017 Hull was City of Culture, during which we built a prototype structure - a full-scale frame of one of the houses - that enabled the self build techniques to be practiced and the planned room sizes to be assessed. It was a rewarding and useful exercise which cost only about £7500. Unfortunately it didn't help us get Planning Approval first time around and a year was lost before we were given the chance to meet the members of the Planning Committee directly, without the mediation of officers, in advance of the second submission. It then sailed through to an Approval.

There were always concerns that the final design, shaped as it was by the wishes of the original group of self-builders, was overly complex. There were north-facing entrance porches & south-facing decks; one house has an extra bedroom for a family member with special needs; and all the roofs feature dormers rather than rooflights. The incorporation of both PVs & Solar Hot Water panels made the south-facing roof pretty crowded and the large-format tiles

were a struggle to work around everything that was going on.

Building lessons

With the delays due to Planning, all the original self-builders dropped out leaving others to build the features they had requested. The basic frame design is simple enough and the double stud walls not too complicated to build but the additional features added to the work required and slowed progress.

The ground-works were complete and the frame of the first house up when the first Covid lockdown occurred. Despite this only two weeks were lost in which no progress was made at all. Also the entire building programme has been carried through by a remarkably small number of people. Most weeks only three or four have been on site and then sometimes only for four out of five days. Specialist help was brought in where necessary but the achievement made by the charity in delivering the quality of construction should not be downplayed.

The houses' as-built fabric performance remains to be assessed. The disappointments of a poor air-tightness test result was in some ways compensated for by the better-than-expected sound-proofing of the party wall construction. The first needs further consideration but the latter provides a useful template for future projects.

The services strategy for the houses: the soundness of the fundamental decision to go all-electric, will have to be assessed over time. Space heating is via simple domestic-

tariff panel heaters - which is an expensive way to heat a room but very economical to install. It is hoped that the performance of the fabric will mean the energy use can be kept within affordable limits.

The PVs have been generating electricity for daytime use by the Giroscope offices for over twelve months now and the cost of about £400 per installed panel makes their inclusion in future projects an attractive prospect. However, the tenants will benefit directly from the output of the Solar Hot Water panels plumbed into each house's system. The output from these has been consistently high and this should help off-set electricity use for water heating. Each house is being supplied with an induction hob & microwave to reduce energy use for cooking as much as possible.

When energy use calculations were undertaken at design stage the reduction in demand by the incorporation of heat-recovery on the ventilation system was deemed marginal given the additional expense & maintenance implications. In the end a combined mechanical extract serving both kitchen & bathroom was installed. This gives a steady 4L/s airflow with a humidistat-activated override. We will see how the tenants get on with this as a system. There have already been comments about fan noise.

Another change from the first group of self-builders to the final tenants has been the substitution of baths for showers. This will have an impact on water use but may be a good way to use all that solar-heated water.



Images:
Top: 2016 site planning model,
Bottom: Frame raising
Overleaf: PVs and Dormers
all Caroline Gore-Booth

Buildings in use

The three houses are ready for occupation but, inevitably, the landscaping works are still to be completed. The access ramps and bridge serving the two end houses have been installed but the balustrading is not yet complete. Two of the three south-facing decks have been built but, interestingly, the tenants seem to favour sitting out on their north-facing entrance decks as these catch the evening and early morning sun.

Then there is the issue of how to deal with the contaminated soil in the small private and the larger, shared, gardens. The industry standard solution of digging out 600mm of topsoil and replacing it with clean material seems a strategy of shipping the problem elsewhere. A proposal for on-site

remediation with testing over the next three years has been submitted to the Council for their consideration. We await their response.

It should be borne in mind that whilst planning for and building these three houses Giroscope has acquired, renovated and let out about 15 other properties, both houses and flats. The cost per unit - the purchase & building work - has been considerably less than the cost of building one of the self-build houses. However, everyone who visits the new-builds appreciates the difference in the quality of the interior spaces, the connection to their south-facing gardens and the personalisation that has been possible.

The houses will be monitored over the coming years and the feedback from the tenants used to inform future decisions.

In addition to the consideration of any future new-builds Giroscope also has the considerable task of converting its existing stock of Victorian terraces to a fossil-fuel free future. There is plenty of work to do yet. ■



CrossCut at Falkland Build School

Laura Jaap, Cross Cut Cooperative www.crosscutcoop.com; Instagram [@cross_cut_coop](https://www.instagram.com/cross_cut_coop); Facebook [@crosscutcoop](https://www.facebook.com/crosscutcoop)

Cross Cut Co-op are a feminist building company and the only women and non-binary led course provider in Scotland. As an ambitious young start-up, they sprung up to challenge the existing cultures of the building industry. They aim to create safer, high quality, accessible learning and working spaces for women and non-binary people.

Under East Lomond Hill, in the Field of Learning on Falkland Estate, Cross Cut broke new ground, running their first 'Intro to Hut Building Course.' Over four days, participants experienced: how to safely use hand and power tools; how to put together timber wall panels; the communal raising of wall frames; how to make rafters; installing the many layers of build-up that make up a wall, including cladding with both vertical and horizontal larch boards.

Alongside Cross Cut's course, Becky Little, Daniel Postma and Duncan Roberts also tutored groups in different building styles and together we created a passionate little building community for the week. The Build School was quite the social hub allowing for a beautiful atmosphere that brought together craftspeople, natural building skills and knowledge.

Cross Cut's Hut Building cohort also had some words to share on their experience!

"As an individual I felt very supported to learn completely new skills and build confidence, which I know will now allow me to pursue projects of my own at home. While educational in both tool use and building techniques, the course was also

great fun and I will highly recommend Cross Cut to my friends."

"I was rather anxious before I arrived, but instantly felt relaxed and supported to undertake tasks a million miles out with my comfort zone."

"The Cross Cut course I attended was hugely enjoyable in an atmosphere of professionalism with great attention to the health and safety of the group."

"Last week was utterly memorable and inspiring. Covid had me become pretty reclusive by necessity. This course challenged me to step out of my comfort zone in many ways and I loved it. What a lovely group of people and what great professional teaching."

"I loved everything about this course. Jodie and Laura were great teachers, and I learnt a lot from them. Having the opportunity to work on a project with a bunch of new people for four days was brilliant. Not only did I gain extra skills and improve my confidence with power tools, I made a bunch of new friends. A wonderful antidote to Covid!" ■

Images:
Hut building at Falkland, Laura Jaap



Review of *'Natural Building Techniques: A Guide to Ecological Methods and Materials'* by Tom Woolley

Sam Foster, Architect

“You can’t write on that book!” exclaimed my wife as we sat down for a long train journey and I started jotting notes, in pen!, in the margins of architect Tom Woolley’s new publication. “Oh yes I can,” I replied, not really knowing how else to record my thoughts in a systematic way, but safe in the knowledge that SEDA had offered to buy me a copy if I really wanted one. Don’t let the fact that I’d already bought this one before being asked to review it imply that it’s any good though: you’ll have to keep reading to find out if that’s the case...

Natural Building

Set across ten chapters, with five of these each focusing in detail on specific material types – earth, timber, lime & masonry, strawbale and hemp – the book is thoroughly illustrated with well-sized colour photographs, most of which do a decent job of adding to the text. (My inner architect demanded a few technical drawings). The context for, and importance of, natural building materials and techniques is clearly set out in the first chapter; so too is the value of building better in the first place, instead of relying on technology to come to the rescue.

It is refreshing to see the health benefits – to builders and occupants – mentioned numerous times throughout the book too, and Woolley rightly refers to the fact that the materials and techniques described are relevant equally to refurbishment and newbuild, irrespective of the size of a project and whether it’s for a home, an office or a factory.

The author has a long history of working with, and promoting hempcrete construction, so it’s no surprise to find that chapter quite a bit more detailed than the others. This isn’t a criticism though, as hemp and hempcrete are probably less well-known than timber, lime and earth, and certainly have a major role to play in the UK in reducing embodied construction pollution.

Throughout its 160 pages the book is peppered with plenty of references to further reading and source information. I was a bit puzzled by some omissions though: for example, there’s no mention in the straw chapter of Barbara Jones – arguably the UK’s most vocal and active proponent of strawbale for over two decades, and the author of perhaps the most useful UK book on strawbale construction. Similarly, the section on greenwash doesn’t mention offsetting – perhaps one of the greatest global greenwashing scams doing the rounds.

Questions

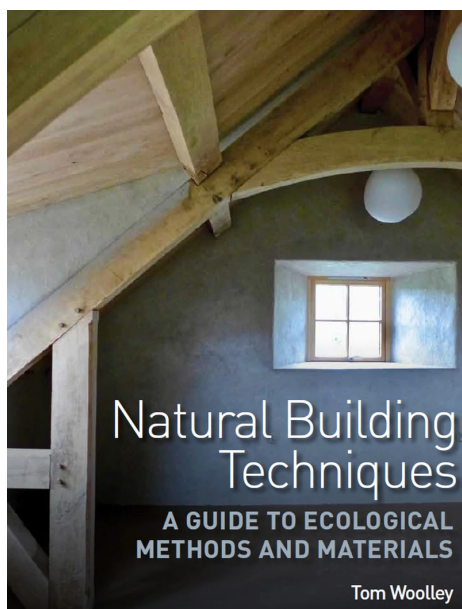
The pedant in me found the book posing questions in its sub-headings (e.g. “What are the advantages of natural materials?”) before leaving them unanswered. In Ch.3 (Timber) there’s a fairly pointless table on various exotic timber species’ FSC / PEFC certification status, which could have better served the reader by containing, for example, information on the availability, strength and durability of homegrown timber. I also don’t understand how Chapter 8 – Paints and Finishes – can entirely miss any mention of floor coverings, which can have just as many health risks as paints.

Overall the book treads a tricky path between offering general information to those with a passing interest in natural building methods and materials, and folk like architects who will be interested in lots of detail too. Despite its compact size it packs a lot in and you shouldn’t be disappointed if you buy a copy. ■



The Crowood Press

NEW BOOK



As the need to respond to climate change becomes a serious requirement for all building projects, so too does our understanding of how these bio-based and renewable materials can help to reduce carbon emissions. With convincing evidence that natural materials work as well as, if not better than, conventional materials, this helpful guide offers an outline of many of the materials, products and methods of construction that are available, equipping readers with confidence to create healthy, ecological homes.

With 200 colour photos, this comprehensive book will be of interest to self-builders, home-owners, architects, environmentalists who want to reduce the impact of construction on the planet

Tom Woolley is an architect, educator and builder who has campaigned for the wider use of green and low impact building materials since editing the Green Building Digest in the 1990s. Having taught in the UK and worldwide, he helped develop the sustainable architecture Masters course at the Centre for Alternative Technology in Wales. Working with Rachel Bevan Architects, Tom has helped to establish hempcrete construction, and is Chair of the UK Clean Air Steering Committee and a consultant to ECOS, the Environmental Coalition on Standards.

PUBLICATION DATE: 25/04/2022 ISBN: 9780719840470

£20.00 paperback 160 pages

www.crowood.com

Laminated Veneer Lumber (LVL)

Peter Wilson, architect and founding Director of the Mass Timber Academy Ltd

If, as Alex de Rijke of dRMM Architects once famously said, mass timber is the material of the 21st century, then LVL - possibly the least well-known or used of the glue laminated systems (the others being cross laminated timber and Glulam) - is the one most likely to take the spotlight by the end of this year. But before you turn the page at the mention of 'glue lamination', we need to have a grown-up discussion about modern adhesives and their use in combination with the principle of renewable construction material we have available to us: wood. In parallel with extensive R&D in the manufacture of mass timber, adhesive technology has advanced dramatically in recent years, with MUF and PUR being the most commonly used in laminate systems today. Put simply, these are solvent-free formulations with zero adhesive-related formaldehyde emissions in the finished wood products.*

So to laminated veneer lumber (LVL) and its manufacture and use. Like Glulam, it is formed from layers of wood in which the grain in every layer runs in the same direction. Unlike Glulam, however, LVL's layers are only 3mm thick and are produced by putting a long blade against a rotating log to peel a continuous veneer that is subsequently glued and pressed into boards or beams. There are two principle advantages to this over CLT or Glulam: the resulting LVL products have significantly greater strength and they make far more efficient use of the raw timber (i.e. greater yield from each log than if they were sawn into boards). Another important characteristic is that extremely long LVL

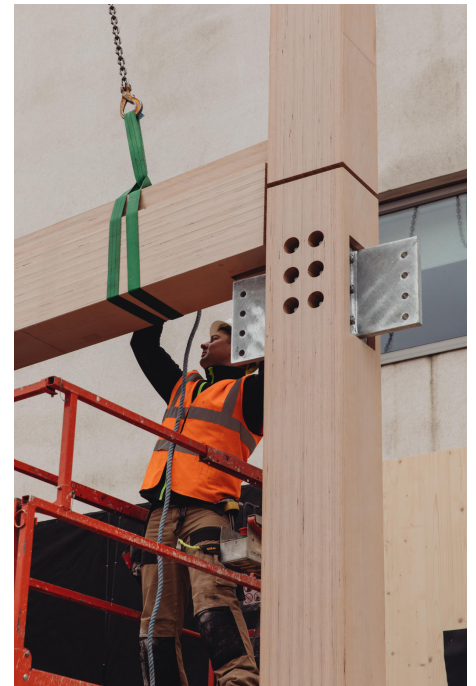
panels can be produced this way: panels that can then be curved in two directions, offering remarkable opportunities to design with wood in ways never possible before.

Black & White Building

You may not be aware of (m)any LVL projects in the UK, but there are some remarkable examples, not least the five-storey B&W office building currently being completed in London's Shoreditch area that is attracting considerable attention from commercial developers. Its prefabricated beech hardwood LVL post and beam structure supports a CLT core and slabs, but the apparent simplicity of this fully-engineered, precision-built timber construction belies its groundbreaking innovation. Sitting on a very tight site and erected at remarkable speed with no major plant, practically no noise and no waste, its optimization of material delivers a powerful sustainable agenda with only 410 kgCO₂e/m² embodied carbon (A1-A5). Designed by Waugh Thistleton Architects, the practice is currently completing a major Horizon 2020 'Build-In-Wood' research project for industry-wide publication in September, whilst recently starting a four-storey LVL commercial building on-site in Milan that is intended to demonstrate the findings from their researches.

To ensure architects and structural engineers get up to speed with this remarkable material, Timber Development UK (TDUK) in collaboration with the

Mass Timber Academy will shortly be announcing details of an in-depth online course to take place in Autumn 2022. Look out for further information. ■



Images:
Overleaf top: LVL construction, Waugh Thistleton Architects
Overleaf bottom: Project visual, Forbes Massie
Below: Frame taking shape, Waugh Thistleton Architects



Rural Tourism Infrastructure Fund (RTIF) Projects

Doune Castle: Ardoch Burn Crossing

Gary Treacy: HES National Investment Team, Project Architect (RIAS, RIBA)

As part of the Doune 'Sustainable Tourism Project' initiative at Doune Castle to explore and demonstrate the delivery of Responsible Tourism policy, the initial projects have been focused on sustainable infrastructure with external partners.

Administered by VisitScotland, the Rural Tourism Infrastructure Fund (RTIF) supports sustainable, inspiring and collaborative infrastructure projects that focus on improving the visitor experience and support the enjoyment of Scotland's rural communities. The RTIF projects at Doune have been developed in collaboration between Stirling Council, Historic Environment Scotland (HES) and the representatives of the local community including the Kilmadock Community Development Trust and Kilmadock Community Council.

Bonnie Doune

Doune Castle is located on the banks of the River Teith in the village of Doune to the north-east of Stirling in central Scotland. It was built as the home of Regent Albany, 'Scotland's uncrowned king' and his rich tastes can be seen clearly in the architecture of the medieval courtyard castle. Doune Castle is now in the care of Historic Environment Scotland, and you can walk today in the footsteps of rulers both real and fictional as Doune Castle is also a popular filming location and has featured in Monty Python and the Holy Grail, Game of Thrones and Outlander.

[Historic Environment Scotland - Doune Castle](#)

The dramatic increase in visitor numbers in recent years at Doune Castle due to this filming popularity has resulted in a number of significant challenges alongside the opportunities that this increased profile presents. A major barrier to addressing these challenges and realising opportunities is a lack of key infrastructure. Up to now, there have been no obvious routes between Doune Castle and Doune Village and therefore, the majority of visitors to Doune Castle are not exposed to the other attractions in Doune and surrounding area, including the River Teith, Ardoch Burn, Doune Ponds and a village centre with quality retail and food & drink offering.

Since the approval of the Doune RTIF Application in June 2019, we have been fortunate to be able to deliver the projects as intended through the challenges of the last number of years. Our first RTIF Project completed in early 2021 creating a new connection from the Castle, past the site of the Roman Fort towards Doune Village using a new stepped ramp and path.

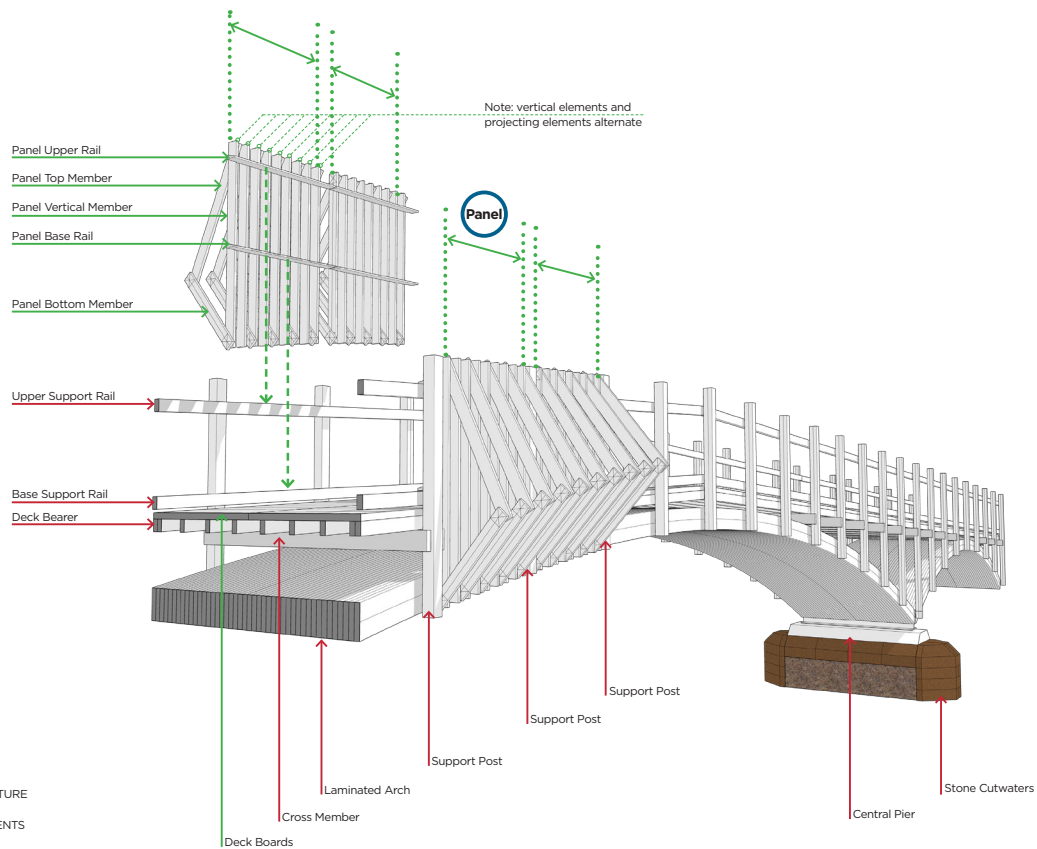
This was followed by the most significant RTIF project: a new pedestrian bridge crossing the Ardoch Burn by the Mill of Doune, and associated paths. Completed in January 2022, this new route leading from Doune Castle to Castle Farm enables important cultural and natural assets to be enjoyed by both visitors and the local community.

[Doune Castle Ardoch Burn Crossing:](#)

[Showcase Video](#)

The configuration for the bridge is a double arch: a 20m span to clear the Ardoch Burn and a 10m span across the area of flood plain connecting the high points on either side of the crossing. This arch arrangement is ideally suited to an innovative bridge structure made from short lengths of timber. These laminates are generally 1500mm to 2000mm long, depths up to 250mm and always 50mm wide and, in this case, the construction is a 'glue and screw' method whereby the timbers are vertically laminated using glue and screws between each row of laminates to create what is effectively a single solid mass of timber. This innovative and empirically tested method allows arches with a flatter profile to be constructed. The bridge is then installed in two completed arch sections without the need for scaffolding in the sensitive watercourse and forms a durable structure that requires very limited maintenance during its life span. The main span of this bridge at Doune Castle is currently the longest single span of a timber 'glue and screw' arch ever built.

The arches support a more traditional post, beam and joist deck arrangement. Added to this base structure, the guarding on either side of the bridge is an expressive three-dimensional sculptural form constructed from timber lengths connected into panels and mounted off primary support rails, to enhance the geometry of the arches spanning the Ardoch Burn.



DOUNE CASTLE: ARDOCH BURN CROSSING CONSTRUCTION DIAGRAM



Images:
Previous page top: Completed Bridge,
Historic Environment Scotland
Previous page bottom: Construction Diagram,
Historic Environment Scotland
Left: Factory progress, Beaver Bridges
Above: Bridge stone pier
Historic Environment Scotland

The primary timber for the bridge is homegrown Scottish Larch, sourced locally from the woods to the north-east of Doune in conjunction with the Moray Estate, within which Doune Castle is located. The use of a laminated structural solution is particularly suited to using local larch as this engineering approach greatly improves the structural performance of the material that otherwise would not be appropriate for bridge construction. Once felled, the timber was then cut locally to the timber sections required, using mobile saw milling equipment. Visually graded, ready for kiln drying treatment and finally planed and CNC machined to the exact timber dimensions, ready for fabrication. The two structural arches were manufactured off site by Beaver Bridges, the bridge contractor, delivered to site and finally lifted into place as complete structural elements.

Meanwhile the supporting groundworks, riverbank abutments and intermediate pier were completed, with the latter clad in stone by the in-house HES apprenticeship team, developing their traditional skills to cut and lay available ashlar stone to create the cutwater profiles, and a local Doune stone as infill to the sides. New paths then completed the connection from the Castle to the riverside and further on the other side to connect with the village.

Doune Castle Ardoch Burn Crossing:
[Timelapse Video](#)

Infrastructure investment

The final RTIF project to complete the Castle and Village connections was the installation of a new Signage & Interpretation route around Doune, including new information signage at Doune Castle to highlight the attractions and services available in the village, new maps and wayfinding signage to promote a circular walking route through the village, using the new path connections and interpretation panels, providing insight at key places of historical interest.

This important investment in new infrastructure has delivered important links between Doune Castle and the local community, promoting the many natural scenic assets and attractions that Doune has to offer. Also, the expansion of the path network within the Castle grounds enhances the visitor experience, engaging with the impressive natural environment and other cultural assets that form the setting for Doune Castle itself. ■

Location:

Doune Castle, Doune,
Stirlingshire, FK16 6EA

Client:

Historic Environment Scotland (HES)

Funding Partners:

VisitScotland, Stirling Council, Kilmadock
Development Trust

Architect:

Historic Environment Scotland (HES),
National Investment Plan Team

Engineers:

Fairhurst with Geoff Freedman Rural
Bridges

Contractor:

Beaver Bridges

Responsible Tourism at Historic Environment Scotland

Gary Treacy: HES National Investment Team, Project Architect (RIAS, RIBA)

Vanessa Glindmeier: HES Responsible Tourism Co-ordinator

Historic Environment Scotland is a charity and public body leading the way in protecting, understanding and sharing Scotland's historic environment, for today and for the future. We want the historic environment to make a real difference to people's lives: to our health, to our economy, to our culture and to our environment.

[HES Heritage for All](#)

Historic Environment Scotland is also the largest operator of paid-for visitor attractions in Scotland and tourism worldwide, currently contributes around 8% of global carbon emissions, making it a key sector in a net zero transition. We want our visitor attractions, and the communities they are nestled in, to be sustainable places to visit, and a responsible tourism approach helps us prioritise the wellbeing of our staff, visitors and the local communities of which we are part. To reflect our commitment, we have included Sustainable Tourism as a theme in our Climate Action Plan.

[HES Climate Action Plan](#)

Ecological infrastructure

We wish to ensure that we provide our visitors with the facilities, infrastructure and information they need to visit our properties in care, to ensure their visit is as environmentally responsible as possible. We aspire to do this whilst continuing to deliver increased economic and wellbeing benefits to communities and maintaining a financially resilient organisation, as well as supporting the wider tourism sector in its

ambition to become more environmentally, socially and economically sustainable.

The threats to our cultural assets from climate change are increasingly understood, but perhaps less well articulated is the significant contribution that the historic environment sector can make on a range of fronts in transitioning to a low carbon economy. Heritage assets can make better places for people to live in and better places for people to visit, whilst making a vital contribution to Scotland's green recovery from the pandemic and its transition to net zero and a climate resilient society.

Taking the approach of using Scotland's past to support our future, the recent HES Green Recovery Statement supports the green principles set out by the Scottish Government and highlights seven key areas in which the historic environment can help deliver an economic recovery, one of which is responsible tourism.

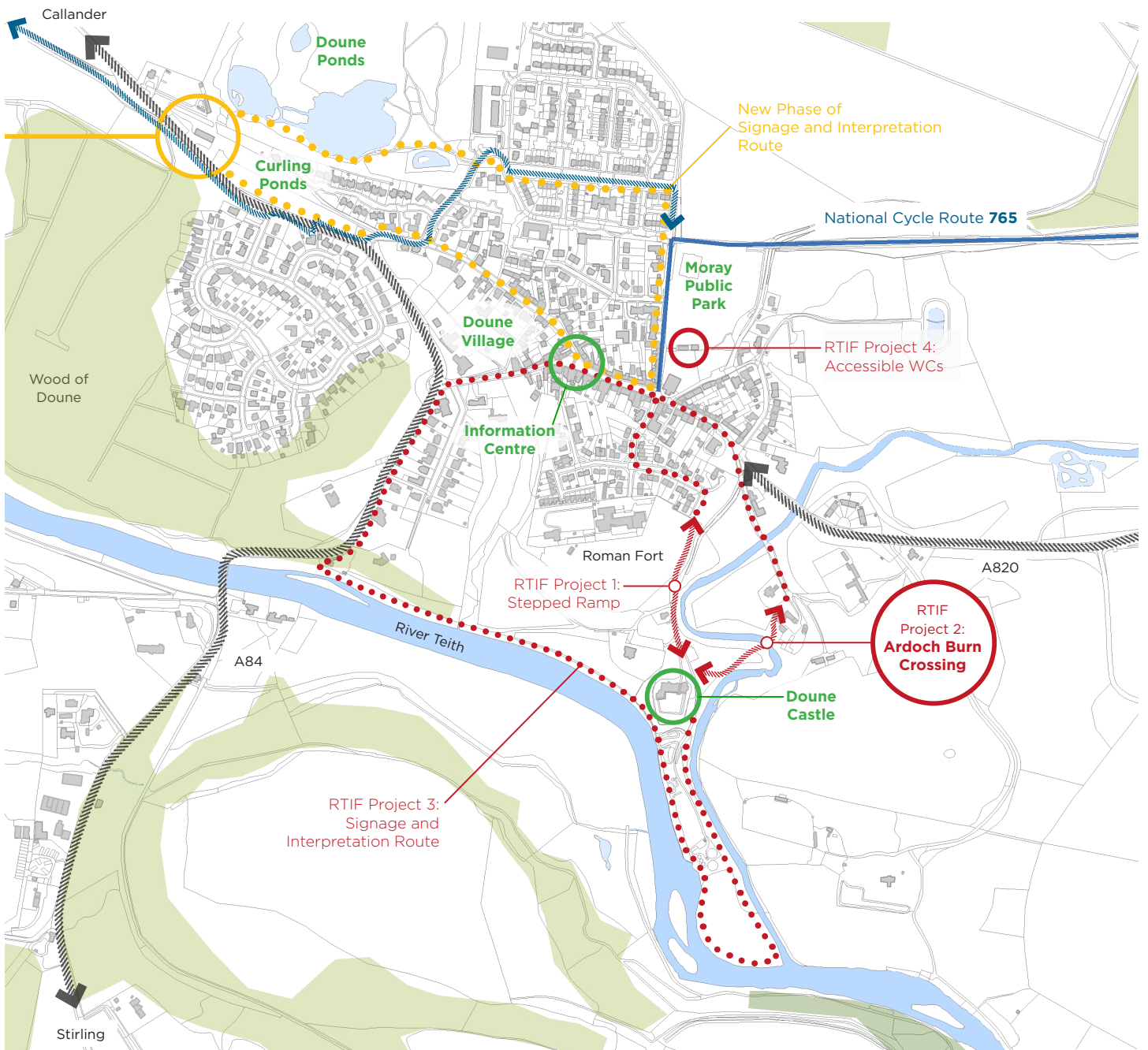
[HES Green Recovery Statement for the Historic Environment](#)

Sustainable tourism

Heritage tourism can support low carbon activities by using sustainable supply chains, reducing energy use and waste generation on sites, and developing lower-carbon and regional itineraries. Tourism can work for the local area when good quality, local jobs are created and sustained, and local businesses and communities are included in decision making.

The 'Sustainable Tourism Project' initiative at Doune is an invaluable pilot, providing a model framework of how HES might address key challenges: reduce the carbon footprint of our tourism operations, encourage social and cultural diversity and maximise benefits of tourism for communities. The project focuses on new approaches through familiar tourism functions: Travel, Commercial Operations, Visitor Experience, Access, Landscape & Biodiversity, Infrastructure and Community Engagement. In addition, the project looks beyond the boundaries of the recognised tourist attraction, taking a regional destination approach working with local organisations, the local authority and national agencies such as VisitScotland. The ambition is to explore and demonstrate how Responsible Tourism policy can be delivered

Image: Location Plan, Historic Environment Scotland



Bioproduct Conversations

Gail Halvorsen, architect

By the time you read this, you may have already been part of SEDA Land's double bill on the bioeconomy – "[Imagining Bioproducts](#)" and "[Reimagining Food](#)", held on 13 and 20 June. These two Conversations looked at the range of products that can be made from waste or anything that grows in Scotland, including algae, insects, plants or animals. Given the climate crisis and escalating oil price, it's more important than ever that we wean ourselves off dependence on fossil fuels and pursue a circular economy.

I have been astonished to discover how many products can be made from renewable natural resources. I have also been struck by how many bioindustries lend themselves to operating in remote rural locations, often at a small scale and in some cases on land that is unfit for crops or animals. A common theme of the talks at the conference was that Scotland can reverse declining population in rural areas by creating long-term sustainable industries in bioproducts, as opposed to the relatively low-paid and seasonal ecotourism often proposed by proponents of rewilding. These industries could help turn our rural communities around.

Ecological examples

One example discussed in the second event was vertical farming. Graham Warren, co-founder of [Vertegrow](#), described Scotland's first commercial "Controlled Environment Agriculture" facility near Ellon, Aberdeenshire, which is opening this summer. It will be capable

of growing high-yielding, nutritional crops year round. The new facility will run on renewable energy and use bedding made of locally-grown hemp. A vertical farm can be run from a shed or a shipping container with minimal capital cost on steep or otherwise awkward sites, freeing up good arable land for other uses.

The first Conversation, "Imagining Bioproducts" was SEDA Land's first ever live event, held in [The Gordon Schools](#), Huntly, Aberdeenshire, one of our partners in the mapping project. All earlier ones, starting with A New Vision for Land Use in Scotland in March 2021, were held virtually. Not only did the in-person audience include secondary school children, some of whom are considering what career to pursue, it also included some of their farming families.

As always we weaved in artistic pieces, this time reflecting the juxtaposition of nature and high technology that this event was all about. We showcased two extraordinary experimental musicians – [Tom Lyne](#) and [Tarun Nayar](#). Both spent time during coronavirus lockdown recording sounds from the natural world, and overlaying them with traditional instruments using modular synthesisers. Tom made a series of soundscapes in Midlothian using water, wind and air while Tarun tuned into mushrooms!

Thanks to Open University Scotland for sponsoring two poets – [Sophie Cooke](#) and [Chris Powici](#). We were impressed by the high standard of poems entered

by pupils at the Gordon Schools, each focused on the theme of bioproducts, with the winner's entry read out at the event.

Reimagining Food

Scotland has a massive pollution problem, with 47,000 Olympic-sized swimming pools of waste discharged into rivers and seas in 2016 to 2021. Scottish Water has indicated this cannot be solved just by building bigger sewers. Thousands of tonnes of ammonia are also being emitted annually into the atmosphere by intensive poultry and pig farming.

Jane Shields from [Living Water](#) described how the circular economy can resolve this. Living Water organically treats toxic and other waste from the whisky industry, fossil fuel sector and intensive farming at source. Not only does this protect and enhance local ecology by integrating treatment into the landscape, it transforms waste into a valuable resource. This is such an obvious solution for farmers – turning their waste into compost on site – it is amazing it hasn't been rolled out to all farms already.

Neil Sutherland ([MAKAR](#)) and Gary Thompson ([Woodknowledge Wales Ltd.](#)) talked about a timber supply chain based on local forestry products and the changes that need to be made across the forestry, manufacturing and house-building sectors to deliver low-carbon homes across Scotland.

Images:
Top: SEDA Double Event Banner, SEDA
Bottom: Bioproduct Growing, Gail Halvorsen

IMAGINING BIOPRODUCTS



REIMAGINING FOOD



William Clark ([Zero Waste Scotland](#)), a panelist at the “Reimagining Food” event, wrote an excellent piece on bioproducts in the [winter 2021 issue](#) of the SEDA Magazine, which I would recommend reading for more information on some of the products discussed at both events. He was joined by Des Cave ([Beta Bugs Ltd](#)) and Rupert Waites ([Buck and Birch](#)). Rupert is passionate about wild food and making food out of anything and everything that grows near him. A sense of place for him is knowing and understanding the natural world around him, foraging and being in harmony with nature. Des talked about farming insects as an alternative source of high-protein food for fish, pigs and chickens in the UK, but which, due to an illogical post-Brexit clampdown, cannot be sold for human consumption in the UK, even though insect based food is already widely available in parts of the EU including Belgium and the Netherlands.

Mads Fischer-Moller ([SRUC](#)) was a passionate advocate of bringing Scotland's bioeconomy up to the level already achieved of the Nordic countries that he has advised (he was one of the authors of “[Nordic Bioeconomy - 25 Cases for Sustainable Change](#)”). Nikki Yoxall, ([Grampian Graziers](#)), now based near Huntley on Beldorney Estate, explained how the agroecology farming technique she and her husband James have adopted is bringing biodiversity back to part of Aberdeenshire, and how there is room for sustainably-farmed beef in the future food system.

Recordings of both conversations can be viewed on the new [Bioproduct page](#) on the SEDA Land website. The page includes a general introduction to the subject and case studies.

Mapping project

Members of the mapping team had an introductory day in Huntly on April Fools' Day. So why was I surprised when we were met by a clown and prime minister William Gladstone at The Gordon Schools for the start of our tour of the town centre? We were joined over home-made lunch by members of the arts organisation, Deveron Projects, and Huntly Development Trust. We described our mapping project which was enthusiastically received, although the chair of the trust pointed out that to do the project justice we would need to run it for more than one year – more likely two or three years. This was a reality check for me. After lunch we had a tour of the surrounding area – predominantly upland sheep farms. We visited Nikki and James Yoxall's new regenerative livestock farm on Jeremy Leggett's Beldorney Estate and HDT's community-owned land at Greenmyres with its eco-booth and wind turbine.

Mads Fischer-Moller (SRUC) and Pete Ianetta (JHI) are developing a mind map for the team at Abertay University who are also developing SEDA Land's Food & Climate Game (see Spring SEDA magazine). The game comprises a “grid” of variables for players to choose: inputs, land use, production type, products and effect

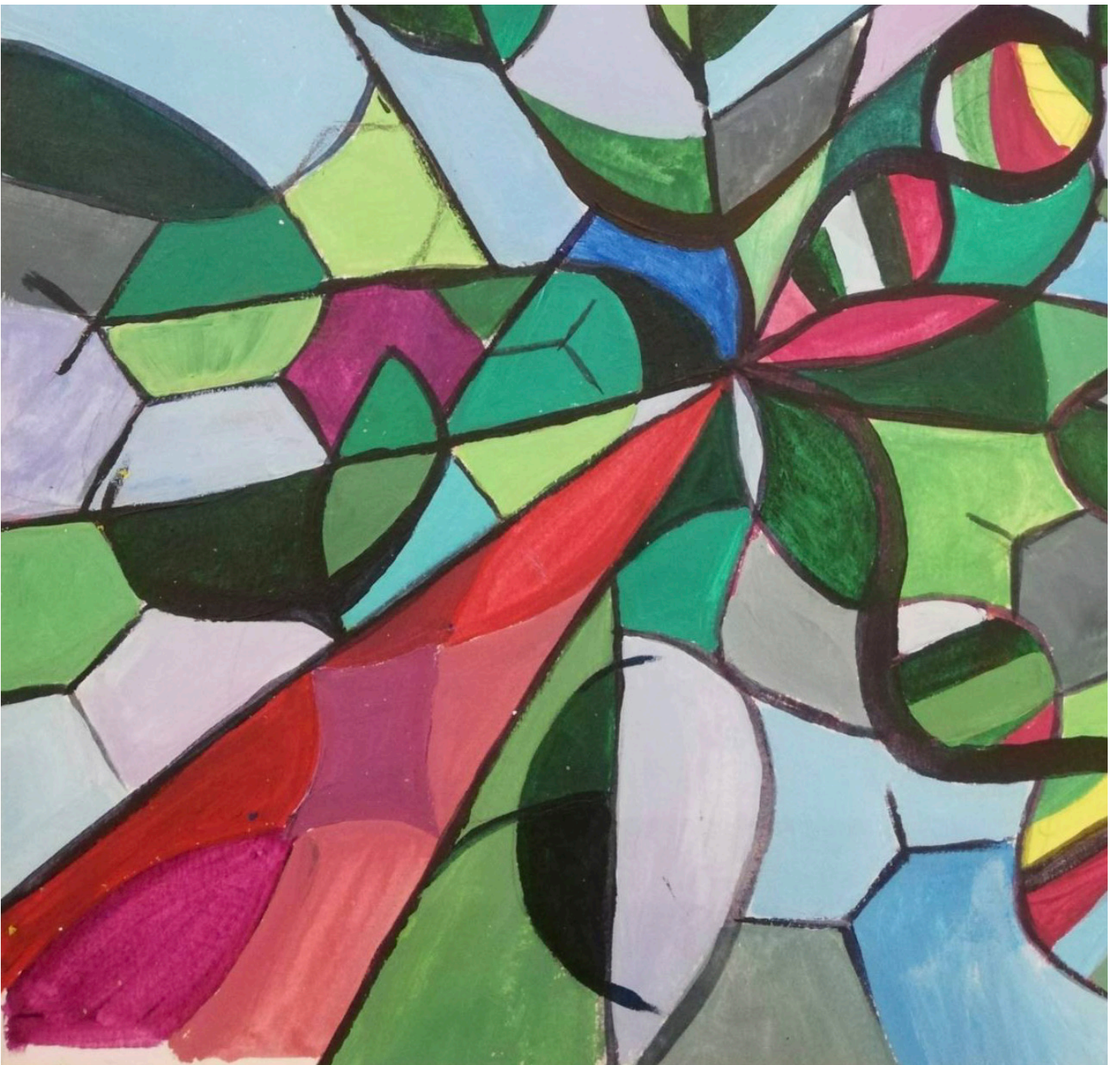
on society. This grid allows players to make links from land use to societal impact and list the “costs” of each decision.

Next SEDA Land event

SEDA Land plans to run another series about planning in rural Scotland this autumn that will address the thorny issues of rewilding, green lairds, carbon offsetting and second homes – so nothing controversial there! Some of these have been covered a lot recently but we hope to take a slightly different angle. ■

We are still in need of administrative help. Please get in touch if you can help!

Image:
'Algae on my plate' Eleanor Fraser



Solar Thermal: Trends, Techniques and Tools - SEDA Solar Spring 1 & 2

Colin Porteous & Glo Lo

SEDA Solar seminars of 2022 have a focus on solar thermal in the spring, and solar electricity in the autumn. The first two featured international market lessons, a specific Scottish manufacturing story, an Austrian urban retrofit and neighbourhood-planning tools.

Learning from Global Solar Thermal Market Conditions & Policies

Bärbel Epp, Managing Director of 'Solrico', a German agency for market research and international communication, explained that in 2020 there had been a 4% reduction in research into solar heating and cooling, and investment in the global market due to Covid19, but a higher demand from homeowners and changes in policy support. The 2021 UK development actually indicated a significant increase from 6,340m² in 2019 to some 20,000m² in 2020, with lessons learned and a call for more incentives. Sunny Italy had also grown by nearly 50% to 225,000m² from 2019-2021, but Bärbel stressed a new impetus was needed; in Austria and France solar district heating is turning around a declining market, and Germany also indicates large-scale potential with exponential growth since 1996 almost up to Italy's level by 2022. For example, Greiswald has the largest vacuum tube array at 13.1MW. Bärbel concluded that solar district heating was a game-changer throughout Europe including the Balkans, with specific

mention to Sweden and Denmark. She also cited industrial applications with small to large parabolic trough arrays, the biggest 82MW, 117,000m², generating steam at 150-300°C.

The next speaker was Klaus Kuchner, key international account manager of Austrian [GREENoneTEC Solar Industrie](#). This has three business units: OEM (Original Equipment Manufactures, making customised collectors and absorbers); Systems ([Sunpad](#), [Thermosiphon](#)); and Projects (large-scale district and process heating). In essence, GREENoneTEC's market is solar thermal district heating, associated with biomass and seasonal storage. GREENoneTEC acquired ArconSunmark as a brand in 2020. The company makes 13.6m² units, which can be handled by crane. Annual production is 1,600,000m² by highly automated, process-secured production lines, e.g. 420,000 flat-plate collectors in 2020. 85% of its products are exported primarily for large-scale district heating, suited to hilly terrain. Klaus showed the world's largest field of over 150,000m² at Silkeborg in Denmark, and concluded with a much smaller UK system, 2,500m² associated with the University of Bristol.

The last speaker, Sean Bingham, Company Director of [Barrilla Solar](#) based in Dorset, addressed a contrasting solar-thermal market, that of individual dwellings, other residential buildings and summer-demand swimming pools, campsites, etc. Sean began by relating the poor experience of the 'Green Homes

Grant' in England (not applied in Scotland). Only a few providers such as Barilla benefited from the brief 2020-21 scheme; he also commented that the UK has become heat-pump obsessed. Solar thermal had few problems compared to heat pumps. Indeed, solar-thermal preheating with a small direct cylinder could augment existing Combi boilers. In order to boost the market, and lower costs, Sean recommended a 'regression formula' governmental incentive scheme with long time frames, forecasting a potential of 1,000 systems/week for England.

Solar Neighbourhoods; urban-level solar planning, Passivhaus building design and local production of solar thermal collectors

Gloria Lo, chairing, introduced George Goudsmit, founder of [AES Solar](#), leading on local production, supported by Robert Wilson, also of AES. George was also a committee member of the Scottish Solar Energy Group, precursor to SEDA Solar, and began by relating pre-AES history. A Findhorn Foundation resident, Lyle Schnadt, inaugurated Weatherwise Solar circa in 1980. By 1990, with Lyle now back in USA, George reconstituted Weatherwise as AES Ltd. Production of a lightweight panel, with a Swedish selective-coated absorber, Tedlar outer and Teflon inner cover, was in Forres. Although Weatherwise had diversified, AES relied solely on production of these solar-thermal panels, with sizable commissions as far afield as the Seychelles. The 2010 Feed-in-Tariff (FIT) significantly changed AES's

Image:
Diesleweg 70 - decentralised MVHR panels (yellow) and sun spaces, SEDA Solar



output towards photovoltaic (PV) panels, but thermal ones are back on the increase, now with a 3mm glass cover. Robert added some details of current production, including roof-integrated panels, and market context – new-build and retrofit sectors, with SAP10 incorporating solar thermal panels into Scottish Building Standards.

Colin Porteous then described a 2010-completed hybrid solar-retrofit, a demonstration project of 1952 and 1970 blocks in Graz, Austria, up to Passivhaus standard (IEA ECBCS Annex 50). The concept is simple – a solar-enhanced insulated ‘onesie’ incorporating active and passive systems. This concept enables maximum prefabrication and economic installation without decanting residents. Performance is assisted by diagonal orientation relative to cardinal points so that all façades are subject to some sunlight diurnally. There are three new solar features complementing new triple-glazed windows: a) active solar-thermal collectors, neatwall-integrated (1952 block) and roof-mounted (1970s blocks), their thermal stores linked to deep-bore, ground-source heat pumps (GSHPs) in basements; b) passive ‘solar comb’ wall panels (these lower the ‘effective’ U-value similar to ‘transparent insulation’ systems, but with economic end-on corrugated cardboard absorbers); c) glazed sunspaces (extended from balconies). Crucially, existing solid walls become high-mass, low-temperature, heaters with warm serpentines from GSHPs fixed to outer surfaces behind the new insulation.

Ventilation is by decentralised MVHR units within the over-cladding.

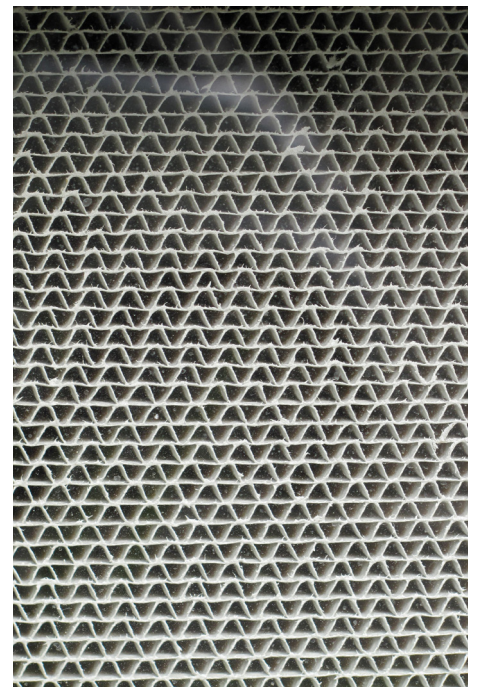
Project architects, Hohensin ZT, in association with AEE Intec (Institute for Sustainable Technologies) and consultants ESA (EnergieSystemeAuschauer), predicted post-retrofit annual heat demand 14kWh/m² (1952) and 12kWh/m² (1970), with the mean cost €816/m². Hence high-grade changes were affordable and met by a combination of financing from the central and regional governments and a non-profit industrial housing organisation GIWOG.

The third speaker, Martin Thebault, a thermal engineer from the French National Centre for Scientific Research (INES), described the use of tools in solar neighbourhood planning (sub-Task C of IEA Task 63). This includes modelling surface solar irradiance of varied typologies and morphologies – both homogeneous and heterogeneous. A complication was that different software often produces varying results for the same inputs, some being ‘sharper’ or less ‘broad-brush’ than others. Martin has been involved with the production of the entire city of Geneva in 3-D, using software used such as Rhino Grasshopper, with its advanced daylight and solar modelling, with plug-ins Ladybird and Honeybee.

Conclusion

The two seminars together highlighted the use of solar thermal in different countries of similar latitudes to Scotland, successfully utilising the technology to reduce hot water and heating demand by up to 20%, as with projects monitored in Denmark. The solar district heating systems achieve economy of scale and were therefore more successful in implementation. Solar district heating could make a turnaround, being more cost-effective than individual systems, yet multiple ownership of properties would require central intervention to coordinate. Together with an appropriate tax on fossil fuels and incentives for renewables, including solar thermal in the different countries, these systems have been demonstrated to work very well in combination with heat pumps and biomass boilers. In the following discussion, Richard Atkins also brought up the Norton Park project, which used solar slates as developed by the late Kerr MacGregor, which on average raised the temperature by 6°C in Scottish winter months, and, in turn, halved the energy required to heat incoming fresh air to maintain comfort. With appropriate modelling tools in design, carefully planned use of solar thermal systems in conjunction with other technologies, demonstrate that solar thermal has a role to play in the market and our sustainable future. Klaus called for “simple, affordable systems that people can believe in”, including governmental support to be inclusive of all renewable technologies. ■

Images:
Below, left: Diesleweg 52 wall integrated solar thermal panels and 'solar comb' on 1952 block, SEDA Solar
Below, left: Close up detail of end on corrugated cardboard in a 'solar comb' panels, SEDA Solar





Thoughts from the Chair...

Catherine Cosgrove, SEDA Chairperson

In our last magazine, we put out a call for SEDA members to gather together and discuss the future direction of our organisation. It was heartening to see many of you at the Charteris Centre in Edinburgh in May and to hear your thoughts about what we do and don't do well, what subjects you think we should cover and how we can spread our knowledge.

This event attracted a good mix of recently joined and long standing SEDA members, which gave us a broad range of opinions and expertise. It's very important that we don't become an echo chamber organisation, repeating the same opinions to an audience that we know already agree with us. Although, there were many frequently raised topics, e.g. retrofit, climate change, health & wellbeing, it was good to identify other subjects that SEDA should look at, e.g. de-growth and sufficiency and community energy.

Holding this as an in-person, rather than a Zoom conference, was also very enjoyable. While we've managed to hold our events online throughout lockdown, there's no doubt that they aren't as satisfying as being in a room together. SEDA is a community and one of our strengths is that we can ask any of our members for advice and knowledge. It's a lot easier doing this in person with a cup of tea and a biscuit than it is online. That's one of the lessons we learned

from the assembly, that we need a social SEDA as much as a formal SEDA. The informal discussions that spring up from our events often spark new ideas and it was good to see people at the SEDA assembly agreeing to work together to investigate topics they had been discussing.

When we started Green Drinks events a number of years ago we thought that they might grow independently of our formal seminars. All they really need is a few SEDA members to meet up in a local pub and talk about sustainability issues. If you want to host your own Green Drinks event, then feel free to set it up and let us know the details. We'll spread the word through the SEDA community and help make it a success.

At the heart of the SEDA assembly was a strong wish to identify our goals, how we move forward and what actions we need to take to deliver them. We've made a good start but we have to maintain this momentum. We'll be holding a Green Drinks event on 1st July in Edinburgh to discuss the next steps. I'd like to invite you to attend and to help shape SEDA's future.

I hope to see you there!