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The TRY2025 Future City Vision

Today's Work, Tomorrow's Heritage

A Future of Harmonious Living

— A Botanical Future City Concept —

The Environmental Island

GREEN FLOAT

Printed in Japan



The Botanical City Concept

We live remarkably convenient lives in cities that have developed along economic lines.

But happiness should be measured separately from material wealth.

Contact with Nature. Time passed leisurely in cultural pursuits. Healthy and comfortable living.

And blending into and living and growing harmoniously with Nature as part of the ecosystem.

We can make a city, like a single plant, that embodies these principles.

Our model of a new environmental city was born from these aspirations.

The Future Environmental Island Green Float

～ Proposing “Botanical Cities” on the Equatorial Pacific～

The GREEN FLOAT concept embodies two areas of innovation.

GREEN innovation

Recognize the limits of industrialized civilization
and learn from natural systems

Botanical City

- Beyond CO₂ reduction towards carbon negative
- Food self-sufficiency and zero waste
- 100% renewable energy



FLOAT innovation

Create new possibilities for city locations:
the ocean surface

Floating City

- Save island nations from rising sea levels
- Immune from the impact of earthquakes and tsunamis
- Free from typhoons and hurricanes

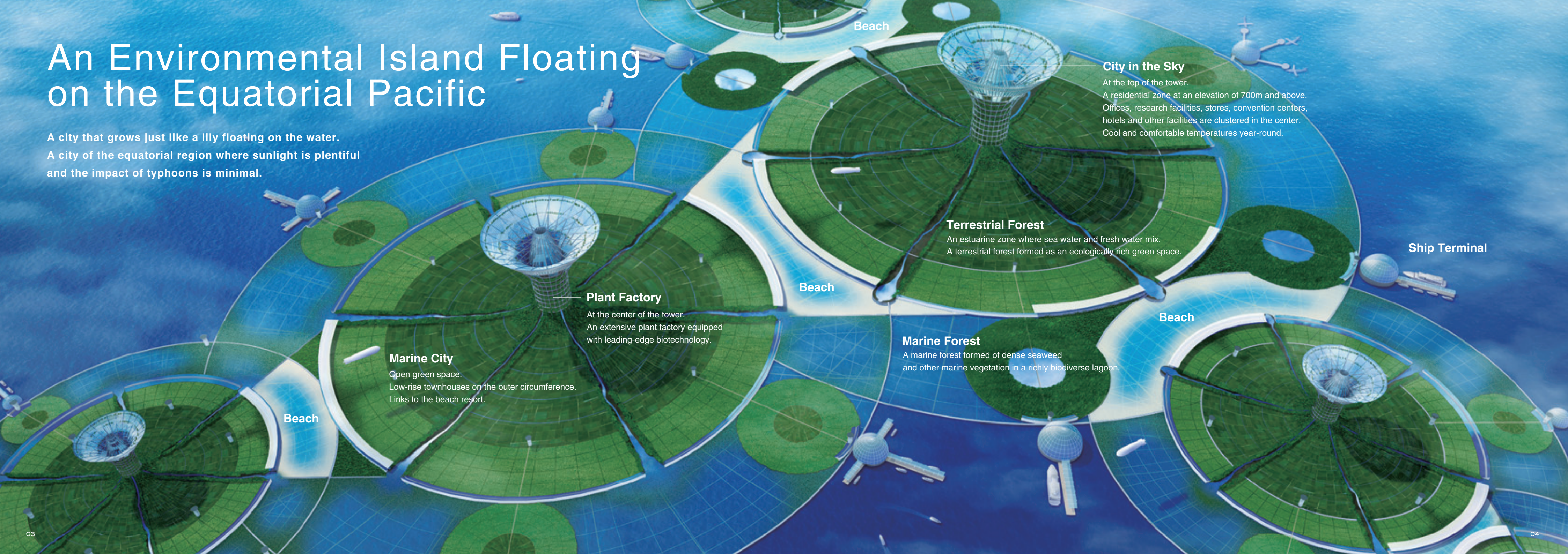


Seeking New Affluence for the Era of the Global Environment

An Environmental Island Floating on the Equatorial Pacific

A city that grows just like a lily floating on the water.

A city of the equatorial region where sunlight is plentiful and the impact of typhoons is minimal.



Beach

City in the Sky

At the top of the tower.

A residential zone at an elevation of 700m and above. Offices, research facilities, stores, convention centers, hotels and other facilities are clustered in the center. Cool and comfortable temperatures year-round.

Terrestrial Forest

An estuarine zone where sea water and fresh water mix.

A terrestrial forest formed as an ecologically rich green space.

Ship Terminal

Beach

Plant Factory

At the center of the tower.

An extensive plant factory equipped with leading-edge biotechnology.

Marine City

Open green space.

Low-rise townhouses on the outer circumference.

Links to the beach resort.

Beach

Beach

Marine Forest

A marine forest formed of dense seaweed

and other marine vegetation in a richly biodiverse lagoon.

Living harmoniously with Nature like a dandelion is the key to the botanical city.

Dandelions spread gently, their seeds borne by the wind.

Where plants grow, a variety of living things gather.

Plants, animals and humans all grow according to natural law and by maintaining the balance of order.

This amazing mechanism is the basis of the botanical city.

City in the Sky (30,000 residents)

A “daily life zone” is established at an elevation of 700m and above. Residences and services are clustered within a 500m radius, which is considered a comfortable walking distance.

- Outer circumference has residential housing complexes with central corridors (ocean views for the outer units, city and sky views for the inner units)
- Center has living-support service functions, including office, commercial, cultural, educational and medical care facilities

Tower (Plant factory)

Contains a plant factory, aimed at 100% food self-sufficiency. Functions as a production facility to support the inhabitants.

- A plant factory with the latest technologies

Waterside (10,000 residents)

A residential zone is located on the outer circumference of the central plant. It adjoins the marine forest, which is a treasury of ocean life, and the beach resort.

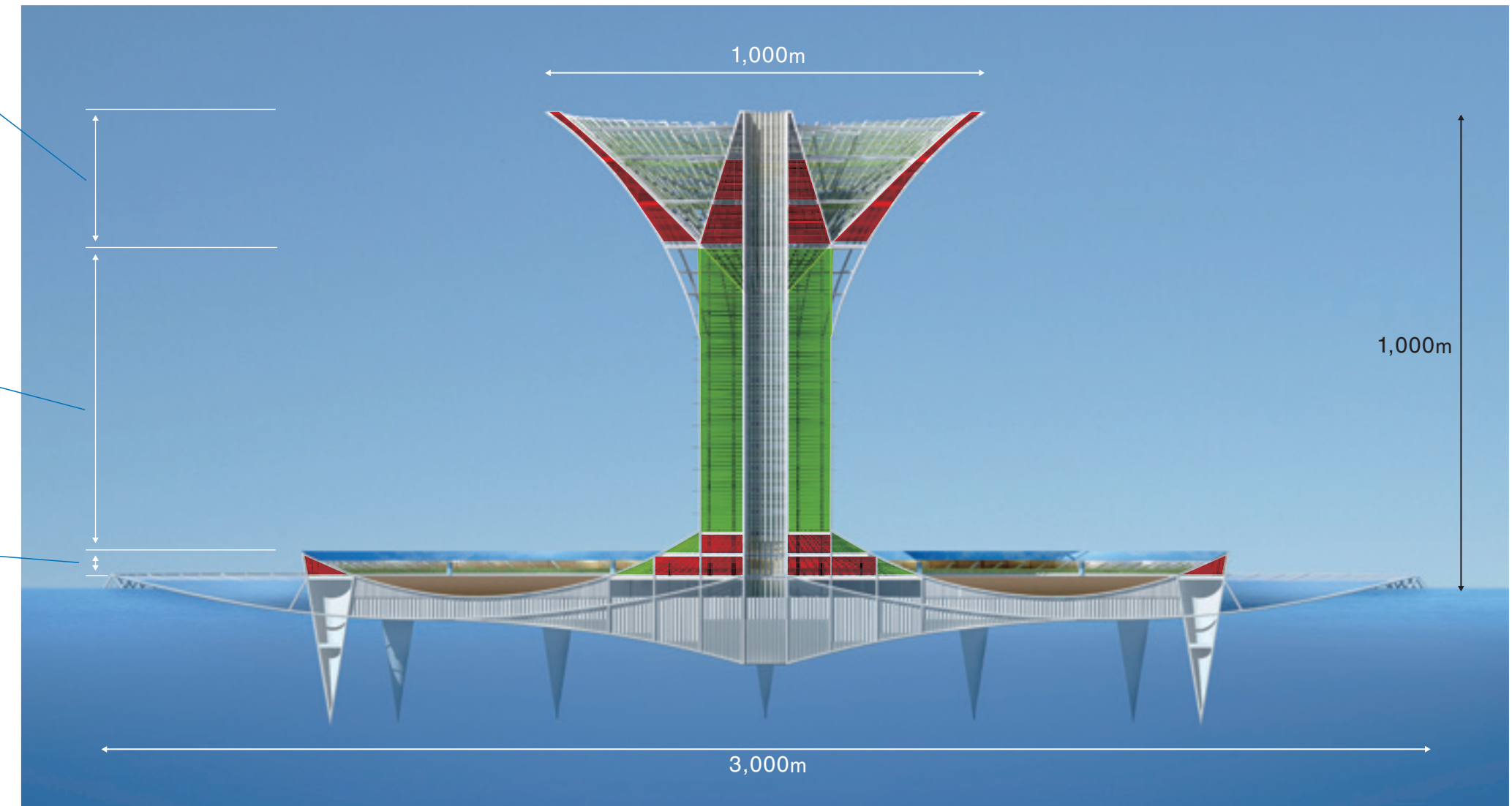
- The outer circumference has low-rise townhouses for rural living
- Envisioned as a place for living based on agriculture, fishing and SOHO

Environmental Island Green Float

The Environmental Island Green Float has a diameter of 3,000m and floats on the ocean like a flower petal.

It is shaped like an inverted cone to maximize ground surface exposure to sunlight.

It consists of a vertical City in the Sky, a village-scale community with a diameter of 1,000m and green and aquatic open spaces rich in sunlight.



MASTER VISION

A City in the Sky with a Sense of the Sky and Greenery

An area rising 700-1,000m above the equator.
Here you find an energy-conserving compact city that is pleasant and peaceful,
with no strong winds and a temperature of about 26-28°C year-round.

New Affluence in the Midst of Nature

- Enjoyable living in close touch with Nature's splendor
- Expansive living with views of the sky and ocean
- A friendly, walking-scale community

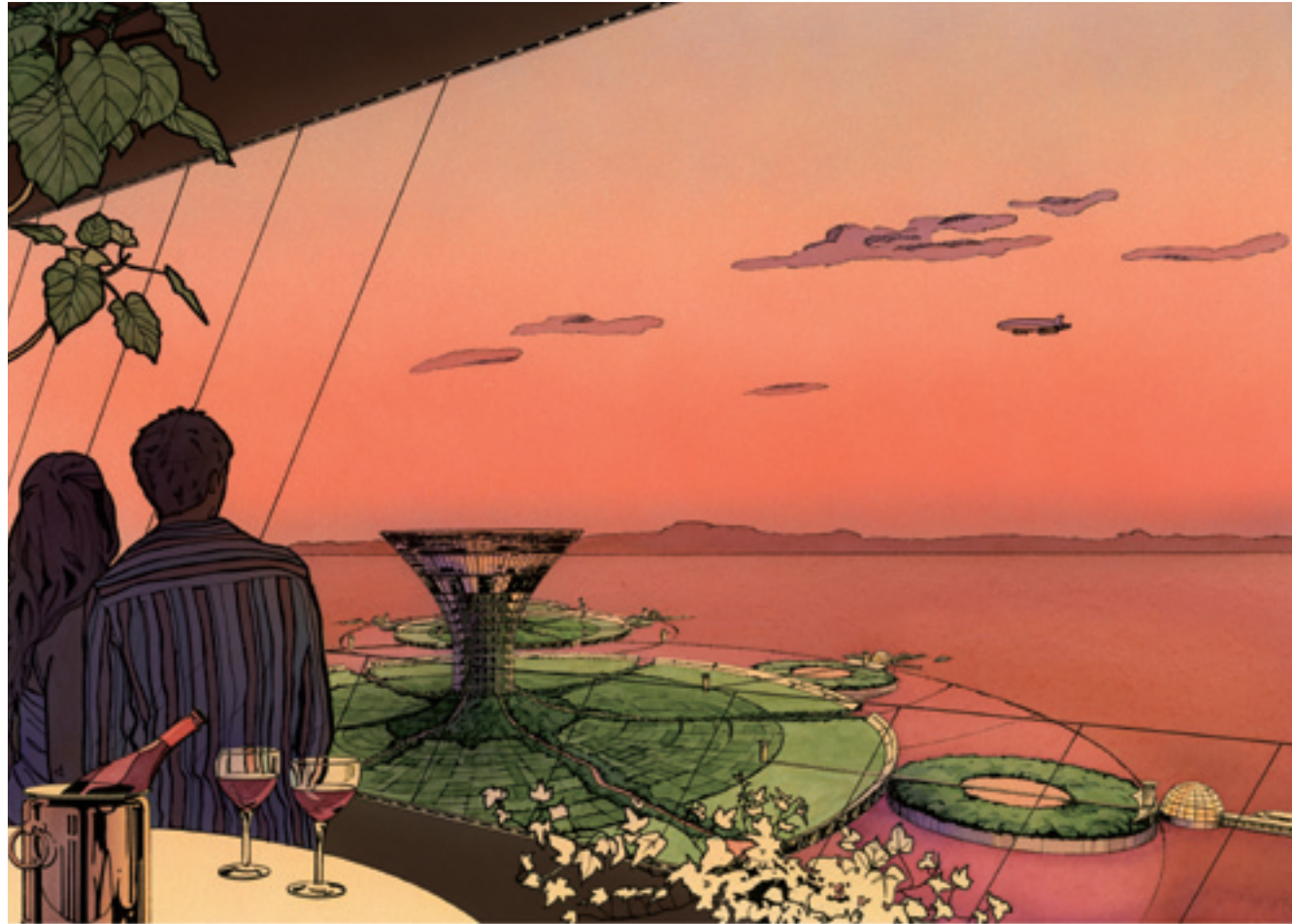
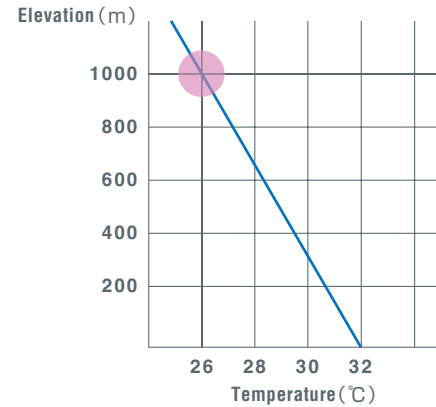


Terraced community in the sky



Gardening in the sky

The temperature at 1,000m above the equator is a refreshing 26°C year-round.



View from a residence

City in the Sky A Residential Zone with 30,000 Inhabitants

Planted area: About 560,000m²
(Approximately 12 times the area of Tokyo Dome)

- 30 Floors: The residential zone offers a 30-floor, vertical living area extending up from 700m above sea level.
- 200 Hectares: A 200ha residential zone is envisioned spanning 30m from the outer circumference.
- 10,000 Units: About 30,000 people living in approximately 10,000 units, with an average unit area of roughly 200m².



A Waterside Resort with a Sense of the Ocean and Greenery

In the oceanfront area, the low-rise townhouses are bases for living.

Summer beaches spread out before your eyes, and the lagoons are teeming with fish and shellfish.

Living here raises the happiness index, not economic indexes.

New Affluence in the Midst of Nature

- The richness of Nature is part of your everyday life
- An enjoyable resort life where you can do what you want when you want
- First-hand education in Nature through direct contact

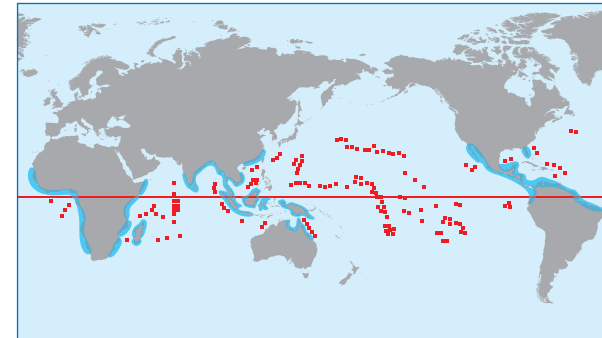


Take a stroll



Explore with children

Global Mangrove and Coral Reef Distribution



- Mangrove distribution
- Coral reef distribution

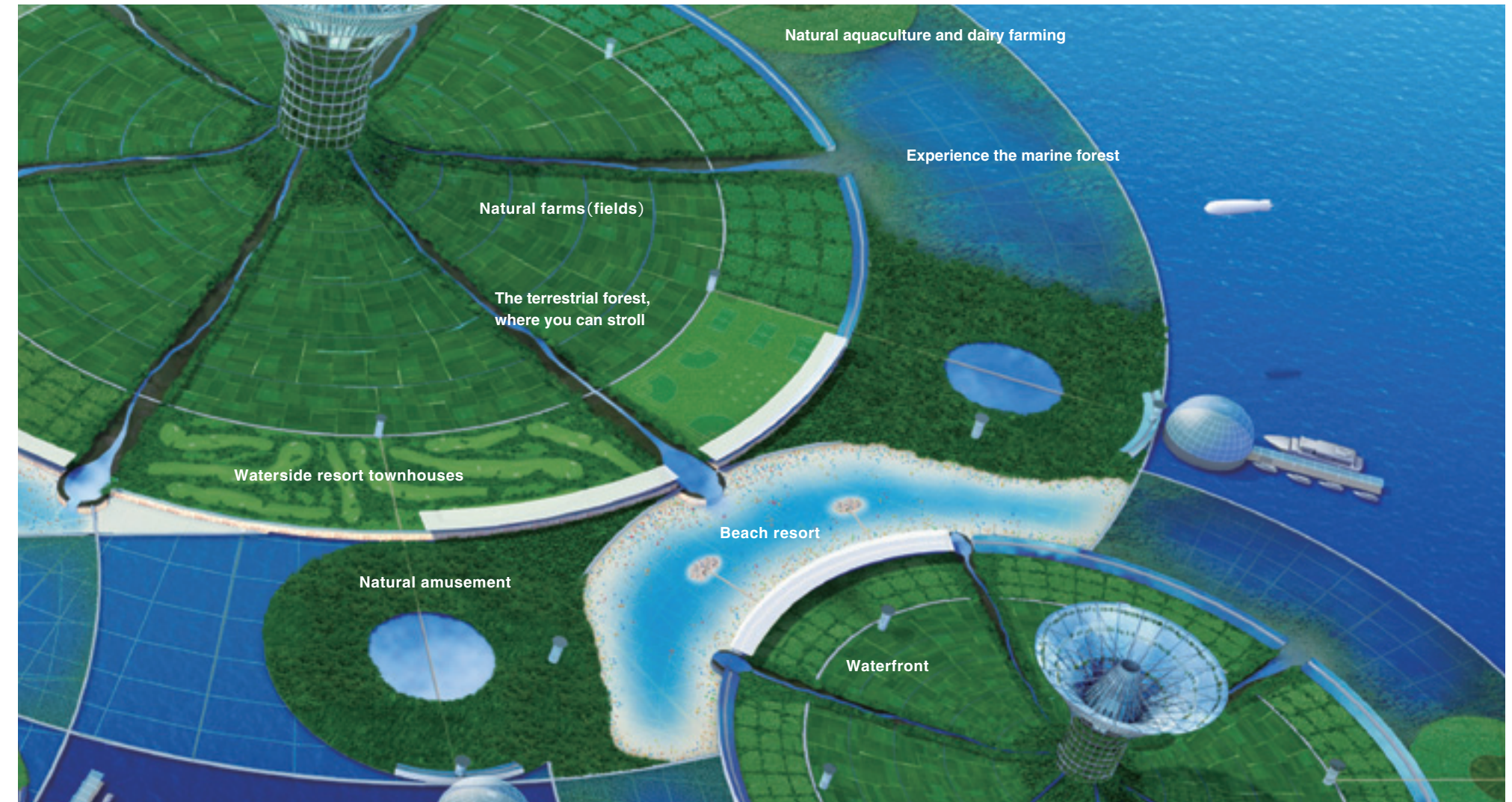


Lagoon resort beach

Waterside A Residential Zone with 10,000 Inhabitants

Planted area: About 650,000m²
(Approximately 14 times the area of Tokyo Dome)

- Townhouses: Low-rise townhouses along the exterior circumference waterfront.
- 45 Hectares: A 45ha residential zone is envisioned, spanning 30m from the island's coast.
- 3,000 Units: About 10,000 people living in approximately 3,000 units, with an average unit area of roughly 150m².



New Industry Incubation Office and Plant Factory

New business models are born here.

Future businesses that fuse Nature and technology will begin.

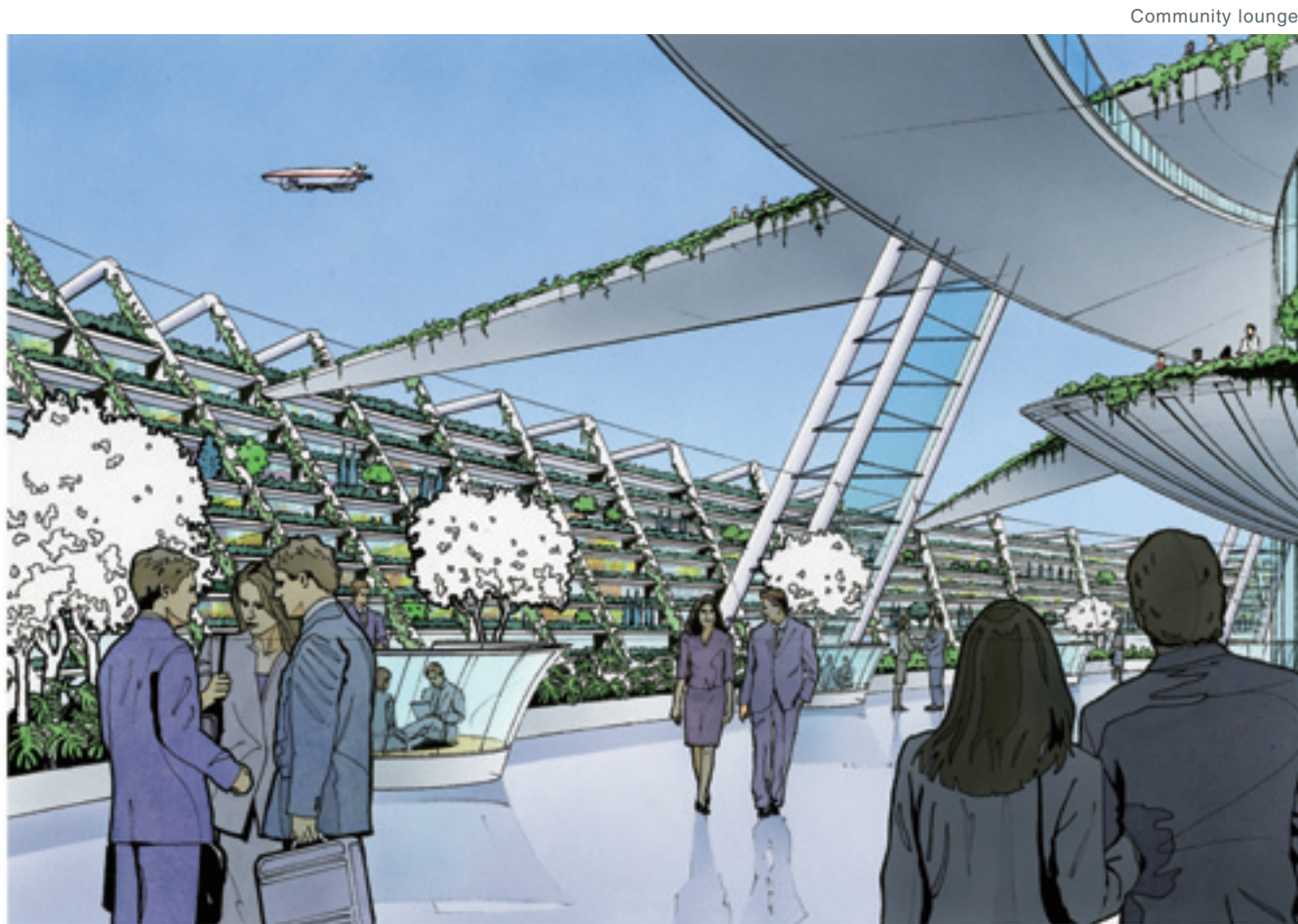
New Affluence in the Midst of Nature

- Living close to work, you can eat lunch at home with your family
- A base for leading-edge biotechnology research that captures the world's attention
- A natural life with organic vegetables



■ Biobusiness: Base for New Industry

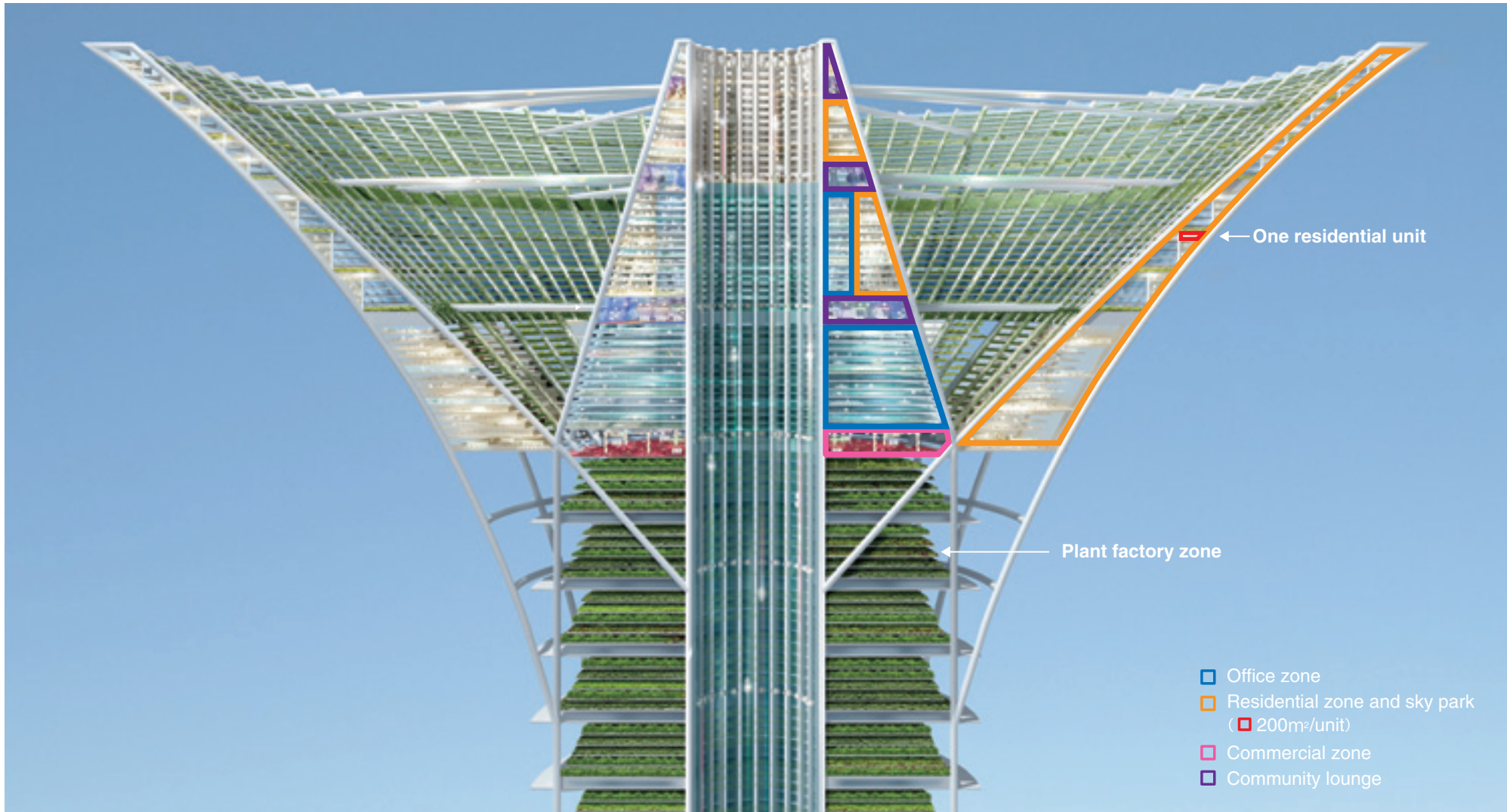
- Pharmaceutical market
- Agrimarket
- Food and cosmetics markets
- Beauty and health markets



Tower A Work Zone for 10,000 People

◆ Planted area (Plant factory): About 3,500,000m²
(Approximately 75 times the area of Tokyo Dome)

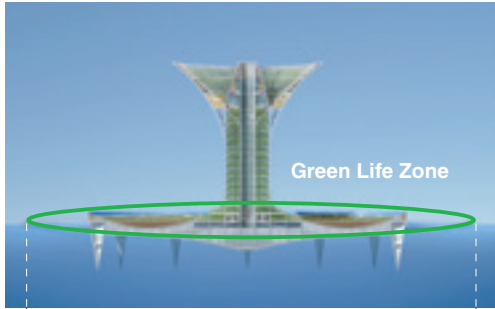
- Workplaces and residences are close together:
The optimal scale for sharing community news.
- Food production and consumption are close together:
Food self-sufficiency begins with harvesting only necessary amounts when needed.



Human-Scale Distances and Configurations: An Urban Village That Grows Like a Lily Floating on the Water

A compact village with a walkable radius of 1km is defined as a cell (district).
Cells are added to form modules (cities), which join to form units (countries).

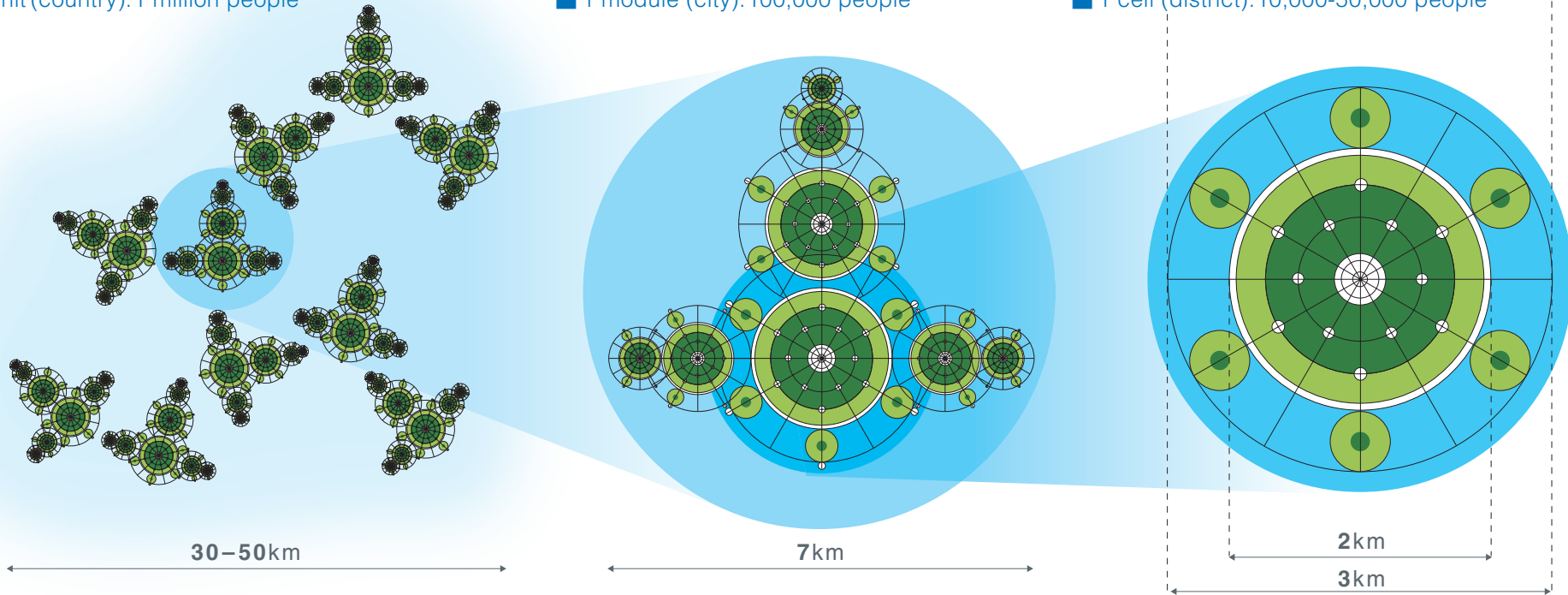
- City scale: Compact cities that are restricted to the walkable scale of villages
- City configuration: Fractal geometric systems that resemble the world of Nature
- City composition: Grow from cells (districts) → modules (cities) → units (countries)



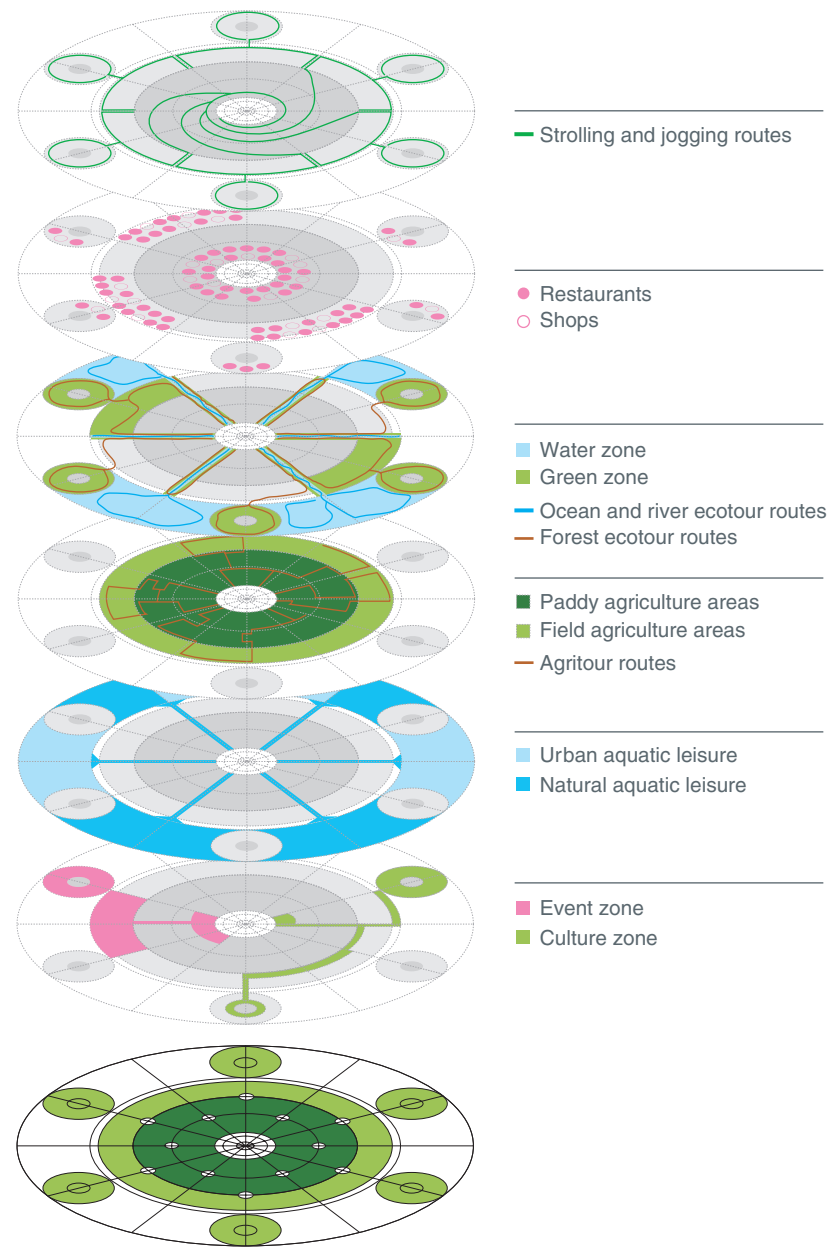
■ 1 unit (country): 1 million people

■ 1 module (city): 100,000 people

■ 1 cell (district): 10,000-50,000 people



GREEN LIFE ZONING



Strolling and jogging zone

Shop and restaurant zone

Ecotourism zone

Agritourism zone

Aquatic leisure zone

Culture and salon zone



Advanced technologies of the future, born amid Nature

If a city could absorb CO₂ like a single leaf,
using sunlight for photosynthesis.

If we could purify our own environment
with our own natural power.

If we could grow by changing garbage into energy.

The clues to leading technologies for flexible
and pleasant living are found in Nature.



TECHNOLOGICAL VISION

CO₂ Reduction and Energy Conservation

- Carbon negative
- Carbon chain (Carbon cycle)
- CO₂ recovery and ocean sequestration
- Power generation from a space solar power satellite
- Power generation from ocean thermal energy conversion
- City in the Sky cooling system
- Wave power generation

Ecosystem and Planting

- Formation of diverse ecosystems
- Creation of a shallow inland “sea” (lagoon)
- Planting on upper levels
- Growing of mangroves to create ecotones
- Maintenance of tropical forests and creation of estuaries

Self-Sufficiency and Recycling

- Plant factory for food self-sufficiency
- Waste recycling system
- Grain, livestock and other farming in the plains portion
- Clean up and conversion of drifting
“garbage islands” into energy resources

Safety and Security

- City disaster and business continuity planning (BCP)
- Structural planning/disaster and evacuation measures/
strong wind countermeasures/wave and tsunami
countermeasures/lightning countermeasures

Maritime Construction

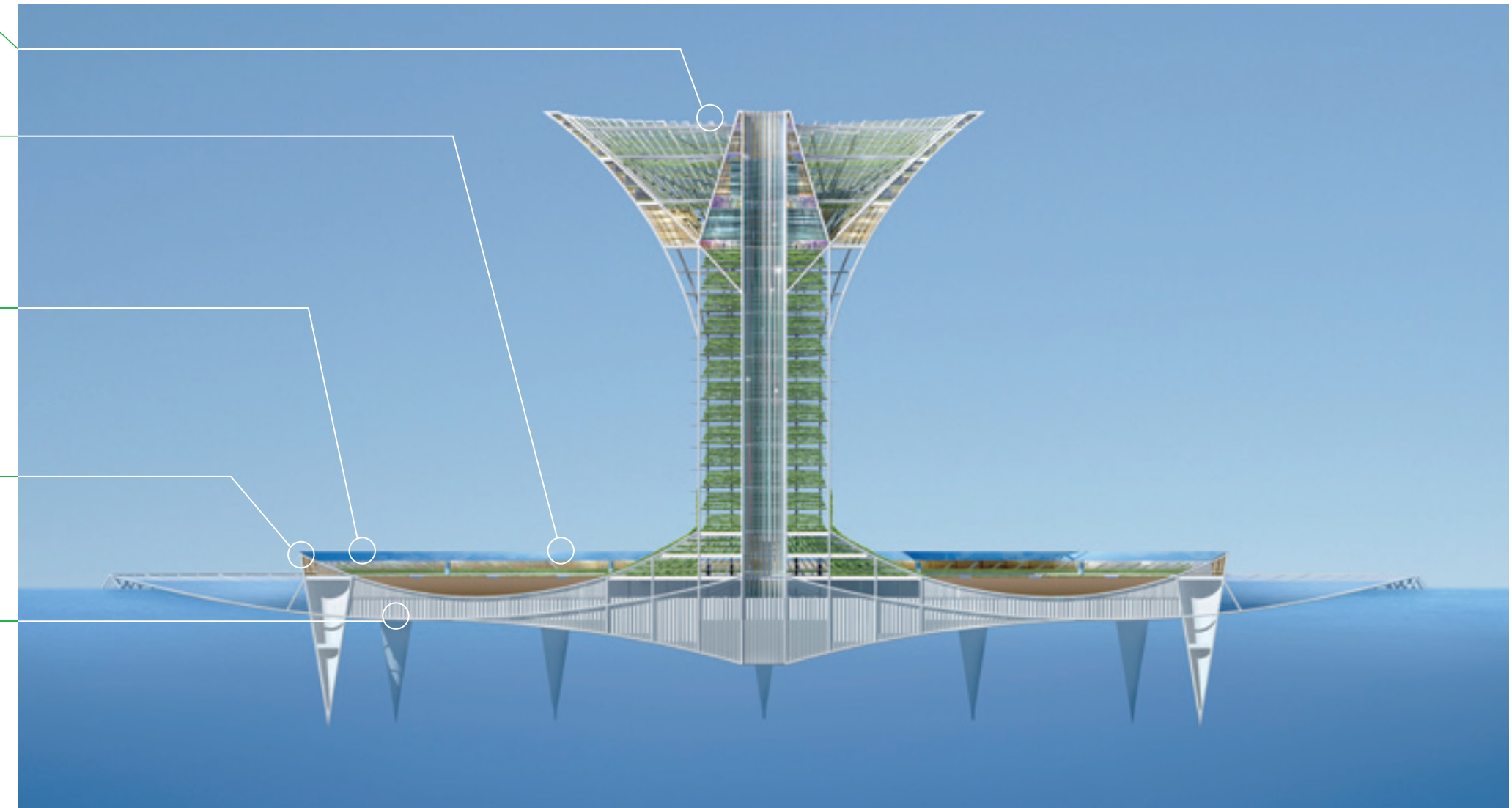
- Magnesium alloy structural materials are refined
from seawater
- Construction of an artificial offshore ground structure
(Bonded honeycomb structure)
- Ultra-high-rise marine construction (“Smart” system
float-over deck structure)

Environmental Island The Technology behind Green Float

Reducing CO₂, conserving energy resources, reducing waste products, solving food problems,
preserving ecosystems, preventing pollution ...

The question is how to deal with these issues comprehensively.

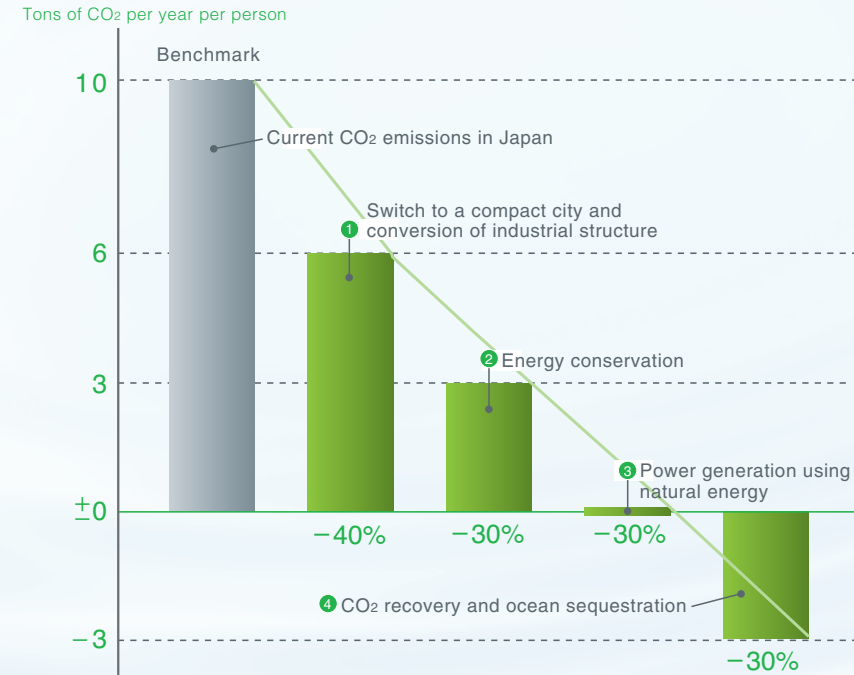
We are gathering leading global technologies to do so based on a botanical approach.



Going Beyond CO₂ Reduction to Carbon Negative

To create a city that absorbs CO₂ like a plant,
we will employ environmental technologies
to achieve a carbon negative system.
We will also work to generate power without using fossil fuels.

Steadily Reducing CO₂ to Become Carbon Negative

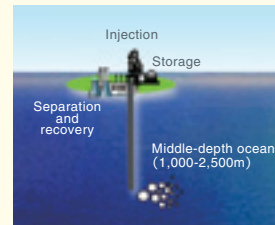


- 1 Switch to a Compact City and Conversion of Industrial Structure** CO₂ Reduction: About 40%
- Reduce CO₂ through more efficient transportation and distribution resulting from the shift to a compact city.
 - Buildings and factories that emit large volumes of CO₂ are out of step with the times. We will select only those industrial structures and buildings that perform in line with the era of the global environment.

- 2 Energy Conservation** CO₂ Reduction: About 30%
- At 1,000m above the equator, the temperature is around a comfortable 26°C. This external air temperature contributes significantly to energy conservation. The energy conservation merits of the City in the Sky are fully employed through measures including residential unit air conditioning that uses the cool air from higher elevations, and dehumidification and water heating that employ heat from the sun.
 - In addition, we will adopt the newest next-generation technologies to eliminate fossil fuel use and increase thermal insulation and facility efficiency.

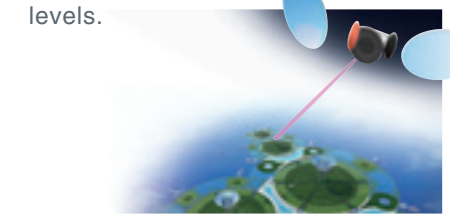
- 3 Power Generation Using Natural Energy** CO₂ Reduction: About 30%
- We will fully employ a range of natural energy sources including space solar power satellites, ocean thermal energy conversion, waves, wind and solar power. Through the elimination of fossil fuel use, emissions will be reduced to nearly zero.

- 4 CO₂ Recovery and Ocean Sequestration** CO₂ Reduction: About 30%
- Underground storage and ocean sequestration have begun to be considered as CO₂ fixation methods. The CO₂ absorption capacity of the ocean is thought to be orders of magnitude greater than terrestrial forests. We can expect large-scale CO₂ reduction and fixation following a global agreement.



Power Generation from a Space Solar Power Satellite

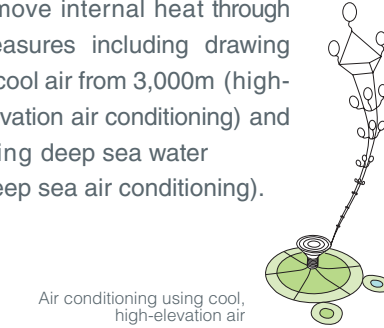
We will use an energy supply facility in geosynchronous orbit that collects energy from sunlight and transmits it to the Earth in the form of microwaves. This will make stable solar energy available for use both night and day. The quantity of energy is said to be 5-10 times terrestrial levels.



Source: Japan Aerospace Exploration Agency (JAXA)

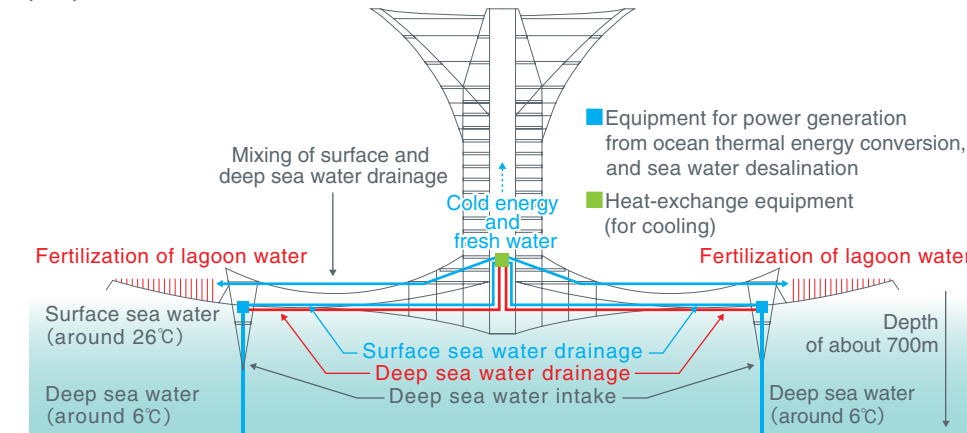
City in the Sky Cooling System

The top of the tower will essentially maintain a temperature of 26°C without air conditioning due to the effect of the tropical maritime climate and the 1,000m elevation. In addition, we can achieve low-energy air conditioning to remove internal heat through measures including drawing in cool air from 3,000m (high-elevation air conditioning) and using deep sea water (deep sea air conditioning).



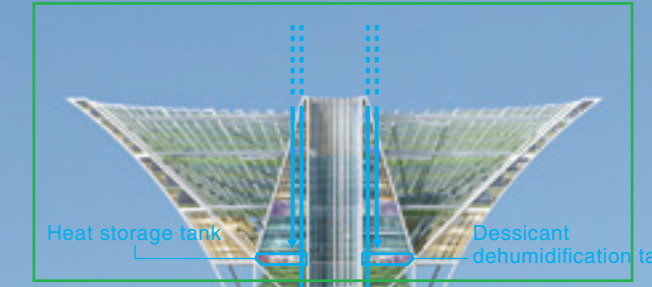
Power Generation from Ocean Thermal Energy Conversion

This generation system uses the temperature difference that exists between deep sea water and surface sea water to drive heat engines. A 30MW ocean thermal energy conversion system could meet the electrical power needs of 100,000 people.



City in the Sky Air Conditioning Using 100% Natural Energy

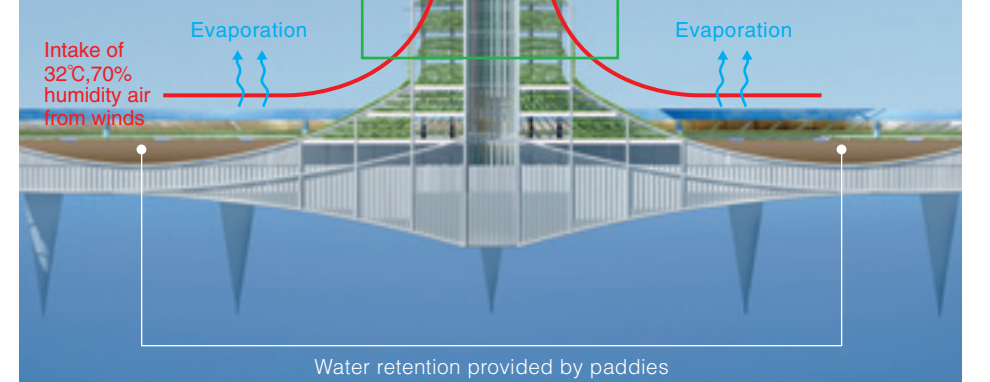
- External air temperature: 26°C at elevation of 1,000m (6°C lower than at sea level)
- Cold energy source: Intake of cooler, higher-elevation air
- Cold energy storage: Heat storage through nighttime radiational cooling
- Cooling: Dessicant dehumidifiers (reheated and dried using daytime solar radiation)
- Heating: Heat collected through solar water heaters



Plant Factory

A Cultivation Environment Using 100% Natural Energy

- Securing water for irrigation from condensation
- Maintaining a high-humidity planting environment



A Bustling Botanical City Where People Live in a Harmonious Balance with Nature

We aim to preserve and maintain biodiversity in order to form an ecological network linking forests, rivers and the ocean.



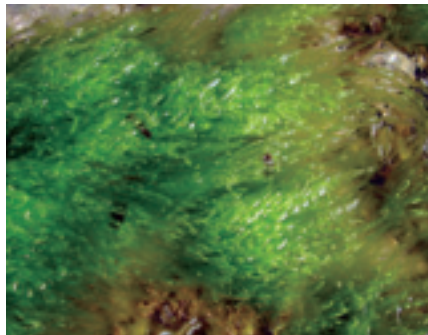
Mangroves (in the midstream of a river)



Mangroves (in a tidal wetland)



Coral reef



Seaweed bed

Terrestrial Forest — Biodiversity through a mixture of forest and farmland —

We will create a space for a thriving diversity of life through a mixture of forest, fields, waterways, reservoirs and grasslands. In addition, we will place importance on human contact with Nature including making places where people can experience agriculture.

Organic Agriculture in Harmony with Nature

No chemical fertilizers or agricultural chemicals.

Using the Water-Retention Capability of Fields

The water-retention capability of fields prevents flooding and seepage damage, as well as any sudden river or sea pollution.

A Mantle of Tropical Forest Vegetation

Forming a vegetation girdle of shrubs and vines will safeguard the interior of the forests by protecting them from winds.

Mangroves in Estuaries Where Sea Water and Fresh Water Mix

We will grow mangroves in the estuaries where juvenile fish and fingerlings are raised.

Marine Forest — Biodiversity in coastal waters —

Around the coastal circumference we will create shallows while maintaining harmony with natural ecosystems. Together with water purification and enhancing the biodiversity of the shallows, we place importance on the relationship between natural ecosystems and human activities such as shellfish and algae harvesting.

Cultivation of Microorganisms and Water Purification Using the Tidal Wetlands of River Mouths

Fine sand and muddy tidal wetlands accumulate organic matter and cultivate diverse microorganisms, and act as filters to improve water quality.

Cultivation of a Diverse Ecosystem Using Coral Reefs

Coral reefs are beautiful and shallow areas in the ocean. They have a high density of diverse dwellers and serve as a refuge for smaller organisms.

Creating a Lush Marine Forest by Cultivating Seaweed Beds

Using techniques including light concentration, we will form clusters of marine plants such as eelgrass and seaweed.

Ocean Ranches with Automated Feeding

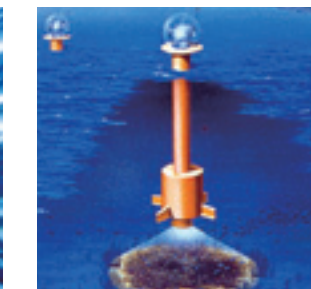
Buoys sound chimes and automatically begin the feeding.

Aquaculture Islands

We will strive to completely farm-raise tuna by managing the entire cycle from adult fish to spawning to hatching and back to adult fish again.



Ocean ranch



Marine planting system



Ocean ranch using an acoustic feeding system

A Futuristic Recycling Society That Learns from the Edo Period.
Garbage and CO₂ Produced in Daily Living Are
Used to Cultivate Food and Achieve Food Self-Sufficiency.
Total Recycling including the Ability to Use Wastepaper
and Scrap Wood as an Energy Source.

The blessings of sunlight and the ocean permit 100% food self-sufficiency by cultivating
the riches of the sea and land.
By converting waste into energy, we can create a city that recycles resources.
We aspire to a model for a city for the environmental era that is self-reliant
and places no burden on the environment.



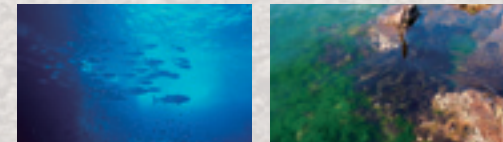
Self-Sufficiency through the Riches of the Sea and Land, Which are Nurtured by Equatorial Sunlight and Ocean

On the fields that spread across the plains, we will produce three crops a year using organic bioagriculture, without agricultural chemicals or chemical fertilizers. In addition, we will raise animals such as cows, pigs and tuna on the aquaculture and livestock agriculture islands and ocean ranches.

Riches of the land



Riches of the sea



The Ultimate Recycling System, Following the Example of the Edo Period

① Garbage from daily living nourishes food



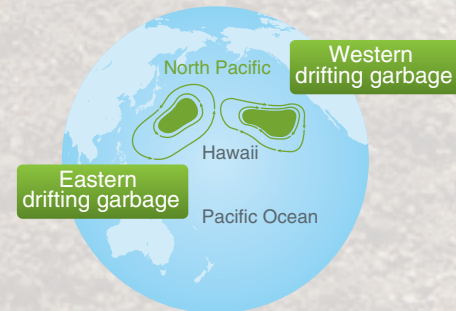
② Reusing wastepaper and scrap



Reintroduce as a Future Recycling System

Recycling Drifting Garbage Islands

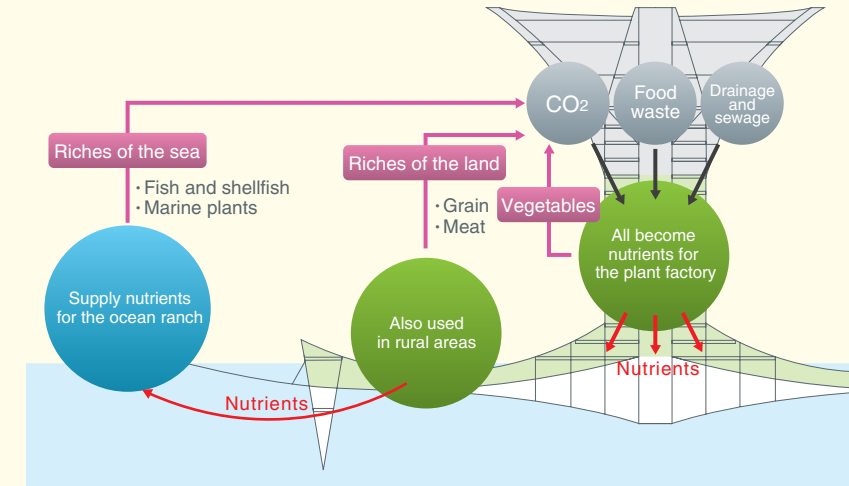
As part of our efforts to purify the global environment, we will recover the large "islands" of garbage drifting around the Environmental Islands and convert them into energy in waste treatment plants.



About 100 million tons of garbage drifts around the Pacific Ocean, spreading over an area twice that of the continental United States.

Source: U.S. ocean researcher Charles Moore

① Garbage from Daily Living and CO₂ Nourish Food



Plant factory



Agricultural and Residential Areas Are Close Together

- Fresh vegetables year-round
- Harvesting only necessary amounts when needed

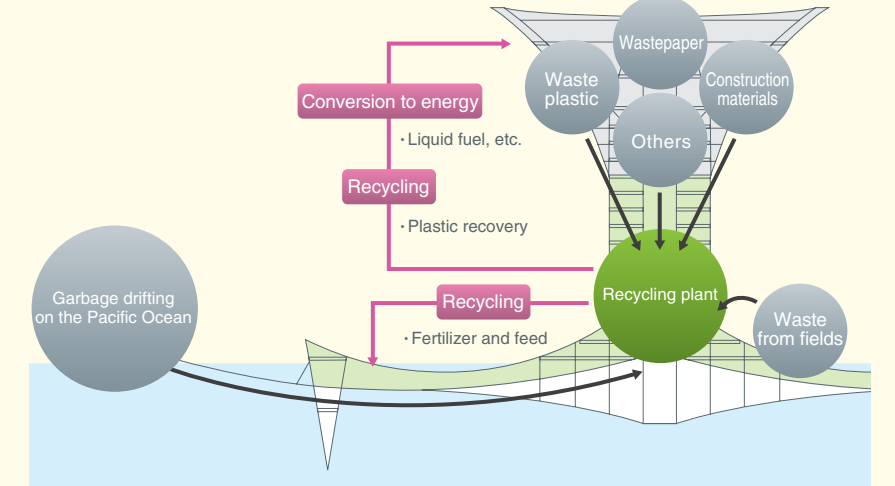
Stable and Large Quantities

- Using equatorial sunlight and artificial light

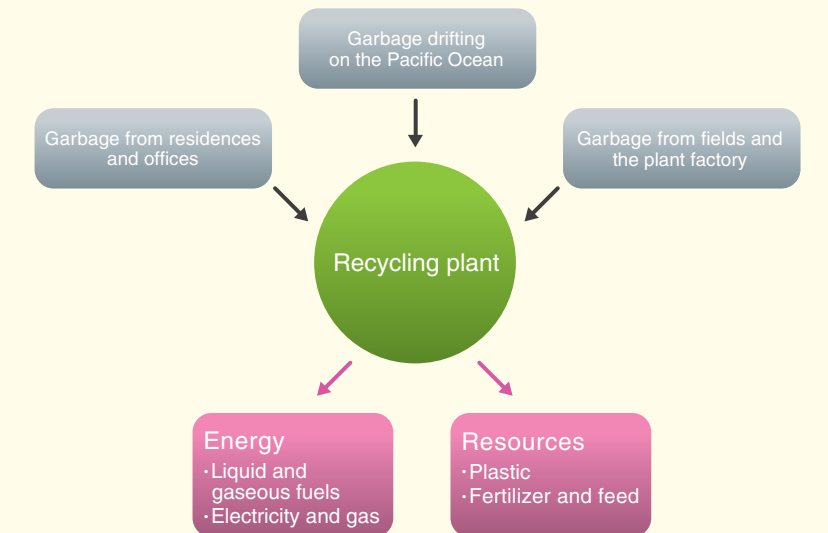
Food Safety

- Traceability
- Completely chemical-free agriculture

② Create Energy from Wastepaper and Scrap



Recycling plant

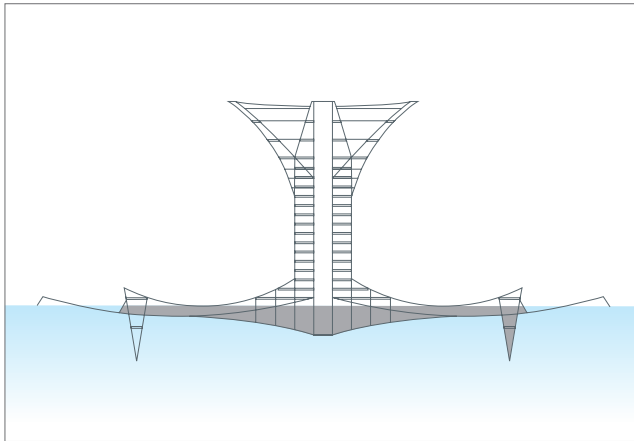


We Will Ensure Fundamental Safety in the Construction of the Floating Marine Structure. Human Safety and Business Continuity in Case of Disaster Are the First Priority for the 1,000m Tower.

We will employ comprehensive urban disaster prevention and a business continuity plan (BCP) to respond to potential natural and urban disasters. Measures will include the adoption of predictive active control functions for disaster prevention based on weather forecasting and information from wind and wave sensors.

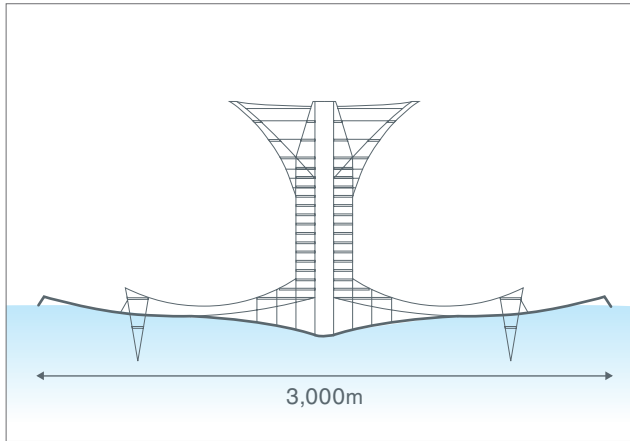
◆ Fundamental Safety as a Floating Marine Structure

① Floating on the Ocean Surface



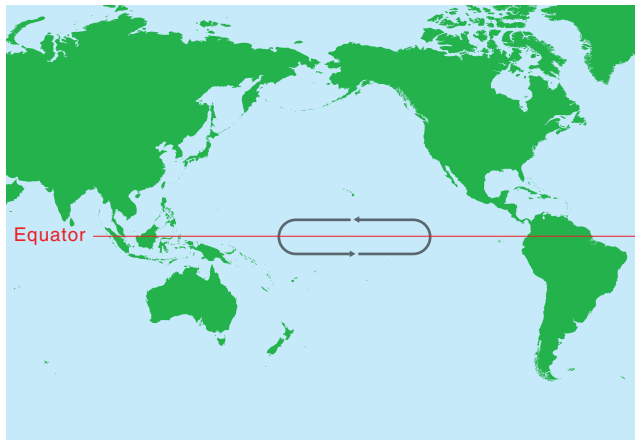
The structure is balanced by water weighing 400 million tons. This is equal to the weight of around 1,300 large-scale oil tankers (300,000 tons each).

② Unshaking Structure



From the point of view of wavelength, wave height and natural periods of occurrence, we estimate that normal seas, strong wind waves and tsunamis will have almost no effect on structural safety and livability. To make this a reality, we will need to make adjustments based on detailed weather data.

③ Slowly Migrating

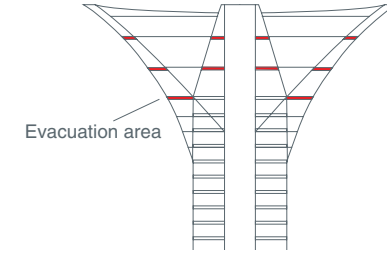


To ensure adequate sunlight for the marine environment, the platform will float gently with the tides rather than staying in a fixed location. We will use electromagnetic induction and power only at tidelines and to control positioning.

Disaster and Evacuation Measures

Highly safe evacuation areas every 100m

Each 100m of height is segmented as an individual unit for disaster prevention purposes. This prevents damage from spreading to other units and keeps fire from spreading. In addition, each unit contains an evacuation area to provide temporary shelter.



Strong Wind Countermeasures

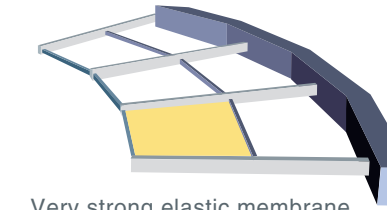
Vibration-reduction equipment coupled to wind force sensors

Basically, large typhoons do not cross the equator. However, as a countermeasure in the unlikely case of strong winds, active control vibration dampers will decrease the effects by using sensors currently employed in airports to measure the force of the wind and estimate its influence on buildings.

Wave Countermeasures

Very strong elastic membranes along the outer circumference work as a wave buffering mechanism

Very strong elastic membranes are attached to the bottom of the lagoons around the outer circumference, with the shallows above the membranes around 10m higher than sea level. The water pressure difference limits the movement of the membranes, thus buffering the force of open sea waves. In addition, 20-30m high seawalls are constructed to handle a worst-case scenario. Further, sea banks are established to prevent waves from entering the low-rise residential zone, providing a second barrier.



Very strong elastic membrane
The water on top of the membranes is 10m higher than sea level. Water pressure makes the membrane resistant to movement. As a result, wave movement from the open ocean is not transmitted through the membranes.

Earthquake and Tsunami Countermeasures

Offshore tsunamis have gentle vertical motion

Tsunamis are not a hindrance to safety, because their impact in the open ocean is not like in coastal areas. Offshore tsunamis have gentle vertical motion.

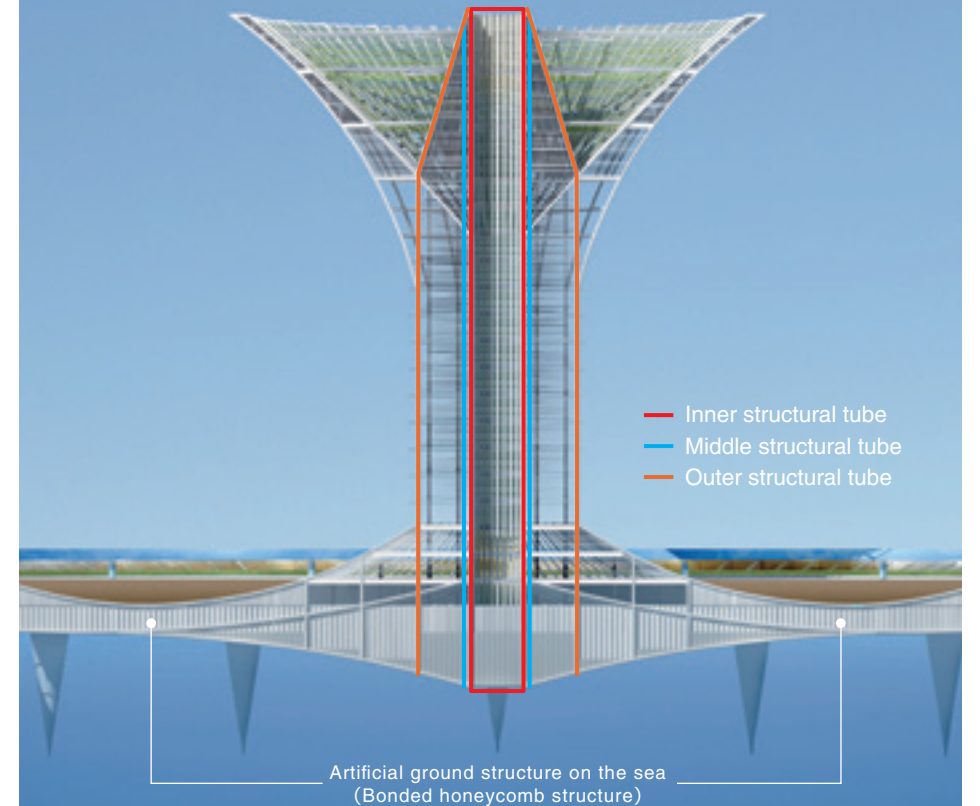
Lightning Countermeasures

Lightning protection mesh on the outer walls

In addition to lightning rods around the circumference of the tower top, because the structure is very tall, mesh lightning conductors will be placed on the exterior walls as a countermeasure against lightning strikes on the side walls.

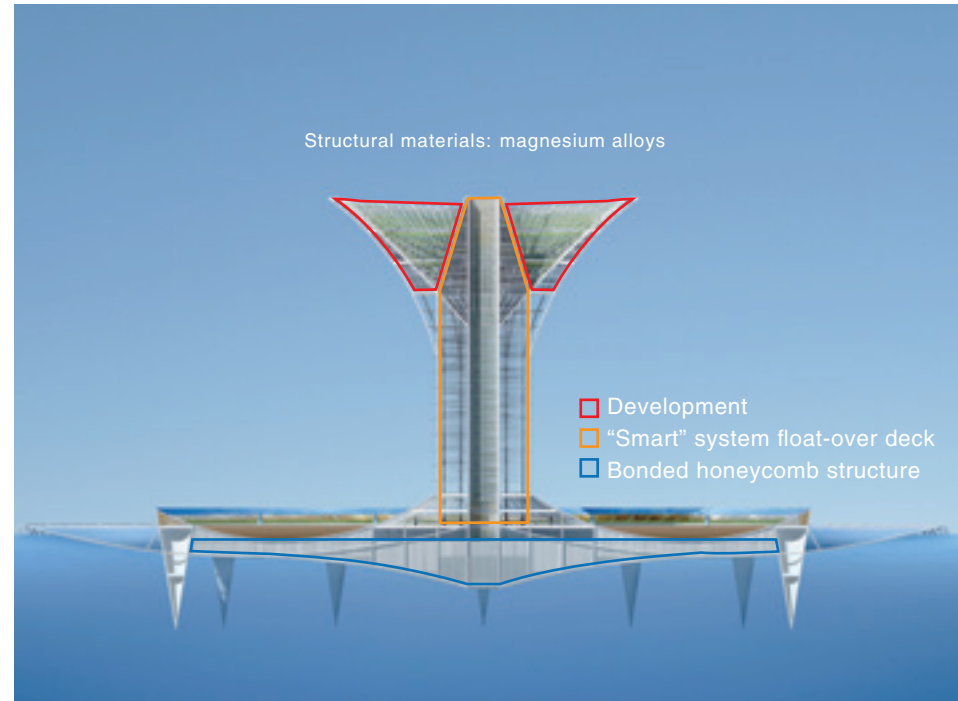
Structural Planning: Triple Megatube Structure

The 1,000m, ultra-high-rise tower is composed of three structural tubes. Residences and the plant factory are located between the outer and middle tubes, and equipment for vertical circulation, such as elevators, in the inner tube. The residences in the outer circumference of the City in the Sky form a projecting megaterrace terrace linked to the central core by bridges.



The Floating-Type Structure Built at Sea with a Bonded Honeycomb Structure from Magnesium Alloy Structural Materials Refined from Sea Water

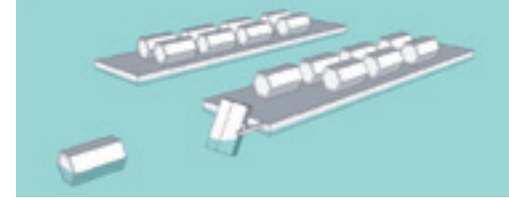
We can construct the Environmental Island on the sea, using materials found there and incorporating new ideas from safe, near-future marine production technologies in harmony with Nature.



Construction of an Artificial Offshore Ground Structure (Bonded Honeycomb Structure)

The honeycomb structure incorporates hexagonal cells. Widely used in construction and leading-edge aerospace fields, this structure is more than 90% air, making it both strong and lightweight. We will construct an artificial offshore ground structure by linking these honeycombs.

STEP 1



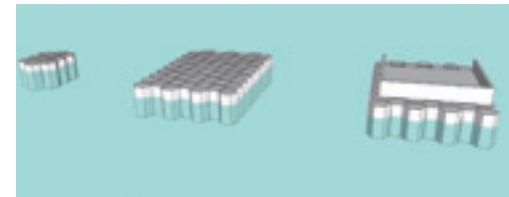
Individual honeycombs are produced on special wave-resistant barges equipped with concrete plants. Approximately 20m wide, 50m tall and weighing from 5,000 to 7,000 tons, they are turned on end and set afloat by equipment at the edges of the barges.

STEP 2

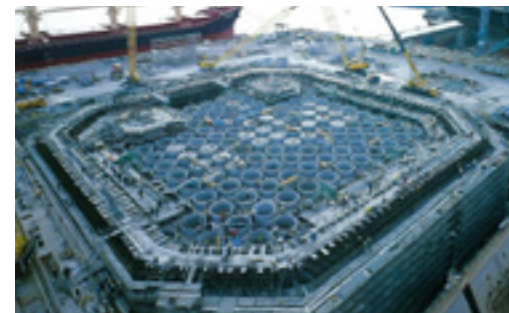


Water is injected into the honeycomb units, to achieve a balanced position. Units are bonded into square groups with other honeycombs with rubber gaskets on bonding surfaces, using water pressure to join them together by forcing the interstitial water out. In addition, high-strength concrete and studs are used as secondary bonding to achieve close coupling.

STEP 3

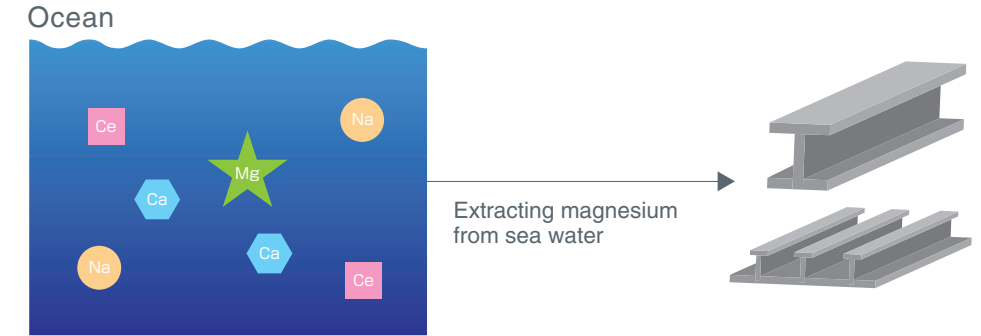


Once the 50m high floating substructure is coupled and expanded to create an artificial ground structure, construction work on the ground will begin.



Magnesium Alloys: Structural Materials Created from Sea Water

The Environmental Island's structural materials are magnesium alloys whose primary raw material is sea water. Because magnesium is found not only in ore but also in sea water, if it is smeltable there is no danger of depletion. Sea water is composed of about 0.13% dissolved magnesium by weight, so one ton of magnesium can be extracted from 770 tons of sea water. Because its specific gravity is a quarter that of steel, magnesium has a superior specific strength. In addition, it has gained attention as an environmentally friendly material even compared to other lightweight structural materials such as fiber-reinforced plastic (FRP) because it can be melted down and recycled.



Ultra-High-Rise Marine Construction ("Smart" System Float-Over Deck)

We will build the ultra-high-rise tower with "Smart" system float-over deck marine construction, employing the unique properties of marine construction. The building is not erected above the surface. Construction of the framework is conducted above sea level, but as the structure is completed it is temporarily submerged. Once the framework is assembled, it is lifted in one movement using the buoyancy of sea water. Rather than moving people and equipment to the upper levels, we can consistently perform construction at the surface platforms, thus ensuring safe, efficient construction.

