circular economy 1 ...

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Circular Economy 1

Circular Economy and Regenerative Sustainability

Circular Economy Principles

Designing Out Waste

Break

Circular Economy 2

Design for deconstruction

Circular Economy: Building Layers

Circular Economy Futures

Q and A
What does Circular Economy mean to YOU?

Reducing Waste?

Improving Business Opportunity?

Improving Nature and Environment
“The Circular Economy involves a fundamental rethinking of products, materials, systems and commerce. It is not simply next-gen waste recycling”
“What I really like about circular economy thinking is that it takes inspiration from the ecological cycle, where everything is connected, and where we are part of nature, not apart from it”  Martin Brown
100% Recycled

Only 9% all plastic recycled

91% to land, sea, air

10% Recycled
Circular Economy thinking &
Regenerative Sustainability
EGO.
Man’s tyrannical dominion over nature

ECO.
Earth friendly actions to reduce our impact on the planet

SEVA.
Thinking, Designing, Making, as part of nature, not apart from nature,
“The planet does not want to be saved. Or rescued. Or even changed. Our planet wants to be loved. Love is not a game of numbers and spreadsheets, checks and balances, debts and contracts. It is an exalted dance of joy, respect and gleeful, mutual appreciation and true partnership”

“We should all be dancing. But right now the music’s stopped. And I sense it won’t authentically restart until we properly reconnect with what really matters, our deeper selves, each other and our home”

SEVA
Ed Gillespie
‘The End of saving the world’
Bristol declares ecological emergency over loss of wildlife

Mayor calls for urgent response to declines in birds, bees and mammals such as hedgehogs
Construction Declares is global petition uniting all strands of construction and the built environment. It is both a public declaration of our planet’s environmental crises and a commitment to take positive action in response to climate breakdown and biodiversity collapse.
What would good look like if we all put the climate, ecological, health, justice emergencies at the heart of what we do?
LIVING BUILDING CHALLENGE 4.0
A Visionary Path to a Regenerative Future

PLACE
WATER
ENERGY

HEALTH & HAPPINESS
MATERIALS
EQUITY
BEAUTY
Taking Toxic Materials out of the Built Environment …

THE MATERIALS WE BUILD WITH ARE AS IMPORTANT AS THE FOOD WE EAT, THE WATER WE DRINK AND THE AIR THAT WE BREATHE’

RED LIST

IMPERATIVE

13

RED LIST

The intent of this imperative is to foster a transparent materials economy free of toxins and harmful chemicals.

All projects must avoid the following Red List chemical classes in 90% of the project’s new materials by cost. 32 “in situ” materials do not need to be removed or vetted for Red List chemical classes. 33

- Antimicrobials (marketed with a health claim)
- Alkyldiols and related compounds
- Asbestos compounds
- Bisphenol A (BPA) and structural analogues
- California-banned solvents
- Chlorinated Polyethylenes (CPEs), Chlorinated poly-vinyl chloride (CPVC)
- Chlorinated monomer
- Chlorosulfonated polyethylene (CSPE)
- Polysiloxanes (chlorides, PVC)
- Polychlorinated biphenyls (PCBs)
- Polycyclic aromatic hydrocarbons (PAHs)
- Short-chain and medium-chain chlorinated paraffins
- Toxic heavy metals
  - Arsenic
  - Cadmium
  - Chromium
  - Lead (added)
  - Mercury
- Volatile organic compounds (VOCs)
  - Wood treatments containing creosote or pentachlorophenol

32 Refer to the v4.0 Materials Petal Handbook for complete and up-to-date listings of the numerous Red List exceptions. For purposes of the Living Building Challenge, “materials” includes systems furniture and excludes FF&E.

33 A list of CAS registry numbers that correspond with each Red List item is available and should be projects based on their date of registration. Materials deemed hazardous by a remediation professional must be addressed appropriately.
A DECLARE LABEL ANSWERS THREE QUESTIONS:

Where does a product come from?

What is it made of?

Where does it go at the end of its life?
Circular Economy Principles
Take → Make → Dispose
Today's economy is hugely wasteful

- 69% consumed
- 11% consumer waste
- 20% value chain waste

1% sitting in congestion
5% driving
1.6% looking for parking

- Typical European car parked 92% of time
- Average European car has 5 seats but carries 1.5 people/trip

60% of European offices are not used even in working hours
50% of residential dwellers report living in too much space
CIRCULAR ECONOMY PRINCIPLES

1. Eliminate waste, pollution, negative social & environmental impact

2. Keep products and materials in use

3. Regenerate natural systems
Video

What is the Circular Economy

https://youtu.be/zCRKvDyyHml
Opportunities in construction and real estate

Source: Ellen MacArthur Foundation –
Delivering the Circular Economy: a toolkit for policy makers 2015
Opportunities in construction and real estate

Source: Ellen MacArthur Foundation –
Delivering the Circular Economy: a toolkit for policy makers 2015

Industrialised production and 3D printing of building modules
€450-600 million

OPPORTUNITIES €1200 MILLION

Sharing and multi-purposing of buildings
€300-450 million

Reuse and high-value recycling of components and materials
€100-150 million
Waste not …
3 Principles of designing out waste

There are five key principles around how to design out waste. As with many ideas within the theory of circular economy, these principles are not discrete, disconnected topics for consideration. Instead, they can all play a part within, and complement, the others. Section 5 of this guide demonstrates how these principles can be applied to recognised concepts of building design.

Design for waste-efficient procurement

This is a facet of the efficient management of the overall construction process. It involves early and ongoing communications between clients, design teams, contractors and sub-contractors, and a review of any specifications that may restrict waste reduction options. If departures from standard specifications are required to enable waste reduction, these are more readily implemented if identified by the design team and discussed with the client and contractor.

Design for materials optimisation

This principle focuses on making the most efficient use of resources without compromising design or quality. Design solutions that lead to a significant reduction in waste generated and costs consider the minimisation of excavation, simplification and standardisation of materials and components, and dimensional coordination.

Design for off-site construction

The concept of industrialised prefabricated building, based on the principle that as much of the work as possible is done in a factory environment, leaving simple assembly operations to take place on site, is not a new one. Off-site construction can result in changes to on-site practice and may require different specialist skills. Therefore, it should be specified early in the design process. Off-site manufactured components should incorporate the principles of designing out waste in their own design.

Design for re-use and recovery

This principle focuses on the whole life cycle of the materials used, extending their life and preparing for recovery. Actions relating to this can involve re-using existing structures on site, sourcing reclaimed products such as roof slates or timber components, excavation arisings (such as using intelligent cut-and-fill methods to minimise waste generation and the need for virgin materials) or crushed demolition materials.

Design for deconstruction and flexibility

Design for flexibility of use and deconstruction, as well as climate adaptation, is a principle focusing on the whole life cycle of the building and is strongly linked to the design for re-use and recovery principle as it allows for materials to be re-used at the end of their life. Examples of this idea can include the use of partitions to allow spaces to be reconfigured or the use of bolts instead of adhesives for deconstruction.
We require our suppliers to use secondary (re-used or recycled) materials wherever possible and otherwise to use virgin materials certified in accordance with responsible sourcing best practice.

We require our suppliers to procure products that adopt a precautionary principle to chemical content, removing substances with potential health risks from ingredient lists.

We require manufacturers or supply chain partners with a social justice policy, or demonstrable track record in championing social equity throughout the industry.

The PC shall produce a strategy for the sustainable sourcing of construction materials to be utilised during the works, to achieve zero waste to landfill and that supports a circular economy in construction, this shall be drafted for approval prior to commencement.
**Circular Economy**: The principals of the circular economy are a vital element of this project. Attention is drawn to the Sustainability Brief and the (project) circular economy tender response requirements. *(Circular economy guidance for construction clients: How to practically apply circular economy principles at the project brief stage UK GBC April 2019)*
Waste = Food: A core principle of ecology and circular economy thinking.

While we continue to use the word WASTE, we will always be focused on better ways of dealing with ‘waste’, i.e. recycling, reusing and preventing it from going to landfill – and, to a lesser degree, avoiding it in the first place.

Michael Braungart (co-author with William McDonough of the influential *Cradle to Cradle: Reinventing the Way We Make Things*) has referred to our tendency to use words such as ‘reduce’, ‘avoid’ and ‘minimise’ as the waste language of ‘guilt’.

But in nature there is no such thing as waste – only food and resources for the next cycle.
Can we ‘Pro-struct’ Not Construct?
Implementing Project Circular Economy
Initiate a Stage 0/1/2 Circular Economy Workshop

Impact Investing
Introduce CE Principles

Establish

Project CE Principles

Project Key Drivers

Project Key Actions
**PURPOSE**

CE PRINCIPLES
- Eliminate waste, pollution, negative social & environmental impact
- Keep products and materials in use
- Regenerate natural systems

FRESHWATER CE
To Improve Social and Environmental impact of Freshwater whilst addressing needs of:
- Tenants
- Future Generations
- Wider Community
- Freshwater Project Team

**KEY DRIVERS**

- Eliminate Fuel Poverty
- Reduce Costs
- Improve Value
- Future Proof Freshwater
- Control and Understand Materials
- Healthy Environment, Safe Environment
- Improve Quality of Life for residents and staff
- Innovate through Value Engineering
- Learn from previous, learn forward and replicate
- Education and Advocate

**KEY ACTIONS**

- Forecast Life Cycle Maintenance, Repairs
- Rethink value and valuation
- Eliminate Waste (Freshwater Zero Waste Plan)
- Maximise opportunities for standardisation
- Create set of DID Principles for Freshwater
- Maximize Building Flexibility
- Explore new (CE) Materials
- Use Healthy eco paints, sealants & solvents
- Use Red List / Precautionary Principle / Verify Materials
- Ensure Healthy Interior / Biophilic Design
- Maximise Garden Use, Access to nature
- Make Composting easy
- Design Better (using DID?)
- Value Engineering for CE
- Undertake POE Ryde
- Prepare Freshwater plan-forward case studies
- Adopt CE principles
- Change cost, sustainability economic mindsets
- Raise Supply Chain / Operation / FM Awareness
- Home Tenants
- Advocate for industry improvement
RIBA Plan of Works 2020
Key Design Principles

- Prioritise building re-use
- Carry out whole life carbon analysis of all building elements.
- Prioritise ethical and responsible sourcing of all materials
- Prioritise low embodied carbon and healthy materials
- Minimise materials with high embodied energy impacts
- Target Zero construction waste
- Promote use of local natural materials
- Consider modular off-site construction systems
- Detailing to be Long life and robust
- Design building for disassembly and the circular economy
- Offset remaining carbon emissions through recognized scheme
Appoint CE Champion for

  Design Stage /
  Construction Stage /
  Operational Stage

Include CE

  Progress reviews
  Project KPI (against actions)
Lessons Learnt

During Project for next stage
Feed into next project(s)
   Design
   Construction
   Supply Chain
In use
WE SHOULD NOT USE THE WORD ‘SUSTAINABLE’ UNTIL WE GIVE AS MUCH BACK AS WE TAKE
CUERDEN VALLEY PARK VISITOR CENTER, PRESTON, UNITED KINGDOM.

SEEKING LIVING CERTIFICATION
“TODAY IS THE WORST THIS BUILDING SHOULD EVER PERFORM AT...”
CAN BUILDINGS LEARN?

WHY DO WE SEE END OF LIFE AS ‘DEMOLITION’

DO WE ONLY USE BUILDINGS?

ARE WE OCCUPANTS OR INHABITANTS

ARE WE PROSUMERS OR CONSUMERS
What if Manufacturing made the world a better place?
Smart Ocean Chair

From Ocean to Office

Fishing Nets → Pellets → Chairs
Is this circular?

Confusing upcycling with the circular economy

plastic breaks down when exposed to the sun, attracts bacteria and can you imagine if it set on fire thus releasing highly toxic gasses such as dioxins, furans, mercury and polychlorinated biphenyls into the atmosphere?