

SEDA

SEDA at 30

Politics, Pandemic & Persistence

The Scottish Ecological Design Association magazine

Spring 2021

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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 is made up of a large number of people involved in, 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 is concerned with 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 the opportunity to connect with a wide network of talented designers. Our upcoming events can be found boxed in green throughout this issue.

Cover image: SEDA

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Nick Domminey, Viktoria Szilvas & Raina Armstrong

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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Editorial

Scottish Elections, COP26 and celebrating SEDA's 30 years

Nick Domminney

Scotland hosting COP26 in November, the Climate Crisis, biodiversity / soil / water loss, environmental pollution, pandemics and many other human induced threats to life on the planet will be key concerns for the Scottish elections in May. SEDA magazine decided to offer to the main contending parties an opportunity to present their strategies for tackling these crucial issues.

You can read the responses from Scottish Labour, the Scottish Liberal Democrats and the Scottish National Party on the following pages. The Scottish Green Party agreed to respond but did not submit a contribution. The Scottish Conservative Party has yet to respond to the three emails which we sent, including to their Shadow Cabinet Secretary for Environment,



David Steel

Climate Change and Land Reform.

Of course, this edition is not all party politics. SEDA Specification, for example, has an advertorial report from a natural building materials

supplier, which offers SEDA members a free subscription to the quarterly magazine, Passive House Plus. Among many other contributions, we have an introduction to a SEDA supported design guide- on the Health Effects of Modern Airtight Construction; a plea for centralised data for hygrothermal design; SEDA Solar; a wide-ranging piece on the struggle to make architectural education Climate Crisis compliant; the latest report from the Hull self-build which we have been tracking since site start; and, with SEDA's 30th birthday this year, we are delighted to have the thoughts of one of the founders, Jim Johnson.

As ever, please [email us](#) with comments, disagreements or ideas for future issues.

If you would like to become a member of SEDA, please visit seda.uk.net/become-a-member ■

SEDA AGM and Conference:

Celebrating SEDA's 30th birthday and exploring the challenges ahead
7th – 10th June 2021

For the second year running this will be an online event. Our provisional running order is:

Day 1: review of SEDA's first 30 years with possibly one speaker for each decade.

Day 2: looking forward to likely changes over the next 30 years and how we adapt to or influence them.

Day 3: a keynote speaker followed by the AGM proper. It will be a great opportunity to look back and look forward to the challenges that lie ahead.

Gauging the Political Climate

We asked SEDA members what to put to the contenders. The responses were then collated into these seven questions.

- 1 Given that the Scottish Government has made a unilateral commitment to better the UK government's Zero Carbon date of 2050, would your party support a Scottish Carbon Tax or Carbon Incentive to encourage net zero CO₂e and, if so, to what extent?
- 2 The UK government's VAT imposition on building renovation and zero rating on newbuild is a significant disincentive to the CO₂e reductions, which can be achieved by reusing existing buildings. How would your party counter this disincentive?
- 3 Given that the UK government has committed to banning the sale of petrol and diesel for private vehicles from 2030, would your party support bringing forward that date, wider restrictions on petrol/diesel vehicles in urban areas, and/or extending this ban to other CO₂ emitters such as public transport, haulage and maritime vessels?
- 4 Buildings are currently under construction which will need to be refurbished to meet the Scottish Government's 2045 net zero carbon (NZC) target. Will your party proactively change Building Standards to require NZC standards or Passivhaus standards for all new build and major refurbishments?
- 5 With improvements in the Building Standards for thermal performance, embodied CO₂ within construction materials and processes is an increasingly large proportion of their total CO₂e. Will your party support measures to reduce these emissions such as requiring and enforcing high percentages of re-used/recycled materials/components, percentages of materials, which sequester CO₂ such as timber, or absorb CO₂, such as lime and materials which do not require energy intensive processing or transport?
- 6 Does your party support the inclusion of the Climate Emergency and sustainability studies in Scottish schools' curriculums?
- 7 Scottish agriculture has the second highest CO₂e after transport, responsible for 23.9% of all emissions. Does your party support WWF Scotland when it says that these can be reduced by 38% over the next 25 years by organic and regenerative farming methods and, if so, how would your party implement this strategy?



Scottish Labour Party

Claudia Beamish MSP, Scottish Labour Spokesperson for COP26



Claudia Beamish

Scottish Labour

- 1 A mixture of approaches will be required, including investment, regulation, law change, incentives, taxation, conditionality, and more, as well as considering how costs are split between the state, the private sector and individuals. Different methods of financing must be explored to best deliver emissions reductions alongside the benefits of a just transition, which must address the challenges faced by affected workers and communities.
- 2 Government must play a more interventionist role, but policy incoherence like this undermines any government's warm words on tackling the climate emergency. In Scotland, priority must be tackling the scourge of fuel poverty and enshrining everyone's right to a warm, dry home. Scottish Labour would double the energy efficiency funding for a major retrofit programme to deliver this.
- 3 We welcome the aim to ban the sale of new petrol and diesel cars, but there has been no work done to deliver this with the urgency needed. Scottish Labour would invest in green transport options, in order to achieve this aim as quickly as possible, and we will look closely at where this should be accelerated and expanded. In particular, we are committed to upgrading bus fleets and we intend to invest £100 million in new electric buses.
- 4 Unsustainable infrastructure investment now is time and money wasted, and undermines consumer confidence and buy-in of energy efficiency measures. Labour's retrofit programme, rejected by the SNP Government, will deliver both: well-paid jobs and give people homes with longevity. What and how we build is a key part of reaching net zero - it was Labour that made the Infrastructure Investment Plan a statutory requirement. This work must be aligned with the other housing crises Scotland faces of under-supply, unaffordability, quality, and homelessness.
- 5 It was disappointing that the SNP Government dropped the Circular Economy Bill and Scottish Labour is committed to this Bill in the next session. We need a renewed look at lifecycle of all materials. Scottish Labour secured the assessment of lifecycle emissions from national developments in the Planning Act 2019, and we need to do this at smaller scale developments too. The opportunity that design holds to tackle climate change and improve biodiversity, should be seized to maintain Scotland's inventive reputation.
- 6 The climate strikers have been an inspiration and I have seen the direct impact their protests made in Holyrood. The climate emergency must be woven through all levels of education and in upskilling beyond school. These lessons must teach climate justice too, so next generations can understand Scotland's historical responsibility to those on the climate frontline.
- 7 Reducing agricultural emissions is essential if we are to meet our climate target, however, farmers and crofters are currently attempting to do so within a support system and regulatory framework which fail to enable the change we need. We have given a commitment that a Scottish Labour government would publish an Agriculture Bill within the first year of the new Parliament, setting out proposals for a new support system with environmental sustainability at its heart.

Scottish Liberal Democrats

Liam McArthur MSP



The most profound and challenging choices and decisions in Scotland's history will fall to the incoming generation of decision-makers.

Decisions made over the course of the next five to ten years will either make or break our planet.

Scottish Liberal Democrats have long recognised the threat posed as well as the urgency and ambition of the action needed to combat that threat.

Scotland missed its emissions reduction target for 2018 and other years before that. So, while the SNP's rhetoric and promises are world leading, their delivery isn't.

Scottish Liberal Democrats have backed a target of 2045 for net zero in Scotland and argued for it to be adopted at the UK level too. We also played an important part in raising the Scottish Government's ambitions and securing a more ambitious 2030 interim target. Chris Stark, the Chief Executive of the UK Committee on Climate Change, recently described that goal as "very, very stretching".

Over the last five years we have pushed for greater action on electric vehicles, warm homes and the

elimination of plastic pollution. We have held the Scottish Government to account on their support for policies like a third runway at Heathrow, which flies in the face of tackling the climate emergency.

But the next government is going to have to consistently push the boundaries of what is possible. We need ambitious measures to reduce CO₂ emissions, both in terms of incentives to reduce emissions and measures to push back against the worst polluters.

We have previously proposed at a UK level to remove the disincentive that exists under VAT to renovating existing buildings compared to building anew. We didn't get much support and so we welcome this new support of campaigners, such as SEDA, to change public perception about this and to tackle the vested interests in the housing industry.

We want ultra-low emission vehicles to be the norm. At this election we are putting forward plans for a substantial network of high-speed electric chargers so that millions of Scots, who don't have electric vehicles, can have confidence in the technology. We also think the public sector should switch over more rapidly to lead the way and guarantee the network of chargers. Additionally, we have supported the introduction of low emission zones for health and climate benefits.

There are pilots of low emission ferries in Orkney and we need to switch the rest of the fleet over to these technologies as soon as we can. We also want railways converted away from fossil fuels and for the haulage industry to adopt new technology sooner as we see this as an industry where electrification is inevitable.

At our autumn conference last year, we backed a new package of measures to tackle fuel poverty and overhaul Scotland's building code. Scotland has some of the least energy efficient buildings in Europe and fuel poverty is particularly high in rural areas. Under the SNP plan people will still be living in fuel poverty in 2040. That has to change. As well as rolling out a national insulation retrofit scheme to tackle fuel poverty and reduce emissions, we also committed to support councils in building social housing to the high-efficiency Passivhaus standard, massively reducing energy bills. We want to see increased building standards for thermal efficiency to require all new-build residential properties to meet EPC A ratings by 2025, and Passivhaus standards by 2030.

We want to legislate for a circular economy, whereby almost everything we use can be repaired, re-used or recycled. Materials for construction – given the quantity of them - will be an important part of this.



Scottish National Party

Ben Macpherson, Scottish Government Minister for Rural Affairs & the Natural Environment and SNP MSP for Edinburgh Northern & Leith



Under a Liberal Democrat government, a Circular Economy Act would introduce legally binding targets for reducing the consumption of key natural resources and other incentives for businesses to improve resource efficiency.

When it comes to agriculture and the environment, we are supportive of the principle of moving from a support payments system, based on production, to one based on stewardship and preventing environmental damage. In our budget negotiations with the Scottish Government we succeeded in securing £5 million more for agriculture transition funding, which rewards farmers for environmental stewardship and helps our climate change priorities. We are keen to boost local procurement of food in hospitals and schools, both to reduce food miles and to restore a sense of connection between our citizens and the land we live in.

Finally, it is important that the next generation knows how much is at stake. That's why we have backed proposals from Teach the Future to ensure that the climate emergency and sustainability studies are on the Scottish curriculum and that schools are retrofitted to ensure that they meet the principles of effective and green design that we aspire to.

Scottish Liberal Democrats will put recovery first.

1 Under the SNP, Scotland is leading the UK on tackling the climate emergency.

We have been clear on that, after leaving the EU, our preference was for an Emissions Trading Scheme linked to the EU's scheme where possible – or, failing this, a standalone scheme – rather than pursuit of a carbon emissions tax, which would have threatened the devolution settlement.

The UK ETS replaced our participation in the EU ETS in January and ensures a continued carbon market to drive decarbonisation for our largest greenhouse gas emitters.

As Scotland will host COP26, which will include rules on international carbon markets, we will continue to work with other countries to reduce our emissions – which is more important after Brexit, as we've lost access to the world's largest carbon market.

2 The SNP Government has repeatedly called on Westminster to reverse this decision – and will continue to do so.

But this inaction won't stop us improving existing stock

standards in Scotland. The SNP has placed decarbonisation and energy efficiency at the heart of its Green Recovery Plan. We have announced investment of £1.6 billion over the next five years to decarbonise our homes and buildings - reprioritising the Heat Transition Deal to include £50 million for a Green Recovery Fund with a focus on heat decarbonisation and local energy systems.

Also, £20 million to decarbonise heating in social housing, £2 million capital investment for remote communities through our Community and Renewable Energy Scheme and support to enable affordable housing to meet zero carbon standards.

3 By 2030 Scotland's roads will start to phase out new petrol and diesel cars and vans.

We will have almost completely decarbonised our passenger railways and will have begun work to decarbonise challenging transport modes, such as HGVs, ferries and aviation.

We have also made a commitment to reduce car kilometres by 20% by 2030. We will also work with public bodies to phase out the need for new petrol and diesel light commercial vehicles by 2025.

4 The SNP's Heat in Buildings strategy sets out the vision for transforming more than 1,000,000 homes and an estimated 50,000 non-domestic buildings to be using low and zero emissions heating systems by 2030.

We have also published a call for evidence to support the development of the future Low Carbon Infrastructure Transition Programme (LCITP) as we seek input on a range of support mechanisms for development and delivery of large-scale low and zero carbon heat in buildings projects.

5 The Wood for Good programme sets out the timber industry's campaign to promote the use of wood. With the Royal Incorporation of Architects in Scotland and Architecture and Design Scotland, the Scottish Government is supporting timber housing projects.

But there is more we can be doing. Society is inspired by the idea of wood as a building material that can be used, perhaps not to replace concrete block entirely, but instead of concrete block. That could contribute to climate change mitigation.

6 DFM and Education Secretary, John Swinney, has met with representatives of the Teach the Future Scotland campaign to learn of their experiences of climate education.

The organisation has raised a range of topics regarding teacher education and curriculum content.

The SNP has committed to actively exploring all the matters raised by the campaign. Learning for Sustainability has been an entitlement for all learners since 2012 and as such, Scotland has been seen as a global leader in relation sustainability education for a number of years.

Our Learning for Sustainability Action Plan seeks to ensure that all young people are developing the skills, knowledge and values to live sustainably.

7 We remain committed to supporting active farming and food production but farmers and crofters must play their part in reducing emissions too.

A re-elected SNP government will bring forward new policy proposals to underpin future rural support. There will be "green strings," but we will be guided by

the sector-led groups.

While steps are taken to reduce emissions, it shouldn't be done in a way which exports the problem to countries with a poorer track record in terms of animal welfare and production methods. Future policy will support farmers to produce more of our own food needs sustainably and to farm with nature. Targeted outcomes for biodiversity gain and a drive towards whole farm, low carbon approaches will improve resilience, efficiency and profitability.

Our Climate Change Plan update provides a pathway to transform farming in Scotland and to optimise land use.

Over a third of all funding for farming already supports environmental activity. The Sustainable Agriculture Capital Grant Scheme helps farmers invest in specific items of agricultural equipment which will support delivery of greenhouse gas reductions.

The 2021-22 budget commits £45 million for the Agricultural Transformation Programme to help deliver the target of net zero greenhouse gas emissions by 2045 and improve environmental sustainability. ■



COP26:

Our Action Plan

Natasha Houchin, SEDA

The directors at SEDA have had much discussion recently about how SEDA and its members can be involved with, and promote, this year's COP26 conference. As part of this process, we have submitted an expression of interest to the UK Government to exhibit within the COP26 blue or green exhibition zones.

Our proposal title is 'Sustainable Renovation and Retrofit of Existing Buildings'. We hope to share our knowledge, research and publications on sustainable renovation of existing buildings with a wide audience. Our message will convey information to help others deliver a reduction in energy use, provide a healthier indoor environment, use environmentally responsible materials and provide resilience against climate change. With existing buildings, accounting for nearly 40% of all global energy use and carbon emissions, we consider this is a key issue in relation to the built environment that needs to be addressed to help reduce CO₂ emissions and contribute towards Scotland's and the UK's targets for Net Zero Carbon.

Holistic approach

At SEDA, we promote a holistic approach to sustainable retrofit and our members have delivered many

successful projects that can demonstrate best practice design, detailing and construction methods. In the ambition to achieve Net Zero Carbon, we discourage a quick fix approach that runs the risk of carrying out work that could unintentionally create long term damage to the buildings and the health of the occupants. We have made reference particularly to the retrofit of our historic buildings that require a sensitive and evidenced approach to avoid both physical and aesthetic damage. With this in mind, part of our submission ethos is to collaborate with other building and environmental groups to potentially share information in relation to construction lessons learned in relation to historic buildings and the retrofit process in the wider housing context. This is particularly important to policy makers who, having identified their net zero carbon targets, are striving to identify what steps are required to deliver these.

As many of our members are experts in their fields, they have been invited to speak at other conferences and been involved in creating sustainable design resources with other organisations. To allow conference delegates access to a wider range of sustainability information that spreads beyond the organisations present, we propose to team up with other partners



Cristian Ibarra (Pixabay)

to offer as much information as possible. This will provide essential information to social housing providers across the world as they transition to low energy housing. All SEDA publications and any new resources created for COP 26 by us will also then be available on our website. This will also be an opportunity for our SEDA Solar group to share their extensive research carried out into solar design in the UK and Europe.

SEDA support

With a focus on Cities and the Built Environment, as a key theme of this conference, we have also offered to provide information and speakers in support of other organisations who are presenting on this topic at COP26.

With Scotland and the UK's net zero targets paving the way on how we can tackle climate change and carbon emissions, we will continue to strive to influence as many people as possible. We hope to hear the outcome of our application in May and look forward to bringing you more information about COP26 going forward. ■

A Forum for Structural Engineering

SEDA - civil/structural

Ema Hearty, Ruth Crewe, Tim Hetherington & Tom Hay

As a structural engineer, calculating your own carbon footprint is an uncomfortable experience. Whilst others agonise over their foreign holidays and eating habits, structural engineers have to face up to a distressingly large quantity of embodied carbon specified in their day to day work, which dwarfs any personal impact. This is overwhelmingly due to two ubiquitous high embodied energy materials: concrete and steel. The former, which is unrecyclable (certainly in its current form) and the latter, which has only barely begun its transformation into a material suitable for a circular economy. It is an awesome responsibility that the structural engineering profession currently faces.

Barriers to change

But of course, it is not only down to engineers, who are just part of a complex jigsaw. Arguably the choice of span is probably the most



NASA

important decision, which clients and architects may agree up-on early on. Also the weight of construction materials, not to mention the choice of materials themselves, can have a dominant impact. Inherent 'rationalizations' of the building process often go unchallenged. Unwritten rules about, for example, how many different beam sizes are acceptable. And then hidden away in places, such as funding bodies; procurement procedures; insurance

policies and regulation are endless simplistic assumptions about risk, which create some of the most intractable barriers to change. And dare I mention a tax system, favouring new over old, that ensures the fate of so many existing buildings, and with it vast quantities of embodied energy? However, this is not to say that engineers aren't ultimately responsible for the intelligence and efficiency of their designs.

SEDA-CS

With all this in mind, we think it is very timely that SEDA is aiming to launch a new section of its website dedicated to discussing the challenges of building structures. The focus of SEDA -civil/structural (SEDA-CS for short?) will be examining tested low environmental impact solutions, which take into account the particular climate, geology, ecology, regulatory environment and building culture (historical and otherwise) of Scotland. The site will provide access to information (written contributions and links to external websites) in addition to providing a forum to discuss technical aspects and share experiences of structural engineering design. Whilst the context will be the everyday challenges of the practice of structural engineering, we would like to stress that the intention is to create an open forum, which other building professionals and makers will feel welcome to contribute to.

We hope you will join us in this exciting project. ■



NatureScot



The HEMAC Guide

to Healthy Homes

Chris Morgan, John Gilbert Architects

The HEMAC network (Health Effects of Modern Airtight Construction) was established to bring together researchers and practitioners from the fields of indoor air quality (IAQ), health and the built environment to identify shared research agendas and develop research questions and activity.

Funding was received from Arts and Humanities Research Council for a number of projects. One is a user guide (for occupants) and another is a professional guide to help those procuring and designing buildings to understand the risks and create

healthier homes. For this guide, SEDA agreed to be part of the effort to both: raise awareness of the issue and to help resolve it.

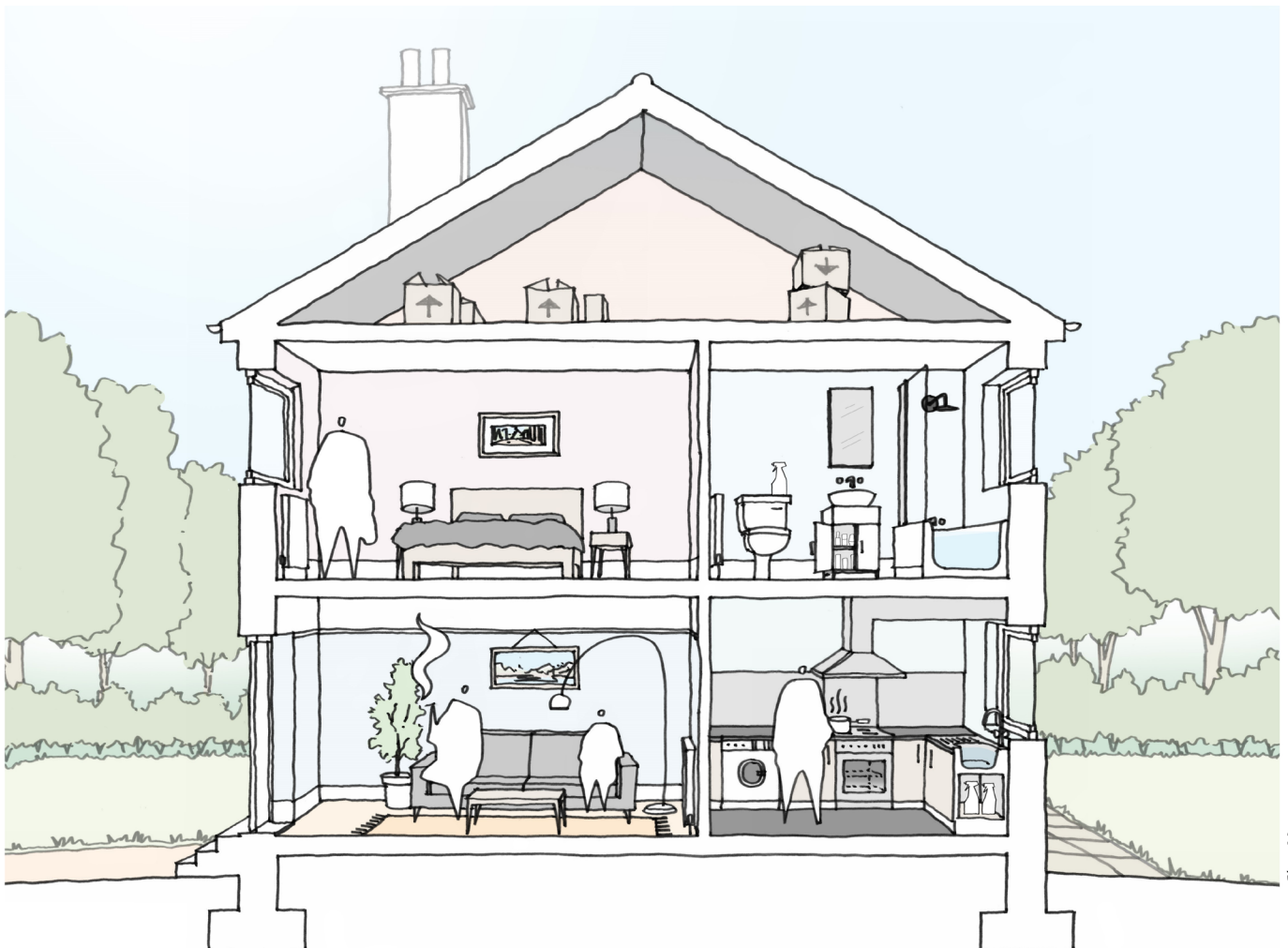
Unhealthy buildings

The premise is simple: we know that making buildings airtight is important for saving energy, but we also know that this is leading to unhealthy living conditions inside many homes. This is because closing up the draughts in a building - without a robust ventilation strategy - can lead to a build-up of heat, moisture and pollutants commonly

found inside buildings.

This guide has an equally simple premise: demonstrate how to reduce the heat, moisture and pollutants in the first instance - source control - and then demonstrate how to ventilate buildings properly, whilst retaining the airtightness we need for saving energy. A final section provides a simple design checklist, along with guidance on setting up a suitable monitoring strategy, to help ensure that once occupied homes can stay healthy.

The guide will be available in June 2021. ■





Giroscope Self Build, Hull

Part the fifth

Duncan Roberts

The anniversary of the first frame-raising at the Giroscope project in Hull passed without much in the way of celebration, but looking at the photographs from 3rd March 2020 and the same date in 2021 shows the progress made - despite the international pandemic.

The 22 PV and Solar Hot Water panels are now in place. The 37sq.m of PVs - being connected to Giroscope's offices next door, rather than to the individual houses - are already wired in and delivering 7kWh per annum to offset the charity's daytime usage. All the roof tiles are on the main roof with the subsidiary bedroom roof still to be finished. The cost of £350/PV panel saved that of 37sq.m of clay roof tiles. Dormer roofs are zinc clad.

The walls are rapidly being covered with a renderboard in advance of a two coat self-coloured render finish. Small areas of the south elevation are to be clad with UK grown larch weatherboarding. A source for this has been found via a sawmill across the Humber in Lincolnshire.

Internally, the houses are sheathed in Norboard OSB as racking resistance, vapour check and containment for the insulation.

About 7.5 tonnes of Warmcel recycled newspaper insulation should be pumped into place by Easter - rather more than two tonnes per house.

All three houses have now been pre-let to existing Giroscope tenants and the layouts of the individual houses are being adapted - within the constraints of the structural frames - to their needs. These tenants are also involved in the landscape planning of the gardens. ■





Looking Back & Looking Forwards:

Seminar 3, December 2020 and Seminars for 2021

Colin Porteous & Gloria Lo

This was the third in the 2020 series of solar seminars, all well attended online and this one under the banner of 'Passive Solar Architecture'. This generic title in fact embodied aesthetically integrated 'active' solar components, integrated in such a way as to enhance rather than detract from the 'passive' intentions, which may have become rather overlooked in recent times. There were three speakers, with the last, Beat Kämpfen of the Zurich practice 'Kämpfen zinke + partner', the keynote and a European star of visually stimulating passive/active unification.

The evening started with a fairly swift ramble by Colin, themed 'in-between' and whimsically subtitled 'passive the song, active the lyrics' to illustrate projects most of which had been visited by the Scottish Solar Energy Group (SSEG). Gloria then introduced Simon Tilley, Director of the Hockerton Housing Project (planning permission 1996), this the autonomous-house swansong of architects Brenda and Robert Vale before leaving the UK for New Zealand.

Since the seminar occurred during winter darkness, Simon showed us a daylight walk-round video of the project before talking in more depth about performance and liveability. Briefly, it is an earth-bermed, single-aspect, south-facing terrace of five single-storey dwellings; the bermed part highly insulated concrete blocks and slabs (Simon preferred the term 'heat batteries' to 'thermal mass'), and the visible part a commodious linear solar semi-outdoor room buffering all the living spaces. Since SSEG's visit, PV arrays have been integrated as a 'crest' to the mono-pitch, mainly-glass roof. There is much more to be said about this project – thermal stability for starters – and much more may be gleaned online and/or by contacting Simon, or from 'Solar Architecture in



Colin Porteous & Gloria Lo

Cool Climates' (Colin Porteous with Kerr MacGregor, Earthscan, 2005).

SSEG's 2009 last international study tour included several of Beat's earlier projects (e.g. Sunny Woods Apartment Building described in 'Sustainable Solar Housing', Robert Hastings and Maria Wall, Earthscan, 2007; and Marché International Support Office, in 'Precedented Environmental Futures', Colin Porteous, Cambridge Scholars Publishing, 2019). Eleven years later Beat brought us up to date with his practice's scintillating oeuvre. He deftly mixed excellent modern aesthetics with equally excellent solar technics; resultant forms and surfaces so well integrated that their solar function is hard to detect – e.g. a photovoltaic mosaic of multi-coloured 4mm squares finishing solid balustrades to balconies.

Nor did Beat's active integration confine itself to electrical generation by photovoltaic (PV) arrays; he was equally deft in terms of integrating active solar thermal collectors (e.g. vacuum tubes as balustrades, or shading devices). He also devoted time to emphasizing the potential for solar retrofit of existing buildings. Overall, the seminar was a great success, with an enthusiastic Q&A session, and complimentary

feedback from participants; Beat's recent 21°C work nicely cohering with Simon's retrospective on Hockerton's late 20thC autonomous ambitions and achievements.

Our next set of lectures start on 17th May 2021, with exploring the embodied carbon of solar panels, its life cycle cost and whether it can be recycled. Then in mid-June and on 11th October seminars on "Storage" split into two sections for the extended content. First instalment on 'Active and Passive Storage', in water and space heating to electrical storage in battery. Second part on "Grid and Infrastructure" investigating the grid capacity and its future, financial models for different infrastructure, domestic and commercial storage methods. Last but not least for the year, on 15th November, would be an "Expert Design, Installation and Maintenance" of solar systems where we shall learn of the correct use of valves switches and controls to our benefit, and how to reduce the performance gap between design and in use of systems through case studies.

Look forward to you joining us on Monday evenings to explore these topics together. ■

Hygrothermal analysis

Why we should consider a more centralised approach

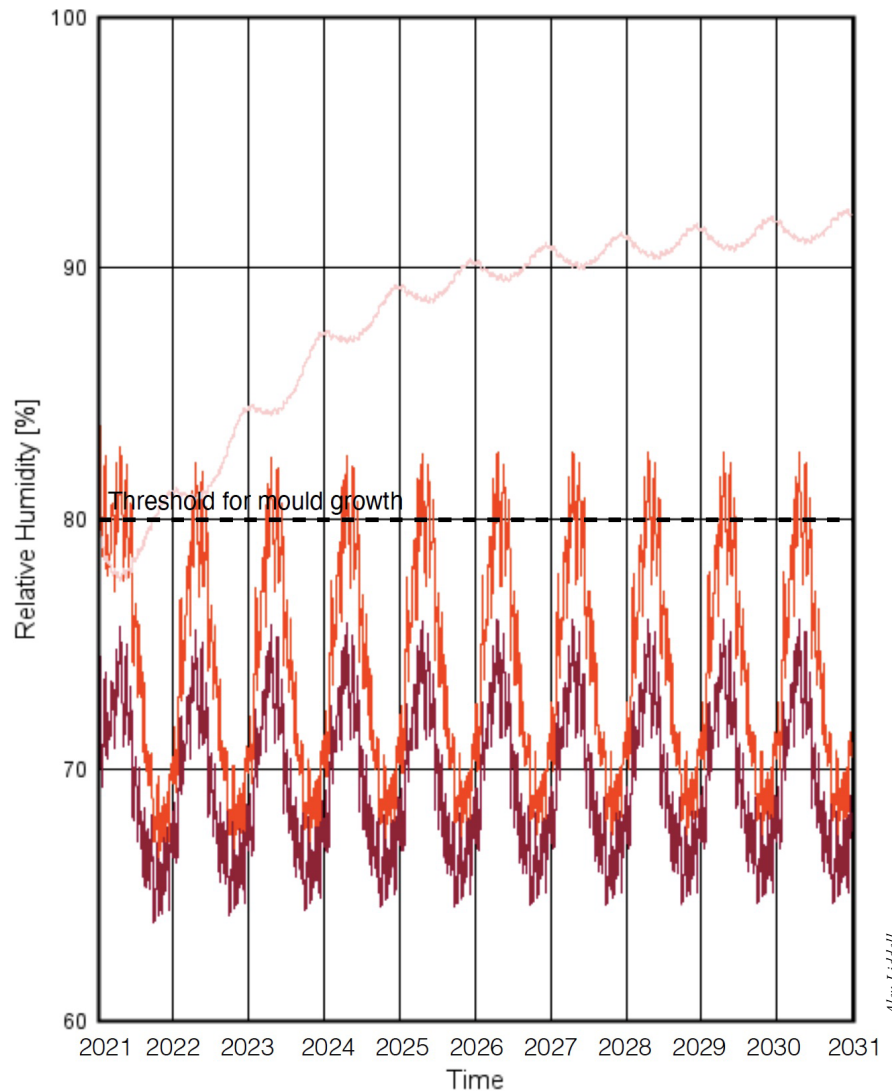
Alex Liddell, Method Architecture

How we should manage hygrothermal knowledge for the greater good.

We need to insulate our existing buildings to address climate change. While insulation on the outside of walls is technically better, this will not be appropriate for many buildings. The introduction of insulation to the inside of walls can result in moisture build up in the wall. We can use hygrothermal analysis to assess the moisture risk.

Hygrothermal analysis considers the combined effects of heat and moisture in building constructions. Most traditional building materials are vapour permeable, containing air and moisture. Movement of moisture within walls driven by external and internal conditions. Within traditional wall constructions moisture and heat mostly achieve a state of equilibrium, with the internal walls generally 'dry'. The introduction of internal wall insulation alters that balance.

While conventional U-value calculations offer a moisture risk assessment, these are based on moisture movement driven by vapour diffusion alone. There are other sources of moisture movement that have a greater impact on the moisture levels in walls, such as capillary action. Hygrothermal



Alex Liddell

- Extruded brick with insulated plasterboard
- Extruded brick with wood fibre insulation
- Extruded brick with calcium silicate

Example output from WUFI

numeric simulation takes account of these and can give a more reliable prediction for the behaviour of moisture in traditional walls over time. (For more information see HES TP15). Conventional U-value calculations are not suitable for

internal wall insulation on solid walls constructions. BS 5250 Code of Practice for Control of Condensation in Buildings (2016) states that hygrothermal numeric simulation should be used.



Why is hygrothermal analysis important?

Retrofit comes with risks, a few of these are:

- internal insulation causing condensation in walls which could affect existing structure such as built-in joist ends.
- loss of architectural heritage through introduction of insulation.
- risk that buildings insulated to low levels could be expensive to inhabit, as energy becomes more expensive.

These risks need to be balanced against the risk of no retrofit and continued climate change. We have to retrofit, but we should attempt to mitigate the risks.

Unfortunately, it is difficult to define a simple set of easy-to-follow rules that are adequate. The ability of a wall to take insulation depends on a variety of factors including climate, location, orientation and materials. For a general value to be applicable in all/ most situations, it would need to be conservative, erring on the side of caution. While this might be a better outcome from a moisture risk position, it would be sub-optimal from an energy conservation perspective. So prescriptive guidance may not be the answer.

The default position

What will happen unless there is a centralised approach?

Some architects will acquire this knowledge. This will be commercialised, commodified and protected, i.e. not shared. Some engineers will acquire these skills, but in allowing others to commodify this knowledge there is loss of agency for architects. Some manufacturers will offer calculations to support purchase of their products. This is convenient, but not risk free for architects.

The problem with the default position is that the knowledge is diluted, which works against the greater good. Mistakes would be made, and when this happens, lessons will not be learnt, as mistakes are commercially sensitive. While this is the more likely scenario, it is less than ideal. As a relatively new area of building knowledge, there is still a degree of evolution in the knowledge to be made. There are gaps in our knowledge.

Centralised hygrothermal knowledge

What is needed is a centralised hub for such knowledge, similar to the Scottish Lime Centre, where specialist knowledge is made available, for a modest fee, as and when required.

With an informed understanding on the specifics of a project, the hygrothermal centre could advise on insulation specification, With such a concentration of knowledge, expertise

will evolve. Insulation installations would be monitored and feedback could refine and improve their guidance. As a result, architects would not need to individually develop their own deep specialised solutions. More importantly, improvements to the Scottish building stock would be based on the most informed thinking.

Much hygrothermal research has already been done. Our universities, for example; HES will publish some of these findings this year; BSI publishes guidance; the UK Centre for Moisture in Buildings undertakes research (This list is not an exhaustive list.) Based on the current works, it may be that hygrothermal hub will be based at one of the established institutions.

So, which will have the best outcomes for the built heritage and environment?:

- individual training, silo research, competition inhibiting sharing of knowledge,

or

- centralised knowledge approach, with expertise and a deep understanding of the topic?

A centralised knowledge approach would require funding. If you share an interest in this topic, please contact me. We could approach RIAS to see if they could lever funding for such an initiative.

Method Architecture

t: 07753 766342 ■



Natural Insulation

Sales through the roof

Will Kirkman, Eco Merchant Managing Director



Will Kirkman

Ecomerchant, Steico's UK distributor of wood fibre insulation materials, has appointed Ultimate Insulation Supplies Limited of Stirling as its Scottish distribution partner. "We have been keen to get a dedicated Scottish distribution centre up and running for some time now" said Will Kirkman, Managing Director of Ecomerchant, "the opportunity to partner with Ultimate came just at the right time. Their extensive warehousing capacity coupled with their own vehicle fleet means we can import directly from our European factories into Scotland and deliver across the country at local haulage rates".

Darren Smith, Managing Director of Ultimate Insulation Supplies, added, "the whole team at Ultimate Insulation Supplies are delighted to have been appointed by Ecomerchant to help develop sales of Steico products in Scotland." Ultimate Insulation Supplies is a family owned, independent insulation merchant, with high quality sales and distribution teams. They are exceptionally well placed to serve the Scottish market with Steico products. "Our friendly and highly knowledgeable sales team are here to support new and existing wood fibre customers with an exceptional experience", continues Darren. "From their initial product enquiry, to any technical enquires, all the way through to the delivery of the material directly to site, anywhere in Scotland! We very much look forward to working with Will and his team to deliver our Ultimate Experience

to our customers." In addition to insulation materials, ancillary products such as plasters, renders, fixings and membranes commonly specified with Steico insulation will also be available from Ultimate.

Natural insulation sales are booming with demand, surging across most of Europe, and Scotland is no exception. According to Will Kirkman, 2021 sales growth is expected to be around 30-35% for all natural insulation products and up to 45% for wood fibre insulation. Growth in the sector is being driven by the move to lower carbon buildings, net zero carbon targets, energy efficiency and health concerns.

Steico is responding to this rapidly increasing demand for wood fibre insulating materials by expanding its production capacity, investing €75 million in increased production capacity. In Gromadka, Poland three new production lines will be set up. Two lines will be built for flexible wood fibre insulation with a combined total annual capacity of over one million cubic metres. Another line with an annual capacity of around 500,000 cubic metres will produce dry process rigid wood fibre insulation boards. At a second plant in Poland at Czarna Woda is increasing in capacity for wet

production boards by 15%, uplifting annual capacity to 135,000 cubic metres, which is expected to go live in the second half of 2021. Steico's French plant at Casteljaloux will increase production of Steico Flex by 45% and increase annual dry process board capacity by 250,000 cubic metres by the second half of 2021. Steico are also increasing production capacity of their air injected wood fibre, Zell, and blown cellulose floc by 50% this year.

Find out more:

Steico: steico.com // Ultimate Insulation Supplies Ltd: theultimategroup.co.uk // Ecomerchant: ecomerchant.co.uk

(This is a paid, promotional article)

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Will Kirkman



Built Environment Education & Training

Where next?

Professor Fionn Stevenson

Current situation

The word education derives from two Latin roots "educare," which means 'to train or to mold' and "educere," meaning 'to lead out'. The former relates to current societal requirements, while the latter prepares us to develop solutions to problems yet unknown, and requires questioning, thinking, and creating. This [original dichotomy](#) has led to the continuing tension between the academy (educere) and industry (educare) over the last century. The combined impact of the climate emergency, rapid resource depletion, mass extinction of species and increasing environmental toxicity has forced a new reckoning, which can, with willingness and care, ensure that requirements for training and education are always informed by the need to be able to address unknown problems, as an act of human resilience. At the same time, a small band of sustainability educators across the four nations has always been attempting to do just this, and it is timely to first recall a partial

and personal history before exploring what's happening just now.

Deep pedagogy

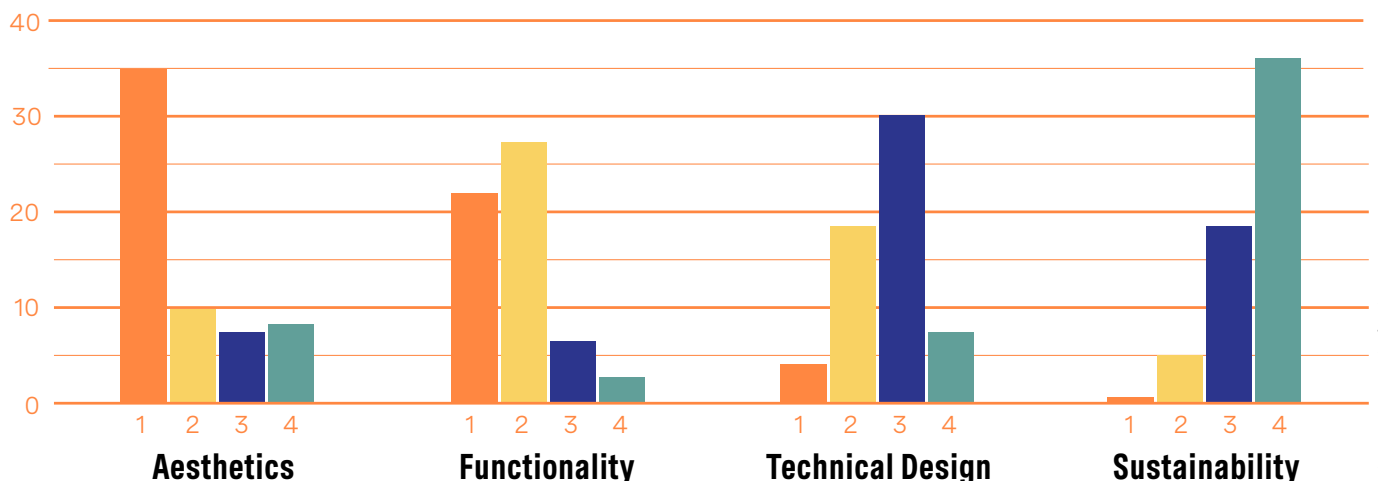
Robert and Brenda Vale ploughed a lonely furrow when teaching in the 1970s and 80s, based on their work on the [autonomous house](#). As tutors, they inspired me to join Brian Edwards and then Lori McElroy to run the Green Studio Unit at Strathclyde University from 1989-94, and to initiate, together with the late Krystyna Johnson, the first SEDA Student Competition during that time. Sandy Halliday then developed and ran a seminal Sustainable Construction CPD series of workshops and holistic guidance sponsored by the Department of Trade and Industry in 2000, and established the [RIAS Sustainability Accreditation Scheme](#) in 2005. Meanwhile, I worked with other educators to publish the 2003 UK [report on Sustainable Design in Architecture](#) which identified further changes that were needed in education. Five years later, I co-organised a series



of three national 'Designs on the Planet' capacity building education workshops which brought 34 Schools of Architecture and industry together to share best practice. All of this eventually led to the freely available 'Buildings and Cities' Special Issue publication in 2020 on 'Education and Training: [Mainstreaming Zero Carbon](#)', which introduced new international research on built environment pedagogy and training and highlighted key recommendations in its [editorial](#).

WHAT ASPECT OF DESIGN WAS MOST VALUED BY YOUR TUTORS DURING YOUR PART 1?

Rated from 1 (most value) to 4 (least value)





Key issues

The above publication touches on a number of key issues. Firstly, education still produces individual soloists rather than team players, with a lack of joint project final submissions, and group work still viewed with suspicion by validation bodies. In 1999, against all the odds, the best project in final year of M.Arch at RGU was a joint submission by three students, encouraged by their tutor (me), showing that teamwork benefits all. One way of decentering design ownership is illustrated in the Special Issue article on a [cyclical sharing iterative design process](#). Interestingly, Howard Liddell used a similar approach during our work on the SHOT project (Scotland's Home of Tomorrow) in the early 1990's.

Another key challenge lies in existing disciplinary silos, which start in primary school and continue with single discipline University courses. In 1994, I tutored on the Heriot Watt Uni Built Environment interdisciplinary project and witnessed first-hand how students struggled to work together – not much has changed. Educational courses, which span across the built environment disciplines are needed to produce 'T-shaped professionals' who are able to address the global challenges we face on a holistic basis and [reach outwards to enable rapid transition](#).

Finally, the issue of assessing competency lies at the heart of current built environment professional educational reform.

At present, UK validation bodies ask for evidence of 'understanding, knowledge and skills', but without reference to any 'standards'. In other words, assessment is done through a highly fallible pragmatic consensus process among peers, rather with reference to any absolute criterion, as would be the case in medicine, for example. A building failing can also lead to people dying, as witnessed in the Grenfell Tower disaster. [Exemplar construction training](#), which uses standards, is highlighted in in the Special Issue.

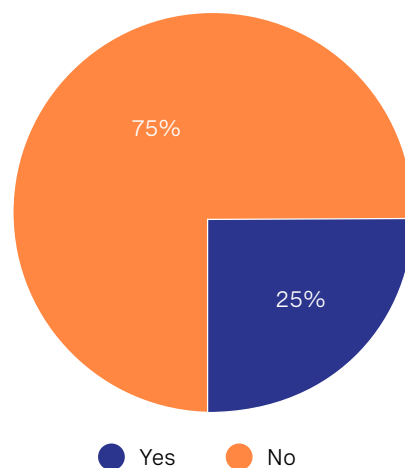
Current action and next steps

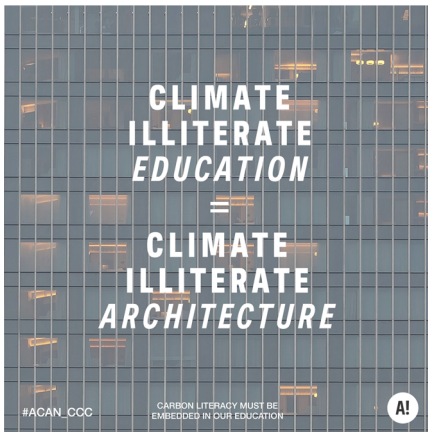
So, what's happening now and next? The CIC Climate Action Framework for built environment education and training was launched in 2021, led by Mina Hasman with co-operation from all leading professional institutions. Meanwhile Scott McAulay continues his amazing work with the Anthropocene



Architecture School, creating [resources](#) and running national workshops for staff and students. We are part of the [Architects Climate Action Network Education Group](#) which has grown to over 200 members in under a year, governed by powerful open anarchy principles developed by Extinction Rebellion activists, and has developed a [toolkit](#) to drive curricula change. The [Students Climate Action Network](#), a new initiative in 2021, already has 14 groups set up across the UK.

DO YOU FEEL YOUR COURSE IS PROPERLY PREPARING YOU FOR YOUR FUTURE WORK?





ACAN

The current [ARB Consultation on Sustainability](#) is unfortunately not joined up with CIC Climate Action Framework or the forthcoming [RIBA Climate Literacy Overlay](#), which will demand mandatory competencies, based on freely available CPD,

provided to its members. It will be interesting to see if these bodies can co-operate more. Meanwhile, as an RIBA/[SCHOSA](#)/[ACAN](#) Education Working Group, we have developed a national survey for all 62 Schools of Architecture to map out exactly what skills exist where, based on the RIBA Climate Literacy Overlay requirements, as a first step towards national skill sharing. The RIAS Education Working Group has also produced a [report](#) with some recommendations related to the climate emergency, but no mention of standards - more work is needed here.

Where does SEDA fit into all of this?

A number of SEDA members are already directly involved in teaching and training. SEDA has a key role to play in ensuring that built environment education and training continually takes holistic account of the wider context. The recent '[Land](#)' series is a prime example of how SEDA can contribute to wider transdisciplinary educational development. The RIAS Sustainability Accreditation Scheme is being relaunched and expanded to include students – SEDA can play a key role in promoting this also. ■



From Stevenson



SEDA at 30

Some recollections

Jim Johnson, founder member

SEDA was born in 1991 from conversations between Howard Liddell and Sebastian Tombs at the RIAS, which focussed on the need for much greater awareness amongst the design community about the environmental challenges facing the world. SEDA was launched at an event at the RIAS, addressed by Ulrich Loening, then of the Centre for Human Ecology at Edinburgh University.

Howard had arrived at his commitment to ecological design through study of the key thinkers and texts, the ones that Sandy Halliday has been discussing in her Howard Liddell Memorial lectures. My wife, Krystyna, and I, in contrast, arrived via intuition and experience. Both born in the mid-1930s we had lived through the rigours of the Second World War – Krystyna through the Nazi occupation of Warsaw with its famine, repressions and terrors. So we both knew that resources like food and fuel were finite. Hence we saw the need to conserve, to recycle and avoid waste. We wanted to join SEDA to learn from the experience of other designers.

The second SEDA event was a warning of the dangers from electromagnetic fields to health, given by Roger Coghill. This came in useful recently, when a developer planned to put an electrical substation right under my Edinburgh bedroom. I had all the counterarguments to hand.

Visits to ecological buildings were popular, such as an early trip to Findhorn where we met Eileen Caddy, one of the founders, who had grown the legendary huge cabbages on the sandhills. A longer journey took us to Wales to see Christopher Day's Steiner School (in retrospect a bit 'middle earthish') and from there drove on to visit Mole Manor, an underground house in the Cotswolds, with its rooms ranged around a pool.

Another memorable visit was to Edenhope, Andy Swales' and Sarah Eno's virtually autonomous house near Selkirk. Their aim was to build a house that would be financially and environmentally affordable and carbon neutral in both construction and occupation. Everything had been calculated and justified – an exemplar. Perhaps a revisit might be possible?



Jim Johnson

Krystyna got huge satisfaction from her teaching at the two Schools of Architecture in Glasgow, so when I wanted to create a memorial after her death in 2003, a student award seemed a natural option. Initially a travel award, aimed at senior students, this produced some interesting reports - one on Bretstappel, another on healthy hospital design in Norway – but the number of applicants dropped until there was little competition. A rethink resulted in the current award scheme aimed at junior students, and involves tutors setting appropriate projects for second year to be assessed on sustainability criteria.

I am very conscious of the many good friends I have made through SEDA, some of whom have moved on, whilst many others are still active. There were times when I feared the organisation might disappear, so I'm pleased SEDA seems in good health at the moment. As our global future looks evermore threatening, I applaud the recent moves to collaborate with others on significant events, broadening out SEDA's scope. The current "Land Conversations" webinars have started particularly well – congratulations all round! ■



David Sed