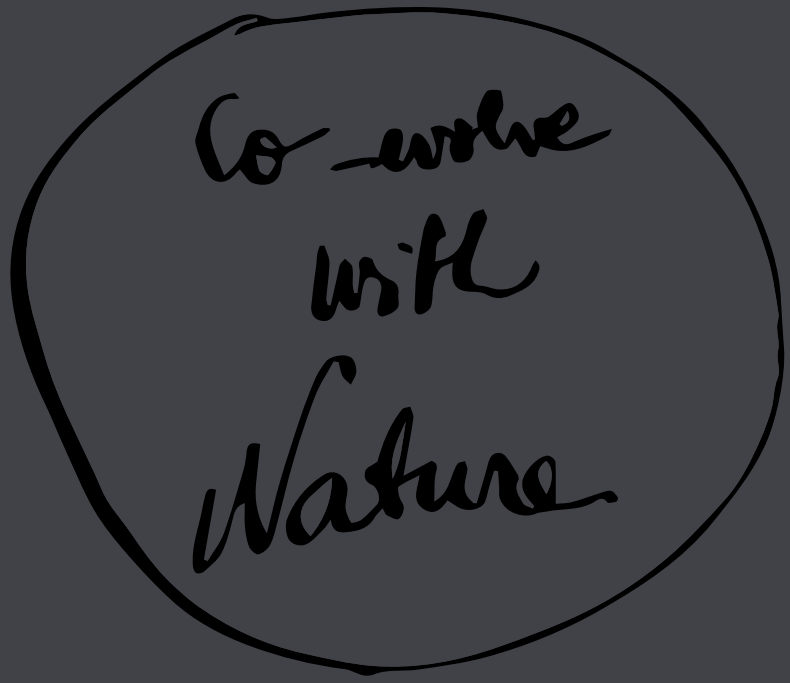
UK Architects Declare
Climate & Biodiversity
Emergency

Regenerative Design Primer



UK Architects Declare Regenerative Design Primer

Draft - March 2024

Contents

This primer is work in progress. We intend to update the document to ensure it stays relevant, and welcome your feedback: hello@architectsdeclare.com

Acknowledgements & thanks

This UK Architects Declare Regenerative Design Primer has come about through the energy, expertise and commitment of many people. AD wishes to thank each and every one involved in researching, drafting, commenting on and reviewing the 'final' document, which remains a work in progress for a regenerative future.

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Images used in this document

Many thanks to all who provided permission to feature an image. We've endeavoured to contact all relevant sources to request permissions. If we have missed any, please do get in touch so that we can resolve this in future versions.

Images are illustrative. The inclusion of any image or quote does not imply endorsement by UK Architects Declare of particular projects or practices, nor of the Primer by those whose work is featured.

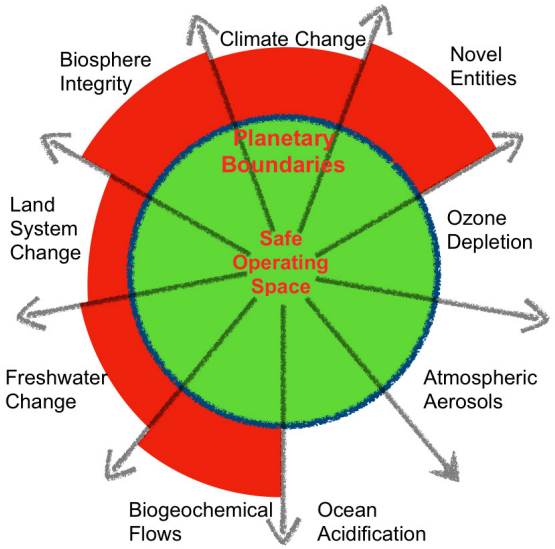
As a work in progress, future versions of this Primer are likely to include different images or quotes.

Introduction

Our current approach to the built environment isn't working. We're crashing critical life support systems and putting our world on a perilous trajectory.

We can still change course and choose a future where human development and nature work together. We thrive as part of nature, not apart from it.

In 2023 the Stockholm Resilience Centre reported that we've now breached six of nine planetary boundaries we rely on. More than 30 years of pushing at 'sustainability' hasn't diverted us from this destructive path. It's as if we care about this but... other things just take priority. Doing more of the same won't reverse the crisis.



Planetary Boundaries breached.
Adapted from Stockholm Resilience Centre's original: 2023 update, based on analysis in Richardson et al 2023".

We need a fundamental transition: away from destructive 'business as usual', beyond 'sustainability' that reduces some harm in some places, to a fully regenerative paradigm that actively creates positives for people, places and planet. We can build a genuinely better future rather than sleepwalk into a damaged one our descendants will have to endure.

Becoming the transition

Regenerative design is a holistic approach – considering all systems, feedbacks and impacts – where human and natural systems can flourish.

Fundamental to this is 'seventh generation' thinking across multiple scales and systems. Our imaginations seldom reach beyond 50 years: our children or grandchildren's futures. We need to consider at least the next 150 or 200 years. How will our great-great-great-great-great-grandchildren view our actions and the consequences? Our thinking must also expand beyond local or national scales to embrace the planetary as well. Our actions are embedded in the world's web of physical, ecological and human systems; we must embed them in our designs.

This is a shift in mindset, and the role of the regenerative designer is to:

- nurture and work to a vision of a flourishing future;
- enable the shift from degenerative towards regenerative in projects, organisations and collaborations;
- actively manage out destructive patterns.

This is challenging. We recognise that designers cannot make the regenerative transition alone. We work within wider teams and partnerships, with clients, supply chains and communities, and in commercial, regulatory and policy contexts that also need to change.

No project or practice can be wholly regenerative within a degenerative system, but each one can contribute something meaningful to the transition. Reducing the barriers, expanding what is possible, securing in place elements of the new, regenerative way of working.

About UK Architects Declare and this document

Regenerative design has been core to UK Architects Declare since we launched our declaration of climate and biodiversity emergency in 2019.

Our vision is of a built environment planned, constructed and operated within planetary boundaries to deliver environmental justice and to support the flourishing of all life for all time.

This Primer complements our Practice Guide (2021). Aimed principally at architects and other designers, we hope it will speak to all who really care about the future and meeting their full commercial, social and environmental aspirations.

Just as no individual project can be fully regenerative in isolation, no guidance can embody all the work that's needed for the regenerative transition. That's why UK Architects Declare has a dual approach, with a common focus on building agency and delivering change:

- Supporting and encouraging our signatory practices on pathways to delivering their declaration. We know this is challenging. Everyone has different starting points. No one can claim they've arrived.
- Demonstrating where leaders – in government, institutions and industry – can change the systems behind the crisis: to move us away from degenerative 'business-as-usual', beyond 'sustainability' and towards fully regenerative solutions.

Together, this Primer, our Practice Guide and Practice Action Masterclasses, and our Building Blocks to Transform the Built Environment manifesto demonstrate this dual approach.

This document is work in progress and will remain so as we review, revise and expand it, using feedback from users, experience from the Index and insights from others pioneering the regenerative transition.

We've structured the Primer around practical suggestions for those working through RIBA's Work Stages. Part of the wider transition will eventually involve change in the RIBA Plan of Work itself. While we operate in the current system, being alive to regenerative opportunities within the Work Stages will help us on the journey towards a regenerative mindset by:

- Making the principles of regenerative design accessible;
- Enabling a common language, better communications and project outcomes;
- Providing practical steps and tools for implementation and delivery;
- Illustrating some of the traits of regenerative design;
- Building confidence for everyone to embrace a different way of shaping the built environment.

We hope you find it a valuable contribution. Please help us improve and expand it with your feedback on this first version, your own experiences with regenerative design and any signposts to other resources or approaches you find helpful.

The Primer also supports the new Regenerative Architecture Index we've launched with Architecture Today. The Index will gather practical experiences of regenerative design, generate new learning, and show where system goals can change.

Sustainable or regenerative?

Some may wonder how sustainable design is related to regenerative design. It is not intended that the two are in opposition but rather that 'regenerative' includes and transcends 'sustainable' in three key ways:

1. From being 'less bad' to being net positive.
2. From being just focussed on humans to considering the whole web of life.
3. From a mechanistic approach that can focus too exclusively on carbon (sometimes referred to as 'carbon reductivism') to a more holistic and systemic approach.

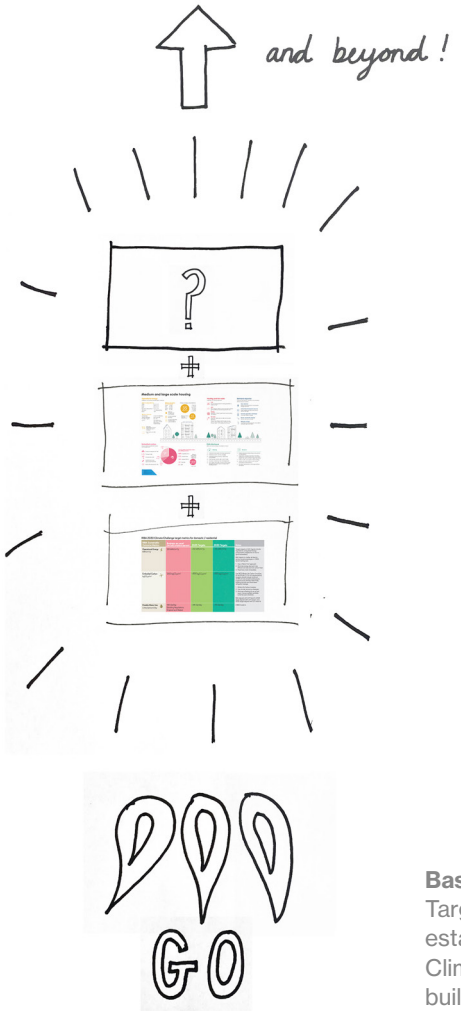
Metrics and targets

The focus on a high-level shift in thinking could be misinterpreted to imply that metrics and targets are not important. This is not the case. We should aspire to reach net positive across a whole range of targets so that, eventually, we can create buildings that generate more energy than they use, harvest more water than they need, enhance occupants' wellbeing, provide habitats for a wide range of species, contribute to community cohesion, and so on.

Illustrating Regenerative Traits

We've used examples simply to illustrate some of the traits of regenerative design, acknowledging that it's unlikely that any contemporary project could meet all aspirations of regenerative design at this stage.

As with any project that calls itself sustainable, we need to be careful with claims of regenerative design, and to look past the visual representations. We need to avoid the same greenwash that's sometimes been applied to 'sustainable' design in the recent past and which has just reinforced the same degenerative trajectory.



Baseline Metrics:
Target metrics such as those established by LETI, the RIBA 2030 Climate Challenge or the net zero building standard should be achieved and beyond...

What is regenerative design?

1.

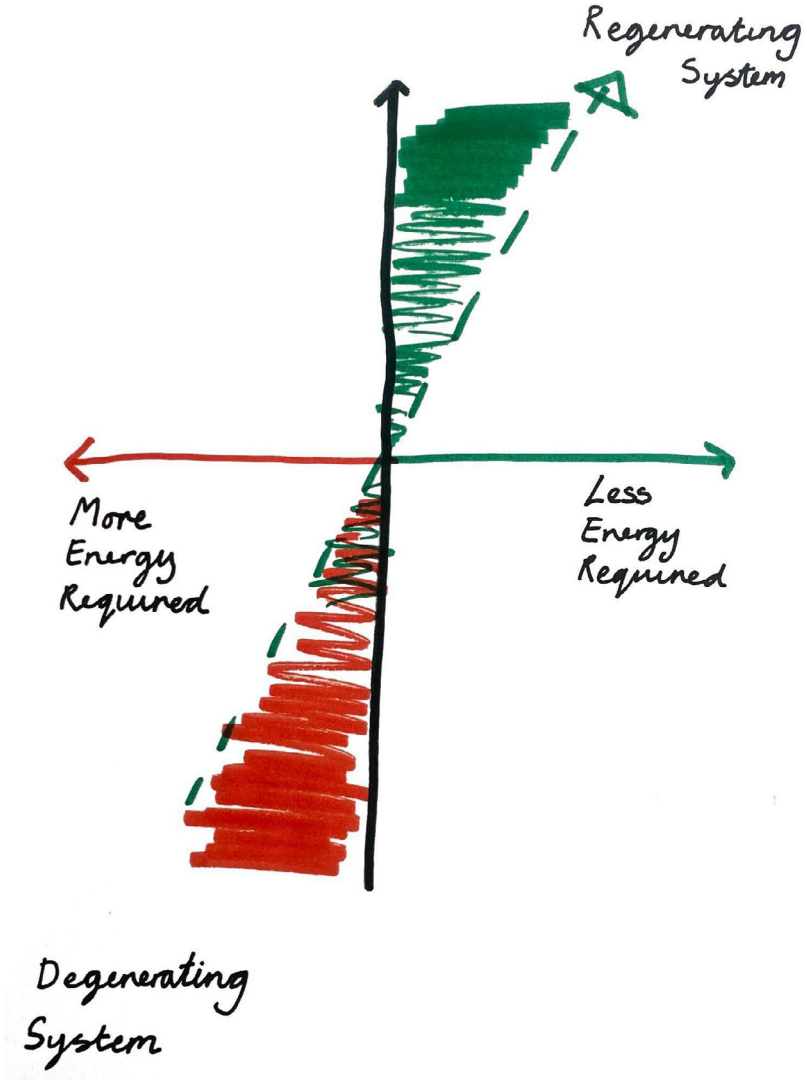
Definition

Regenerative design is an approach in which human systems are designed to co-exist and co-evolve with natural systems over time.

It goes beyond standard concepts of sustainable design. Instead of sustaining the status quo, which is degenerative, it proposes to deliver a net positive impact for the environment by replenishing resources and enhancing resilience.

Regenerative design mimics natural ecosystem processes, which keep cycling and transforming materials and grow healthier and more diverse ecosystems. It uses a systems approach to create resilient and equitable systems that integrate the needs of society with those of nature. This means looking beyond the boundary of a project or a specific site. By doing so, it delivers positive environmental and social outcomes, ensuring both human and planetary health.

Nature is our partner. Let's work with it.



Regererative
Humans **Participating** as nature - Co evolution of the Whole System.

Restorative
Humans **doing things** to nature- Assisting the evolution of Sub-Systems.

Sustainable
Neutral point of not doing any more damange.

Green
Relative Improvement:
(LEED, Smart Code, Green star, etc.)

Conventional Practice
Compliance with Code to avoid legal actions

Image is a copy of that by Bill Reed 'a trajectory of environmentally responsible design'.

Principles

Become a good ancestor. Co-evolve with nature. Create a just space for people.

Regenerative design means changing how we design things and how we work. It is about a mindset shift: from a linear way of thinking that only cares about doing things quickly and economically, to a complex and connected process that keeps improving over time.
We have drawn out three underpinning principles that should be considered as drivers for the practice and in designing all projects. They also underpin our Regenerative Architecture Index.

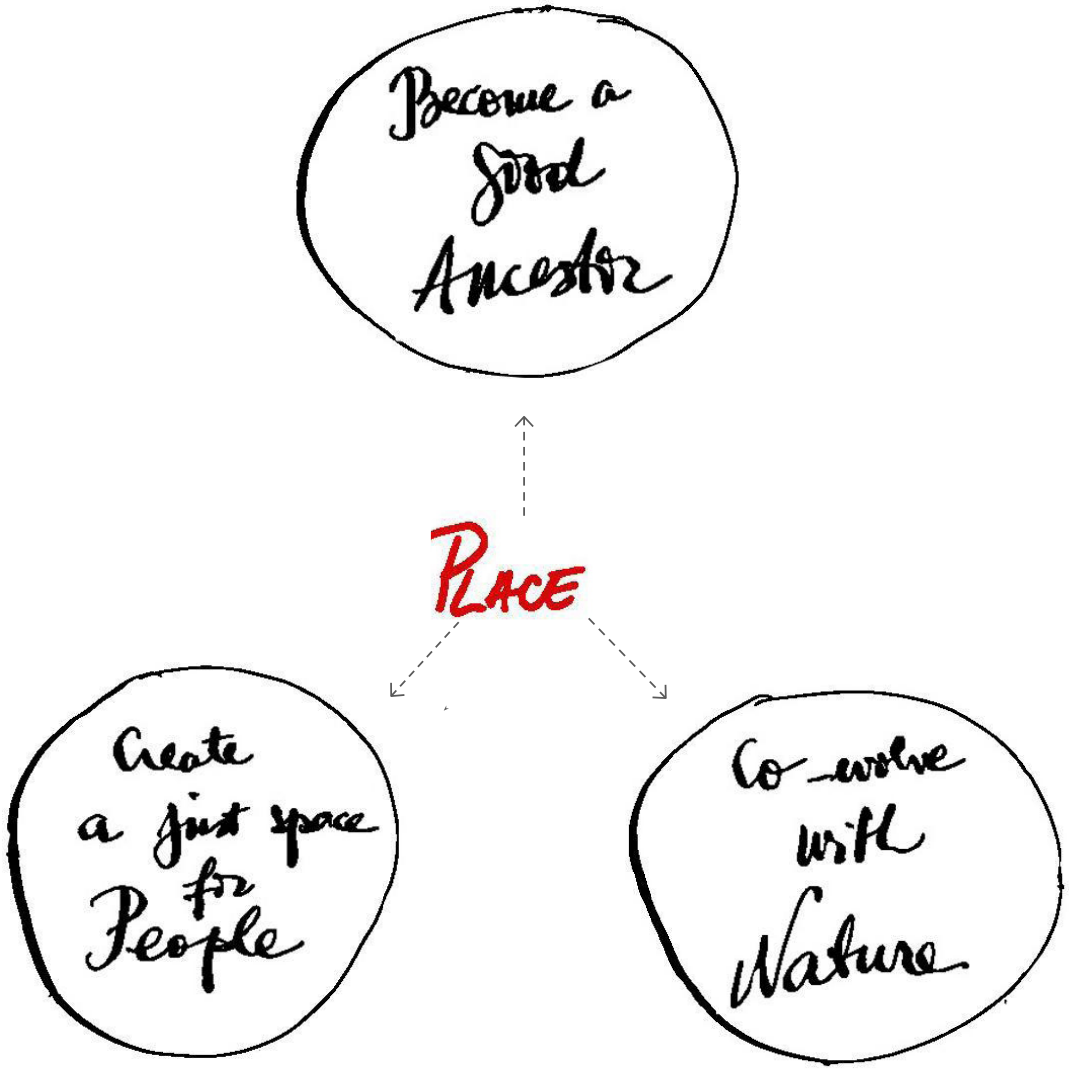
Being a good ancestor

This is about a shift in practice mindsets to consider truly long-term thinking. Our decisions today should consider seven generations ahead, ensuring adaptability and flexibility for the future. This requires innovative thought, as current models are rarely beneficial in the long term.

Co-evolving with nature

This is about recognising that we are part of nature, within integral living systems, not separate from it. Our work should actively regenerate ecosystems by learning from and working with natural systems. This requires designing for circularity and encouraging closed-loop energy, material and water cycles.

Creating a just space for people
This is about providing social connection, economic opportunity and wellbeing for all. Our design processes should foster a shared sense of stewardship where neighbourhoods can self-organise and build their resilience. This requires ethical, inclusive and participative approaches.



Refer to ***page 20*** for more detail.

There is a choice

"Regenerative design is more of an attitude and approach than a checklist of results or reductions."

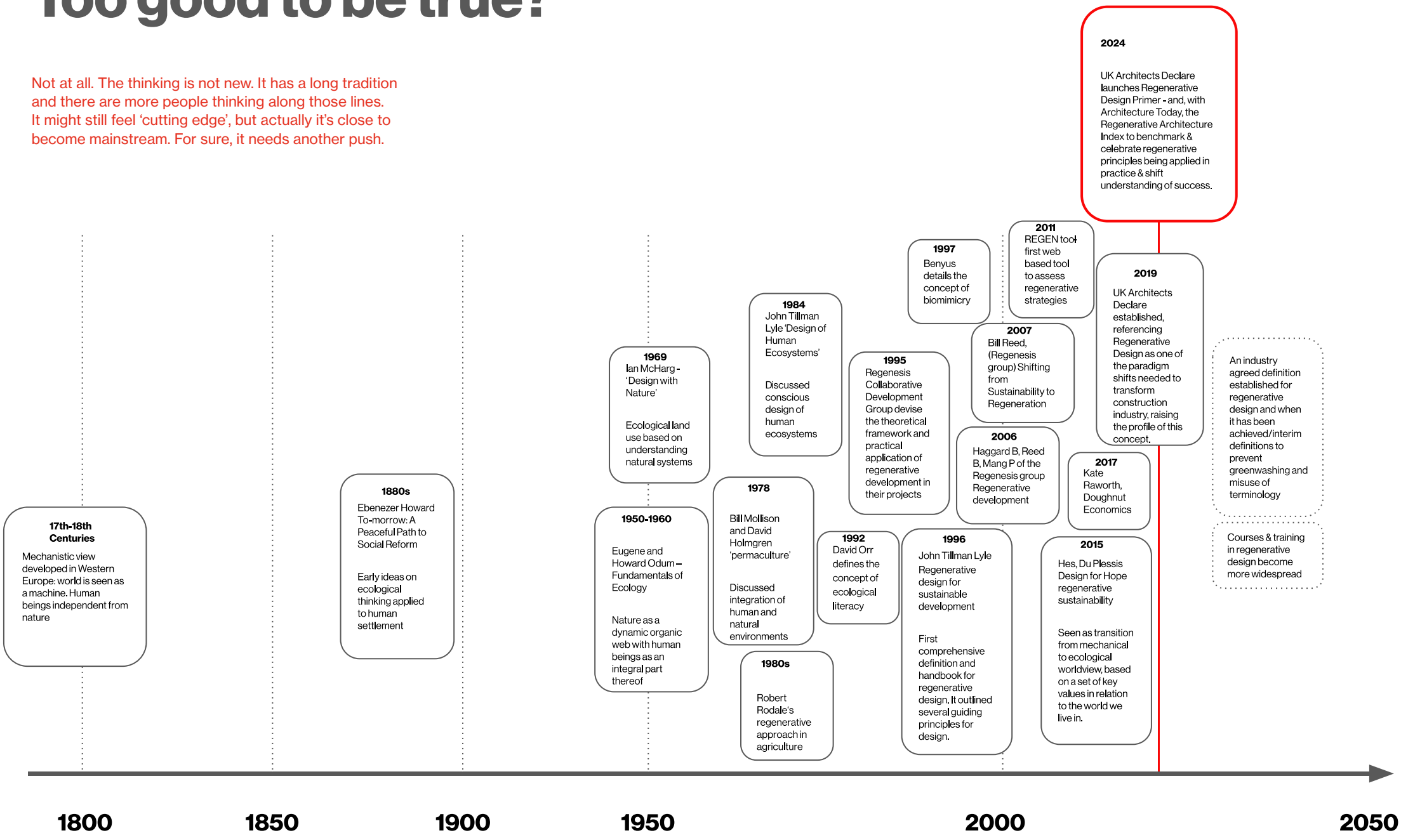
James Hutton, Director of Regenerative Design, Cunningham Group Architects
https://www.buildings.com/resiliency-sustainability/article/10196146/4-principles-of-regenerative-design

The table below illustrates some of the differences between business as usual, sustainable design and regenerative design and highlights how the outcomes would be different if we all really cared - no ifs or buts.

	I don't care	I do care, but...	I really care
	(Business as usual)	(Sustainable Design)	Regenerative Design)
Creating a Just Space for People?	The design is based on traditional principles, following a "this is how it's usually done" philosophy. The appropriateness of the design brief has not been challenged, often with significant design margins. The design and supply of materials is based on a consumptive process, with no thought for the environmental and social consequences.	The design responds to the local environment. Energy use has been significantly reduced and may have renewables installed but still heavily relies on infrastructure for external utilities. Certification processes are the main driver, largely resulting in the use of materials with negative biodiversity impacts and/or low recycled value.	The scheme produces more energy than it consumes, may sequester carbon instead of emitting it and could create jobs and value for all. It gives back to the wider system. Energy is derived from natural energy flows and sources of waste heat have been incorporated into the energy strategy. Materials are selected and sourced more locally, aiming to use biobased and waste materials, with buildings seen as carbon sinks.
Co-evolving with Nature?	Land use has been maximised for construction development. Biodiversity has been reduced by removing established features to make way for construction and for the extraction of materials. Water is not seen as a valuable and limited resource. Reductions in use are through water saving devices on sanitaryware, to achieve compliance.	Communal spaces are provided for recreation rather than enhancing nature. Focus on human rather than planetary health. Biodiversity has been improved but the goal has been around compliance of biodiversity net gain (BNG) and urban greening factor (UGF). Some form of water collection has been implemented but its uses are minimal and the scheme is still dominated by mains water use.	The development has been designed to enhance and protect biodiversity creating a space that coevolves with nature and creates more indigenous habitats. The development positively impacts on land use both onsite and in the wider context. The complete water cycle has been investigated and nature-based solutions utilised so that rain and wastewater are treated and stored onsite.
Becoming a Good Ancestor?	No review has been undertaken of past projects and this project's long term performance. No consideration is given to how material choices impact on people and planet. Communities are not considered in design decision making, with engagement considered a tick box exercise to secure permissions with little influence over outcomes.	Mixed use developments have been proposed but likely result in limited amenities for the community. Reductions in embodied carbon have focused on the building scale. There has been no thought as to how materials will be reused in the future.	Communities are integrated into the built environment and are given priority. The built environment remediates the harm that has resulted from years of conventional development, with materials and processes providing positive impact to communities. The design ensures that future generations are not burdened with potential dangers due to careless creation of products, with waste seen as a resource.

Too good to be true?

Not at all. The thinking is not new. It has a long tradition and there are more people thinking along those lines. It might still feel 'cutting edge', but actually it's close to become mainstream. For sure, it needs another push.



How to apply it

2.

How to apply it

Think of regenerative design as a mindset, NOT an additional task.

In this guide, we discuss a **'Regenerative Framework'** which encompasses all other elements of traditional project briefing and objectives. Regenerative design relies on a different mindset and high ambitions, with feedback that supports learning and adaptation throughout. This is a circular process, where effort in the initial and final stages can have disproportionately big and positive impacts. Ensure that fee allocations allow for intelligence early on and adequate feedback at the end.

Before you start: Project your deep purpose!

Workstage 0: Commit time at the start.

Workstage 1: Develop the Regenerative Framework for the project.

Workstage 2: Be explorative.

Workstage 3: Test your Regenerative Framework (ambition) - really push the boundaries!

Workstage 4: Illustrate the whole lifecycle of your project and invest time into bringing contractors on board.

Workstage 5: Allow for upskilling and integrate the supply chain into the Regenerative Framework.

Workstage 6: Start the handover early.

Workstage 7: Make time for feedback!

Before you start...

Project your deep purpose and get your house in order!

There are always obstacles, but taking control of how you project yourself is completely within your control and a powerful message to clients. Position yourself to attract the kind of projects that align with your goals. Encourage a cross-sectional collaboration for investment, ensuring alignment throughout the firm, as everyone has a unique contribution to make.

Project your deep purpose

- Do you have a clearly stated purpose aligned with the planetary emergency?
- Consider seventh generation thinking – will your practice's work be considered a positive legacy seven generations from now?
- Project that purpose – does this come across on social media and on your website?
- Attract the right clients, projects and staff ... and hopefully this will inspire those who are less engaged.
- Put down your roots and embed yourself within your local community and ecosystem – develop and maintain a deep understanding of place.
- Plan social events that foster your team's deeper connection with nature and the community, e.g. build a community wildlife pond or host a repair workshop.
- Explore the possibility of collaborating upstream with clients to co-create project briefs, ensuring genuine regenerative goals are established from the start. This can help projects stay on course, particularly during challenging times.

Regenerative Trait: Don't build if not necessary
Anne Lacaton & Jean-Philippe Vassal, architects
Lacaton & vassal

"Quality, charm, life exist. The square is already beautiful.. As a project we've proposed doing nothing apart from some simple and rapid maintenance works - replacing the gravel, cleaning the square more often, treating the lime trees, slightly modifying the traffic- of a kind to improve use of the square and to satisfy the locals."

Image credit: ***Lacaton & vassal***

Note to readers
Images in this Primer illustrate 'regenerative traits'. We cannot point to a recent project as being completely regenerative at this stage. In order to find a truly regenerative building currently, we would likely need to look back far into the past to find examples of indigenous buildings, before anyone was uttering the phrase 'regenerative design'!

Get your house in order!

- Consider becoming a B-Corp or other social or planet-driven organisation to ensure social and environmental impacts are considered alongside profit.
- Educate yourself and your staff: promote knowledge sharing for the benefit of society and the wider world.
- Have an ongoing investment in research for regenerative design.
- Acknowledge that one of the biggest barriers to change is risk aversity. Consider staff incentives for innovation and encourage 'learning through doing'.
- Does the practice have a clear succession plan, which passes on ownership and protects a legacy?
- Refer to part one of AD's Practice Guide – **'Practice Roadmap'.**

Regeneratlve Trait: Community and Upskilling

A project in Rwanda, prioritizing local employment, where 90% of the 1200-person workforce hails from Bugesera district, the project's site. An impressive 35% of the construction budget was allocated to labour, injecting millions of dollars directly into the local community. Notably, 90% of the entire budget was spent within 500 miles of the site, fostering growth in local industries and businesses, both directly related to construction and otherwise.

A remarkable 58% of the site leadership team comprised females, defying the male-dominated construction industry norms in Rwanda. This commitment to gender equity not only serves as a model for future generations but also recognizes that women tend to allocate more income to household essentials like housing, food, healthcare, and education.The diversity of natural building materials led to comprehensive worker training in various skilled trades, from stone and earth masonry to carpentry and natural fibre weaving. This training's lasting impact is exemplified by a cooperative formed by workers trained in rammed earth construction on the project. This cooperative continues to build rammed earth structures across the country.

Image credit: ***MASS***

RIBA Workstage 0
Strategic Definition

Commit time at the start.

Set out a clear ambition: think of an eco-system in which human development and the natural habitat exist in symbiosis.

First contact with the client

- Explore a joint **Regenerative Aspiration** with your client e.g. surpass the BNG requirements significantly and work to real zero rather than net zero emissions.
- Make sure this is captured in the initial engagement letters.

Invest in resources and intelligence early

- Assess the fee structure to ensure that the design team is empowered to solve problems at an early stage, when changes can be made more easily and cost less. Emphasise to the client any advantages in cost and programme certainty early on.

Strategic exploration between architect and client*

- Explore this document's three principles of regenerative design with the client. What does the client really value? Is it a matter of 'I care, but ...' or 'I really care'? This stage presents an opportunity to stretch their ambition.
- Do they need a new building or a built solution at all? Can they get what they want with their existing assets?
- Discuss what it would look like if the construction of this project brought healing rather than harm?
- Develop the business case – keep it long term and holistic.
- This isn't new, but remember to look back to previous projects: what has worked and what hasn't? De-risk your design.
- Avoid hasty design decisions without deep understanding of your site.

** Resist clients who ask for lots of early speculative (meaning free) work; much of this is strategic exploration, where you can often create the most value for your clients – right at the beginning of a project. You don't need to give it all away for free!*

Regeneratlve Trait: Community Stewardship

WeCanMake is a neighbourhood test space in Bristol, imagining and making new ways to create homes that build social infrastructure and community wealth. So far, WeCanMake has delivered two community-led, low-carbon, locally made, Living Rent homes in the Bristol neighbourhood of Knowle West, with the land and homes held in trust for community benefit in perpetuity.

With a focus on developing scalable community-led models for unlocking urban infill sites and retrofitting homes using MMC and biomaterials, what WeCanMake have collaboratively designed, developed and tested in Knowle West is open for others to adapt and adopt for their own context.

Image credit: ***WeCanMake***

RIBA Workstage 1
Preparation & Brief

Develop the Regenerative Framework for the project.

Choose a committed and inclusive design team, increase the level of ambition for the project, think long term and understand the site in terms of its natural systems. This will all feed into a Regenerative Framework for the project, formalising high levels of ambition. Remember to think of regenerative design as a mindset, not an additional task.

Help your client choose the right team

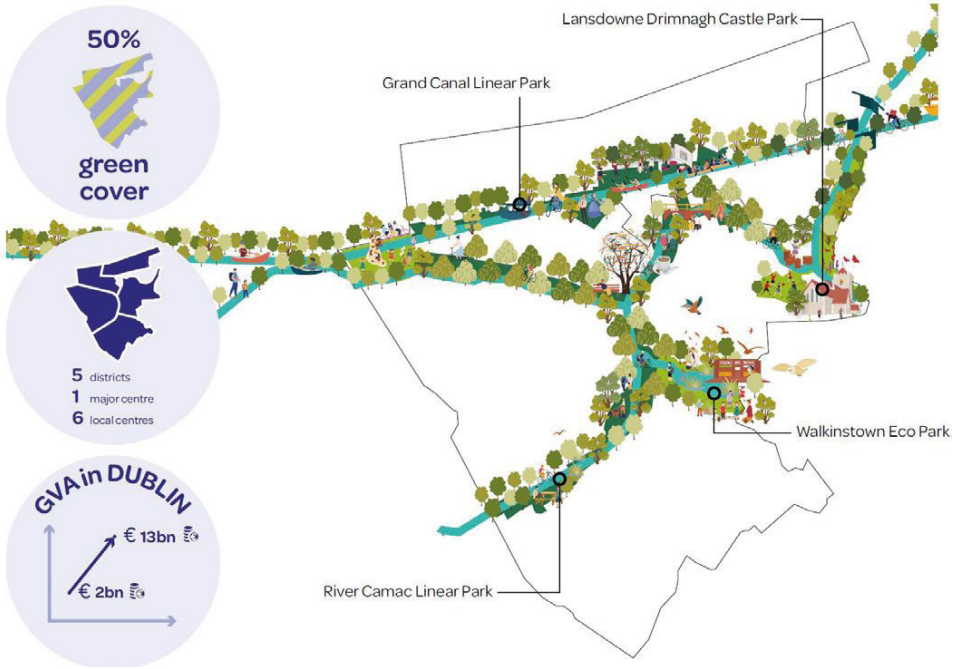
- Consider the benefits of having a whole team of partners that are signatories to Built Environment Declares. Most local authorities have now declared a climate emergency and you will be able to use this as positive leverage when you get into negotiations about planning consent.
- Start with the right team from the outset. Include early-stage experts you might not have considered in the past and who support inclusivity and co-evolution with nature, such as an ecologist, community engagement officer, cultural historian, social scientist, sustainable economist, health practitioner, etc.
- Start mapping where the connections already are between the site and its community – ensure you have considered key stakeholders as much as possible. (See early site appraisals and systems mapping on the following pages).
- Consider collaborating with smaller scale companies or individuals. Specifically, explore collaborating with those who are likely to think differently from you / your company.
- Think about who might use the project seven generations from now; this may impact who you get on board.

Regeneratlve Trait: Community Consultation
The Space; Architecture & Design by ***IF_DO***

*"Engaging the community in the design process has been an important ambition of the project from the outset. Working alongside engagement specialists **Street Space**, a programme of community engagement events took place over August and September to raise awareness about the project and involve people in shaping its future. A series of pop-up events, spontaneous interactions and collective celebrations were used as a tool to reveal the knowledge and experience of local residents."*

Initial meeting: initiate mindset shift and long-term thinking

- Make setting regenerative design the key ambition of the project at one of your first client and design team meetings! Make sure everyone is on board. The early stage of the project is a golden opportunity – your best chance to set high ambitions.
- Choose the location carefully. Consider holding the first meeting on site and engaging with the wider ecosystem from the outset.
- Open minds: consider hosting a workshop with the full project team, including the senior client, using one of the many exercises documented by **The Long Time Project** . The 'Human Layers' exercise, for instance, enables participants to engage with seven generations through the lives of people they care about. This helps everyone in the team think about what our personal purpose or legacy is. It can be a good way of helping to set the level of ambition high.
- Focus on benefits for your client: long term legacy, maintaining commercial viability.
- De-risk your project: if you don't set the targets high enough, the end result could be out of date by the time it is built. Targets, policies and regulatory requirements are continually evolving and becoming more ambitious.



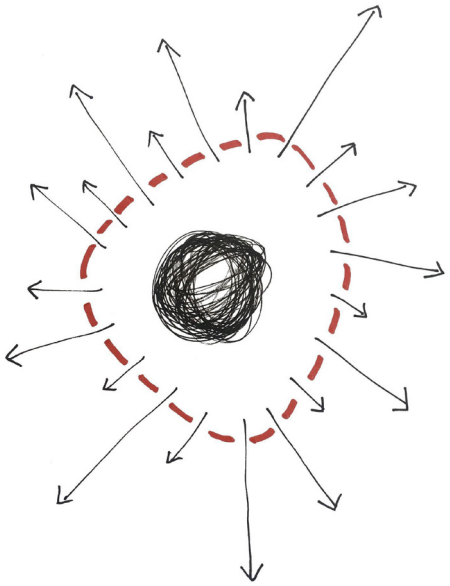
Regenerative Trait: Large % Green Spaces on site and Surface Water Drainage
City Edge, Dublin, ***Maccreanor Lavington***

- City Edge sets itself the ambition of 50% green cover, embedding sponge-city principles, with all surface water falling on the site dealt within the developments, public realm, parks, and renaturalised river system.
- 15-minute city principles.
- Heat recovery from the trunk sewer,
- Opportunities for storage of renewable energy on-site through existing hydrogen production that can also power buses.

Image credit: ***Maccreanor Lavington***

Early site appraisals and systems mapping

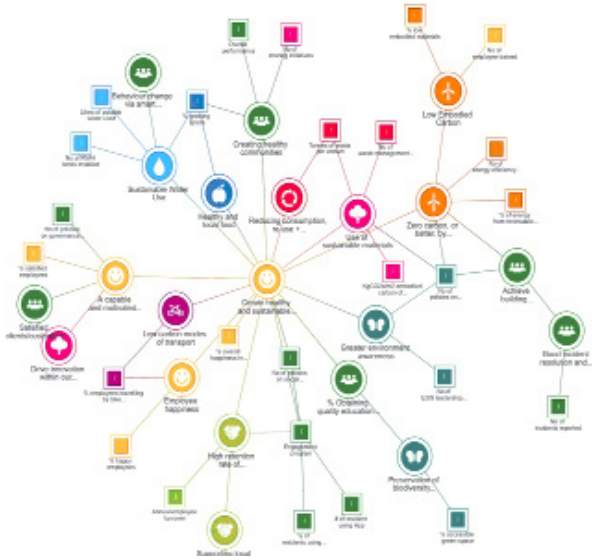
- Gather information in relation to the project site and its ecological systems, include wide-ranging site surveys. Remember to think outside of the site boundary during this exercise.
  - › Are there existing carbon sinks on site (i.e. trees, soil)?
  - › How does water move through the site?
  - › What biodiversity exists on site and what can reasonably be concluded is missing?
  - › What role does the site play for wider ecosystem networks or migrating species (e.g. a wetland for migrating birds, or perhaps as a habitat for particular development stages, or as seed sources)?
  - › Create a materials inventory of all potential building materials that exist on site or locally.
  - › What human and social networks exist? You could look at various mapping tools such as the ***OnePlanet*** tool , ***Resilience Web*** or Tony Hodgson's ***World Mandala system*** to name just a few
  - › What exists adjacent to the site and what opportunities are there for positively impacting the wider ecosystem?
  - › What transport connections and community facilities are there?
- Develop a map of resource flows for the location. Be mindful that cities will increasingly need to resemble ecosystems – running on solar energy, zero waste (everything as a nutrient), interconnected and interdependent.
- How can your project enhance the wider ecosystem of nature, people, place, and resources?
- Envisage what a thriving ecosystem would look like in this location.



Draw Permeable Boundaries....

" The old-fashioned notion of a solid legal red-line around a site is not good. We need the site to have a semi-permeable boundary, through which things can pass in both directions... resources, people, bugs, energy, air, climate, money, hope, thought, time, health..."

Chris Wise, Senior Director, **Expedition Engineering**



Regenerative Trait: Map the Wider Ecosystem of customers, suppliers, partners and stakeholders

Oneplanet is an interactive resource map designed to help local organisations and businesses reduce their impact on the planet in various ways by creating 'joined-up' actionable plans which link into the wider 'ecosystem' of customers, suppliers, partners and stakeholders.

Develop a Regenerative Framework for the project

Building on the early Regenerative Aspiration agreed with the client, develop a Regenerative Framework that focuses on our three main principles. It should encompass all aspects of the project brief and environmental ambitions.

Become a Good Ancestor

- Think long-term for planetary health, challenge the suggested design life, consider designing for climate resilience, adaptation and disassembly.
- Consider the impacts of decisions on ecosystems and people now and seven generations into the future.
- Discuss your client's legacy and payback period
- What kind of local economy are you supporting through the materials that you specify e.g. local materials, specialist local trades?
- Aim for stretch targets – these should allow you to achieve standard assessments such as BREEAM, LEED etc with relative ease.
- Avoid getting too bogged down in simplistic targets alone; concentrate on overall outcomes. Many benefits will be challenging to measure by conventional metrics (i.e. social benefits). Is your client comfortable with that?
- Look at the bigger picture and focus action through joined up thinking.
- Adopt feedback loops for learning and transformation. enabling end users to continuously adapt and improve their environment.

Co-evolve with Nature

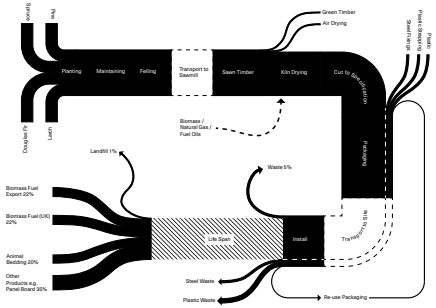
- Develop co-evolution: a mutually beneficial relationship with nature and recognition of its agency.
- Use nature as a source of inspiration for innovative design solutions. Consider the use of biophilia and biomimicry.
- Think outside of your site boundary
- Look to actively regenerate the ecosystem of your project and aim to return the developed land to its pre-development ecology and hydrology (i.e. all stormwater and water discharge – including grey and black water – treated on site).
- Bring source materials and site closer together
- Design closed-loop cycles of materials, energy and water that eliminate waste and pollution.
- Aim to produce more energy on site than your project consumes and feed back into the wider grid or system.
- Optimise building fabric performance to eliminate waste of energy.
- Choose materials and products that have a net positive impact on nature and communities – work with these materials to inform the design from the outset.

Create a Just Space for People

- Shift from the relentless pursuit of economic growth at all costs to planetary health and prosperity.
- Recognise that ecological recovery brings massive health benefits for the local community.
- Engage local stakeholders and co-design the project with them, to foster a sense of stewardship and responsibility.
- Build capacity for the community to design and maintain their own buildings and infrastructure.
- Facilitate dynamic feedback to allow continuous improvement.
- Consider all people, not only the site's future users, to promote equity.
- Discourage extreme accumulation of wealth as an objective.
- Create a positive impact through your supply chain – not just reducing harm: responsible sourcing of materials, working with living wage accredited suppliers,creating meaningful employment etc.

Keep thinking about

- Invest time in understanding your site, its context and potential evolution to deliver long-term benefits.
- Consider repurposing existing assets before building new – that's what nature would do: transform what exists, only rarely starting from scratch.
- Discuss metrics: check you are going above and beyond standard metrics such as those established by LETI, the RIBA 2030 Climate Challenge or the net zero building standard or environmental ratings such as BREEAM if required.
- Look into lessons learnt from previous, similar projects and make sure this feedback is catalogued and disseminated throughout the office.
- It's never too early to think about handover and use, in preparation for stages 6 and 7. Start client involvement in this process from the outset to ensure an effective and successful handover.



RegeneratIve Trait: Circularity of Materials
Material Cultures

Circular biobased construction
The research report *"examines the potential positive impacts of a bioregional construction economy, from improvements in biodiversity to an increase in construction jobs and security; building a case for redistributing the values of the construction industry towards a cleaner, sustainable methodology for growth that is beneficial to all."*

Image credit: ***Material Cultures***

RegeneratIve Trait: Considering Wider Ecosystem
Exercisfältet Stormwater Pond, Uppsala, ***White Arkitekter***

The city of Uppsala is growing and densifying around Exercisfältet, a former military training area. This has led to an increased need to both treat and detain stormwater; to protect nature from the city's polluted water and to protect the city from flooding due to reduced infiltration and climate change. With thoughtful design, the pond is more than infrastructure, allowing messy biodiverse ecosystems to thrive alongside a popular place for rest and socializing. The recreation pond is made as small as possible, flooding in times of heavy rainfall and extending into water pools. In extreme weather even the timber promenade will flood. The vegetation is carefully adapted to the natural conditions of the site and consists of species that are both hardy and water-purifying, providing rich habitats.

RIBA Workstage 2
Concept Design

Be explorative rather than starting with standard solutions.

You are starting to test your Regenerative Framework. Make sure everyone is working hard to stay on track – recognise that this will be challenging!

Explore

- Create a safe space for exploration without prejudice or fear of suggesting alternative solutions. Keep the atmosphere positive and open for alternative thinking. This stage is the best time to come up with new ideas.
- Encourage everyone to challenge traditional thinking and banish the status quo.
- Don't work in silos or isolation. Explore solutions that have been implemented in fields beyond the built environment.
- Think across scales of the environment: building - block - neighbourhood community - city - planet!
- Be comfortable with approaching project elements in a different order to normal in order to drive positive impacts, e.g. considering MEP, Civils, Landscape and infrastructure at the start to drive outputs that consider wider project opportunities.
- Compare concept proposals with other regenerative projects. What lessons can be learned? How can you go further and improve on their achievements?
- Look at constraints as positives e.g. the use of a certain material may put constraints on your design but see this as an opportunity to experiment with different forms.
- Explore multiple options and compare outcomes by using early stage tools such as whole life assessments, or Living Building Challenge.
- Strive to use circular materials only.
- Agree with the design team how to evaluate proposals against the Regenerative Framework.

Regeneratlve Trait: Community Involvement and Circularity
Yes Make

Using reclaimed materials involves labour intensive processing and that is a big part of why it is easier to throw things away and buy new. We select reclaimed materials where this processing involves accessible tasks that volunteers of almost any age can be set up and crack on within 1-5 minutes. We have a seemingly limitless supply of kids, students, corporate groups and general volunteers looking to get involved in some form of physical labour: increasingly so following covid and the new normal of working from home. We think of this as the urban harvest and we achieve it with the support of our communities. We then follow a material-first design process based on the materials that we immediately have in front of us or are due to become available. Think of cooking with what is in the fridge. We achieve ambitious design intent where ethical material sourcing is integral as opposed to an afterthought that stands to limit the design intent of a project. Our production philosophy aims to maximise the proportion of a build that can be completed by the lowest possible age of volunteer (typically 7+). This way we can achieve maximum community participation, without compromising on the design value of the finished piece.

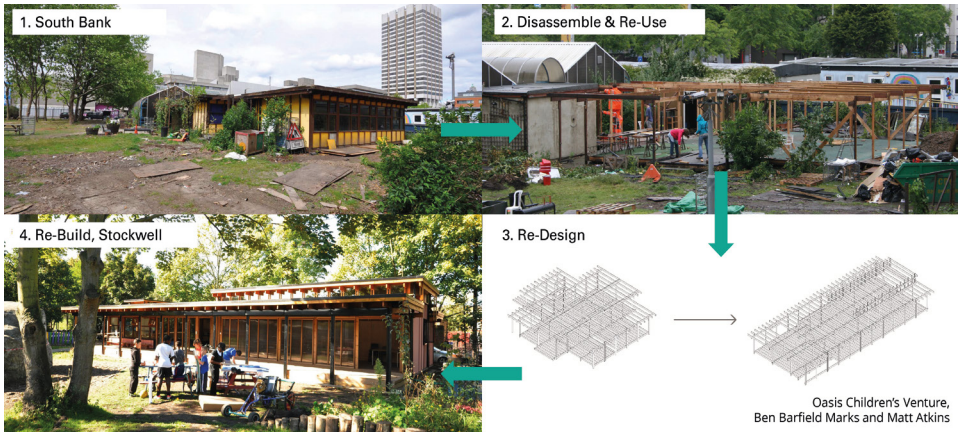
Image credit: ***Yes Make***

Engage the supply chain

- Be open to using new materials.
- Think local and circular, investigate natural resources available in your area and brainstorm methods to incorporate them into the project, thereby bolstering and enhancing local supply chains and the circular economy.
- Environmental and ethical or social criteria should also be considered in addition to geography. And for non-locally sourced materials, the origin and the impacts should be rigorously assessed.
- Use the knowledge and skills of supply chains to help produce positive solutions.

Keep thinking

- How can the Regenerative Framework help you to come up with creative solutions?
- Are you approaching the design from a living systems perspective? How would nature do this?
- Are you engaging local stakeholders and using their knowledge to find solutions?



RegeneratIve Trait: Design for Reconstruction

- The Building was an office for Coin Street Community Builders on the South Bank. It was deconstructed, redesigned by Ben Barfield Marks and Matt Atkins and rebuilt for OASIS Children's Venture as an office and Play building. It won the first RIBA MacEwen Award.

RIBA Workstage 3

Spatial Coordination

Test your Regenerative Framework (ambition) - really push the boundaries!!

Try to put some more qualitative data into your scheme. This is when you need to start bringing wider stakeholders and the planning authority on your regenerative journey (if you haven't already).

Targets and tradeoffs

- Test proposals until they break – don't be afraid to review, step back and amend designs.
- Apply quantitative data to your solutions, possibly incorporating social and environmental indicators (e.g. HACT, Climate Impact and BNG assessments) alongside more standard targets.
- Data shows you the impact of your decisions and allows
- you to choose more informed options, so gather as much as you can!
- There will be tradeoffs to make in this stage. Take your time looking at the various options, think broad and select the solution that delivers the best outcome in terms of:
- Becoming a Good Ancestor
- Co-evolving with Nature
- Creating a Just Space for People
- Think beyond certification and put effort in where it counts.
- Consider keeping multiple options on the table as a reminder that there are different ways of doing things.
- Tell your story, share insights of pioneering projects and give others the confidence to follow.

Regenerative Trait: Circular Economy

The Brighton Waste House was the brainchild of architect, academic and climate activist ***Duncan Baker-Brown***, who was keen to point out that the huge amount of waste generated by the UK construction industry was actually a useful resource. Situated on campus at the University of Brighton, it was designed and constructed in partnership with social housing maintenance provider The Mears Group, together with apprentices, local volunteers and over 360 students from The University of Brighton and The Brighton Metropolitan College. The Waste House comprises over 55 tonnes of material other people threw away. It is the first permanent public building (it's actually a teaching studio not a house) in the world to be made from over 90% waste material whilst performing at close to PassivHaus levels of efficiency – creating, as it does, over 30% more electricity than it consumes. As well as being a teaching facility and a thought-provoking polemic, the Waste House has more recently attracted two EU funded Interreg research projects with a couple of high-profile outputs tested on the building, i.e., Roman Concrete tiles made of waste oyster shells and insulation made from old duvets.

Image credit: ***BakerBrown Studio***

Engage positively with the planning system

- Regenerative design involves going beyond target driven sustainability requirements, and requires a greater degree of flexibility than typically applied through standard planning practices.
- Bring the local planning authority on board and share the journey with them. Explain your regenerative ambition and principles.
- Discuss alternative approaches with the planning authority such as Local Development Orders, supported by Design Codes which set out the key parameters to protect the long-term ambitions and to achieve the flexibility needed.
- Keep pushing beyond achieving the minimum requirements needed to obtain planning permission.

Cost and risk

- Appraise the project through the lens of multiple currencies (e.g. social and environmental) and not only financial cost e.g. using the HACT Social Value calculator ***(Driving Value in Social Housing | HACT)*****.**
- Time is your friend. Longevity of the project and materials can present very good value, as can flexibility and the ability to adapt a building over time. Make an investment case for regenerative design rather than a cost plan.
- Innovation means learning by doing. 'Failure' to meet the full regenerative ambition means learning what to do differently. It also de-risks your client's project because you can demonstrate that you have been striving for a regenerative solution that surpasses minimum requirements.

Regeneratlve Trait: Community Living and infrastructure
The Phoenix Project: A Sustainable Urban Living Revolution in Lewes, East Sussex, Masterplanned by ***Human Nature*****,** alongside Periscope and Kathryn Firth from Arup**.**

The Phoenix project is more than just a housing development; it's a bold reimagining of community living, emphasizing sustainability, placemaking, and community engagement. The project seeks to showcase that sustainable living can indeed be a joy rather than a compromise. With a strong focus on climate-progressive measures, the development integrates a data-driven renewable energy system, comprehensive on-site recycling, waste management, composting facilities, and an innovative urban farming and community gardening strategy. These elements are designed not only to minimize environmental impact but also to foster a sense of community and connection among residents.

Can you suggest an example of a regenerative trait that could be featured in the next edition of this primer?
hello@architectsdeclare.com

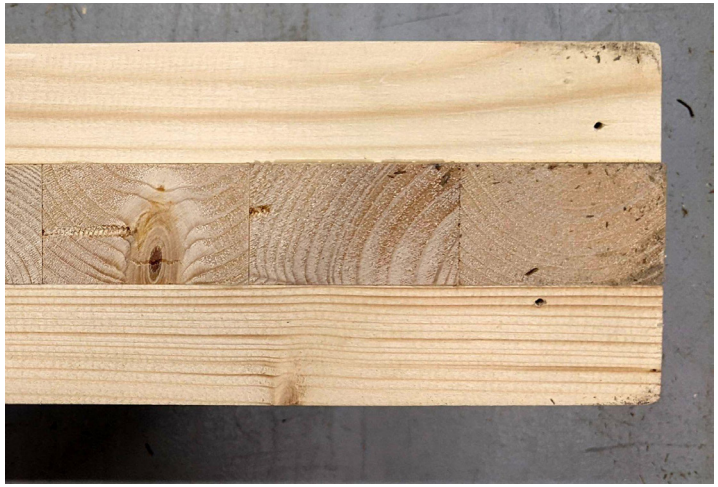
RIBA Workstage 4
Technical Design

Illustrate the whole lifecycle of your project and invest time into bringing contractors on board.

Ensure drawing packages contain information for future adaptation and disassembly. Develop details that minimise materials use. Prepare specifications that include not only methods of construction and performance in use, but also end-of life strategies. Engage with contractors to take them on their regenerative journey and help them align with the vision of your project.

Materials and detailing

- Specify both technical and environmental performance criteria of materials to ensure value engineering reflects your Regenerative Vision. This is particularly important for design-and-build contracts. The specification should capture the important regenerative features such as the origins of materials, health impacts and embodied carbon.
- Think about materials and fixing as part of a whole building system. The lifecycle of all materials and components and their replacement cycles should be considered.
- Be efficient with the design; build less and strive to reduce both the number and quantity of materials used.
- Simplify detailing to enable easy dismantling.
- Engage manufacturers about how their materials can be recycled.
- Be a good ancestor: ask questions about whether a chosen material can be reused or how it might meet future standards.



Regenerative Trait: Circularity

The construction industry creates vast quantities of waste. Wood waste is currently chipped, downcycled and incinerated.
UK CLT intervenes by capitalising on the structural and aesthetic properties of reclaimed timber. We turn it into a long-life, modular product: cross-laminated secondary timber.
This circular economy initiative increases the carbon storage capacity of the built environment, reduces pressure on forests, and creates jobs in urban remanufacturing.

Image credit: ***UK CLT***

Design packages

- Consider including drawings and specifications that show how the building can be repaired and later dismantled.
- Consider including drawings and specifications that show how the building can be adapted over time, e.g. promote the use of non-glued MMC elements to enable greater flexibility.

Contractors, Building Control and wider stakeholders

- Encourage open discussions among the project team: how does this project deliver more benefits compared to 'sustainable design'?
- Continue engagement with wider stakeholders and share knowledge and learning beyond the project team.
- Discuss with your client their aspirations for appointing a contractor. Explore what qualities contractors need to deliver the Regenerative Vision and work within the Regenerative Framework.
- Cost plans prepared by the Quantity Surveyor (QS) are likely to pushback on certain regenerative design decisions. Make the QS an integral part of your team and ask them to help achieve the project's Regenerative Aspiration in a cost effective way.
- There may also be pushback on any regenerative elements that are perceived as causing an extension of delivery programme. This could include longer lead-in time for non-standard materials. Evaluate whether these can save your client time and money in the future. Explore ways of minimising delays by engaging with the supply chain and carefully plan phasing and delivery.

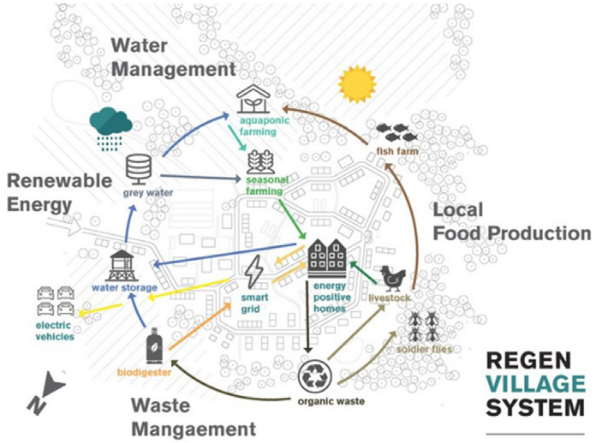
Regenerative Trait: Circularity

Modcell adopt *'flying factory'* practice to bring source materials and site close to one another and support local communities.

Image credit: ***Agile Property***

Keep thinking about...

- Remain curious and confident to question the norm!
- How can you increase your project's positive impact beyond the site boundary?
- It may seem early, but this is a good time to start the conversation with your client about taking control of their asset. Aim to make the handover a gradual process. There is more information on this in Workstage 6.
- There can be many push backs during this stage. Be prepared to engage with those pushing back and make them part of the solution. Work as one team to resolve issues. Refer to the Regenerative Vision and Regenerative Framework and ask: How can we achieve this?
- Remember: If there is no push back, you might have set your ambitions too low and not pushed hard enough yet.



Regenerative Trait: Positive Energy District
Positive Energy Planning Process (PEPP), ***White Arkitekter.***

Recognizing that energy is a critical factor in regenerative districts and neighbourhoods, White Arkitekter goes beyond traditional architectural roles. An holistic approach integrates energy considerations into spatial planning, emphasizing the importance of making buildings, neighbourhoods, and whole districts net producers of clean energy. To assist with this White Arkitekter employs their own well-developed methodology PEPP (Positive Energy Planning Process), guiding clients in co-creating attractive and energy-positive districts and neighbourhoods. White Arkitekter developed the roadmap for Uppsala Business Park as a Positive Energy District in a collaboration between the municipality, the local electricity network operator and property owners. Waste heat from laboratories in the business park is used in a heating and cooling network along with ground-source heat pumps and geothermal energy. Solar panels on the roofs and façades of new and existing buildings in the district will result in greater energy production than that required in the buildings with planned development by 2031.

Regenerative Trait: Upskilling
Training - ***airtightness detailing workshop*** - ***Haworth Tompkins***

Image credit: ***Haworth Tompkins***

RIBA Workstage 5

Manufacturing

Allow for upskilling and integrate the supply chain into the Regenerative Framework.

Onsite activities can be key to the success of a project. Bring both the design and end users into the construction process and support contractors in delivering the Regenerative Framework.

Embed construction in the context

- Allow the development to act as a catalyst for the surrounding area during construction. Build a regenerative narrative with the community. Sow the seeds for the future success of the project at a time that is often perceived as painful by those around.
- Discuss with both client and contractor opportunities to engage the wider community during construction. Could there be events or workshops for the wider community to participate? Could there be a regular drop-in workshop, making use of the equipment on site for repairs?
- Conduct workshops on different methods of construction and materials to teach new and transferable skills to construction workers. Consider certification and allow enough time for this in the programme.
- Align the supply chain with the principles of people and and nature.

Regenerative Trait: Upskilling

Working collaboratively with contractors on site, training workshops and sharing knowledge - ***Bere:architects***

Airtightness report and guide ***here***

On site

- Have a clear strategy for ensuring that design changes during construction adhere to the Regenerative Framework.
- Immerse yourself in the construction with new materials. Consider site visits to other projects, to further your knowledge.
- Nominate an on-site Regenerative Champion.

Commissioning

- Set out clear guidance for the aspirations of the Commissioning Plan. This should involve the broader building design team, not just M&E, and the end user. Make the process collaborative.
- Allow sufficient time for commissioning to help the end users to adapt and improve their environment.
- Ensure the people commissioning the systems understand how they work – refer to the Commissioning Plan drafted in earlier stages
- Be involved. The operation of the building is integral to the project delivering the Regenerative Vision.

Regeneratlve Trait: Upskilling local community
Mike's Cottage, ***Pamphilon Architects***

Both the client and architect wanted to use woodfibre and lime plaster as a breathable and lower embodied carbon alternative to EWI but were faced with a total lack of tradespeople willing to do the installation. Pamphilon Architects spent time helping to upskill a local carpenter and is now working with local initiatives such as the ***Cambridge Retrofit Hub*** to endeavour to set up a system of mentoring to others so that these skills can be passed on in an affordable manner.

Image credit: ***Pamphilon Architects***

RIBA Workstage 6

Handover

Allow for upskilling and integrate the supply chain into the Regenerative Framework.

Onsite activities can be key to the success of a project. Bring both the design and end users into the construction process and support contractors in delivering the Regenerative Framework.

Soft launching of responsibilities and ownership

- As regenerative designers, we become stewards of places we design and need to remain engaged with our clients in the long term.
- Create the golden thread. Help the client write their regenerative care plan for the building, indicating expected lifespans.
- Prepare new owners and users: they will need to keep monitoring, adapting and evolving the regenerative asset or systems. It is really important that they take full ownership of how to interpret and use their building.
- Prepare intuitive, easy to understand end user information.
- Consider having a community event on completion. Allow the construction team to meet the end users and understand their initial feelings about the building.

This is not new, but remember

- You need good records of 'as built' information. This allows future generations to understand your vision and intent for their building.
- Consider the use of material passports as a way of tracking resources.
- Become familiar with the types of feedback required. Look at the AD Masterclass '***Closing the Loop***'.

Example Regenerative Care Plan
Coming in the next edition. Would you like to help us put one together?
hello@architectsdeclare.com

RIBA Workstage 7

In Use

Make time for feedback.

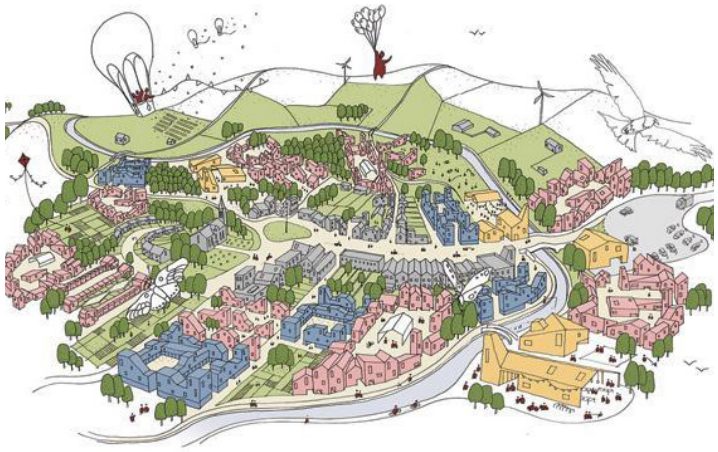
This is arguably one of the most important stages for delivering regenerative design, therefore make enough time for this. Ensure that you have systems in place to feed lessons learnt into your future projects and the evolution of existing projects. The regenerative process does not stop at the end of construction. This is the time to create long-term processes that ensure the places where we work, live and play continue to thrive.

Plan the future

- Set fixed dates with your client to review the building in one, three, etc years time. Consider taking your office on a visit for an open discussion on lessons learnt.
- Establish a process of disseminating lessons within the office and wider community. Build a library of regenerative design lessons.
- When planning retrofit or adaptive works, refer back to the Regenerative Framework (which can also evolve if needed).

Engage your client

- Eliminate the concept of waste. Help them to eliminate unnecessary requirements for maintenance and creation of waste as a result of building use.
- Understand and communicate the limitations of design. No structure will last forever or solve all problems. Mimic nature and help your client to evolve with the building.
- Continue to engage the community to understand what is working and what is not. The building should be embedded culturally as well as physically.
- When designing smart systems, think about the future. Data use should be carefully considered against the carbon and ethical impact.
- Regular feedback is essential. Make post occupancy evaluation an ongoing exercise.



Regenerative Trait: Augmenting existing infrastructure systems
VeloCity, ***Mikhail Riches***

"We need to build new houses in places that will enable people to move towards zero-carbon lifestyles, reduce car dependency and promote travel. Our VeloCity multidisciplinary team's proposal for new housing in the OxCam corridor won the National Infrastructure Commission's competition seeking ideas about where to place 1M new homes. Our holistic approach located new development within a 6 mile radius of existing and proposed transport interchanges and identified development opportunities to revitalising communities. .The proposal aims to grow and link villages to create a supporting network of services that preserve their rural character."

Image credit: ***VeloCity***

Go for it!

3.

Go for it!

Excited and ready to go? Let nothing hold you back.

Doing things differently means pushing at boundaries to eventually move them, and finding ways to reduce barriers. While this can feel daunting, you are not alone in doing so. Reach out to the like-minded and keep moving forward.

To consider

- Organise a session in your practice or with peers to discuss this guide and feed back any comments to hello@architectsdeclare.com
- Be open and kind with yourself and others and accept that trying new things may not always work out. 'Mistakes' are an integral part of learning and improving.
- Share knowledge to learn faster and evolve your designs quicker.
- Involve your client, and all built environment stakeholders. Share your enthusiasm, and help them understand the role they can play in delivering a shared vision.
- Participate in the wider community – join other groups and attend events.
- Join like-minded groups and individuals to push for and advocate change.
- When perceived barriers prevent you from going for it - be vocal, reach out to the community for support.
- Keep going, you have agency and are making a difference - **don't give up!**

Regenerative Trait: Relationship with Nature
Hackbridge School, ***Architype***

"Set between a conservation wetlands area of Metropolitan Open Land and the pioneering BedZED eco-village, Hackbridge Primary School provides a playful and natural haven for students in the London Borough of Sutton. The all timber building is a trailblazing example of sustainability, with the Passivhaus Plus design supporting the school's achievement of becoming the first truly zero-carbon school in the UK."

Image credit ©***Jack Hobhouse***

A regenerative glossary

4.

Regenerative terms

In this section we have set out some brief definitions of new terminology. Common definitions of 'regenerative' include the following:

"A system of technologies and strategies, based on an understanding of the inner working of ecosystems that generates designs that regenerate socio-ecological wholes (i.e., generate anew their inherent capacity for vitality, viability and evolution) rather than deplete their underlying life support systems and resources."
Regenesis Group

"Enabling social and ecological systems to maintain a healthy state and evolve"
RESTORE

Interbeing

The writer Charles Eisenstein has made the case that a lot of our problems arise from a 'story of separation' that sees us as isolated individuals in a competitive world of survival of the fittest. The opposite of this is 'interbeing' (a term coined by Vietnamese monk Thich Nhat Hanh) which is a state of connectedness and interdependence of all phenomena. It is worth asking ourselves how different our towns and cities would be if they were designed based on interbeing.

Further reading:

- Hanh, **T. N Interbeing: Precepts for Everyday Living** (1993)
- Eisenstein, **C The More Beautiful World Our Hearts Know is Possible** (2013)

Systemic Perspectives

Systemic perspectives examine groups of interrelated, interdependent and enmeshed systems forming a complex whole in a holistic manner, rather than reducing them to systematic smaller pieces they hold within them.

Further reading:

- Meadows, D. **Thinking in Systems** (2009)

Planetary health

Whereas national health and global health are just about humans, planetary health is the idea that our health as humans is inseparable from the wellbeing of the living systems on which we depend for oxygen, water, nutrients and much more besides.

Daniel Christian Wahl was an early advocate of planetary health in his postgraduate work, leading to the publication of his book (see below).

Further reading:

- *Wahl, D. C.* **Designing Regenerative Cultures** *(2016)* ***planetaryhealthalliance***

Ecological economics

Ecological economics aims to align our economic system with planetary limits. It represents a broader and more holistic approach than environmental economics, which has tried to reconcile environmental concerns with market mechanisms by putting a price on nature (i.e. natural capital or the monetary value of ecosystem services). Many critics of environmental economics have argued that this assigns extrinsic value (i.e. the value of nature to us as humans) without recognising intrinsic value (the rights for other species to exist).

Further reading:

- Raworth, K. **Doughnut Economics** (2017)

Private sufficiency / public luxury

The writer George Monbiot has observed that too often society is organised based on private luxury and public austerity. If we instead aimed for private sufficiency and public luxury, we could create a good quality of life for all global citizens within planetary limits.

Further reading:

- *Monbiot, G.* **Public luxury for all or private luxury for some: This is the choice we face**. *Read* **here**

Biologically-inspired design approaches

There is a growing consensus that the key challenge for humans in the planetary emergency is to integrate everything we do into the web of life that supports us. Consequently, there is a lot that we can learn from the way that life has evolved over aeons into an abundant, regenerative system.

This applies at both a practical and philosophical level. The writer Jeremy Lent has made the case (in his book The Patterning Instinct) that the root cause of our current unsustainability is our sense of separation from nature. While we may not think this as individuals, our economies are organised as if nature is an externality. Leading thinkers such as The Regenesis Group have proposed that the ultimate aim for regenerative design is to reach the point where humans are participating and co-evolving as nature.

Bioregionalism

An approach which proposes that socio-economic systems would be more just and sustainable if they are based on regions defined by biology (for instance by watersheds and bioclimatic characteristics) rather than by abstract political boundaries.

Bioregionalism (also referred to as 'Bioregioning') proposes that striving to source most of our raw materials within bioregions will also re-establish a greater connection between the buildings we create and the place in which they are located.

Suggested sources:

- Wahl , D. C. **Designing Regenerative Cultures** (2016) Triarchy Press
- ***Bioregional Regeneration for Planetary Health*** by Daniel Christian Wahl
- Wearne, S., Hubbard, E., Jónás, K., & Wilke, M. (2023). ***A learning journey into contemporary bioregionalism. People and Nature,*** 00, 1–17.
- '***How do you know when a bioregion is a bioregion?'***
- ***'Material Cultures'***
- Desai, P. and Riddlestone, S. Bioregional Solutions: **For Living on One Planet** (2002) Schumacher briefings

Biomimicry

This functional discipline (distinct from biomorphic design which is form-based) looks to biological adaptations as sources for innovation. The philosopher Freya Mathews, in Towards a Deeper Philosophy of Biomimicry states that "biomimicry in design circles . . . has . . . moved us closer to the goal of planetary ecological integrity, closer than the traditional environment movement ever did."

Advocates for biomimicry make the case that this approach can be used to design out toxins, to develop low energy manufacturing, more efficient structures, passive thermoregulation, and many other solutions. For just about every challenge we face there will be equivalent solutions in biology that can inspire high performance innovation.

Suggested sources:

- Ask Nature (allows you to enter a functional question and it shows biological examples that deliver that function together with scientific sources that can be studied) ***asknature***
- Benyus, J. **Biomimicry: Design Inspired by Nature** (2009), Mariner Books
- Gruber, P. **Biomimetics in Architecture: Architecture of Life and Buildings** (2010), Birkhauser
- Mathews, F. ***'Towards a Deeper Philosophy of Biomimicry'***
- Mathews, F. ***'Biomimicry and the Problem of Praxis'***
- Pawlyn, M. **Biomimicry in Architecture 2nd ed**. (2019), RIBA Publishing

Biophilia

Developed by the eminent biologist E.O. Wilson in 1984, the biophilia hypothesis is based on the idea that, because humans evolved in direct contact with nature, there is a lot of evidence to suggest that we are happier, healthier and more productive when in regular contact with nature.

Since then, biophilia has been developed into a comprehensive design discipline (particularly by consultants Terrapin Bright Green) with a substantial evidence base that can be useful when making a persuasive case to clients.

Suggested sources:

- Terrapin Bright Green, '***14 Patterns of Biophilic Design***'
- Terrapin Bright Green, '***The Economics of Biophilia***'
- Sturgeon, A. **Creating Biophilic Buildings** (2017) Ecotone Publishing
- Wilson, E. O. **Biophilia** (1984), Harvard University Press
- Kellert S. & Wilson, E. O. **The Biophilia Hypothesis** (1993), Shearwater Books

BioTRIZ

The forerunner to this is the Russian problem-solving methodology called TRIZ (an acronym that roughly translates as 'Theory of rational and inventive problem solving'). Developed by Genrikh Altshuller. TRIZ was taught in all Russian schools and some have claimed that this explains why the Russians were more inventive than NASA in the space race.

More recently, it was adapted by Nikolay and Olga Bogatyrev to include biological strategies in addition to human inventive principles. This can be a very useful method for resolving difficult functional challenges.

Suggested sources:

There aren't many readily implementable sources for BioTRIZ as it requires a one or two-day training course to be proficient.

An alternative would be to involve Olga Bogatyrev in a workshop. She can be contacted on ***olga@biotriz.com.*** Olga is working on a book that will compile 55 BioTRIZ strategies with case studies. Publication is anticipated in late 2024.

Biotriz ***Youtube***

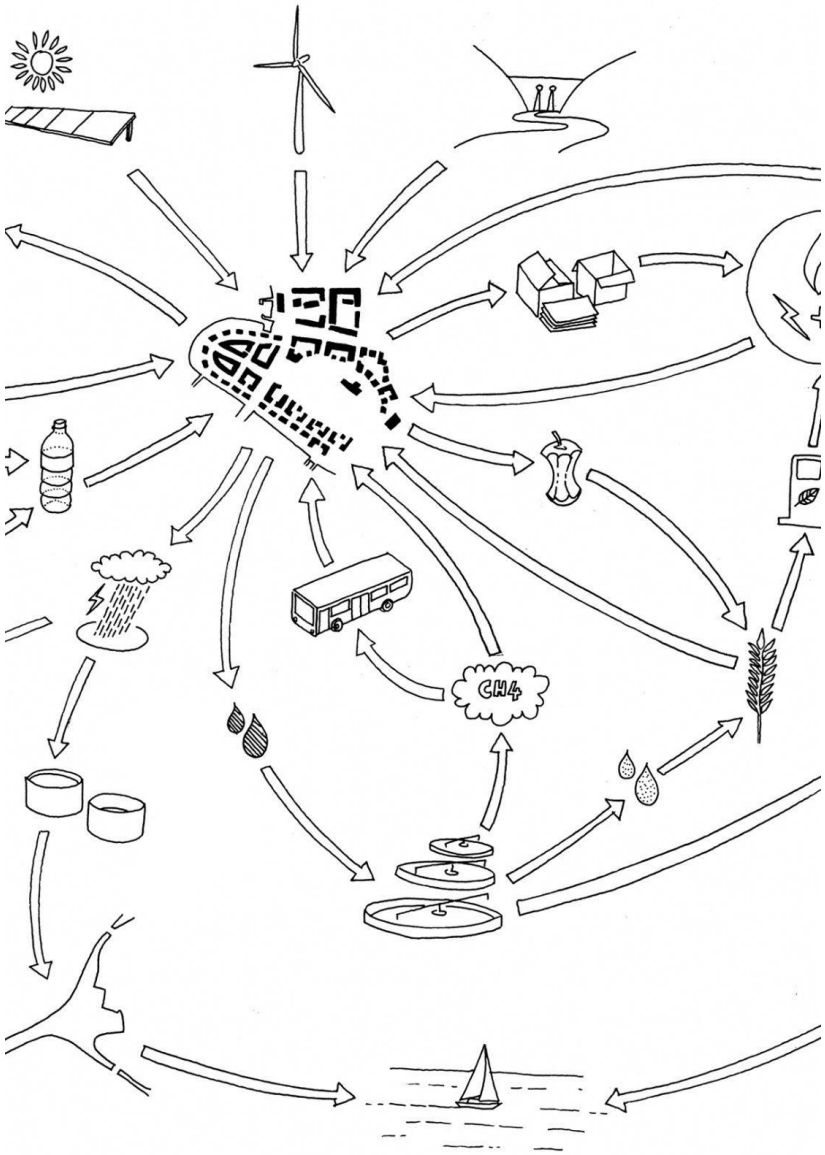
Ecomimicry

Ecomimicry (also referred to as ecosystems thinking, industrial ecology or industrial symbiosis) takes inspiration from the way that ecosystems work in interconnected webs of species, in which the under-utilised resources from one part of the system becomes the input for another part.

To date, the idea has mainly been applied to industrial systems (Kalundborg in Denmark is one of the most commonly referenced examples) and has been very successful in increasing resource efficiency and transforming waste into value. Hammarby Sjostad in Sweden is one of the few urban examples. Applying ecomimicry to cities may well be the biggest and most under-explored opportunity in the circular economy.

Suggested sources:

- Thomas Graedel and Matthew Eckelman, **Industrial Ecology and Sustainability** (2023), World Scientific Publishing Company
- ***'Hammarby Sjostad – A unique environmental project in Stockholm'***
- Chapter 3 in: Oliver Broadbent and James Norman **The Regenerative Structural Engineer**, IStructE 2024
- Chapter 3 in: Michael Pawlyn **Biomimicry in Architecture 2nd ed**. (2019), RIBA Publishing
- Ken Yeang **Saving The Planet By Design: Reinventing Our World Through Ecomimesis** (2019), Routledge



If you want to dig deeper

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Al-Sabouni, M. (2016) **The Battle for Home: The Memoir of a Syrian Architect**, Thames and Hudson Ltd, UK

Al-Sabouni, M. (2021) **Building for Hope: Towards an Architecture of Belonging,** Thames and Hudson Ltd, UK

Baker-Brown, Duncan (2017) **The Re-Use Atlas: A designer's guide to the circular economy**, RIBA Publishing

Broadbent, O. & Norman, J. (2024) **The Regenerative Structural Engineer**, iStructE Ltd, UK. Available at: ***The Institution of Structural Engineers***

Cheshire, D. (2021) **The Handbook to Building a Circular Economy**, RIBA Publishing, UK

Dabiri, E. (2021) **What White People Can Do Next: From Allyship to Coalition**, Penguin, UK

Daly, H. (1991) **Steady-State Economics**, Island Press, US

Gowler, p. et al. (2024) **Circular Economy and Reuse: Guidance for Designers**, iStructE Ltd, UK

Hes, D. & Du Plessis, C. (2014) Designing for Hope, Routledge, UK

Hopkins, R. (2021) **From What Is to What If: Unleashing the Power of Imagination to Create the Future We Want**, Chelsea Green Publishing Co. UK

Ichioka, S. & Pawlyn, M. (2022) **Flourish: Design Paradigms for Our Planetary Emergency**, Triarchy Press. Available ***triarchypress***

International Living Future Institute (2024) **Living Building Challenge 4.0: A Visionary Path to a Regenerative Future**. Available ***living-future***

Jackson, T (2016) **Prosperity without Growth: Foundations for the Economy of Tomorrow**, Routledge, UK

Korten, D. (2024) **Paradigm Shift, Earth Community, Ecological Civilization and the Phantom Wealth, Earth Charter Institute**. Available ***Paradigm Shift, Earth Community, Ecological Civilization and the Phantom Wealth - Earth Charter***

Krznaric, R. (2021) **The Good Ancestor: How to Think Long Term in a Short Term World,** WH Allen, UK

Law, B. (2014) **Woodsman**, HarperCollins Publishers, UK

Mang, P. & Haggard, B. (2016) **Regenerative Development and Design: A Framework for Evolving Sustainability**, Wiley, UK

Material Cultures & Dall, A. (2022) Material Reform, Architectural Association Publications Ltd, UK

McHarg, I. (1969) **Design with Nature**, The Natural Press, UK

Meadows, D. (1999) **Leverage Points: Places to Intervene in a System, The Sustainability Institute**, US. ***Donella meadows***

Meadows, D. (2008) **Thinking Systems**, Chelsea Green Publishing Co., UK

Moore, A. (2021) **Do Build**, The Do Book Co., UK

Rodofsky, B. (1987) **Architecture Without Architects: A Short Introduction to Non-Pedigreed Architecture**, University of New Mexico Press, US

Raworth, K. (2018) **Doughnut Economics, Cornerstone**, UK

Reed, B. (2007) **Shifting from 'Sustainability' to Regeneration, Integrative Design Collaborative and Regenesis**, Arlington, MA, US

Reed, B. & 7group (2009) **The Integrative Design Guide to Green Building: Redefining the Practice of Sustainability**, Wiley, US

Sanford, C. (2013) **Principles of Regenerative Design Paradigm**. Available at: https://www.youtube.com/watch?v=zLXX6VqWYTg

Sanford, C. (2017) **The Regenerative Business: Redesign Work, Cultivate Human Potential, Achieve Extraordinary Outcomes**, Nicholas Brealey Publishing, UK

Watson, J. (2022) **Lo-TEK. Design by Radical Indigenism**, Taschen, Germany

Websites Resources:

www.thelongtimeprojectorg
https://regenesisgroup.com/
https://fab.city/
www.letterstotheearth.com

If you want to dig deeper

Podcasts that discuss regenerative topics:

- *Building Sustainability*
- *Charles Eisenstein Random*
- *Ecological Civilization*
- *Emergence Magazine Podcast*
- *Endless Vital Activity*
- *Ffern*
- *Flourish Systems Change*
- *Future Ecologies*
- *The Green Urbanist*
- *Outside In*
- *Regeneration Rising (part of RSA Conversations podcast)*

Podcast episodes on specific topics:

- *All that we are*
- *Change agency*
- *Coevolution with nature*
- *Human microbiome*
- *Human supremacy*
- *Indigenous knowledge*
- *Interbeing*
- *Long term thinking*
- *The Metacrisis (Part 1) (Part 2)*
- *The Great simplification*

UK Architects Declare
Climate & Biodiversity Emergency

UK Architects Declare

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UK Architects Declare is a not-for-profit organisation and growing network of more than 1,300 architectural practices across the UK, committed to addressing the climate and biodiversity emergency.

Our Vision for our sector's part in tackling the emergency is bold: "A built environment planned, constructed and operated within planetary boundaries to deliver environmental justice and to support the flourishing of all life for all time."

Launched in May 2019 by the then 17 UK recipients of the Stirling Prize, it quickly attracted hundreds of other architectural practices from across the UK. Under the wider banner of Built Environment Declares, the declaration has now spread to cover 43 groupings across 28 different countries. Globally, over 8,000 signatories have signed up to variations of the original declaration.

We welcome contributions to our funding to sustain and expand our programme. See our ***Support Us*** page.