GREEN NEW DEAL SUPERSTUDIO

Project title: Greenway – A Vision of an Ecologically Ideal Neighborhood

Names of authors: Earle Barnhart, Hilda Maingay

Statement:50 years ago, alarmed by environmental deterioration, we at the New Alchemy Institute and later Green Center set out to design, test and personally implement on a home scale, biological systems and eco-technologies that restore natural systems and support the development of resilient communities orchestrated by people, not corporations.

This Greenway project is a vision of such an ecologically ideal neighborhood, where basic needs are provided in ecologically sustainable ways with renewable energy.
The Greenway is a network of homes, greenhouse, gardens, farms, schools and businesses, connected by sheltered corridors.
Housing is integrated with agriculture.
Ecology is integrated with technology.
People are integrated with the cycles of the Earth.
Design elements have multiple functions and all 'wastes' are managed as resources.

The Greenway network architecture is modular, to allow for mass-production and rapid assembly. Once built, such communities would function with circular bio-economies.
The need for such nature based, self directed communities has never been greater.

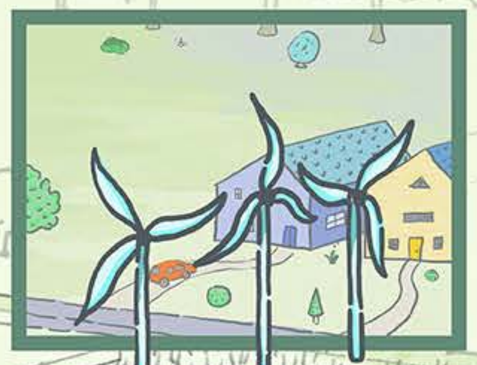
Since we started our research 50 years ago, the rate of environmental destruction and global warming has increased, threatening our food and clean water supplies. Even more alarming, Phosphorus, a non-renewable and essential agricultural fertilizer, is being depleted. Presently mismanaged and wasted, it is polluting our water.

There will be no social equality and stability without food and water security.
There will be no food and water security without restoring natural ecosystems.
To restore natural ecosystems, ALL resources have to be recycled. Our survival depends on it.
There is no time to waste.

GREEN NEW DEAL SUPERSTUDIO

1: GREENWAY INFRASTRUCTURE - Create a Zero Waste Community

Powered by the sun and wind, Recovering and recycling ALL nutrients,
Regenerating soils, Sequestering carbon + Non polluting



Turbines
Wind Power and Food

Silvopasture
Grazing among food trees.

Be-A-Tree Natural Burial Park
The Ultimate Recycle

The Ecodrum Community Composting Center: Fast and versatile

Log Compost Boxes
Low-cost, low-labor, long-lasting.

'Smart' Mini-Grids
send electricity automatically to priority uses, stores it for future use, or share it with other local grids.

Bamboo: Edible, Structural, Carbon-sequestering.

Chickens Eat scraps, bugs, weeds, and give eggs.

Recovered urine
applied as fertilizer to hayfields doubles the production of hay. 1/8 acre of wheat fertilized with a year's worth of one person's urine produces 320 lbs of wheat, enough to make 360 loaves of bread.

Alley Cropping
Row crops among trees.

Hedgerows: Pest control, biodiversity. **Windbreaks:** Save energy, biodiversity.

Equity Through Togetherness

All Ages, Skills and Capabilities

Eco-Toilet
No water, nutrients recovered.

Unheated Greenhouses
Cool Season Vegetables

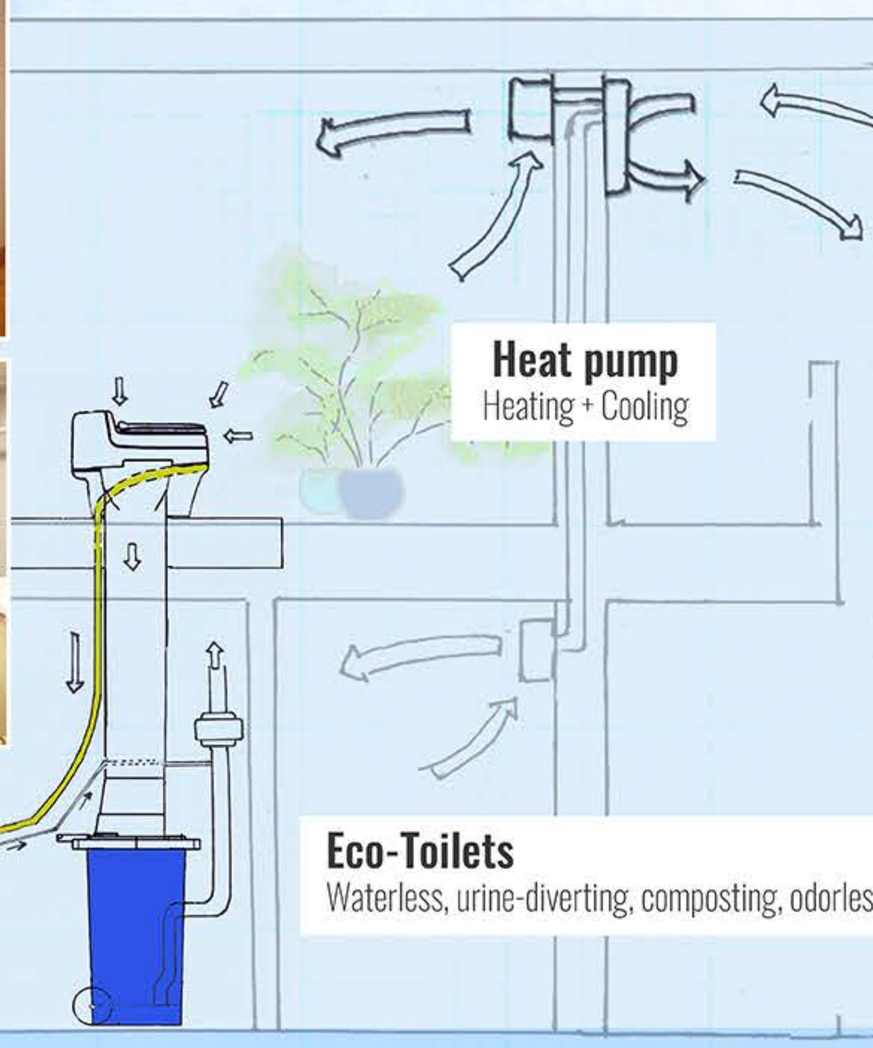
Raised Beds Vegetable Gardens
High yields, no machinery. Mulched with organic materials and fertilized with human urine - regenerate soil, conserve water and sequester carbon.

The Green Center, Inc. www.newalchemists.net
capecodalchemists@gmail.com
Earle Barnhart, Hilda Maingay - ecological design
C. Lily Ericsson - graphic design

GREEN NEW DEAL SUPERSTUDIO

2. GREENWAY BIOSHELTER - Join a Socially Equitable Commons

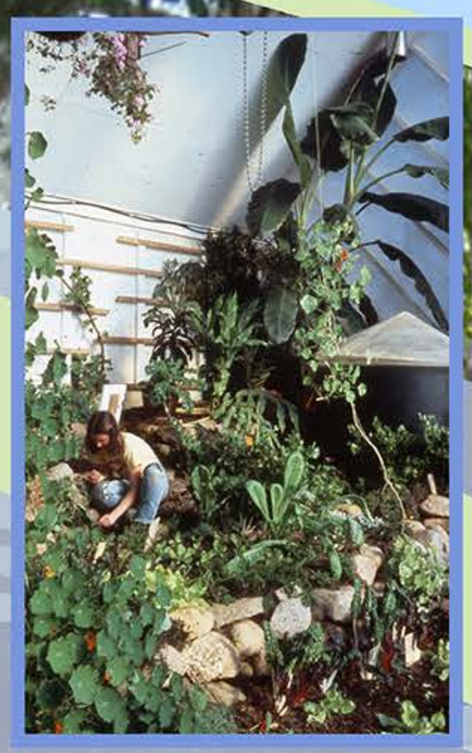
Self Reliant, Resilient, Locally Controlled and Directed



Heat pump
Heating + Cooling

Water Tube
Absorbs heat from air in day, heats air at night

Eco-Toilets
Waterless, urine-diverting, composting, odorless, silent



Bioshelter Ecosystem
A diverse indoor food-producing ecosystem with fruit trees, annual and perennial crops, soil organisms, beneficial insects, ponds, fish, frogs and people.

Aquaponics
Fish, vegetables, nutrient rich irrigation water AND passive heat storage.

A household of four will save about 75 gallons of water per day by using a waterless eco-toilet.

Well in groundwater provides water when rain is insufficient.

A household of four needs 4 gallons of potable water per day for drinking and cooking.

Water Purification:
The inner xylem core of a pine branch purifies water. Wood 1" long and 3/4" diameter filters 1 gallon per day. Two inches diameter filters 4 gallons per day. (MIT Water Lab)

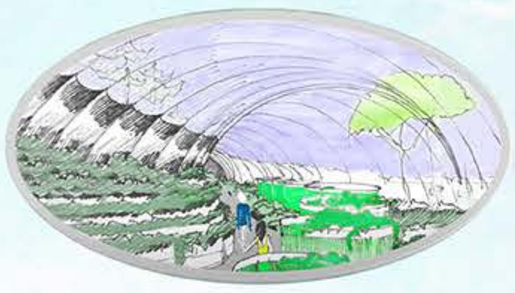
An aquaponics pond can produce 30 lbs of tilapia in a 6 months growing season, as well as 18 heads of lettuce/week. A pond with only fish can produce 40 lbs of tilapia. Nutrient-rich pond water also irrigates and fertilizes indoor and outdoor crops.

1/10 acre of raised beds can grow a year's supply of vegetables for ten people, without the use of machinery or fossil fuel.

The Green Center, Inc. www.newalchemists.net
capecodalchemists@gmail.com
Earle Barnhart, Hilda Maingay - ecological design
C. Lily Ericsson - graphic design

A household of four generates about 200 gallons of graywater per day, best used for subsurface irrigation of hedgerows, windbreaks, berry bushes and orchards. Plants and soil filter and clean the water naturally before it reaches the groundwater.

GREEN NEW DEAL SUPERSTUDIO



3. GREENWAY MISSION - Follow Nature's Way

Closing the Nutrient Cycle + Decarbonizing Human Support Systems

EAT

GROW

RECYCLE

FERTILIZE

FOOD NUTRIENT CYCLE

VEGETABLES

GREENHOUSE

CROPS

AQUAPONICS

DAIRY MEAT

FRUIT NUTS

BAMBOO SHOOTS

CHICKENS EGGS

GRAIN

LAND

NAY FIELDS

GRAIN FIELDS

DUCKS EGGS

FISH

AQUATIC PLANTS

WATER

GREEN HOUSE

VEGETABLE GARDENS

TREE CROPS

FOOD

LANDSCAPE

FECES

URINE

COMPOST + LIQUID FERTILIZER

ANIMAL

FISHPOND WATER

CROP WASTES

N_2O

$N_2O + SO_x$

Electricity

N

FOOD

$CO_2 + N_2O$

Sewer

N

N_2O

N+P

N+P

N+P

Agriculture: 80% of all N20, 10% of total GHG emissions

Heating of buildings: 11% of total GHG emissions

Landfills create lots of methane and toxic leachate

Incinerated sewer sludge

Electricity generation: 25% of total GHG emissions

3-5% of world's natural gas is used to make nitrogen fertilizer

Excessive Nitrogen & Phosphorus fertilizers destroy soil organisms, pollute water bodies and release large amounts of nitrous oxide N_2O

Transport: 29% of total GHG emissions

Nitrogen & Phosphorus from septic tanks and sewer plants enter groundwater

Polluted groundwater causes eutrophication in ponds and estuaries, and dead zones in oceans

The Greenway vision synthesizes existing ideas and technologies into a creative ecological solution to decarbonize existing human support systems.

WHEAT

The Green Center, Inc. www.newalchemists.net
capecodalchemists@gmail.com
Earle Barnhart, Hilda Maingay - ecological design
C. Lily Ericsson - graphic design