SEDA

Climate Emergency

What can we do?

The Scottish Ecological Design Association magazine

Autumn 2019

£3.00

SEDA

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. A list of our upcoming events can be found on page 13.

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Cover image - Extinction Rebellion

Editorial team

Nick Domminey, Viktoria Szilvas, and Raina Armstrong

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Please get in touch if you have comments, or are interested in contributing to, advertising in, or sponsoring further editions.

Opinion

Editorial

So what needs to be done?

Nick Domminey

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After two issues providing guides to being unsustainable, SEDA magazine has removed its tongue from its cheek to take a look at ecological design issues prompted by the 2018 Special Report by the Intergovernmental Panel on Climate Change (IPCC). Widely known as the "Doomsday Report" it exhaustively catalogues the effects of humanity's heating of the climate and the existential threat that this represents to life on the planet. What is particularly remarkable is that these extraordinarily eminent and cautious scientists ditch the previous 2 degrees C limit on global temperature rise that the Paris Summit stated as required to avoid a climate catastrophe, for a far more difficult 1.5 degrees rise. They also baldly state that, to have any chance of achieving this, total global CO_2 emissions must be zero by 2050; with a 50% reduction by 2030. The report notes that this will require an international mobilisation not seen since the total war economies of WW2.

So what needs to be done? The report by the UK Committee on Climate Change (UK CCC) has lots of targets. We take the IPCC report's structure, however, to look at how food production, power & energy, and building and construction need to change to have any chance of meeting the 2050 target and, importantly, what SEDA members are doing in that struggle.

We also have a report from SEDA's successful conference in Forres, including the results of the Krystyna Johnson Award. The AGM decided to support Extinction Rebellion so we have an interview with an activist outlining XR's aims and actions and what we can do. Finally, we have a sideways look at the psychology of sustainability.

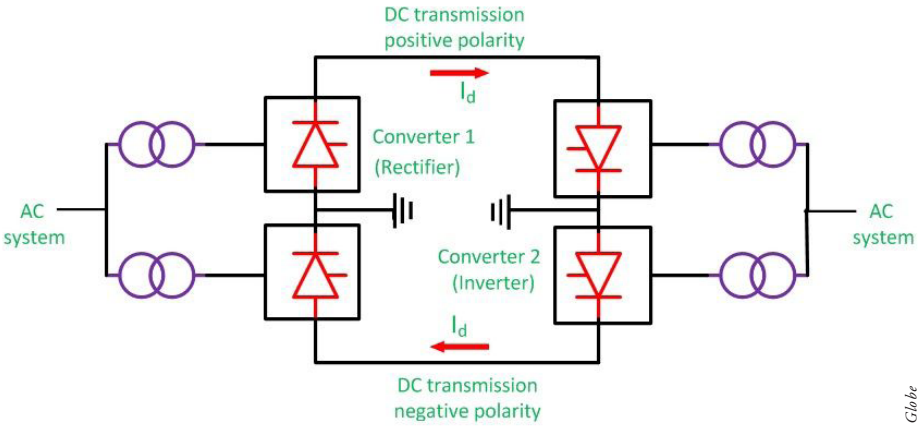
What do you think of this SEDA magazine? Do you have any disagreements or something useful to add to the issues covered? Do you have an idea for an article? Drop us an email at magazine@seda.org

Electrification of the Economy

Upgrading the infrastructure for renewables

Stephen Barty

Energy supply accounts for 18% of UK GHGe. The way to reduce this to net zero is seen as electrification of the economy, based on renewable or "zero carbon" sources. Often forgotten is that such a step change will require an equivalent transformation in the distribution network. Stephen Barty, of Ardler Engineering, has spent a lifetime in the industry and explains what this means.



Bipolar link

Circuit Globe

As humanity seemingly continues to play chess with nature, our planet grows warmer and the evidence for climate change builds. The task of changing our habits, and mitigating the existing impact on the planet is enormous and complex, as fossil-fuelled-energy use continues to drive much of our economy. The development of renewable energy sources, and specifically renewable electricity sources, is fundamental to our sustainable energy future and a sustainable economic model. Energy policy infrastructure at UK and Scottish Government levels is relatively mature with important national & regional targets already in place, however, there remains inherent complacency when it comes to the implementation of these policies, particularly at the UK level.

Scotland has had a running start in the large-scale renewable electricity sector with its long-standing hydro-electric baseline, and great strides have been made more recently with an established mix of onshore and offshore wind. Large-scale tidal energy deployment is also now in growth and will further improve the generation mix which feeds the national grid. Alongside our intermittent renewable electricity sources, we must increase the development of efficient energy storage, which will build on Scotland's existing base of pumped-hydro storage schemes. (See Adrian Leoning's article on page 6).

As the renewable energy sector continues to grow across the UK, and ever larger generators come on-stream, the national grid will continue to play its crucial role in enabling the transfer of electrical power between these generators and the local distribution networks with their consumers. This is not to say that the national grid will always cope in its current form. As populations & economies grow, and we transfer into electric vehicles, there is corresponding growth in the regional load profile and the associated power flows within the grid. With greater transfer from fossil fuelled power

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"It is not possible to fully match localised generation to localised consumption."

Raina Armstrong

stations to renewable electricity generation, we see the power source shift to new geographic locations, sometimes greatly distant from the end consumer. It is not possible to fully match localised generation to localised consumption, and so the grid must be modernised with increased capacity, improved efficiency, and greater reliability. A move to high-voltage direct current (HVDC) and ultra-high-voltage direct current (UHVDC) transmission & the development of new superconductor materials will continually improve the efficiency of the grid infrastructure, but the consensus is that distributed generation via small-scale renewables must continue to play a part.

In the small-scale renewables sector, the rolling back of incentives at a UK level is contentious and has notably slowed investment. The biggest barriers to small-scale renewables development are the availability of capital finance, and the existing financial payback models. The vast majority of us live our day to day lives taking our energy supplies for granted, we care little for where it comes from or how it gets to us – as long as it is conveniently there when we need it! We typically choose our electricity shipper based on their price per kW, or the estimated total financial cost over the contract term, but we pay little attention to the way in which that electricity was generated, and the associated greenhouse gas emissions arising as a result of it.

Many such private investments and day-to-day purchases could arguably change for the benefit of our planet if we lived in a low carbon economy rather than a financial economy. It is currently difficult, however, to envisage such a paradigm shift in our habits, and the challenge to deliver the necessary markets & infrastructure in a world of global connectedness would be admittedly profound. Nevertheless, the aforementioned national policy will move us steadily towards electric or hydrogen-powered vehicle transportation, which can ultimately use electricity generated by renewable sources. Similarly, our buildings will become more energy efficient and will include highly-efficiency heating & cooling systems such as air source heat pumps, which will also use electricity generated by renewable sources. These serve as prime examples that the ongoing electrification of our economy may prove to be the accessible stand-in for a carbon economy in itself.

One must maintain hope that humanity will realise a sustainable energy future, and soon, if we are to successfully slow down, stop, and then reverse our recent impacts to the planet.

Our renewable electricity generation, transmission, storage, and distribution industries are set to be key within that, and we, the consumers, must do what we can to support and adopt this change. ■

Allt Mór

How hydro can help

Adrian Leoning

Scotland has obviously been the home of hydro generation since the mid Victorian era. Of course prior to that there were numerous mechanical energy hydro mills. From the 1890's onwards the growth in both electric lighting and electrical machinery drove the installation of many small, estate-scale hydro schemes. The remnants of these can still be found on many small rivers and indeed a few are still working. Then, in the 1940's the Hydro Act mandated the installation of large scale, grid connected hydro-power generation and this brought not only energy to the larger towns but also electrification to the glens. Small hydro declined as subsidised connections to the grid provided a cheap and reliable power source.

In the 1990's the desire for small scale, renewable energy, increased and with the advent of the Feed-in Tariff (and the prior Renewables Obligation), interest in small- and medium-scale hydro increased. In 2008 it was concluded that there was 800MW of small-scale hydro that was economically viable and this value was later revised upwards to 1,200MW. Of course whilst economically viable, this capacity is not necessarily environmentally benign and so the Scottish Environmental Protection Agency (SEPA) devised best practice guidance for the development of small hydro.

The result, from around 2010, was a rapid growth in the number of small hydro schemes, typically from 50kW up to 2MW. These schemes were generally run of river type which generate power when there is surplus water available in a river. A few were storage schemes which included a small reservoir allowing generation on demand. In the next ten years around 450 small schemes were commissioned in Scotland.

The Allt Mór hydro scheme in Kinloch Rannoch was one of those. From original conception in 2011 it took until 2014 to start construction, the time having been used to carry out all of the necessary environmental studies and develop construction and operation procedures intended to minimise the impact of the scheme. Whilst most hydro schemes are in relatively unvisited areas the Allt Mór scheme is directly in the village of Kinloch Rannoch and on popular walking paths. As a result the scheme was designed to be aesthetically pleasing, low impact and educational. Built with additional space to allow visitors inside the building and with large observation windows this scheme should be more than just a 'building that hums slightly'. A display shows the amount of energy being produced and the effective carbon emissions saved.

Adrian Leoning

"Small hydro declined as subsidised connections to the grid provided a cheap & reliable power source."

Technically the scheme is a run of river project generating 350kW and about 1.1GWh annually. That is enough energy for approximately 250 homes. In addition the scheme is directly connected to a public electric vehicle charger located in the village centre, and the energy is offered free to any visiting EVs. It is expected that the scheme will generate energy for at least 80 years with little refurbishment. In common with almost all hydro schemes, this longevity makes hydro energy one of the lowest impact renewable technologies with the highest return on energy invested of all generation technology. ■

morlhydro.com

Real Power

Duncan Roberts

With power at the flick of a switch, it is easy to forget just how much electricity we actually need for even the most mundane tasks. SEDA member, Duncan Roberts, recounts a salutary experience.

In 2007 we built a temporary structure on the Falkland Estate in Fife which was to be used by SEDA & the Association of Scottish Hardwood Sawmillers as their pavilion during the Big Tent Festival. Having no mains electricity supply to the site, we were delighted to see the stand beside ours was the Edinburgh Woodcraft Folk's Power Pod - a trailer fitted out to demonstrate various sources of renewable energy featuring a battery array trickle charged by PVs & a small wind-turbine.

During the four long, sunny days that it took to build the pavilion we routinely recharged our cordless drill/driver batteries from the Power Pod's 240V socket outlets and enjoyed the sense of virtue that comes from using power tools kept alive by renewable energy.

At the end of the last, particularly hot, day we decided to celebrate our progress with a nice cup of tea & in our innocence plugged an electric kettle into the Power Pod's socket. To our horror, the batteries were drained flat within the time it took to bring the water to a boil - and the designer of the Pod was furious that someone could assume they could use battery power to boil water.

It was a stark lesson on the limitations of renewables & how lifestyles will need to adapt to their widespread adoption. Perhaps cold drinks on hot days are the answer - but what of winter? ■

Duncan Roberts

Scotland's Housing

More than just numbers

Sandy Halliday

How we procure and manage our homes is crucial not only to our well-being but also to the homes' sustainability. One of SEDA's founders, Sandy Halliday of Gaia Research, organized a very successful conference titled "More Than Just Numbers", to explore this very issue. Experts and practitioners, and a wide range of participants were invited to contribute their views.

Sandy Halliday

Context

Housing in Scotland is failing. The problems are very significant in urban & rural contexts. For the last 40 years Scotland's housing has been increasingly dominated by a small number of volume builders and by a purely numbers-led agenda. There is inadequate supply. What there is is ever more unaffordable, is eating up valuable green space, and is often remote from existing social and transport infrastructure whilst offering no biodiversity response. Now, there is growing dissatisfaction amongst the many agencies that this affects. Continued planning-led dominance of zoning for housing/ recreation/commerce/etc. means that there is often little local access to facilities or jobs. This imposes 20th century transport solutions on a 21st/22nd century world. Elsewhere planners & policy-makers are waking up to the immense challenge of facing climate emergency and the impact of pollution on health.

Vital aspects of future proofing not being addressed include affordability, social integration, minimizing energy demands, climate change resilience, social equity, health and well being, and providing for an aging population. No volume built housing in Scotland gets close to conforming to the resource limits of 1–planet living and it is quite unacceptable that with climate emergency quite clearly in our sights that this is not yet a fundamental requirement.

Meanwhile rents and buy-to-lets continue to rise and to fuel homelessness and commodification of housing. Our regulations are inadequate. There is too much underuse of existing buildings. These combine to act against the interests of the common good and undermine a move towards climate resilience and a fair society with appropriate housing for all.

The changes being set in place in Scotland – in part generated by the Land Commission and consideration of Compulsory Purchase Orders for under utilised land – are setting an interesting context for this discussion now. Opportunities exist to investigate housing forms that can deliver best value and climate resilience.

Content

This conference introduced examples of urban and suburban housing from the UK and Europe that is successful in environmental and financial terms and meets the needs of individuals and, importantly, society as a whole. The projects included LILAC in Leeds, Springfield in Stroud, Bath St in Portobello, Kalkbreite in Zürich and Tübingen in Germany. The aim was to show a wide range of alternatives to volume house building, rather than to identify a single solution. It included Mutual Home ownership, co-operatives, co-housing and public sector facilitated procurement.

All the examples demonstrated local involvement, affordability and a commitment to high quality in environmental and social terms. They also demonstrate a wide range of options in terms of life style choice all with low dependence on

"Change is required and wholly possible."

high resource use including high impact travel. It became clear that community involvement was the key to climate resilient communities.

Discussions at the conference focused around three syndicates :-

1. The design qualities we expect from housing to meet 21st/22nd century requirements for healthy, accessible, resource-efficient, socially integrated place making;
2. The financial mechanisms that might offer alternatives to the dominant and evidently unsustainable model of volume building;
3. The organizational options that might enable personal involvement and procurement in line with meeting the social and economic goals.

The target audience for the event included community groups, housing associations, representatives of mature and fledgling co-housing and co-operative housing groups, developers, local authorities and relevant Scottish Government departments.

Sandy Halliday

The Cooperative Kalkbreite in Zürich was devised & developed to invent "a new way of living in the city" – an ecological and culturally diverse way ready for tomorrow. One aim was to meet the requirements of the 2000W society – i.e. keeping energy consumption under 2000W per person, or 48 kW-hrs per day, which is a third of what we typically consume in Western Europe.

Outcomes

The existing model of housing provision will, if allowed to continue, undermine the social and environmental framework of Scotland for generations to come. Change is required and wholly possible. It requires a better-informed government, public sector, and clients. The conference was a step towards communicating real alternatives that would contribute to making Scotland's housing part of a sustainable future. It is clear that we need to:-

- Hold to account those who are failing in government and the professions to provide sufficient, affordable, future proofed housing;
- Inform everyone involved of the wide range of tried and tested alternatives to our current failing model of housing provision;
- Raise expectations, standards and enforcement to levels that will make Scotland's housing resilient to demographic and environmental changes and hence appropriate for the future;
- Inform everyone involved of the potential social, environmental and financial benefits of alternative models for communities;
- Move towards a diverse housing delivery platform that meets real needs.

Two significant outputs emerged.

- A manifesto seeking professional, client and government signatories.
- A proposition for a pilot 'Urban Housing Fair' project based on a new model of housing provision. ■

Cow or Corn?

Could agro-ecological farming lead the fight?

Viktoria Szilvas

Today's food supply chain generates 13.7 billion tonnes of CO_2 globally every year or 26% of anthropogenic greenhouse gas emissions (GHGe). In the UK, food supply emits 63.4 $MtCO_2$ (2010) or 10% of our total GHGe. We import most of our food, of course, thereby exporting our emissions. Non-food agriculture and deforestation emit a further 2.8 billion tonnes CO_2e (5%). Overall food production creates about 32% of global terrestrial acidification and about 78% of eutrophication. 43% of the world's ice and desert-free land is used for agriculture; 87% for food; 13% for biofuels and textile crops (incl. noon-food uses e.g. wool and leather). 66% of freshwater withdrawals are for irrigation, not drinking. With these startling figures in mind, and with our members engaged in agriculture, SEDA's Viktoria Szilvas takes a look at ecological farming.

Could agro-ecological farming lead the fight out of this Climate Crisis?

As the Intergovernmental Panel on Climate Change (IPCC) highlighted in their 2018 Special Report, land use and agriculture play important role in climate heating.

Since livestock farming crept in the centre of public attention in relation to climate change, there are a lot of – sometimes heated – discussions around the topic. Particularly, about the effects of meat (cow & sheep) production on the climate. But what exactly is all the debate about?

Poore & Nemecek [1] analysed around 38,000 farms producing 40 different agricultural goods around the world to compare the environmental costs of various types of food production systems, highlighting that the impact can be 50-fold among producers of the same product.

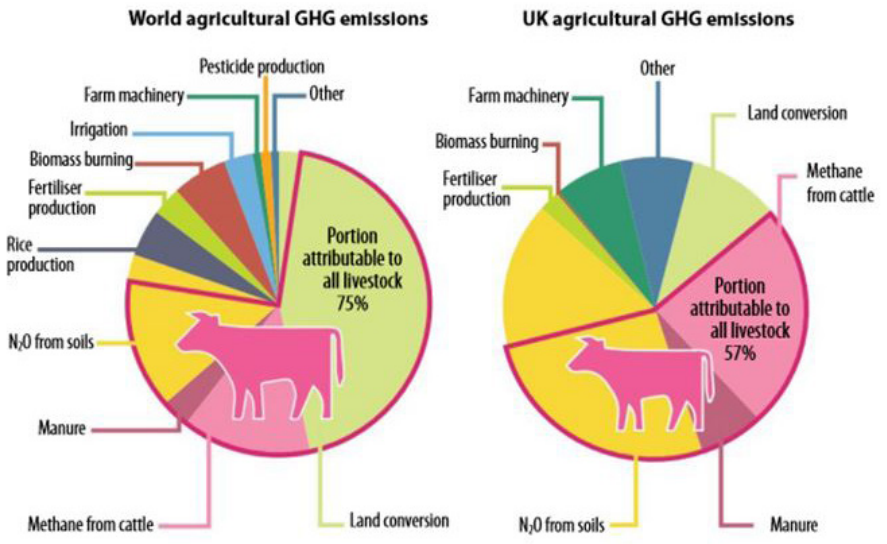


Figure 1: World and UK GHG emissions associated with agriculture, showing the proportions attributed to all livestock. Adapted from Garnett (2007) (2)

As 7.6 billon of us are fed by 570 million farms with heavy impacts on the environment (degrading terrestrial & aquatic ecosystems, depleting water resources, and driving climate change) there is certainly scope for improvement.[1]

These numbers are even more concerning if looking at animal-derived consumables, particularly beef production. The research found that the impacts of animal products (meat, aquaculture, eggs, and dairy) use ~83% of the world's farmland and contribute 56 to 58% of food's different emissions, despite providing only 37% of our protein and 18% of our calories. [1]

We have to be cautious with the numbers though, as firstly they represent a global number, secondly – as the researchers point out – for many products, impacts are skewed by producers with particularly high impacts.[2] Additionally the numbers associated with beef production & GHG emission can include damage by deforestation for cattle, but primarily for logging.[3]

Cows and sheep release methane as part of their digestion process, accounting for 14% of global agricultural emissions. This number is 24% in the UK as 61% of the agricultural land is dedicated

to grazing livestock for meat and dairy[2]. A study by Scotland's Rural College, The Roslin Institute, and The University of Aberdeen has discovered that your average beef cow annually emits the equivalent GHG of a private car driving 12,000 miles a year.

According to calculations, 100g of beef protein produces 105kg of CO_2eq by using 370m² of land area/year[1], however, the amount of energy required per unit of protein produced by grain finished beef is around twice that for pasture finished beef.[4] (Fig. 2) Thus follows the argument, characterised by climate activist George Monbiot, that land which is capable of sustaining arable agriculture should do so, as it is the lowest CO_2e producting method of maximising calories. All other non-cultivated land should be "rewilded"; returned to CO_2 sinks and biodiverse habitats. Grazing non-arable land creates monocultures, reduces its ability to lock in CO_2 & requires control of predators & other restrictions on biodiversity. Many farmers object to this approach, unsurprisingly, both on practical grounds & questioning its ability to create the foods or environments we want.

Focusing on holistic solutions of agricultural systems that are relevant to the local area can greatly contribute to our fight against climate change. Some of the recommended methods include:

1. Changing the diet of grazing livestock: research shows, feeding on food containing fatty acids (e.g. seaweed) can be a potential way to reduce associated methane emissions[2];
2. Using locally produced feed (rather than imported soya) not only cuts emissions, but also food mileage, while saving the Amazon[3];
3. Reducing nitrous-oxide (N_2O) emissions by using manure & agricultural methods that enrich the soil reducing dependence on chemical fertilizers;
4. Managing grazing to stimulate grass productivity as dense vegetation locks carbon
5. Using regenerative farming techniques that accumulate organic matter (e.g. permaculture; organic farming; agro-forestry to name a few)

While the argument about eating meat or not will continue, we can at least focus on how our food (animal & non-animal) is produced, packaged & gets to our table. Indeed changing to more ecological farming is understood to be better for the environment within eco-circles.

Could switching to a more holistic agricultural management system, using more regenerative practices, using less (or no) fertilizer & water, which would increase biodiversity, creating healthier livestock & plants, while feeding us sustainably & increasing carbon sequestration help us fight climate change? ■

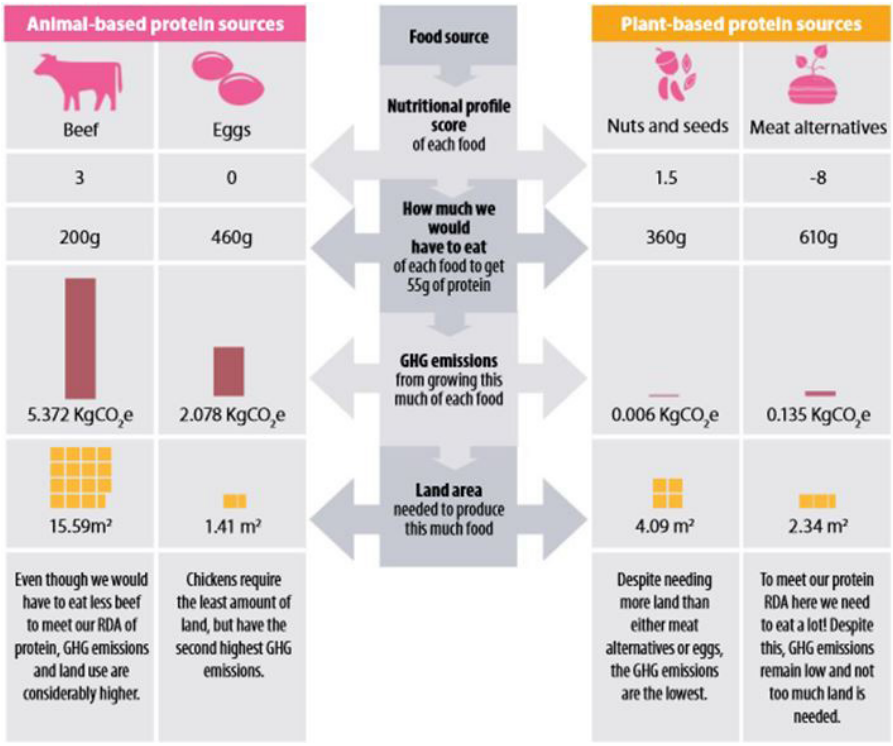


Figure 2: Comparison of four different high protein food sources: their Nutritional Profile Scores (NPS), how much would need to be eaten to meet the recommended daily amount (RDA) of protein & associated agricultural GHG emissions & land used to produce this amount of each food source.[2]

(1) https://science.sciencemag.org/content/360/6392/987
(2) https://www.cat.org.uk/info-resources/zero-carbon-britain/research-reports/zero-carbon-rethinking-the-future/
(3) https://www.theguardian.com/commentisfree/2010/sep/06/meat-production-veganism-deforestation?CMP=Share_AndroidApp_Post_to_News_Feed&fbclid=IwAR0mxFZpttGyAE6YXY-l6qAu45Of5VfuyTQVtdcsdNCqRNpUK7ttrCPY6jU
(4) Pimental, D. and Pimental, M. H. (2008). Food, Energy and Society. Third Edition. CRC Press, Boca Raton, Fl, USA: CRC Press/Taylor and Francis Group. ISBN 978-1-4200-4667-0.

SEDA 2019

Annual Conference

Gail Halvorsen

The theme for SEDA's 2019 conference – held in Forres, Morayshire, over the weekend of 15th and 16th June – was interdisciplinary approaches to sustainable design. Thirty-two of us took over Newbold House, a large Victorian mansion run by the Newbold Trust charity, an offshoot from the Findhorn Trust, where we were served home-made food fresh from the house's own kitchen garden.

As usual insufficient time had been allowed for SEDA's AGM, and David Seel, chairman, had barely finished describing the achievements of the past year, let alone having opened up debate about the future, when it was time for the first speaker. As the AGM was coming to a close, it was proposed that SEDA should support Extinction Rebellion. The proposal was carried by a large majority of those present, though the details of how are yet to be decided.

Dr Ulrich Loening, founder of the Centre for Human Ecology at Edinburgh University, ended the first day's talks with a powerful exposition of a few ecological principles to live our lives by – including fossil-free, comfortable homes and eating only healthy food that doesn't wreck the planet or cost a lot. In short, we need to re-think a lot of assumptions.

On the second day Dr Gemma Jerome, director of Building & Nature, and Sheena Robertson, director of Ian White Associates, presented how the Building with Nature Standard can be applied in practice to ensure greener landscaping and other developments. They gave us hope that the countryside is not going to be taken over by mass housing "rabbit hutches". Sheena described two projects – the completed NHS Forth Valley Hospital and Larbert Woods where Ian White Associates have worked closely with the health board to provide a therapeutic environment, with woodland walks and outdoor teaching spaces for patients & visitors to "escape to", and an interesting 135-acre mixed-use development proposal at New Brunstane, to the East of Edinburgh.

Nick Domminney

Makar and Logie Sawmill

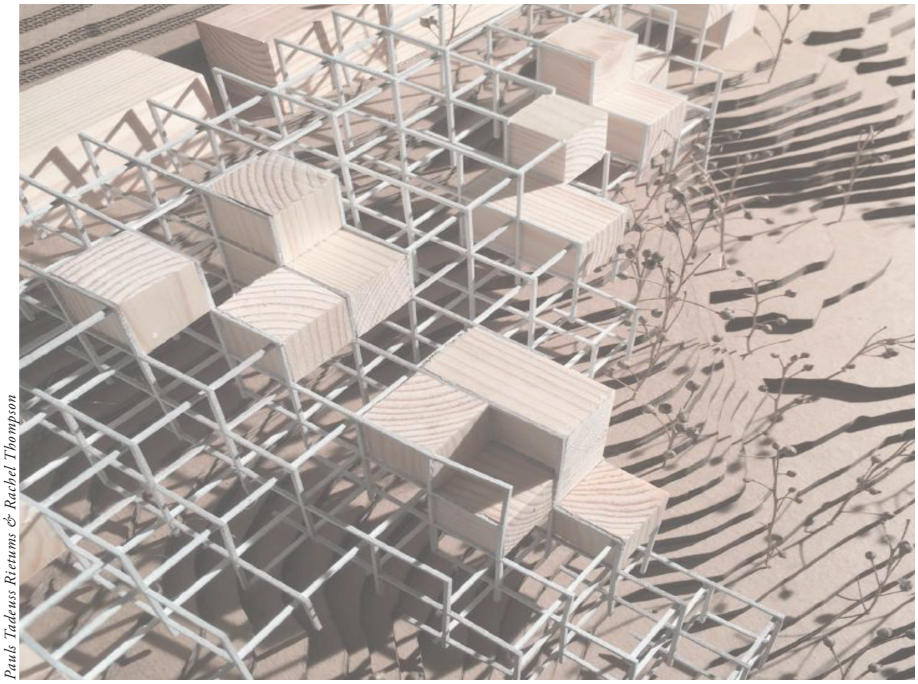
We started the weekend by visiting Makar, Neil Sutherland's architect-led ecological design and build company which prefabricates timber-framed buildings, using local and sustainable materials. Neil employs nearly 50 people, including joiners and architects. They work on a series of "stages" assembling a whole panel on each platform following "The Toyota Way" of which Neil is an admirer. All employees spend time in the workshop to better understand the system. In a similar way to Toyota, the fabricators are also encouraged to suggest improvements to the design and fabrication process – which are listened to. Their main workshop has the largest span of any timber building in the UK. We then visited a completed project, Tara Green, the first of several detached houses to be built on the edge of Kinloss golf club.

We also visited Logie Sawmill, which supplies timber to Makar, as well as to furniture makers and others. Their newly built shed is an impressive construction made of hardwood timber sourced from the Logie estate.

Scottish Hydro

Adrian Loening, director of Mór Hydro, talked about Scotland's

"We need to re-think a lot of assumptions."



Pauls Tadeuss Rietums & Rachel Thompson

hydro-power renaissance. During a history of hydro developments, he showed us examples of hydro design over the ages, from Archimedes' screws to pump storage. Adrian described a project to block the drains of Highland peat bogs, put in by estates for grouse shooting, to resaturate the bogs so they can be used as a water source for hydro power. The side benefit is that it improves the biodiversity of the bogs while acting as a carbon sink.

On the way home, we visited Mór Hydro's Allt Mór scheme – a 350kW high head, run-of-river hydro scheme at Kinloch Rannoch. Our initial disappointment at seeing it still due to lack of water was quashed when a heavy shower set the turbines spinning again. It produces enough energy to power 250 homes. See the inset article for more details.

East Whins

John Gilbert Associates have been heavily involved in the Findhorn Foundation from the start. Gillies MacPhail showed us around their latest development – East Whins – a colourful & innovative eco-village of 25 homes which has been expressly designed to foster a greater sense of community among the inhabitants.

Nick Domminney

KJA winner

This year the Krystyna Johnson Award, in memory of SEDA founder Jim Johnson's wife Krystyna, and drawn from second year Scottish architectural students, was judged by Catherine Cosgrove of Austin-Smith: Lord with last year's winner, Beth Kytzia. The winners were Pauls Tadeuss Rietums & Rachel Thompson of the Mackintosh School of Architecture for 'Ubudehe' – a grid-like scaffold cascading down a New Lanark hillside with a modular system of housing, workshops and community spaces.

Congratulations Pauls and Rachel!

Pauls Tadeuss Rietums & Rachel Thompson

"The UK is 'only' the 15th biggest emitter [of CO^2]"

Extinction Rebellion

Tell the truth | facebook.com/XRScotland

James Westcott & Juliana Muniz Westcott

facebook.com/XRScotland

What is XR for?

XR is a non-violent civil disobedience mass movement to raise the alarm about the climate and ecological emergency we're in. The objective is not to dictate solutions to the crisis. It's to make powerful demands addressed at government, media, and corporations, and to set up a deeply democratic process for how those demands should be met. That means a nationwide citizens' assembly to discuss appropriate policies to start healing our ecology and the climate. XR is not alone in recognising that the climate and ecological emergency are intrinsically linked to our system of governance and economy. That's why we need to set up new structures and processes to properly address it. Representative democracy – MPs in Westminster – have and will continue to fail us when it comes to this crisis: they are too afraid to take perceived risks (when the biggest risk of all is business as usual), and they're in thrall to moneyed interests. Instead, we trust a group of randomly selected individuals – representing every demographic proportionally – to consider the data & policy options brought before them by scientists & experts, and to decide on policy without fear of repercussions from funders or the media. That's the technical description of what XR is. On another level, XR is a movement for direct action that's been proven to make an immediate impact on policy and the media; for alleviating anxiety about where our civilization is heading; and for starting to live, right now, in the kind of joyful, equitable and caring social structures that we want to see throughout society.

Why do XR say Zero Carbon by 2025 when the IPCC say 2050?

For a few reasons, the U.K. is the birthplace of the industrial revolution. Historically, we've borne responsibility for a huge amount of greenhouse gas emissions, even if today the U.K. is 'only' the 15th biggest emitter (depending on how you count). It's a moral issue: we must take the lead, both to redress our historical burden and to show the world that radical and swift decarbonization of the economy is possible (as well as necessary). On top of this, the IPCC is notoriously conservative in all its estimates. The way feedback loops work, zero-carbon by 2050 will be too little too late.

Do you have to get arrested to be in XR?

No. The key strategy is non-violent disruption of business-as-usual, and there are so many different ways of being disruptive, as well as different intensities and thresholds. For example, there is a huge Families group within XR composed of parents attending actions with their children, the majority of whom are not arrestable. They help block roads, do sit-ins and die-ins, and bring a lot of fun and playfulness everywhere they go. The great thing about XR is that anyone with any comfort level can participate. The police will, 99% of the time, warn you before they are going to make arrests, and give you the chance to move away without any consequences. That's part of the privilege of participating in civil disobedience here: generally, the police behave in a predictable, calm, and controlled manner. We're also always polite with each other through the process. It's all very respectful, since it's not about the police and they know it.

What does XR stand for?

There are a few levels to this. In terms of strategy, we stand for non-violent civil disobedience, which has historically proven to by far be the most successful means of forging radical change. In terms of what we're

yearning for: it's an economic, social, and political system – a civilization – that doesn't depend on the pillaging of the living world in service of the illusion of endless economic growth, which isn't making us happy anyway. In terms of specific demands:

1. **Tell the truth:** Government must tell the truth by declaring a climate & ecological emergency, working with other institutions to communicate the urgency for change.
2. **Act now:** Government must act now to halt biodiversity loss and reduce greenhouse gas emissions to net zero by 2025.
3. **Beyond politics:** Government must create & be led by the decisions of a Citizens' Assembly on climate and ecological justice.

How can members of the public support XR?

Non-violent civil disobedience is, in large part, a numbers game. Historically, it's been shown that if just 3% of a population participate in or support a movement for systemic change, that change happens. So the simplest way to support XR is by joining us out on the streets at the next rebellion, starting Monday 7 October in London. The best way to do that, and to forge the meaningful relationships that make XR so powerful & well-organized, is to find and join your local group. There are hundreds of them across the country, & you can find them at rebellion.earth/act-now/join-us/

Are there activities or abilities which SEDA members can offer to XR's campaign?

There's a 'Construction Declares Emergency' working group within XR that needs all hands on deck within the architecture and built environment sector. We're planning events and actions to alert the industry of its responsibility in the climate & ecological crisis. Contact the authors to get linked up. ■

SEDA Events Autumn 2019

SEDA Greendrinks are continuing their series of exciting talks and debates in Glasgow and Edinburgh through the Autumn and into 2020. This follows on from our recent events on the Power of Fungal Remediation in Glasgow in late August, and Rab Bennetts talking on his projects with Edinburgh University, in September in Edinburgh.

Sandy Halliday has just announced that this year's Howard Liddell Memorial Lecture will take place on 21 November, and will follow on from May's Conference on housing, and will have a great line up of speakers. So there will be lots to join in on, to get inspiration, meet your fellow members and discuss important ideas and projects.

Dates to put in your diary are:

Oct 04: RIAS Conference

Edinburgh International
Conference Centre
9am - 2pm

At 11am SEDA will be holding a discussion session on upskilling the profession to deliver:

Maximum Architectural Value, Minimum Environmental Harm

We hope we will get RIAS's members discussing what they need to be able to deliver the best possible advice to clients on sustainability, and how to make it an everyday part of all future design in Scotland. Join us in collectively defining where RIAS & the profession focus its efforts.

October 24: Full day event with Zero Waste Scotland

Edinburgh Centre for Carbon Innovation, Edinburgh
9.30am – 4pm

Applying circular economy approaches to building design & placemaking

A one-day workshop exploring how applying Circular Economy principles to building design will help future proof both the industry and our infrastructure, & create opportunities. Featuring: Mayan Grace, Circular Edinburgh; Sandy Halliday, Gaia Research; Craig White, Modcell; Mariannne Heaslip , URBED & more

Oct 30: Greendrinks Glasgow

Creative Salvage
Project Cafe, Glasgow.
6.00pm – 8.00pm

Nov 21: Greendrinks Edinburgh

Housing Fit For Purpose in Scotland

Following on from Scotland's Housing in May, will look at what makes successful and poor environmental conditions in housing and consider the work of Sherry Arnstein. With Sandy Halliday Fionn Stevenson, Sterling Howieson & more. Full details to be confirmed shortly

Don't forget the Show & Tell night, which will be again at the South Block in Glasgow on 11 December

And coming up in 2019:

January 23: Greendrinks Edinburgh

Fast Fashion: 'Unravelling'
Film screening and debate with Vivienne Stimmel
Full details coming shortly.

Sustainable Thoughts

We need to paint a picture of a possible future

John Thorne

heartlessmachine.com

It's important to understand why we don't all engage more on climate change and biodiversity loss. If we truly understood the extinction we are consuming towards, the imminent loss of humanity, then we would change.

The necessary message is one of truth and action, a telling of how bad things are. Too often environmentalists not only give no hope, but no plan, no vision for the future; Utopia. We need to paint a picture – sometimes quite literally – of a possible future, dispelling the myth that climate disruption is an environmental issue, it is a societal issue. We are storytellers at heart; we need a vision of a clean energy economy and how to get there.

Climate disruption is old news, we've guessed or known about it for around 200 years. It is a complex mix of social justice issues such as poverty, and gender & racial inequality. I have no interest in saving the current system in which inequality is married to fossil fuels; a clean energy society, on the other hand, will be equitable and equal.

Fossil fuels are part of a complex web of arms: chemicals, plastics, nuclear and industrial agri-businesses that must be reformed as a system. It is racist, colonial and benefits white men above all else. Slavery lives on in our clothing, our food, our ownership of land: a continuing 500 year exploitation of the planet and its people.

"Whatever you do will be insignificant, but it is very important that you do it."

Mahatma Gandhi

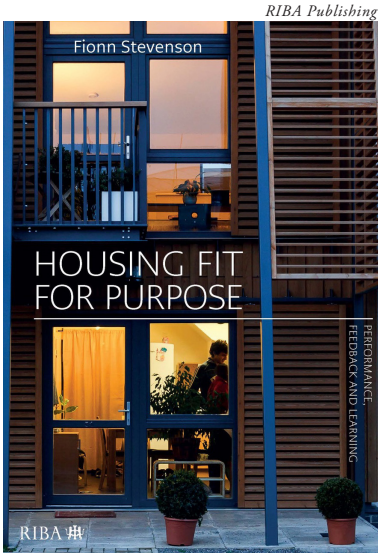
We are not rational beings; we connect and take action through our emotional connections. Incapable of change, we hold a deeply profound fear that we won't see our children survive, that society is at an end. We are psychologically ill-prepared to deal with immediate threats. We are all guilty. We respond by sticking plasters on the hanging, bloody leg that is climate disruption. Psychologically, especially those brave few trying to make a change, feel depressed, angry, and are in anticipatory mourning. We are all psychologically damaged with foolish calls to recycle and tinker with our broken capitalist consumerism. We hide in hedonism. We do less not more.

Filled with old ways, our high anxiety levels are caused by societal lies and hyper-normalisation of complex issues; we are given simple lies to cover the chaos. We must uncover these and shout them down. Art and design can help us connect emotionally, through our professional work and practice.

We cannot ask for sacrifice, but need to lead with a vision of a useful future. No talk of effects or action by 2050 or 2070. The effects are now, and the action is needed now. How dare one company make one penny of profit from plastics, or oil, or chemicals which will lead to an unliveable world, the death of our children?

Have hope, position yourself, recognise empty green-washing, & take positive action. Do what you can, where you can, now. Self-care, compassion, meditation, getting out into nature. Enjoy life. Even if you have faith, act like this is the only life.

John Thorne is the current secretary of Climate Psychology Alliance Scotland, & the Sustainability Coordinator at the Glasgow School of Art. ■



Fionn Stevenson's book, Housing Fit For Purpose, is out now & she will be at the Howard Liddell November Memorial Lecture in Edinburgh.