HUS PLUS© SYSTEM

We Owe Our Children a Better and Sustainable World.

Norwegian Eco Solutions+ ©

Private & Confidential

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The Big Idea

- **Ecoflex-Invisible Intelligence-Smart logic©**

  Self-sufficient & sustainable

  Zero waste/Green House Gas emissions; Plus Energy.

Objectives

Eco Proactive building

- **Eco Footprint:** mitigating ecological effects.
- **Zero Plus:** clean production; No-waste technology; Best available technology (BAT) and Best environmental practice (BEP). Reduce to Zero GHGs emissions and waste; produce own energy during operation building.

Vision

- **The deployment of Intelligent Sustainable Off-grid building solutions for «Zero Emissions» way of living**

Mission

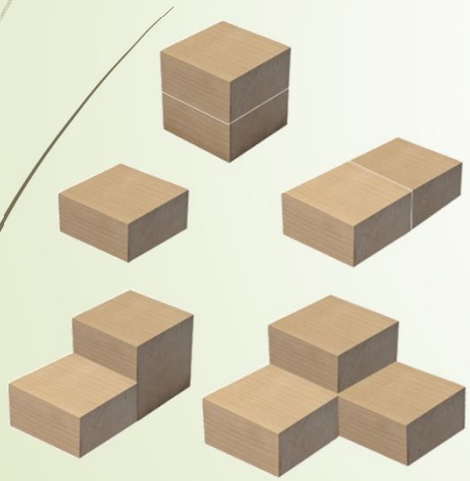
- **Make it simple for people to choose an Eco-friendly lifestyle**

The Concept

Eco Construction + **Integrated Utility Systems** + **Automated Operation**

Ecoflex© *Invisible Intelligent©* *Smartlogic©*

"Modular" + **"Off-grid"** + **"Smart"**



ECOFLEX© PLUS SYSTEM

Norwegian Eco Solutions

Background

Reasoning: a limited planet

- ***The Limits to Growth****: "we live in a finite world."*
- **4.962'962.962 population:** golden number Planet's sustainability.

Increasing population

- **2008**: world's population 50-50 urban/rural; cities to absorb global population growth up to 2050.
- **Global population**: 7 billion (2011); 8 billion (2024); 10 billion (2056).

Decreasing environment

- **Global eco-footprint**: 2,7 hectares/person; **Bio-capacity** of 1,8 hectares/person; **Deficit** of -1,51 report.
- **Cutting timber** faster than trees regrow + releasing more CO^2 than nature sequesters = climate change crisis.
- **Construction industry**: 1/3 of the total GHG emissions, biggest contributor to greenhouse gas emissions.
- **Paris-COP21, 2015**: Climate Change a reality; global action urgent.
- **Norway's** commitments: reduction GHG emissions; Carbon neutral economy by 2050.

High demand - High Prices

- **(+) Population (-) Environment**= (+) Demand (-) Offer= High Price Housing
- **Affordability gap:** acceptable standard costs *vs* households afford; more than 30% of income.
- **1,6 billion** urban dwellers: struggling for housing by 2025.
- **Strategy:** reduce construction costs; improve operations/maintenance efficiency.

The Big Idea

- Eco-efficient affordable building based on modular system; sustainable and distinctive design. High quality construction, unique recognisable brand, high cost-benefit ratio.

Properties

- **Eco-efficient:** high quality standards complying user's needs; reducing life-cycle environmental impact according to planet's carrying capacity.
- **Modular:** standardised compound parts construction system; combination alternatives to personalise the design according user, activities and site.
- **Flexible:** tailor-made building to customer's needs and expectations; redesigned modules displaced in multiple ways; initial solution expandable adding new modules.
- **Fast track construction**: delivering and building timespan shorter than traditional construction. While construction permits processed, modules prepared to deliver.
- **Affordable**: income range young average family; growing in needs through time.

Goals

Minimise building Eco Footprint

- Reduce to minimum environmental impacts construction process.
- Zero emissions building: clean production; No-waste technology; Best available technology (BAT) and Best environmental practice (BEP).

Means: SER Construction System

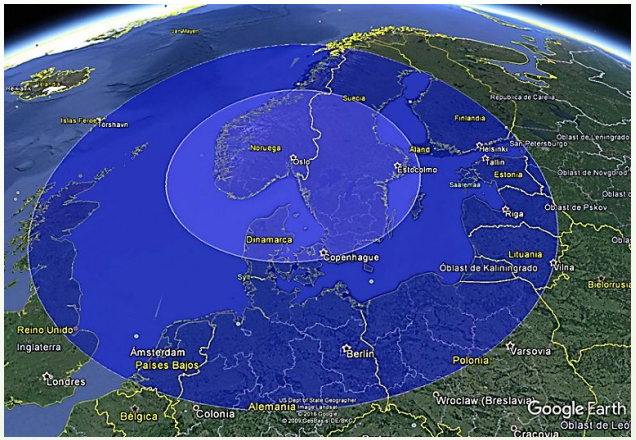
Economically affordable; socially fulfilling; and environmentally integrated;

Sustainable principles:

- Recycling; Renewable; Reusable; Lifecycle; Social.

Criteria:

- **Origin:** geographical location of natural resources and manufacturing place. The centre Oslo, the first circle to Trondheim, approx. 500 kms. (Sweden and part of Denmark) primary source of materials. Second circle to Bodø, 1.000 kms. (north of Germany, Holland, England, Scotland, Poland, Finland and the Baltic countries.)
- **Extraction:** extraction method for the raw material.
- **Manufacturing process:** transformation of raw material and the manufacturing of the finished product.
- **Disposal:** management of waste produced from extraction to final disposal of the product at the end of its lifecycle.
- **Fair trade standards:** framework for decisions regarding trade and production issues.



Design

Fundaments

Design principles: efficient ergonomic construction system following Nature's life essence of *"Less is more"*

Approach: bionics

Analyse nature's best solutions and inspire on their design and processes to solve human problems.

Skeletal system

The loads transmitted by beams, columns and joints, and the walls are supported by the framework. Prefabrication elements, easy transportation and assemblage; less impact in the construction site.

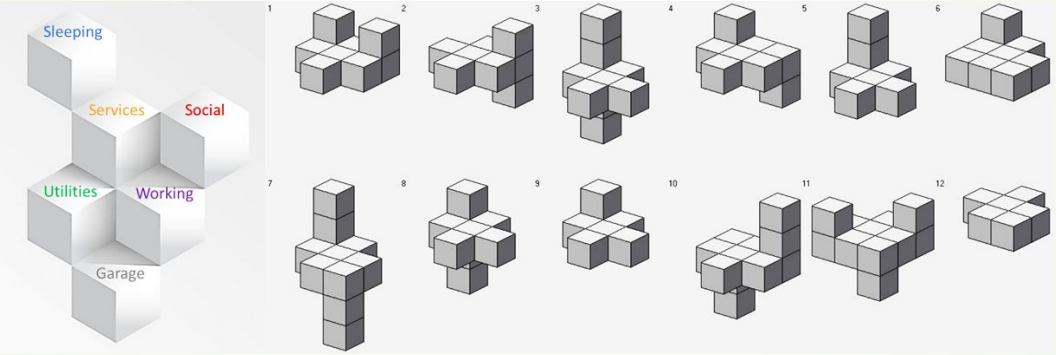
Epidermis system

Skin, separator between conditioned - unconditioned environment of a building: air, water, heat, light, and noise. Components are: walls, floors, roofs, fenestrations and doors. Prefabrication of elements mounted on-site in the structural frame.

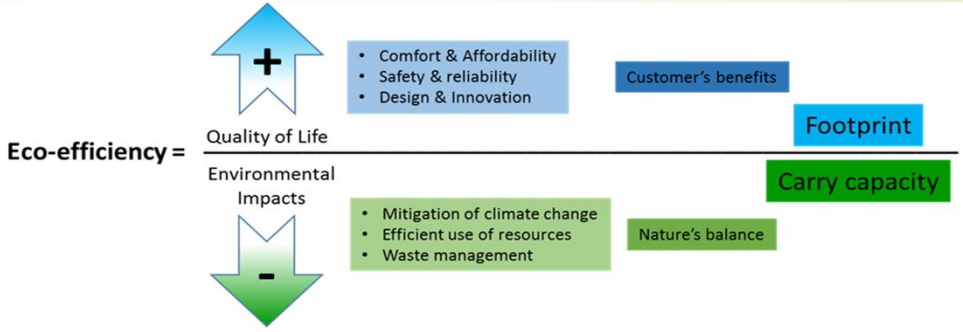
Design

Properties

- **Versatility:** capable of or adapted for turning easily from one to another of various functions.
- **Scalability:** maintain or even increase efficiency when tested by larger operational demands. Addition of elements for complex buildings. Many combinations of assemblage and use
- **Sustainability:** quality objects that endure in time generating positive environmental balance
- **Efficiency:** create more goods/services using fewer resources with less waste and pollution



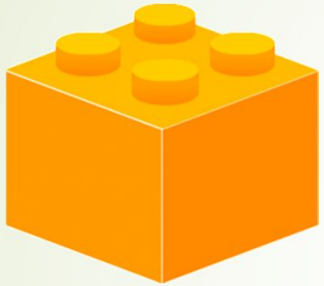
Building sustained infinitely=
+ Materials (Recyclable/Renewable)
+ Water (Alternative/Recycling)
+ Waste (Recycling)
+ Energy (Renewable/Alternative)
+ Air (Non-Polluting Processes)
+ Services (Operation/Maintenance))
x Efficiency
– (Resources (Environmental Consumption)
+ (Proactive (Environmental Restore)
= Environmental Surplus

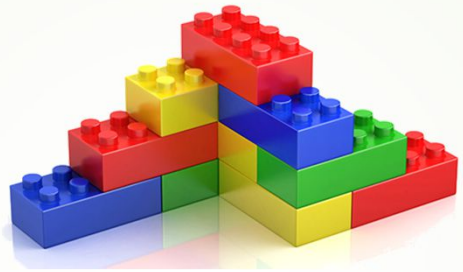


Design

Compound

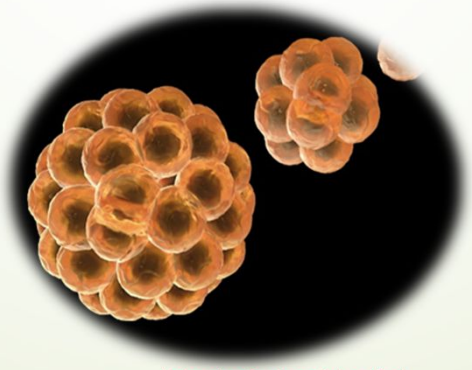
- **Expandability:** expandability, the possibility of increasing in area and function.
- **Lego principle:** create extensive combinations through a simple assemblage system





Module

- **Self-contained standardised unit:** performs defined task; linked with other units to form complex system.
- **Nature Cells:** called the "building blocks of life"; basic structural, functional, and biological unit of living organisms.

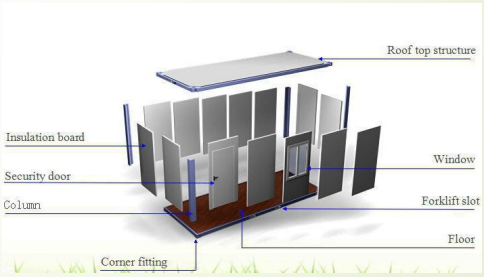


Design

Assemblage

- **Flat-pack:** Ikea Kit principle: prefabricated components on-site.

- Transport



INVISIBLE INTELLIGENCE PLUS©
OFF-GRID SYSTEM

Norwegian Eco Solutions

Background

Reasoning: a wasted world

- **Residential activities:** 32% waste produced by human beings.
- **Lifecycle approach:** 10 to 15% reduction in global GHG emissions; energy from waste, recycling, and solid waste management; Proactive waste prevention decrease to 15 to 20%.

Increasing population

- **Emerging population:** 3 billion middle class; income purchase consuming goods trendy industrial world.
- **Norwegian population:** increased 0,80% (2016); lowest increase since 2006.

Increasing consumption

- **Consumer class:** 1,7 billion; 50% developing world.
- **Norway 2008:** household waste increased average 5%/year; more than consumption volume.
- **Norway 2012….:** increase average waste, less than the consumption volume; **2014 to 2015:** consumption increased 2.0%; waste generation increased 1,1%.

Increasing waste

- **Waste dumped:** 2,12 billion tonnes/year; 99% sold products are garbage within 6 months.
- **2100:** 3 times waste as today; cost increasing from $205 billion/year (2010) to $375 billion (2025).
- **Norway 2015:** 2,3 million tonnes household waste; average 438 kg/household/year; 50 kg (10,25%) less than European average.

The Big Idea

- Self-sufficient, off-grid building; synergic assemblage of existing Utility Services eco-solutions; Zero waste /Green House Gas emissions; Plus Energy; integrated, closed circuit system.

Properties

- **Off-grid:** self-sufficient utility system; high quality standards; no plugged to public infrastructures.
- **Integrated:** interconnected system of existing utility eco-solutions; generate symbiosis and synergies between components/processes.
- **Scalable:** tailor-made customer; pre-established assemble diverse solutions/sizes.
- **Ready-to-install:** timespan of delivering-installing shorter than traditional; while construction permits system prepared to deliver.
- **Affordable:** off-grid system within income range young average family; high “green” expectations.

Goals

Eco Proactive building

- Reduce to Zero GHGs emissions and waste; produce own energy during operation building.
- Plus building: clean production; No-waste technology; Best available technology (BAT) and Best environmental practice (BEP).

Means: SER off-grid System

Economically affordable; socially fulfilling; and environmentally integrated;

Sustainable principles:

- Recycling; Renewable; Reusable; Lifecycle; Social.

Criteria:

- **Origin:** geographical location natural resources and operating place; utility system use local alternative sources; operate in symbiosis natural local environment.
- **Capture:** type source; capture method elements of utility system; renewable materials most sustainable resources; method low energy consuming, no polluting and restoring.
- **Operating process:** transformation raw material / operation utility system, low energy/water consumption, no air/water/soil contamination, no-waste production.
- **Disposal:** management waste transformation from capture/operation processes; final disposal of by-products at end lifecycle.
- **Fair trade standards:** framework for decisions regarding trade and production issues.

Design

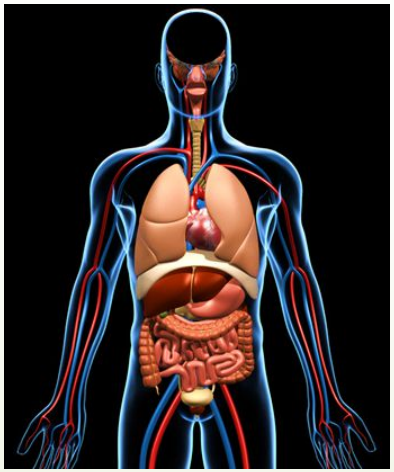
Fundaments

Design principles: maximise alternative sources; minimise use non-renewable materials; generate synergies and symbiosis to preserve, restore and reduce following Nature's basic principles:

Runs on sunlight
Recycles everything
Demands local expertise
Taps the power of limits
Uses only the energy it needs
Rewards cooperation
Curbs excesses from within
Fits form to function
Banks on diversity
Filters water, cleans air, builds soil

Approach: bionics

Analyse nature's best solutions and inspire on their design and processes to solve human problems. Utility system compared to internal organs and conduction systems of human beings, with efficient respiration, nutrition, energy and waste processes.



Design

Circulatory system

Permit blood to circulate and transport nutrients; the engine of body produce/distribute energy whole body; power and electricity system of a building.

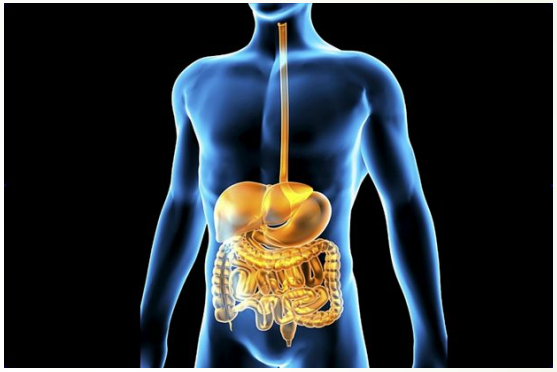
Respiratory system

Ventilatory system intake and exchange of oxygen and carbon dioxide between an organism and the environment; ventilation system of a building.

Design

Digestive system

Breakdown of food into smaller components; absorb and assimilate into the body; expel waste products of digestion; cleaning process; digestive system is the hydraulic and sewage system of a building.



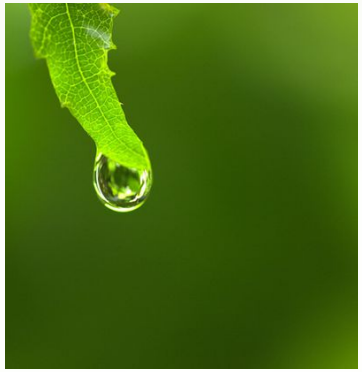
Properties

- **Self-sufficiency and conductivity:** degree of clean operation and no waste by-products from the processes.
- **Scalability:** capacity and efficiency; expandability systems.

Design

Self-sufficiency

Fulfilling own needs in clean and durable way; permit the system to operate permanently without plugged to network; not using polluting methods; nor producing residual waste.



Conductivity

Interconnection interior each systems, and between the systems; support synergies/symbiosis in self-sufficient entity.

Design

Scalability

Cope under increased workload; scales well able to increase level of performance when tested by larger operational demands.

Entity

Self-contained standardised unit; performs a defined task linked with other units to form larger/complex system; identity separate from those of its members.

Nature: organs

Heart, (energy); lungs (ventilation); stomach and kidneys (water and sewage).

Norwegian Eco Solutions

POSSIBLE SOLUTIONS

Progressive modular construction

Progressive modular construction

Progressive modular construction

Multifamily complex

Multifamily complex

Urban development

Countryside development






The Future is now!!!

Norwegian Eco Solutions

A proactive vision of the world
in critical times of change…