

Building Biology Association BBA

IBN BUILDING BIOLOGY CONSULTANTS COURSE

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www.ecodesign.co.uk



What's this about?

What is the course about?

Who should attend?

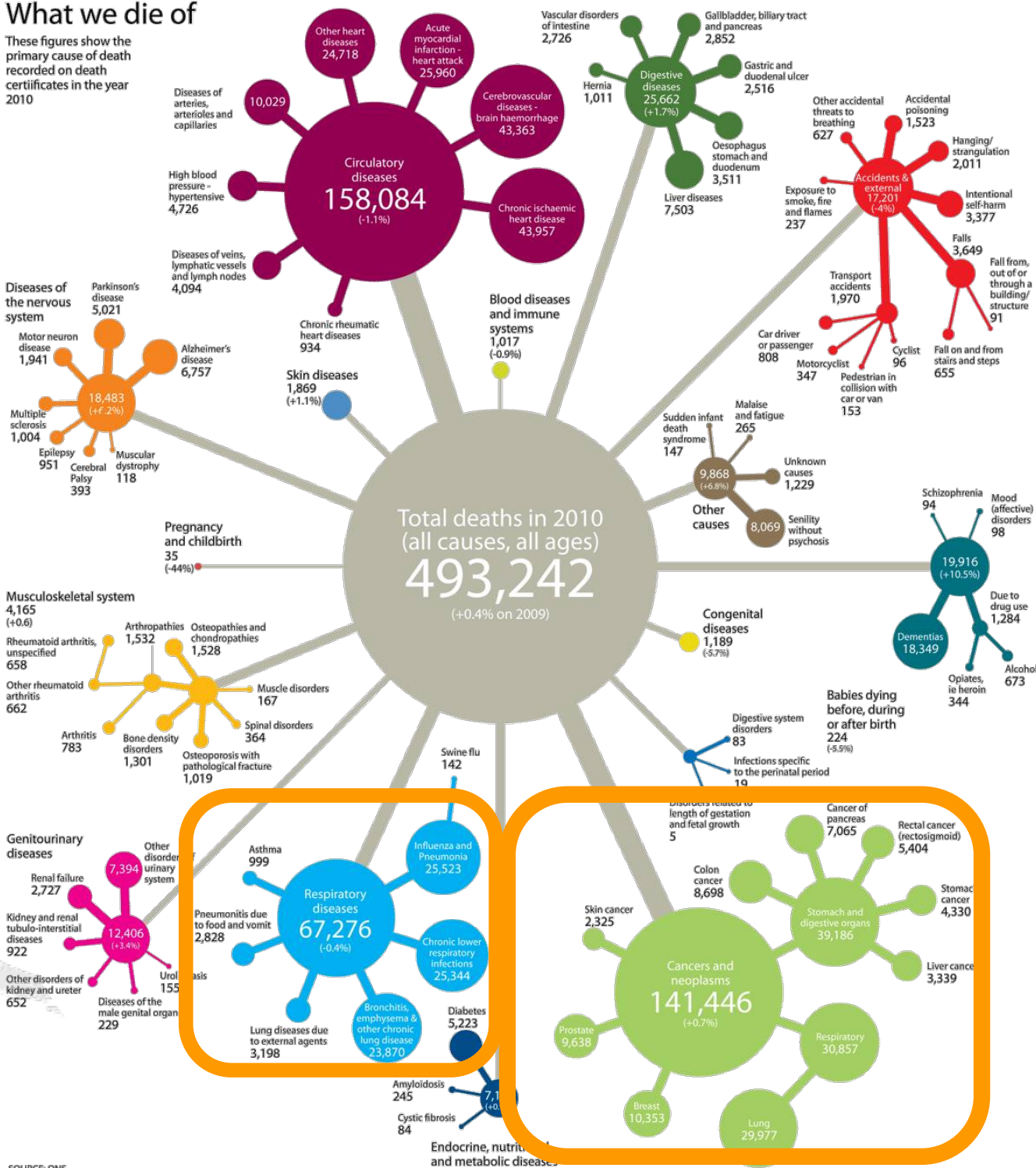
How is the course structured?

What can I do with it?

Where can I find more information and sign up?

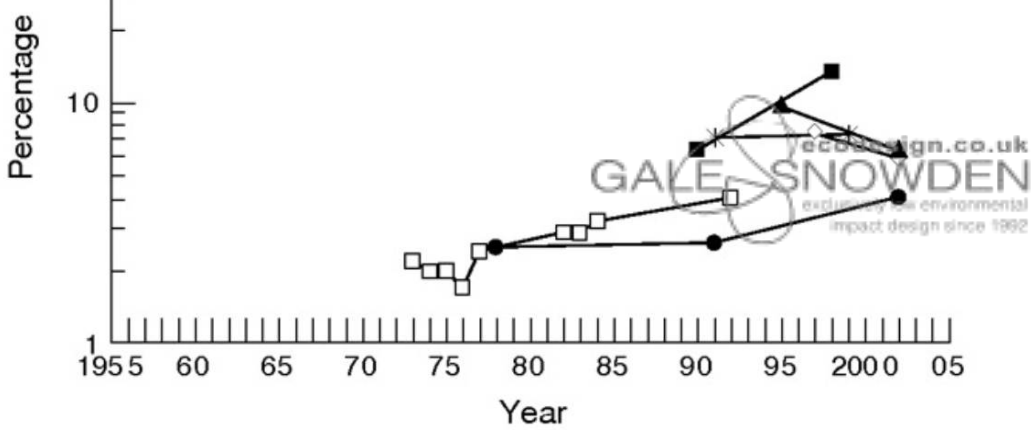
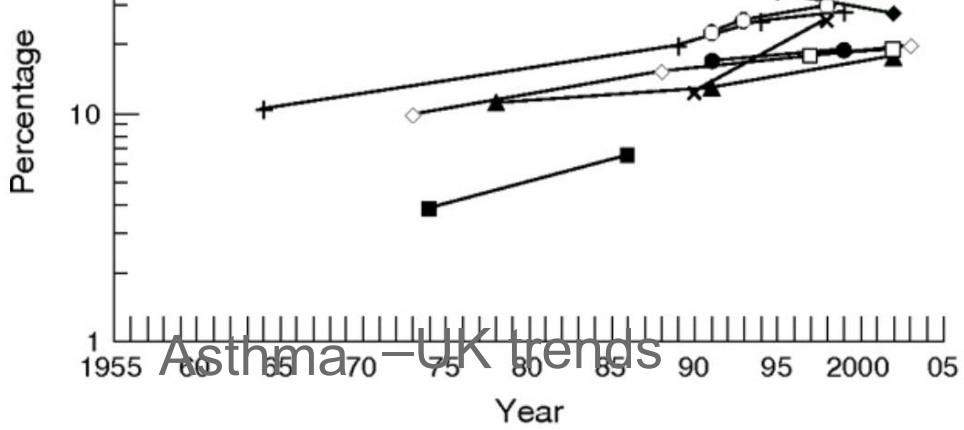
What we die of

These figures show the primary cause of death recorded on death certificates in the year 2010

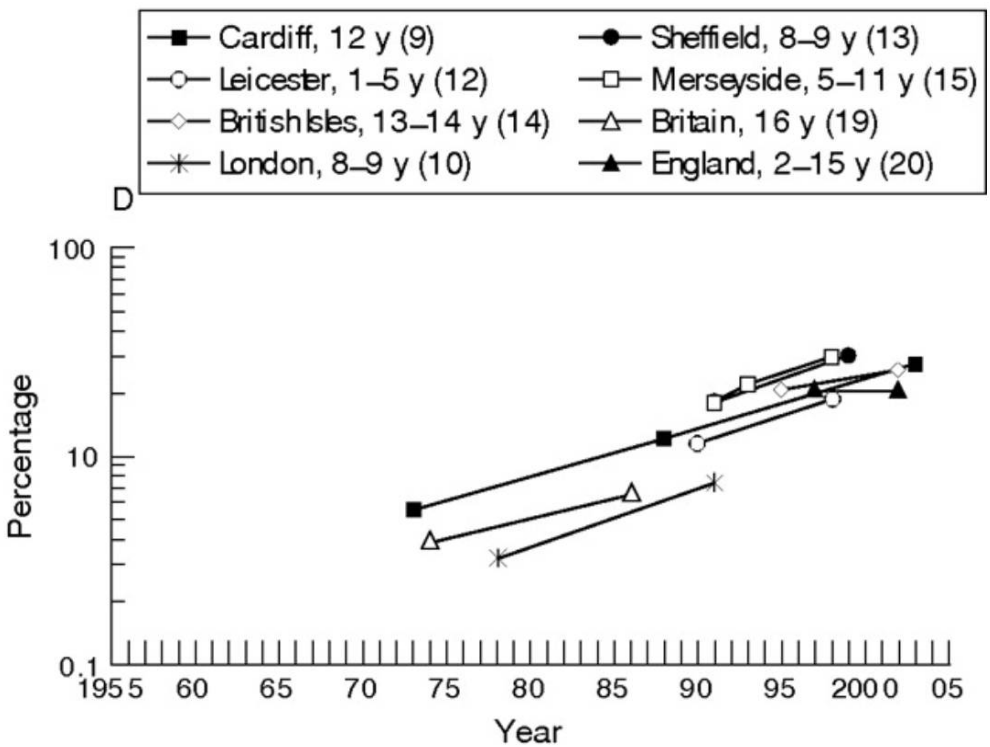
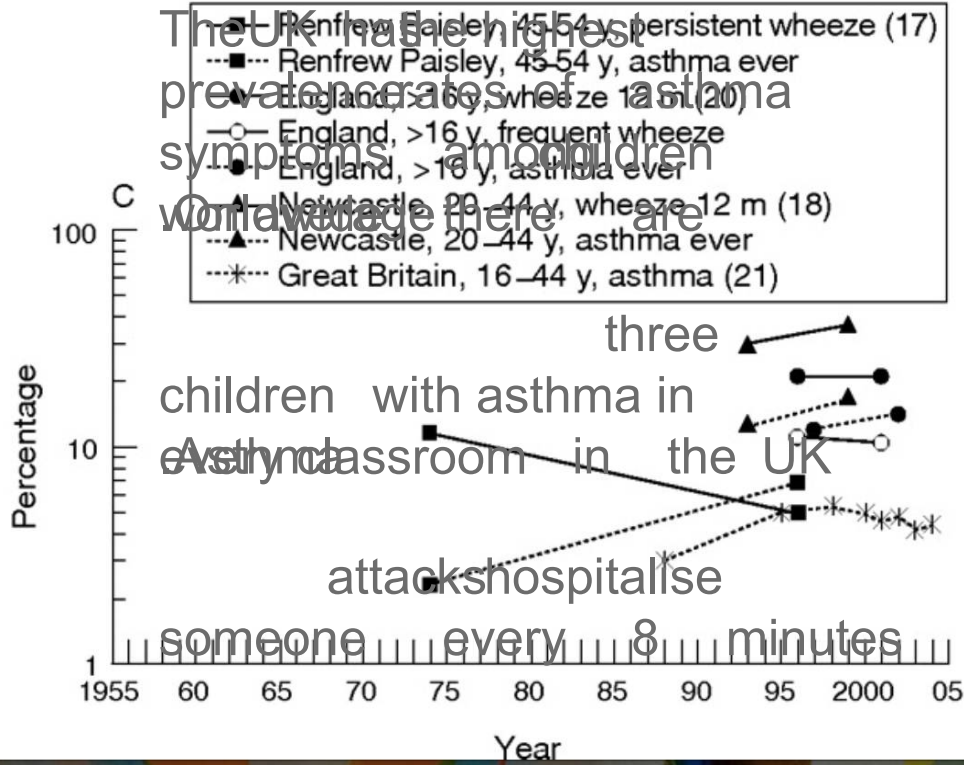


Since the late 1970s, the incidence of already suffering from increases by 5% per half of affected people. Child deaths have increased by 23% that is more than 10% of female Europeans will be affected by dementia by 2014 (EAACI, 2011)

Healthy Design
Does it matter?



The UK has the highest prevalence rates of asthma symptoms among children worldwide here are

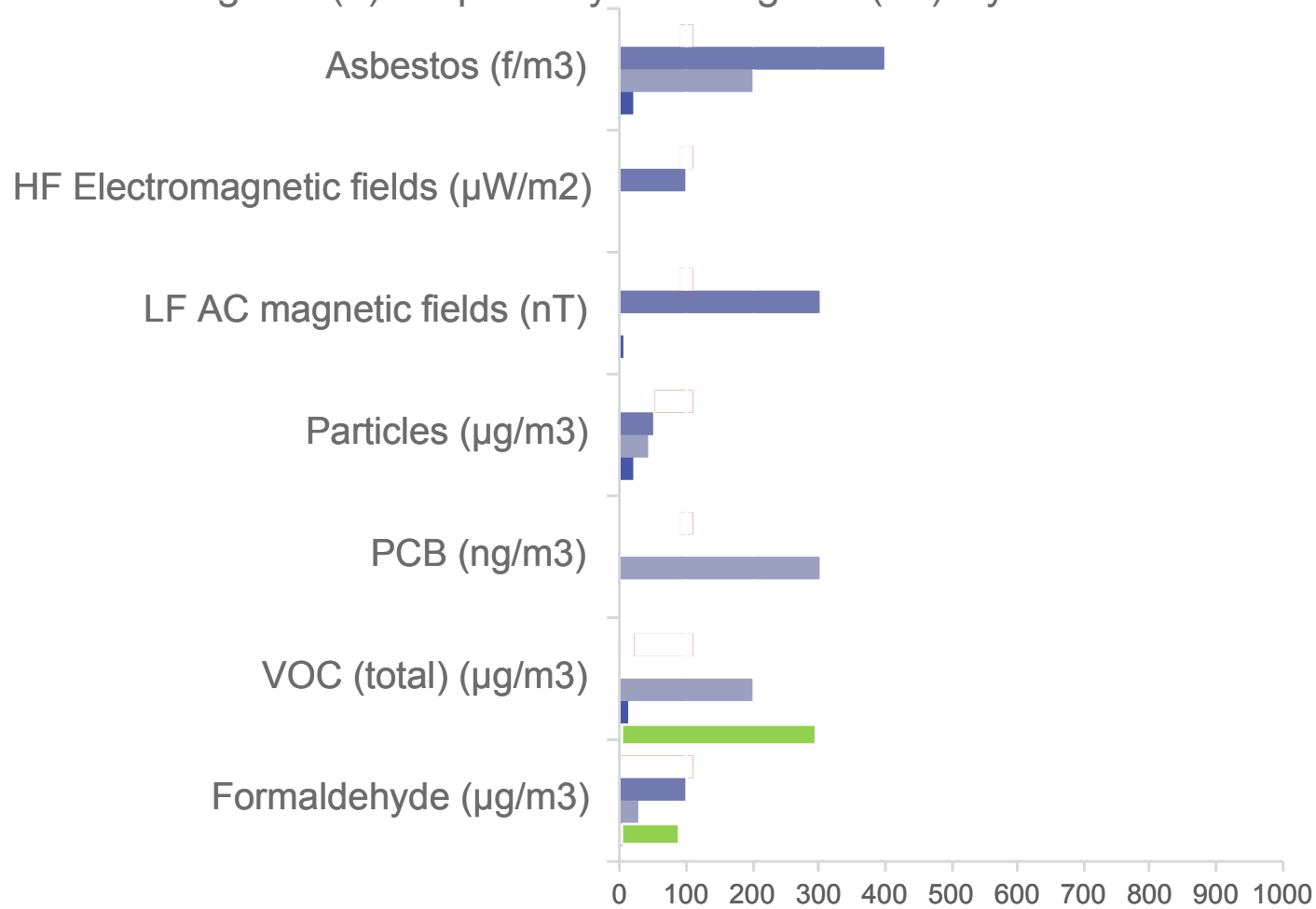


50 years of asthma: UK trends from 1955 to (R.Anderson 2006)

Healthy Design
Does it matter?

Healthy Design –Why bother?

Recommended limits for a range of substances classified as either 'carcinogenic (1)' or 'possibly carcinogenic (2a)' by the WHO.



Healthy Design –Why bother?

On average we spend about 90% of our time indoors and 30% of our time in bedrooms

At these exposure times even low concentrations of harmful substances affect our health in the long term and can cause chronic diseases. More vulnerable inhabitants like children and elderly persons are particularly exposed to this risk

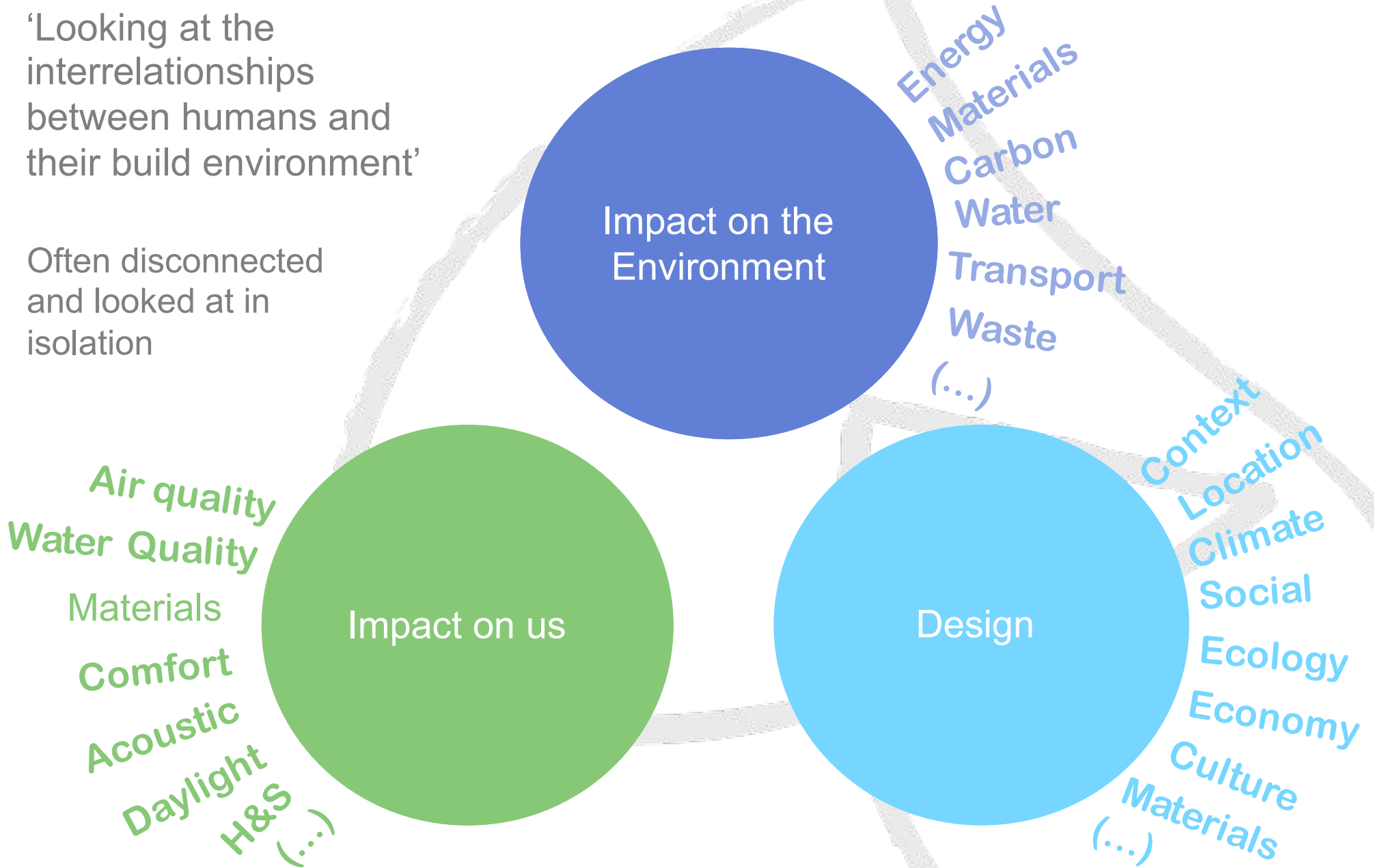
Bau Biology is about managing this risk and reducing it where possible



Building Biology?

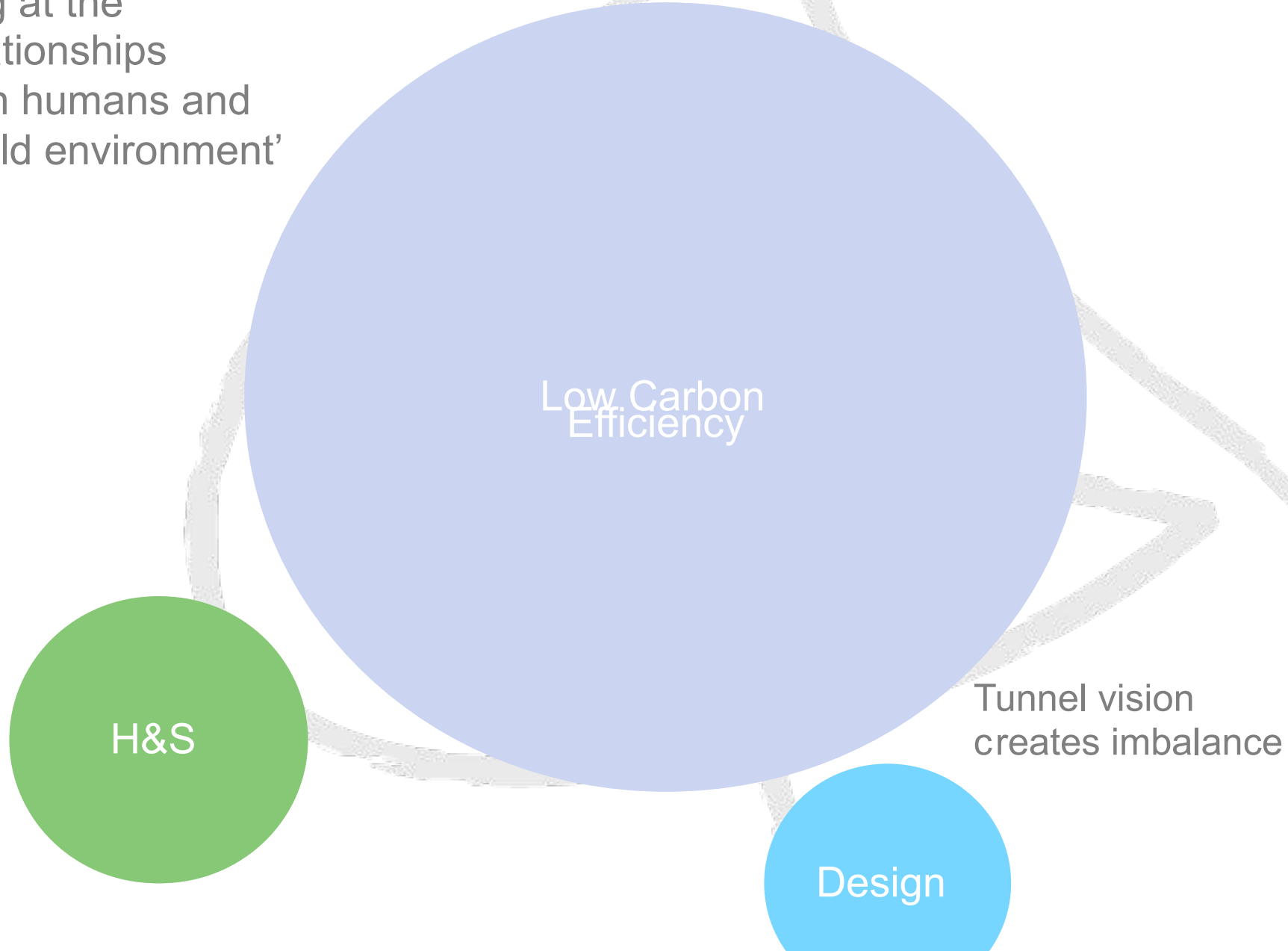
‘Looking at the interrelationships between humans and their build environment’

Often disconnected and looked at in isolation



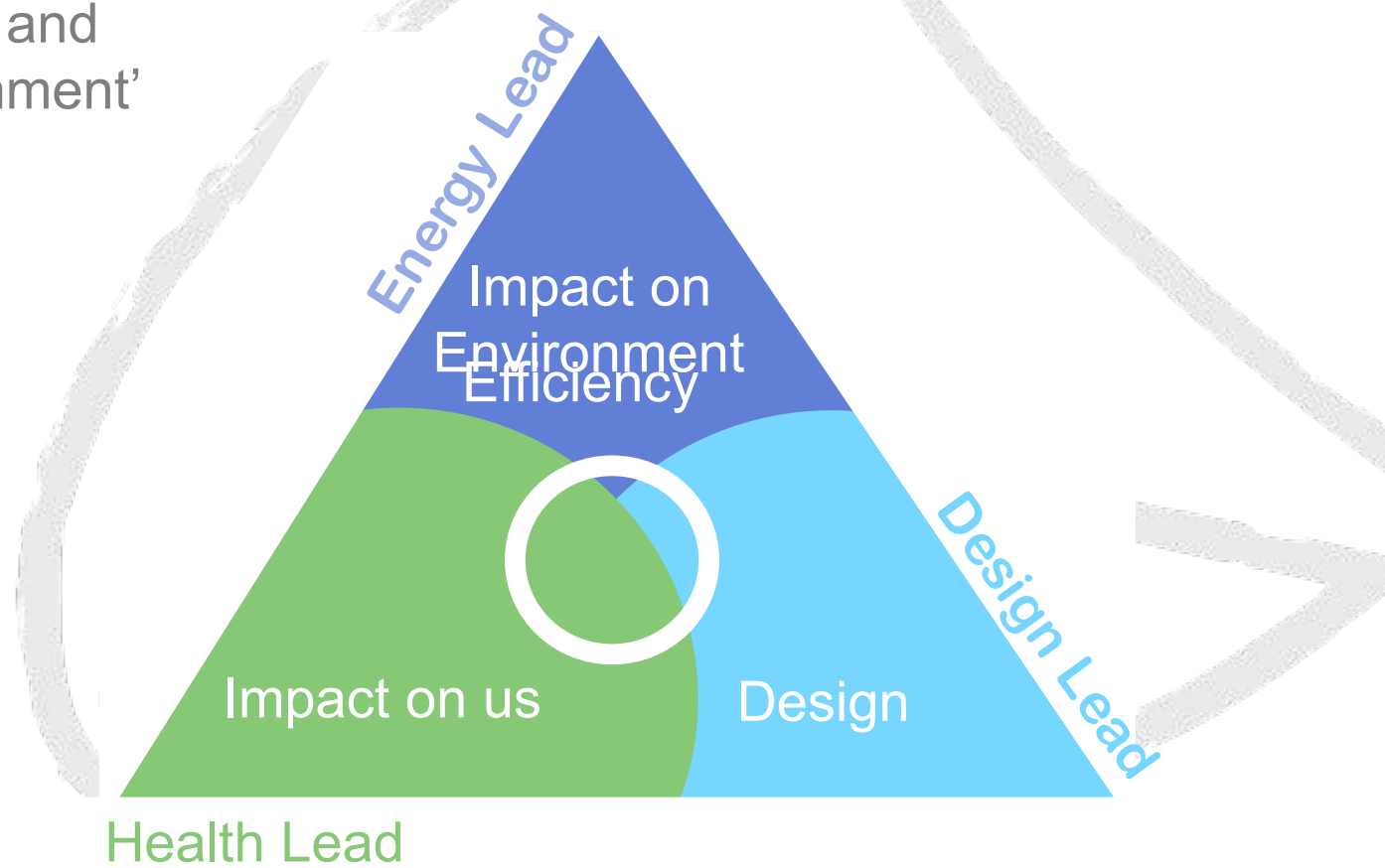
Building Biology?

‘Looking at the interrelationships between humans and their build environment’



Building Biology?

‘Looking at the interrelationships between humans and their build environment’



Healthy Design –Why bother?

What International standards are out there?

Building Biology Standard SBM 2008

Owned and maintained by the Building Biology Institute

Sentinel Haus

Owned and operated by the Sentinel Haus Institute and based largely on the SBM 2008

WELL Building Standard

Owned by Delos LLC. Designed to work alongside LEED and certification is operated by the US Green Building Council

Living Building Challenge

Owned and operated by the Living Future Institute and to large extends now integrated into the WELL Building Standard



Natural fluctuation of the earth magnetic field: temporal 10-100 nT; magnetic storms / solar eruptions: 100-1000 nT; decrease per year: 20 nT

B INDOOR TOXINS, POLLUTANTS, INDOOR CLIMATE

1 FORMALDEHYDE and other Toxic Gases

Formaldehyde in microgram per cubic meter $\mu\text{g}/\text{m}^3$ | < 20 | 20-50 | 50-100 | > 100

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MAK: 370 $\mu\text{g}/\text{m}^3$; BGA: 120 $\mu\text{g}/\text{m}^3$; WHO: 100 $\mu\text{g}/\text{m}^3$; AGÖF reference value 'normal': 30 $\mu\text{g}/\text{m}^3$; VDI: 25 $\mu\text{g}/\text{m}^3$; irritation of mucous membranes and eyes: 50 $\mu\text{g}/\text{m}^3$; odor detection threshold: 60 $\mu\text{g}/\text{m}^3$; immediate danger to life: 30.000 $\mu\text{g}/\text{m}^3$; nature < 2 $\mu\text{g}/\text{m}^3$; 100 $\mu\text{g}/\text{m}^3$ = 0.083 ppm

2 SOLVENTS and other Volatile Organic Compounds (VOC)

VOC in microgram per cubic meter $\mu\text{g}/\text{m}^3$ | < 100 | 100-300 | 300-1000 | > 1000

Values apply to the total sum of all volatile organic compounds in indoor air (TVOC).

Allergenic, irritating or odor-intensive individual substances or compound classes need to be assessed more critically, especially harmful or carcinogenic air pollutants.

Federal Environment Agency Germany: 200-300 $\mu\text{g}/\text{m}^3$; Seifert BGA: precautionary threshold 200-300 $\mu\text{g}/\text{m}^3$; Molhave: 200 $\mu\text{g}/\text{m}^3$; AGÖF target value: 100 $\mu\text{g}/\text{m}^3$; nature: < 10 $\mu\text{g}/\text{m}^3$; AGÖF 'normal' values: toluene 12 $\mu\text{g}/\text{m}^3$, xylene 5 $\mu\text{g}/\text{m}^3$, benzene 1.7 $\mu\text{g}/\text{m}^3$, ethylbenzene 2 $\mu\text{g}/\text{m}^3$

3 PESTICIDES and other Semi-Volatile Organic Compounds (SVOV)

Pesticides		air	ng/m^3	< 5	5-25	25-100	> 100
e.g. PCP, lindane, permethrin, chlorpyrifos, DDT, dichlofluanid...	wood, material	mg/kg	< 1	1-10	10-100	> 100	
	dust	mg/kg	< 0.5	0.5-2	2-10	> 10	
	material with skin contact	mg/kg	< 0.5	0.5-2	2-10	> 10	
PCB	dust	mg/kg	< 0.5	0.5-2	2-5	> 5	
	chlorinated	dust	mg/kg	< 0.5	0.5-2	2-10	> 10
Fire Retardants	halogen-free	dust	mg/kg	< 5	5-50	50-200	> 200
	dust	mg/kg	< 0.5	0.5-2	2-20	> 20	
PAH	dust	mg/kg	< 0.5	0.5-2	2-20	> 20	
Plasticizers	dust	mg/kg	< 100	100-250	250-1000	> 1000	

Sum total values in nanogram per cubic meter (air) and in milligram per kilogram (material, wood, dust), respectively.

Values for dust apply to typical mixtures of substances. Values for adsorbed plasticizers in dust (sum total: x 2); PCB a to LAGA. PAH according to EPA.

Decree of prohibition of PCP (Germany): 5 mg/kg (material); PCP Guideline: 1000 ng/m^3 (air), target value: 100 ng/m^3 ; ARGE-Bau: 1 (air), 1 mg/kg (dust); PCB Guideline: 300 ng/m^3 (target value); PCB target value for remediation in NRW (Germany): 10 ng/m^3 ; AGÖF value 'normal' for dust: PCP 0.3 mg/kg, permethrin 0.5 mg/kg, TCEP 0.5 mg/kg; PAH benzo(a)pyren < 0.2 mg/kg, DEHP 400 mg/kg



quality, indoor climate, lighting and day light, radiation



C FUNGI, BACTERIA, ALLERGENS

1 MOLDS and their Spores and Metabolites

Bau Biology –The 25 Principles

The 25 Bau Biology principles act as a guide and are split into 5 categories

Site

Environmental Impact –Energy -Water

Materials

Design

Indoor Climate –Light -Acoustics



Healthy Design –Bau Biology

Bau Biology Standard -SBM

The ideal is to be as close to an undisturbed natural environment as possible

Based on the precautionary principle where there is evidence of a potential risk this risk is to be designed out or minimized wherever possible

Any risk reduction is worth pursuing



Online Course IBN –What is it?

The Building Biology Course IBN provides an educational opportunity for interdisciplinary study. It increases competence in the field of healthy, sustainable, and holistic building practices for building and medical professionals:

- Architects
- Engineers
- Technicians
- Tradespeople
- Project managers and QS
- Building material manufacturers and suppliers
- Housing providers
- Health care professionals



Online Course IBN –What does it cover?

Scheme Design

Living Environment, context and location
 Building Design
 Architectural Physiology

Ecological and Energy efficient Design

Environmental Performance and labels
 Energy efficient Building Design

Indoor environment

Air quality and Air Pollutants
 Acoustics
 Light and Lighting design
 Indoor Climate
 Electromagnetic Radiation and electrical installation

Services Design

Heating and Ventilation
 Plumbing Systems and Water Efficiency Strategies

Materials and Finishes

Natural Building Materials/Methods
 Natural Paints and Finishes
 Wood Preservation and Treatments

- Efficient electrical and mechanical systems
- How to treat water
- How to apply lighting
- How to specify air conditioning
- How to specify heating
- How to specify ventilation
- How to specify insulation
- How to specify acoustic treatment
- How to specify lighting
- How to specify indoor climate
- How to specify electromagnetic radiation
- How to specify electrical installation
- How to specify heating and ventilation
- How to specify plumbing systems
- How to specify water efficiency strategies
- How to specify materials and finishes
- How to specify natural building materials
- How to specify natural paints and finishes
- How to specify wood preservation and treatments

Oak Meadow -35 new build houses, Devon



Air quality

- fresh air cross ventilation with passive solar pre-heating
- Non toxic –eg: chemical & biological
- reduced dust / mite habitat
- non biocides, radon barrier

Matter / Materials

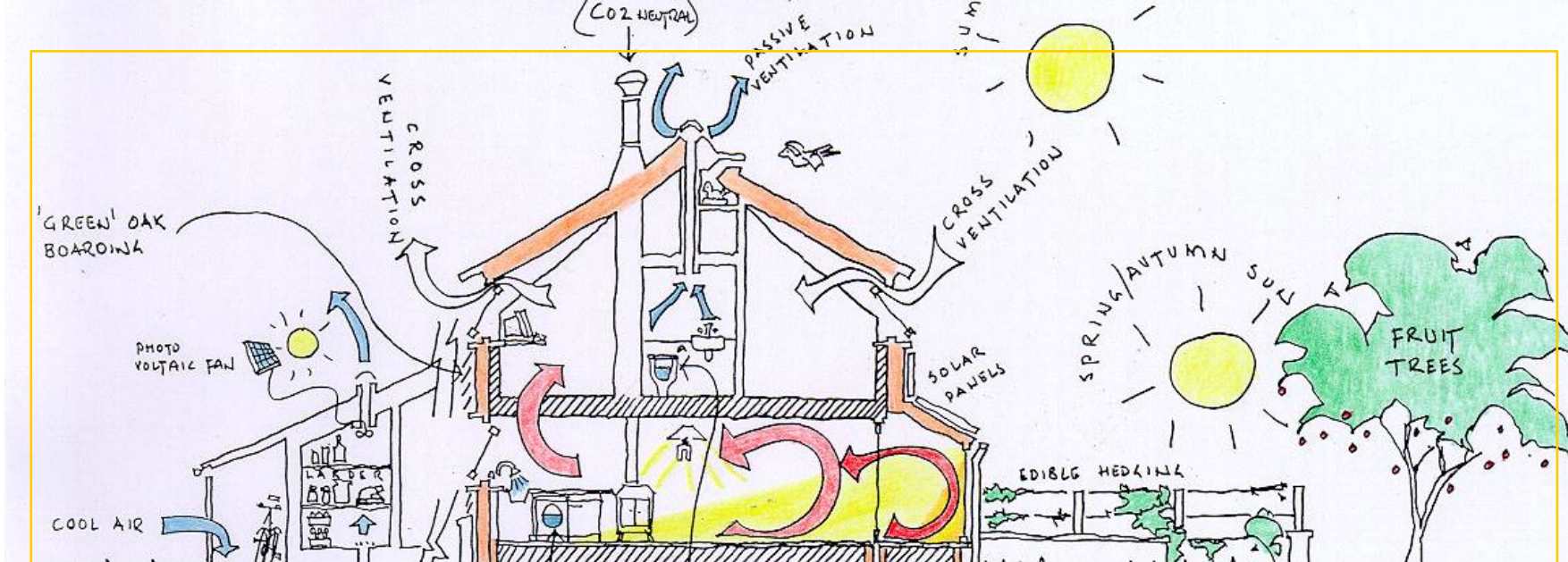
- low embodied energy
- local, ethical sources
- natural, vapour buffering
- minimise /eliminate eg PVC

Water -rainwater collection & low water use

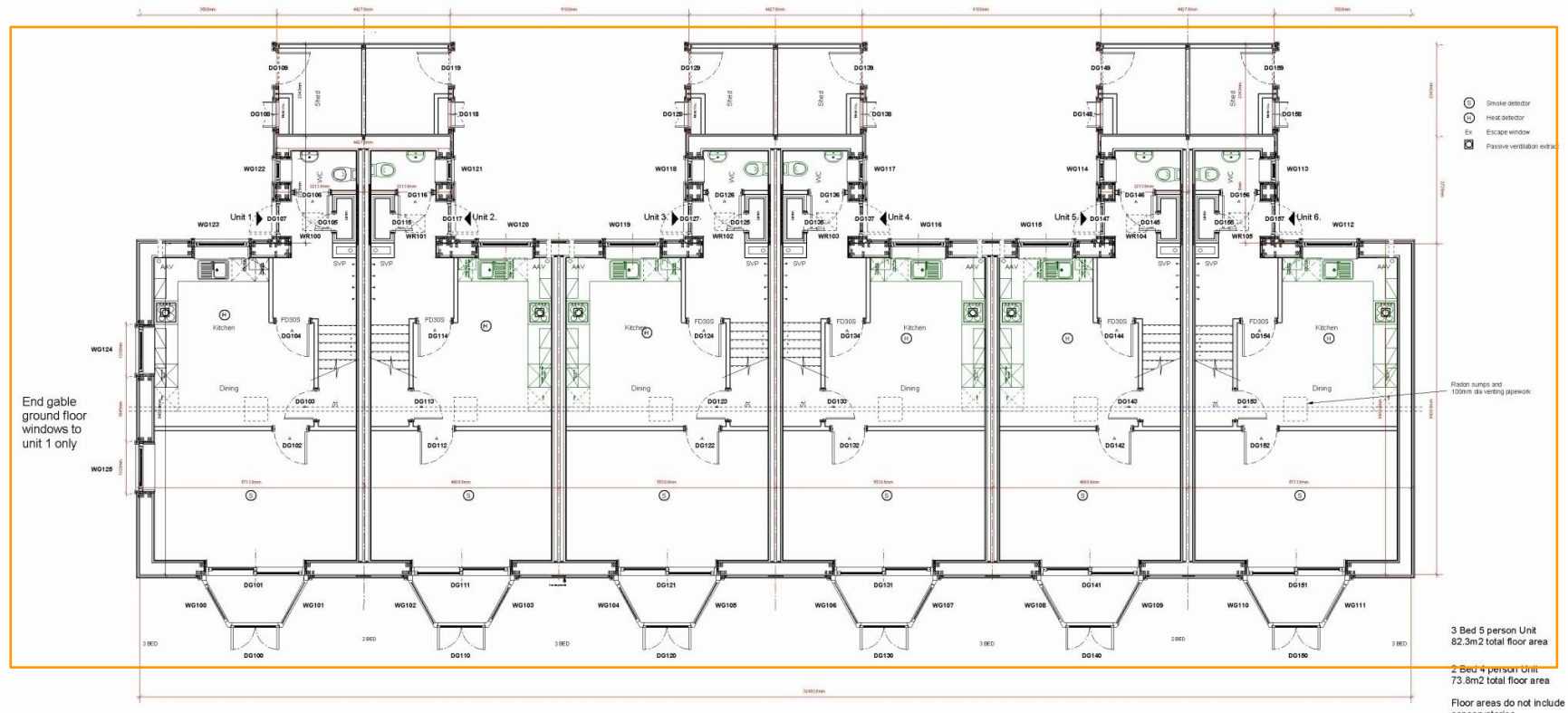
Energy

- low energy passive design
- solar thermal & PV, cool larders
- natural daylight maximised
- healthy electroclimate – layout, appliances, radial /shutoff circuits

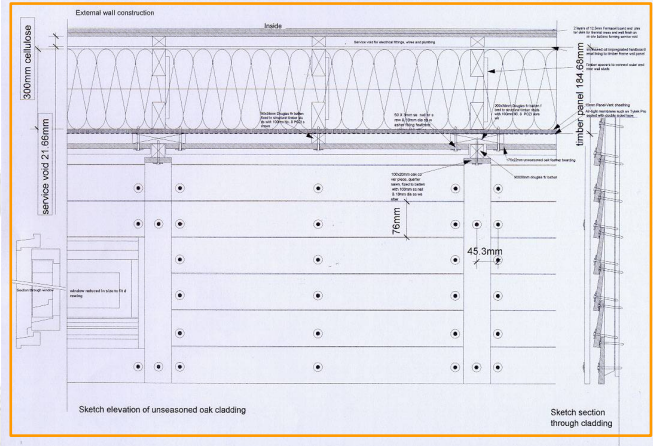
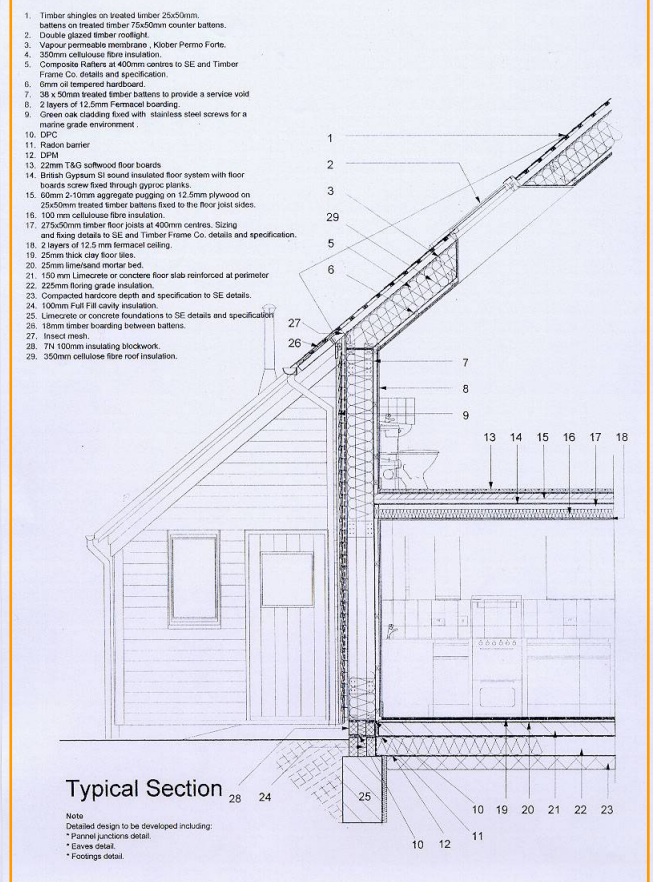




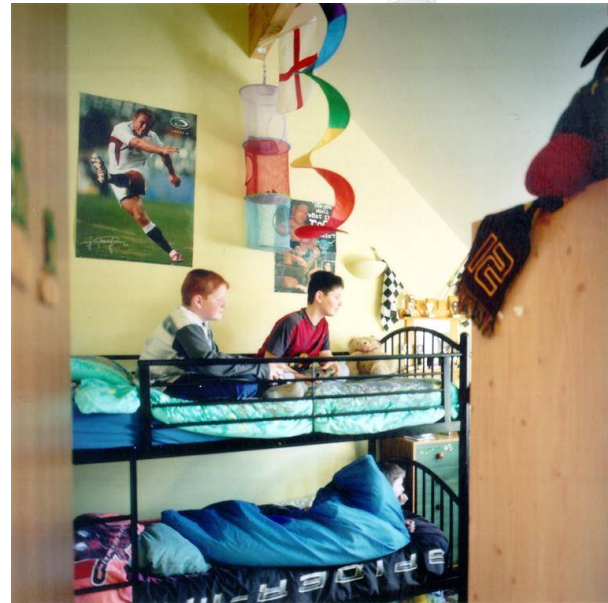
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Twin Frame Construction







Sherwood

New build Passivhaus



Air quality / materials

- Fresh air, MVHR and natural cross ventilation
- natural & vapour buffering
- non toxic - lime wash, organic paints, stains, waxes
- locally sourced using local craftsmen
- reduce dust / mite habitat – clay tiles, slate, cork and solid timber floor boards
- Natural, hygroscopic insulation materials in permeable construction

Water quality

- well/spring water
- whole house treatment via particle filtration and UV
- Stainless steel pipework

Energy

- Passivhaus
- Radiative wall heating
- wood burning/solar panels – heating and hot water
- EMR reduction by radial wiring, layout, shielded cables

Sherwood New build Passivhaus

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 - ble construction



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Crippets refurbishment, Devon



Air quality / materials

- Fresh air, natural cross ventilation
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- non toxic - lime wash, organic paints, stains, waxes
- locally sourced using local craftsmen
- reduce dust / mite habitat – clay tiles, slate, cork and solid reused timber floor boards

Water quality

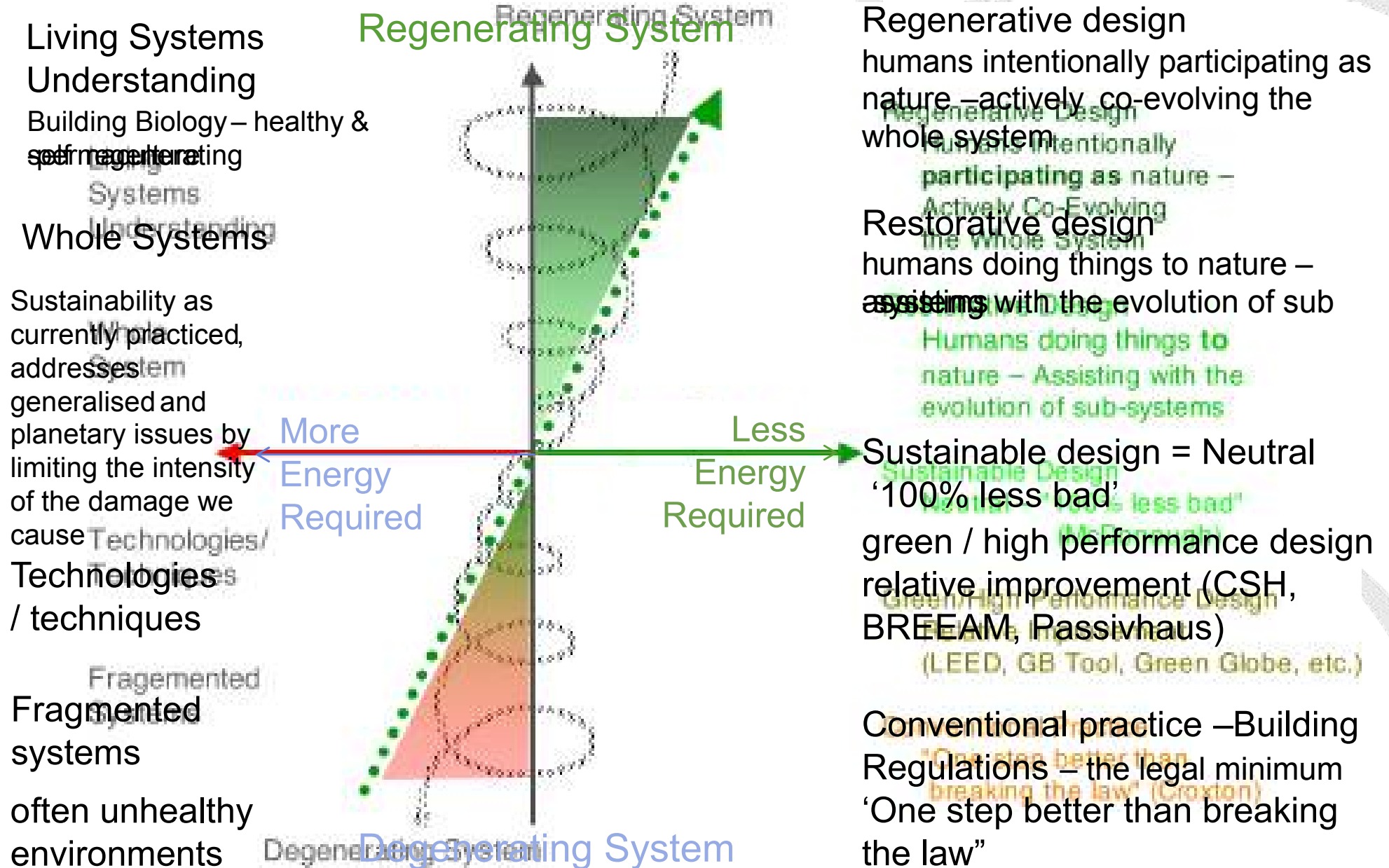
- well/spring water
- whole house treatment via particle filtration and UV

Energy

- thermal comfort - insulation of building envelope, draft proofing, thermal blinds
- wood burning – cooking, heating and hot water
- EMR reduction by limited wiring and appliances, fuse board in lobby space



Trajectory of environmentally responsible design



Regenerating systems address how we partner and thrive in relationship with the unique social-ecological system of each place

Living Systems Understanding

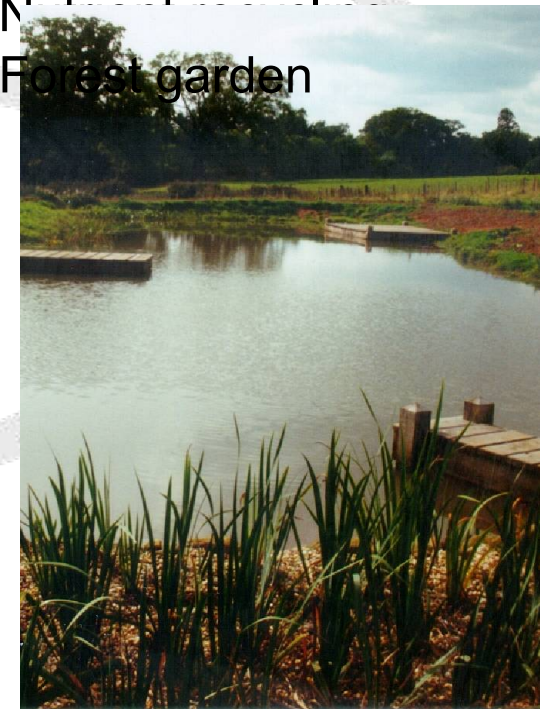


Pickhurst, Surrey

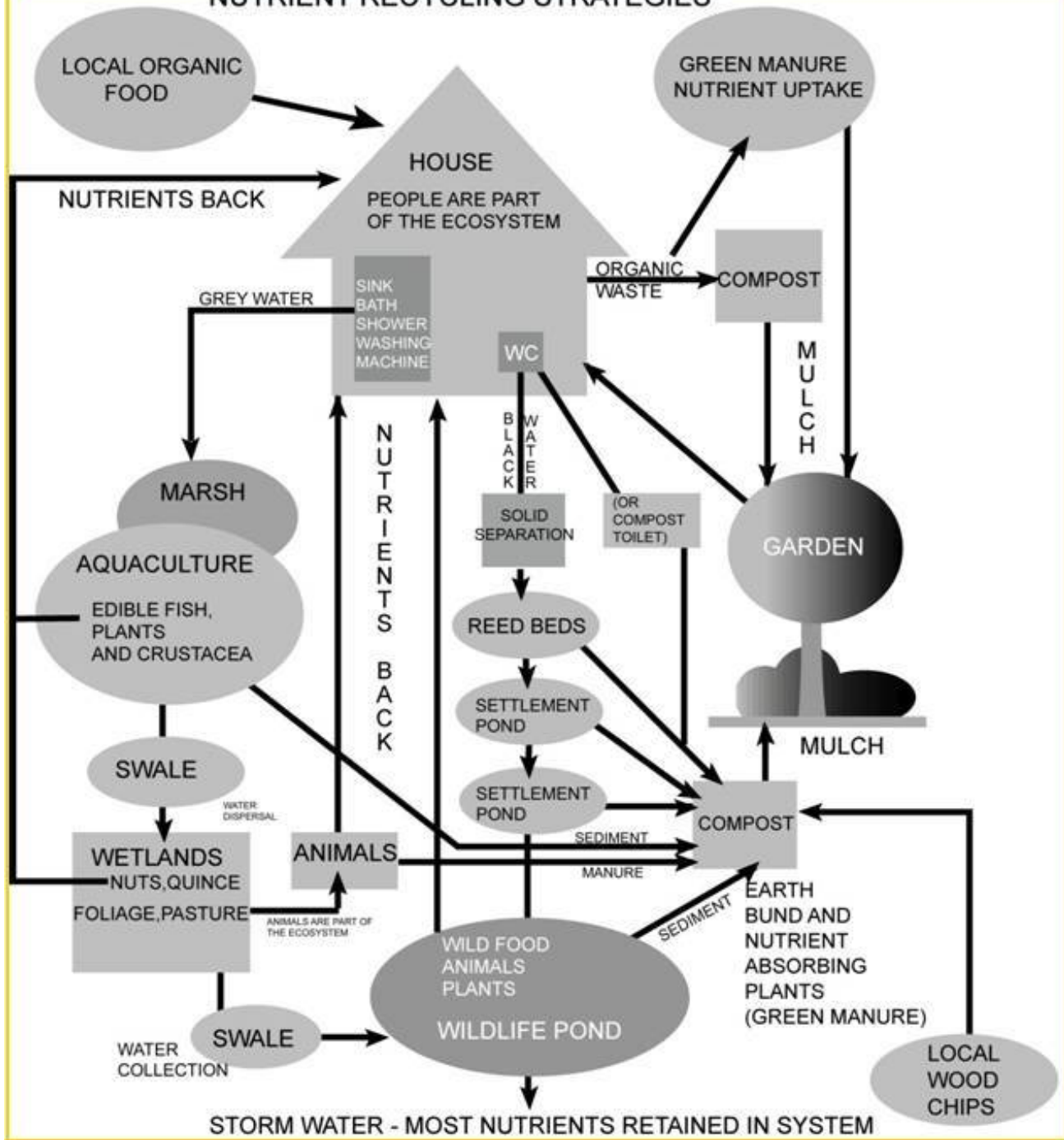
Integration of people as part of a designed productive ecosystem

Food, energy, water, shelter

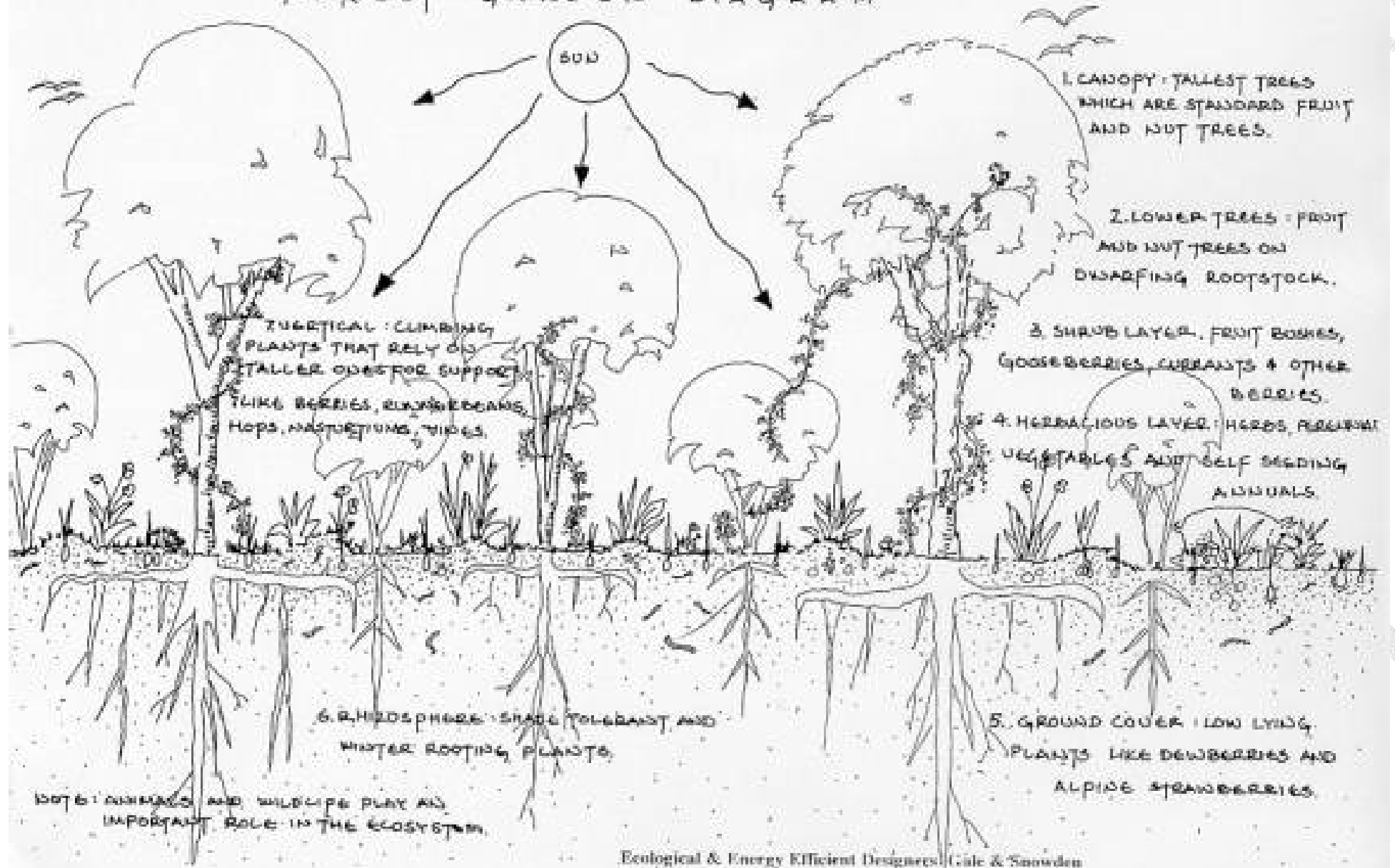
- Aquaculture and aquatic systems
- Reed bed system
- Nutrient recycling
- Forest garden



NUTRIENT RECYCLING STRATEGIES



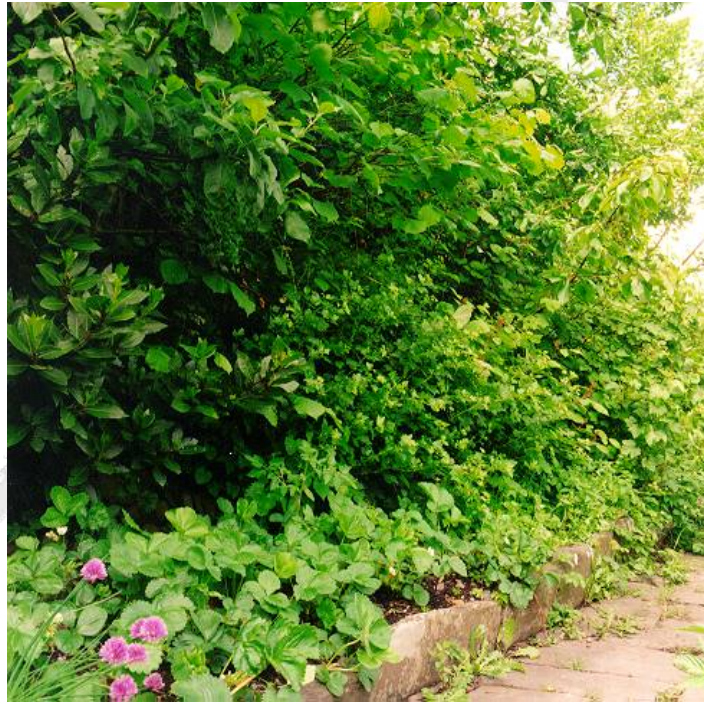
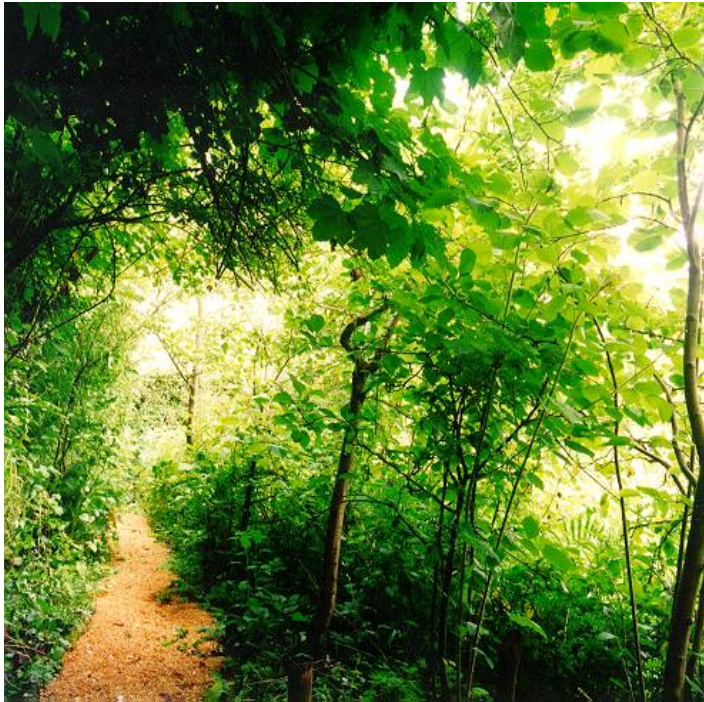
FOREST GARDEN DIAGRAM



Seven layers of a Forest Garden –edible community of species designed to mimic a natural ecosystem



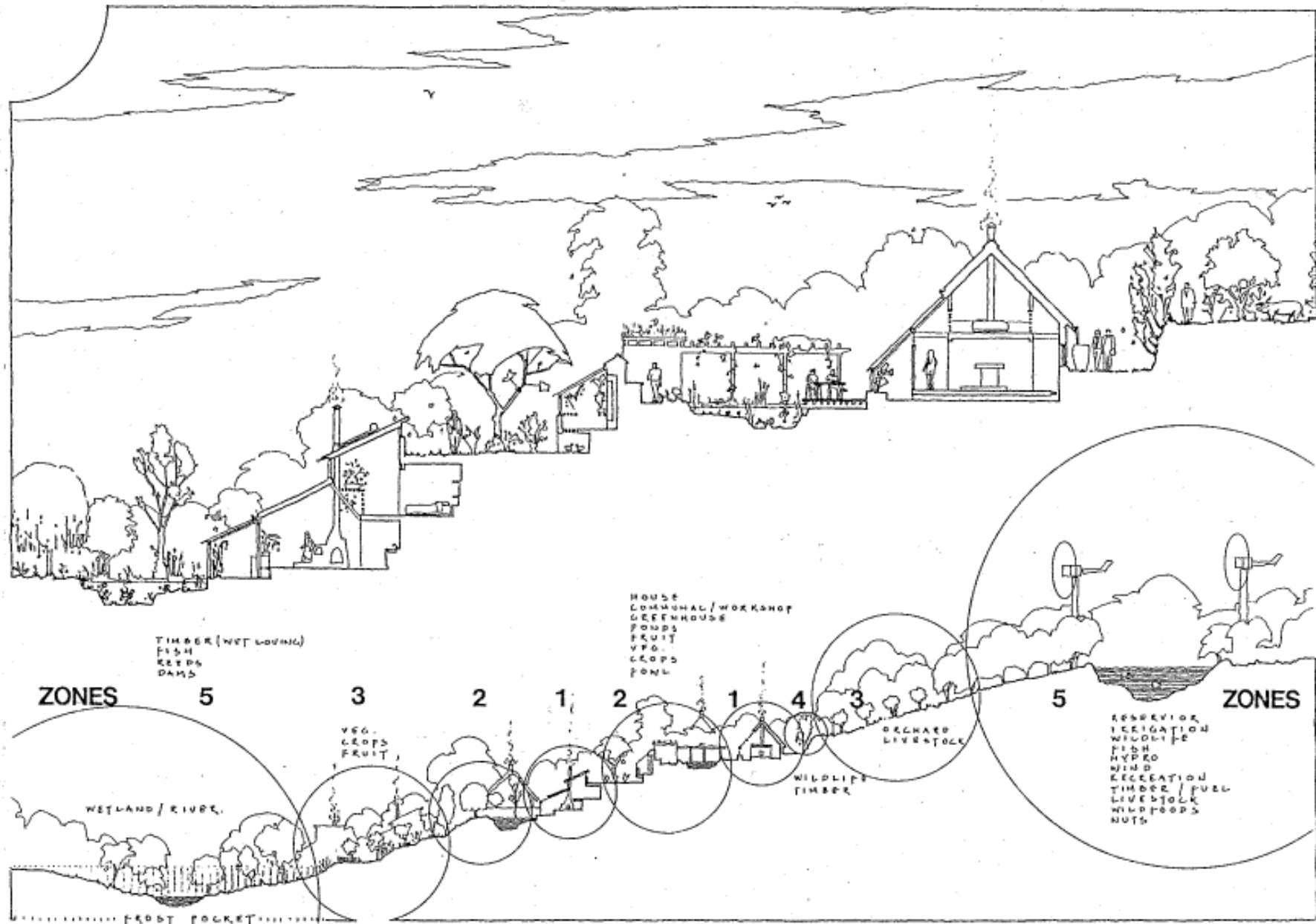
Crippets, forest garden -early days



Forest Garden
maturing

An edible
ecosystem

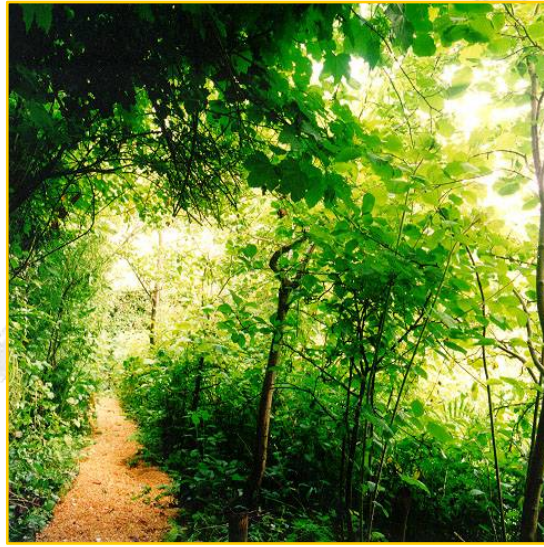
"An object seen in isolation from the whole is not the real thing" -Masanobu Fukuoka -



Integrated Design



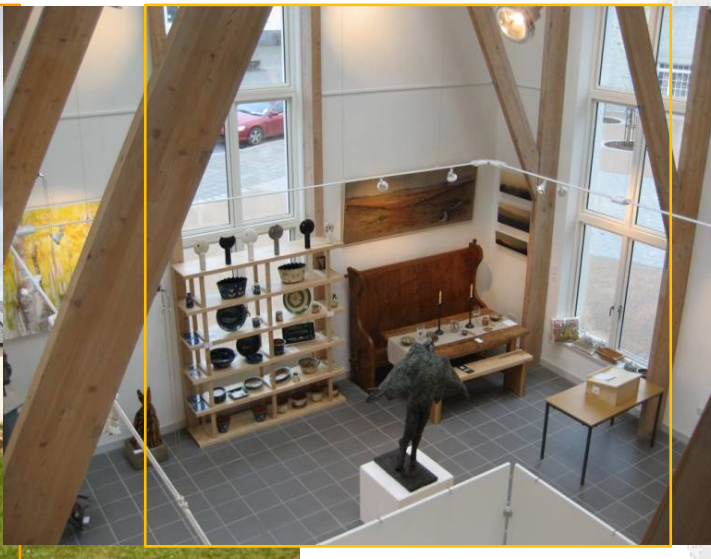
Low Energy



Permaculture



Climate Ready



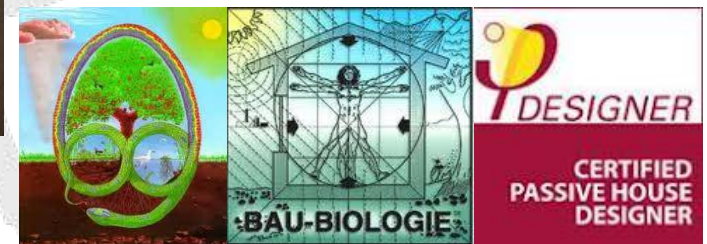
Healthy Buildings

Architects & Engineers
Building Biologists
Building Physicists
Species specialists

Designing integrated ecological systems

Under the ethos of Permaculture:

- Integrated landscapes
- Passive low energy
- Healthy buildings
- Passivhaus design
- Future Climate Ready
- Building Performance Monitoring & Evaluation
- Research & Development



Building Biology Consultants' Role

- Specialist Consultancy services for private, public, and commercial contractors or companies (e.g. construction companies, building material manufacturers, building trades)
- Building design, construction, and remediation with a focus on building biology, ecology, and energy efficiency
- Offering building trades with a focus on building biology aspects
- Distribution and/or manufacturing of building materials, building elements, building systems, installations
- Holistic consulting services for patients and cooperation with health care professionals



Online Course IBN –Structure

The course starts 6 times a year and runs for 1 year

- One year online course
- structured into 20 sections
- online review at the end of each section.

Seminar 1
(3 days)

Seminar 2
(4 days)

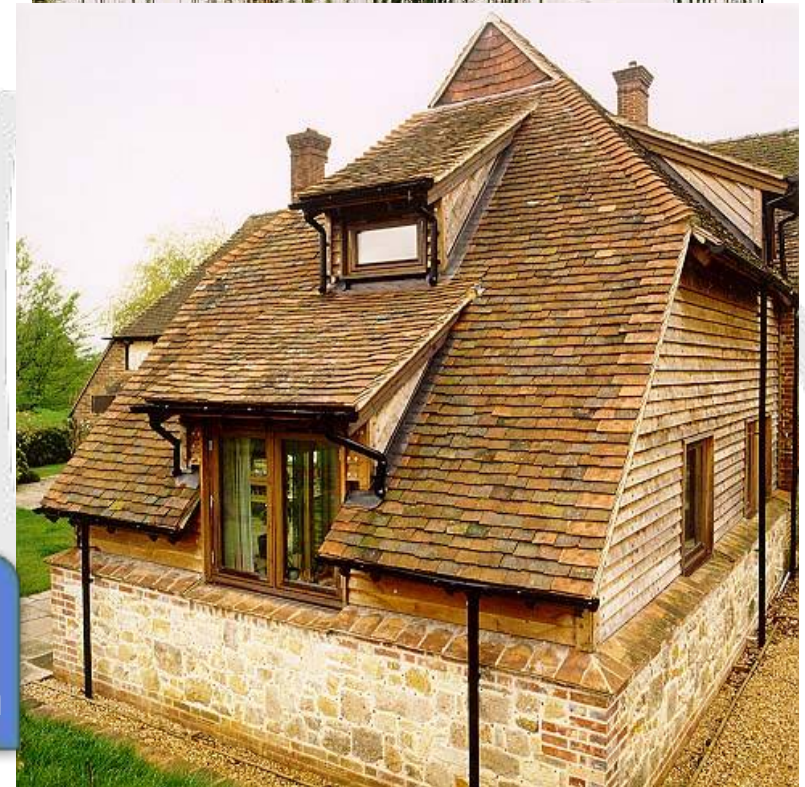
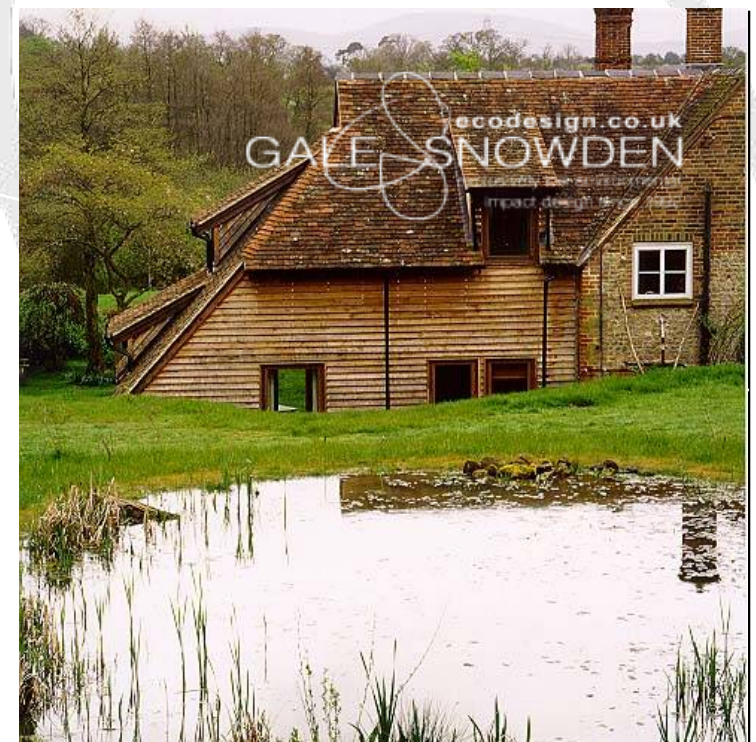
Includes Exam

Certified 'Building Biology Consultant IBN'
option to be accredited with the IBN as a
Building Biology Consultancy IBN

Bau Biology
Testing Methods

Bau Biology
Interior Design

Bau Biology
Services Design



Thank you!

For more information on the course and to sign up visit
www.buildingbiology.co.uk