

**HYPER-FERTILE**

(300 words)

Ex nihilo landscape design: rehabilitating the earth

The current site is a flat expanse of post-industrial polluted backfill. It is therefore necessary to fundamentally restructure the area in order to make it a contemporary viability.

The goal is to work essentially on the soil, the earth, using different means: sculpting the topography, decontaminating the industrial soil, producing energy through biomass, and producing a large quantity of high quality fertilizer.

This project combines energy production with the decontamination of the existing space. We are looking for an image of urban nature that lives according to the rhythm of the seasons through a variety of cultures and environments (afforestation, open sea views, shore gardens, summits) integrated into a user-friendly public space directly linked to the downtown area. The area will also play a role in organizing waste collection across the Copenhagen metropolis.

We wish to engage a natural dynamic between the land and sea on a completely artificial site.

A piece of nature, visible from the city, which suggests monumental sculptures, offers Copenhagen a new image, a strong identity: a signal, a landmark. It is also the center of experimentation and research on sustainable development so that it becomes a "science foundation" : a place of exchange where seminars can be held, and where residents, artist, engineers, architects, landscapers, and scientists can develop experiments for the future together.

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(1200 words)

Ex nihilo landscape design: rehabilitating the earth

The modern city generates pollution that disrupts natural ecosystems and the health of all living beings. This realization has led to the emergence of new “clean” technologies; alternative ways of building the city and producing energy. **Sustainable development is also a matter of behavior and individual responsibility. The project encourages new systems and informative performances.**

Today large cities have inherited difficult-to-manage brownfield, and must necessarily develop **new strategies to become resilient and viable.**

**To make earth that has contaminated by human activity habitable, when the previous architecture has completely disappeared, is to reveal ex nihilo landscape design.**

The project innovates with alternative materials in architecture, soil remediation, and energy production from **biomass**. It allows us to rehabilitate degraded sites, to encourage a local dynamic whose effects have a direct **link to its urban and port industrial context**, and to forge multiple relationships with the environment, businesses, and people who make up the city. This is a kind of **large-scale garden territory.**

This plan, which is site specific to Copenhagen, can be adapted for other polluted sites.

**We offer modern and progressive works of art, monumental sculptures which are also energy sources in a place to live and trade in the heart of the Danish capital.**

**SUSTAINABLE LAND ART PROJECT: EARTH REHABILITATION**

The project seeks to reconcile art and sustainable development through the reintroduction of Nature, its dynamics, temporalities, with sculptures that perform multiple uses and functions, adapting **earth in all its states.**

“Post-industrial fallow” has come to life with spontaneous vegetation but it still bears the scars of contaminated soil. Repurposing is **an evolutionary process**. The **phytoremediation** project aims to treat the land with plants to beautify the urban environment and make it **a source of clean energy production**. Sculpting the site’s topography produces a specific **“renaturalized” landscape**. Different ways of working the land will restore the land to its nobility and its potential, **generating a new place, which combines art and life.**

## Monumental sculptures with diverse functions :

- **Phytoremediation totems: producing a viable environment**

The area of land to be depolluted is built with many facets for plant treatment areas doubling as living sculptures. **Experimental works** which are designed closely with research laboratories and analysis (monitoring, testing, surveys...), these sculptures are also explained to visitors.

These living depolluting objects, built into **colored mounds**, create amazing structures and combined with vegetation, fungi, roots; offer a range of **varied textures for seasons, years...**

**Totems symbolize the restoration of balance between Man and Nature.** They become a kind of machine to produce soil substrate, to give life to the earth by the action of associated plants and microorganisms (over 400 species of depolluting plants) which is a productive asset and prevents a wider contamination.

The overall system thus **rescues the soil**, to develop several strategies for vegetal depollution and a range of habitats (flowering, woody, and herbaceous plants.) Contaminated soil is extracted and placed in layers on the site in localized areas. The soil is available for free spaces for installations and strolling.

The biological technique called phytoremediation used to clean up contaminated soil consists in using **hyper-accumulating plants** capable of absorbing heavy metals, along with micro-organisms, such as filamentous fungi, and microflora. During the first ten years, the harvested plants will be used as raw material for industrial combustion furnaces.

### Two applications of hybridization

**-The totem:** earth is arranged in structures, **layer by layer**, ending with a thick topsoil, to make these production units reusable in the medium and long term.

**-The associated area:** land is divided into plots of various sizes in order to grow depolluting plants according to agricultural principles. "Horizontal" production allows regular fallow and constant turnover in the plants.

**The art instillation is therefore in situ;** it neither removes earth nor creates a waste site.

- **Manned Totems: the production house**

Manned totems demonstrate a new way of building with earth. The **alternative technique** is proposed for schematic large-scale production: topsoil is used here with straw for its insulating capabilities in **habitable container spaces** which already belong to the harbor aesthetic. They are implemented as a simple embankment, creating a protective envelope which is both **low-cost and low-tech**.

- **Inhabited digester totems: recycling, power generation, and fertilizer**

At the heart of these inhabited islets **methanation digesters** are spread: dry fermentation of vegetable or animal organic material in an oxygen-deprived environment produces biogas, which is transformed into **electricity** by means of a motor cogeneration. **Engine heat** is used to heat water and the living spaces of the entire site. Excess energy is fed into the public grid.

Sources of nourishment? Lawn clippings, the contents of on-site dry toilets, **green agricultural waste** (such as manure) and waste that come from the neighborhood and city: sludge and grease from wastewater treatment plants, industrial waste (paper mill industries, industrially produced food and pharmaceuticals). An airlock holds the odor of input material to the storage location.

After two months, the biogas produced by these methanations offers **an excellent fertilizer to feed our land and create a substrate**. As it releases no odor, it is directly integrated into the public space, as a pedagogical tool.

For every **100 tons of organic products placed in the digester**, there will be **90 tons of digestate available**.

**The whole site will be able to process up to 9000 tons of organic products per year, and produce 379980m<sup>3</sup>, or 1.8 million kilowatts/hour of electricity per year through biogas. This would match the consumption of 720 households of four people, using 2500KW/h per year.**

- **The Grotto—Environmental Forum: knowledge production and exchange**

To complete the design of this site destined to revitalize the soil we propose a place which **brings together the collective energies in environmental research**: a meeting hall structured on the concept of sharing. It could host exhibitions, conferences, a documentation center...

**Its publicly accessible summit platform appeals to the Little Mermaid rock 500m in front. The site ends the line of defense against the city after the Kastellet, encouraging both natural dynamism, and artistic and technical innovation for Life.**

The hyper-fertile project aims to be **a iconic** place for sustainable development. A place of exchange, experience, and art, to communicate about new technologies for energy production and exploitation of this energy. **The challenge** is to demonstrate that it is possible to rehabilitate the earth and create a healthy environment that is easy to **cultivate elsewhere**.