

# OASIS.

*that saves lives and create a better future*

by Zeynep Uzun

OASIS  
Mobile disaster relief prototype

Bachelor Thesis Project  
By Zeynep Uzun

Bilkent University, Ankara, Turkey, 2020

## ABSTRACT

### Problem

Disasters have a huge impact on people's lives economically, psychologically, and physically. They happen anywhere, in an instant, and end up with irrevocable outcomes.

After a disaster happens, recovery time gains importance. In this time, when every piece is collapsed or loses its function, people need a "shelter" new home, to gather and heal.

### Method

For that reason, Oasis has designed. It is a mobile architecture piece, that can travel all around the world in order to help victims. It offers clean water, food, and shelter, things to assist recovery both mentally and physically.

Before anything happens, Oasis will serve the country and develop their economy, by the employment opportunities with farming areas, the energy that it produces for itself and for the country, and education that it offers about marine life, and farming. In the meantime, people will get used to seeing Oasis, along with it becomes their socializing area.

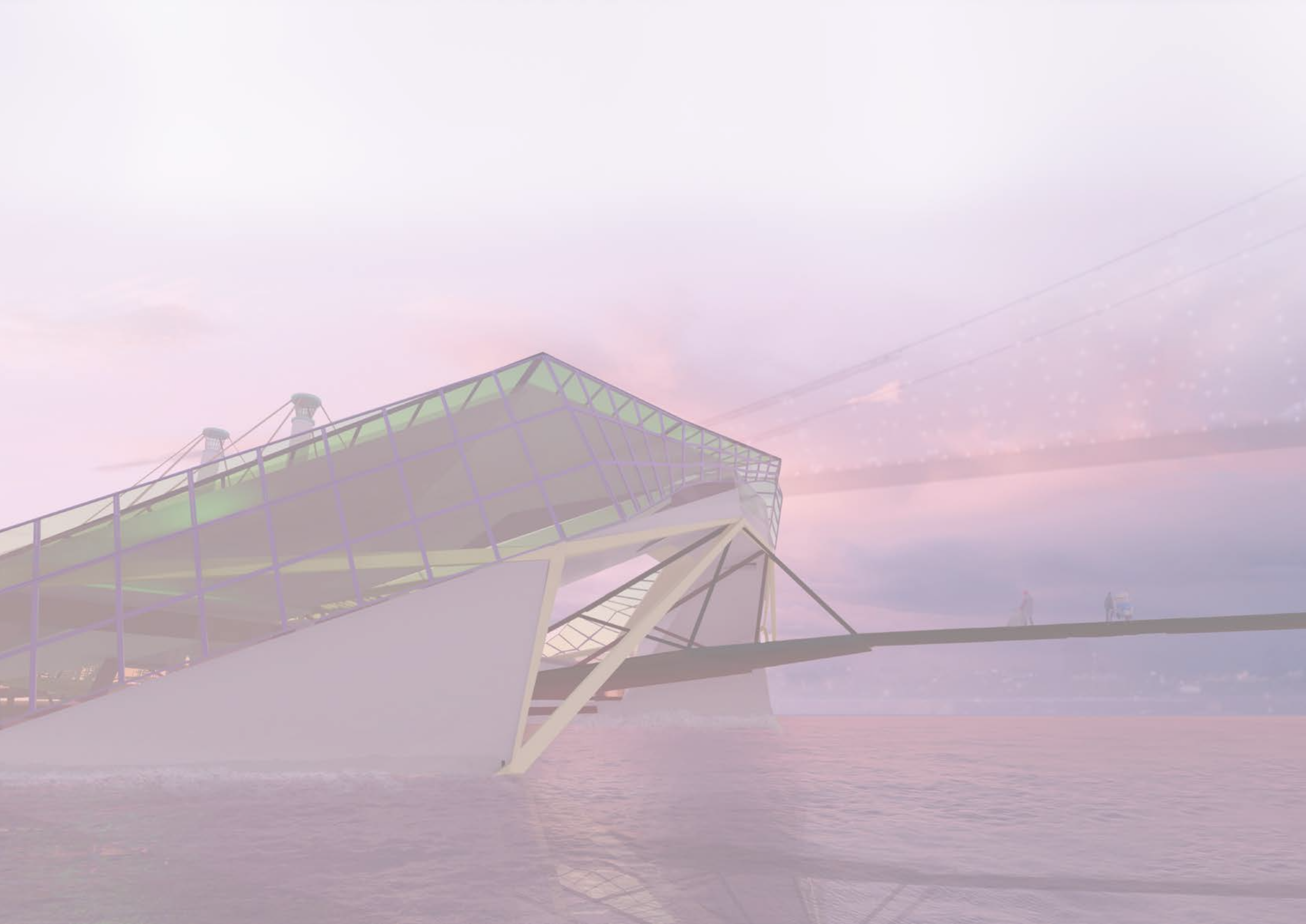
### Expected Outcomes

The outcomes of Oasis will be easily seen before and post-disaster. Since it is a prototype that fosters their country's situation economically, environmentally, and socio-culturally before something happens Oasis will become their safe-zone. And, when a catastrophic event happens, their safe-zone on the water surface, Oasis, will be ready to serve as a new home for them.

## **Acknowledgement**

I would like to express my sincere gratitude to my professor Mark Paul Frederickson for his real and virtual support during this pandemic issue, to my precious studio friends for their critics and feedbacks, and to my family who supported me in every way throughout my life.

I dedicate this thesis to the disaster victims, especially victims of the 1999 İzmit, Turkey earthquake, who shows us the important things about life and finding the strength to continue their life. And, I hope some day this design will be just used before nothing happens for the development of the country.



# CONTENT

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Introduction

Analysis

Literature Review

Understanding Physics

Cases Studies

Design

Key Properties & Systems

# INTRODUCTION

THE QUESTION IS NOT IF —

BUT WHEN

When a devastating earthquake will hit Istanbul, we need to be prepared. After an earthquake in Izmit, 1999, regulations have since become stricter and the disaster and emergency body AFAD was established, 20 years after the Marmara earthquake critics say preparation for a large earthquake is wholly inadequate. According to AFAD estimates, an earthquake in Istanbul could kill nearly 30,000 people, injure 50,000 others, destroy 44,800 buildings and leave 2.6 million people homeless.

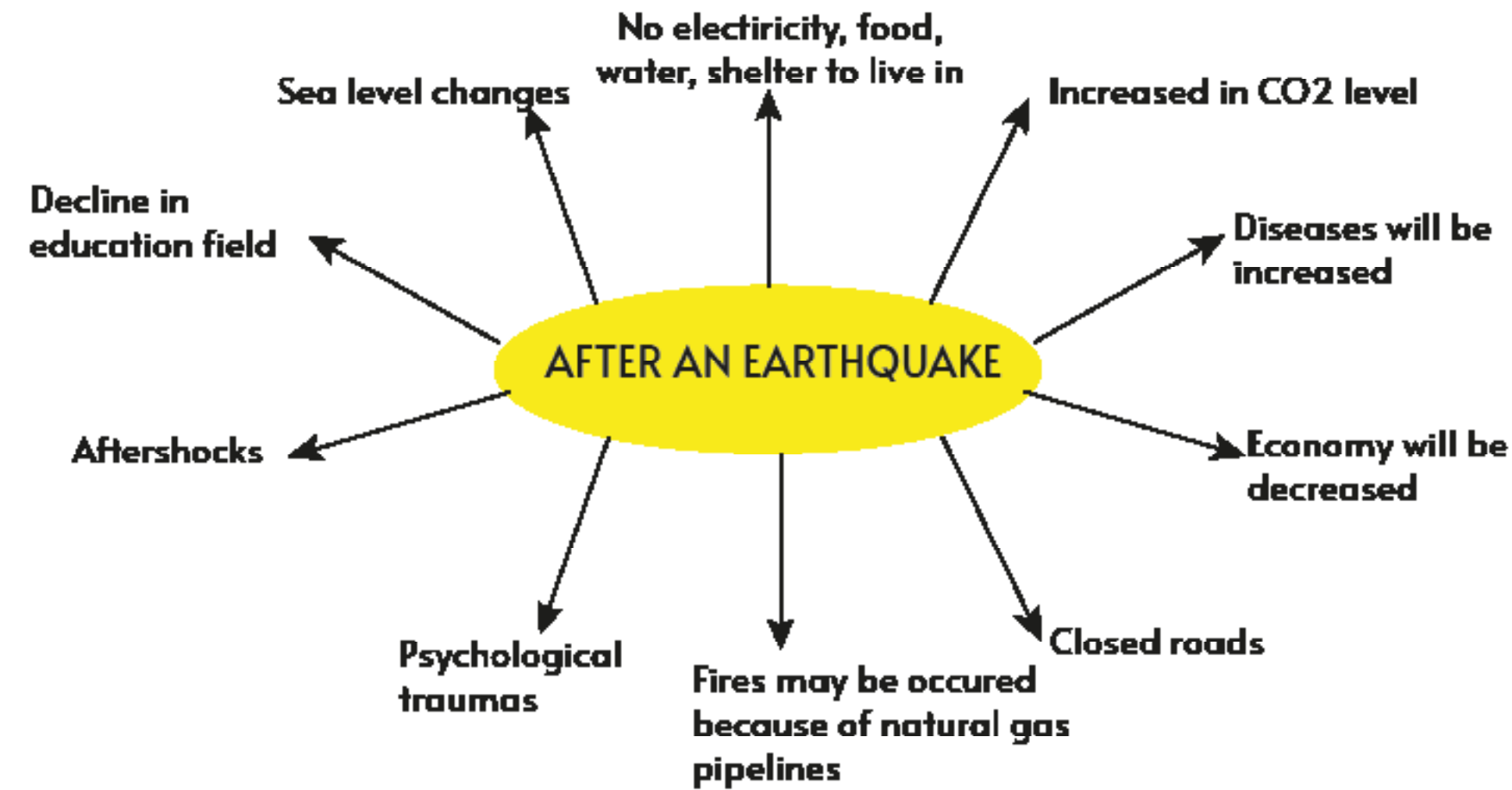
So, in that design, it is tried to create a new shelter for these homeless people. This shelter will be their new home, where they heal, gather, learn and live.



## AFTER AN EARTHQUAKE

The results of earthquakes are devastating. With the collapsed buildings the roads will be closed, the ambulances, food, water will be hard for certain points. The fires will be occurred because of the natural gas pipelines. Sea level will change and may be tsunamis will occur with an earthquake and aftershocks

After all these things happen people may be have a chance to heal physically, but the psychologically healing may take years.



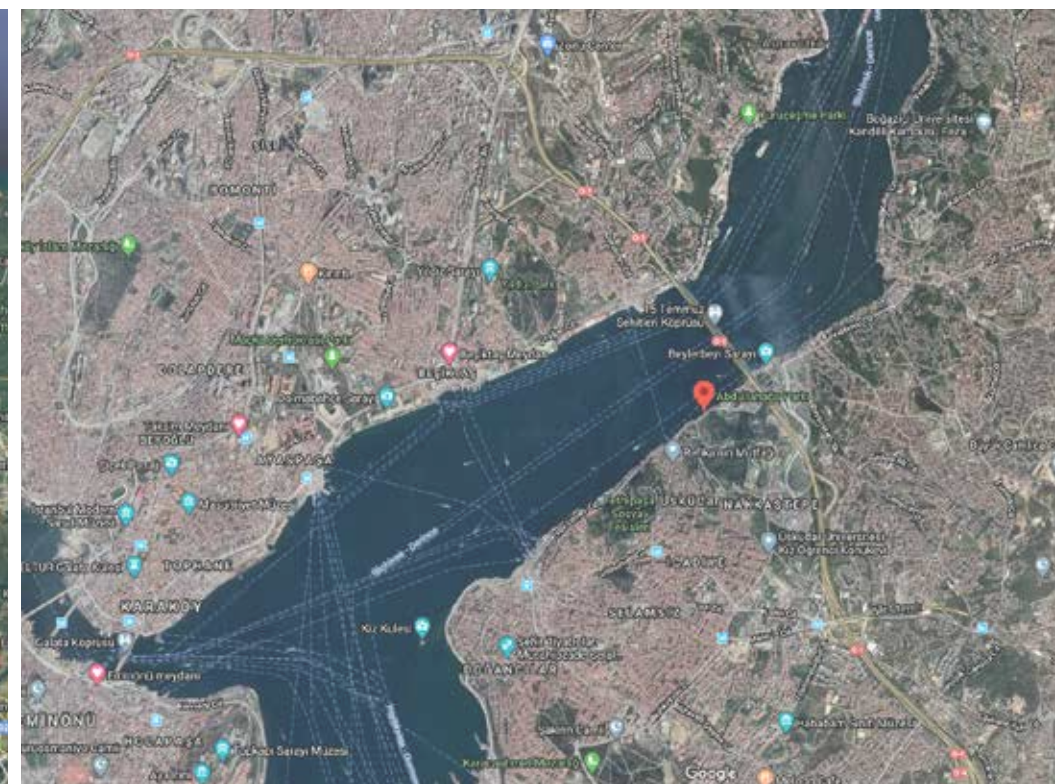
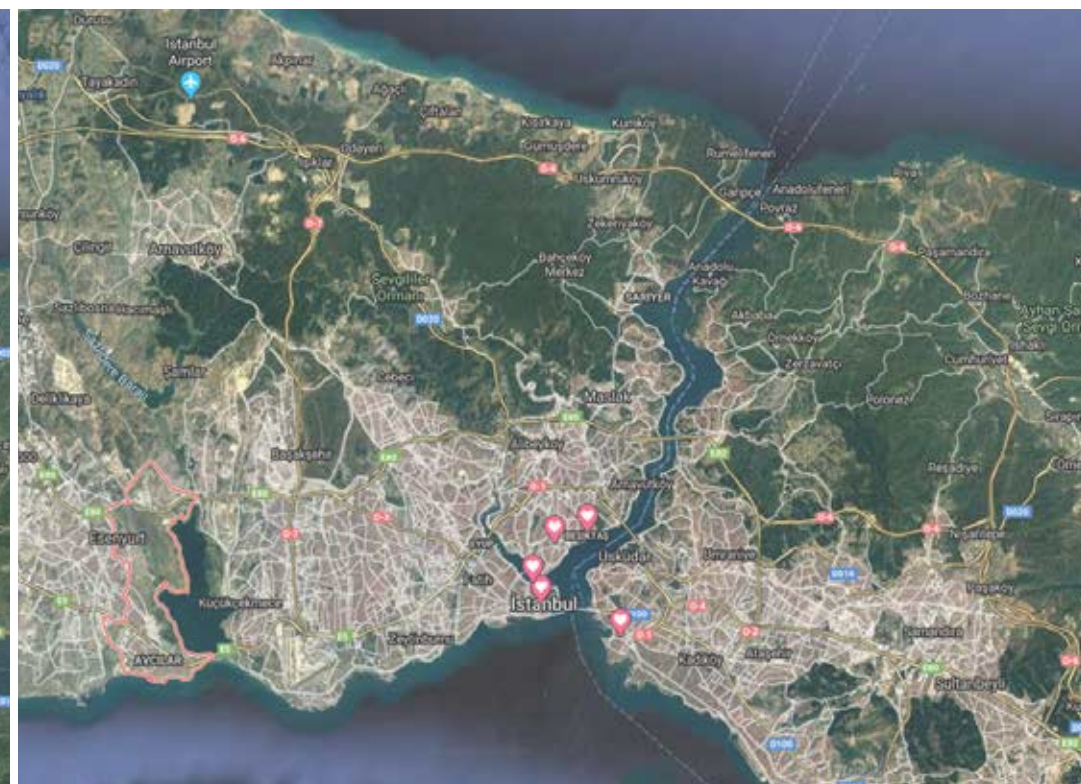
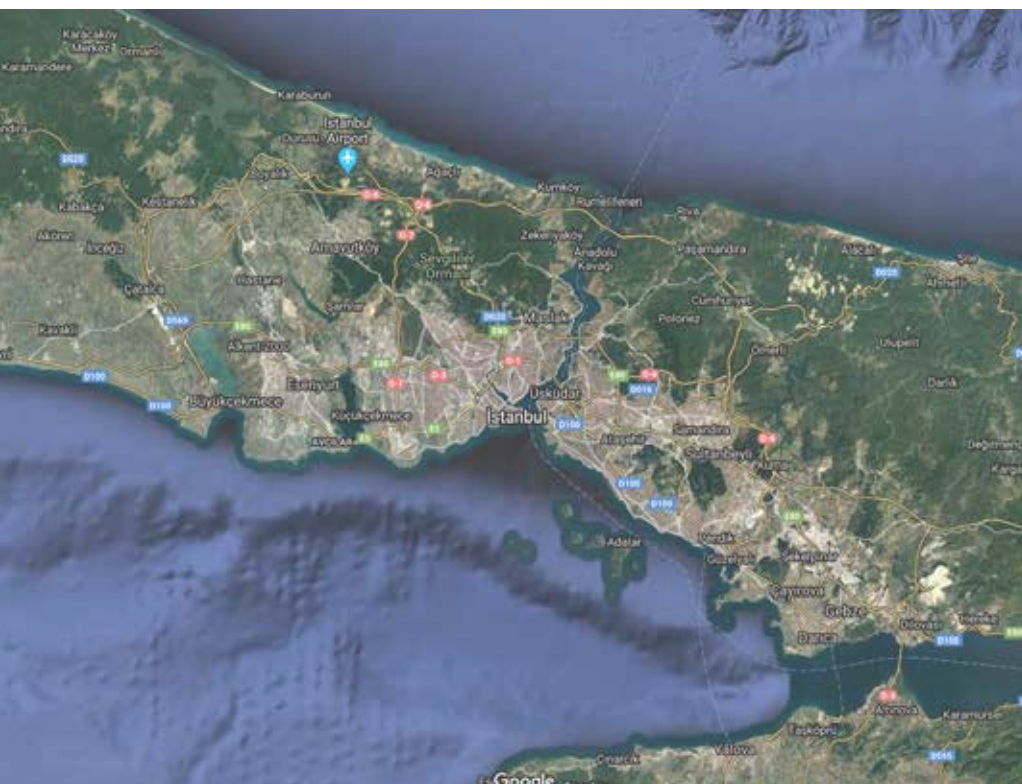
## SAFE ZONE TO BE ON THE SURFACE OF WATER AFTER AN EARTHQUAKE

To deal with,  
-Aftershocks  
-Closed roads  
-Tsunamis  
-Sea level changes  
-Fires

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# SPECIFIC LOCATION

Since it is mobile prototype, it can travel all around the world. But, for a starting point since Istanbul is one of the earthquake zone, Bosphorus is selected as a first locations of prototype.



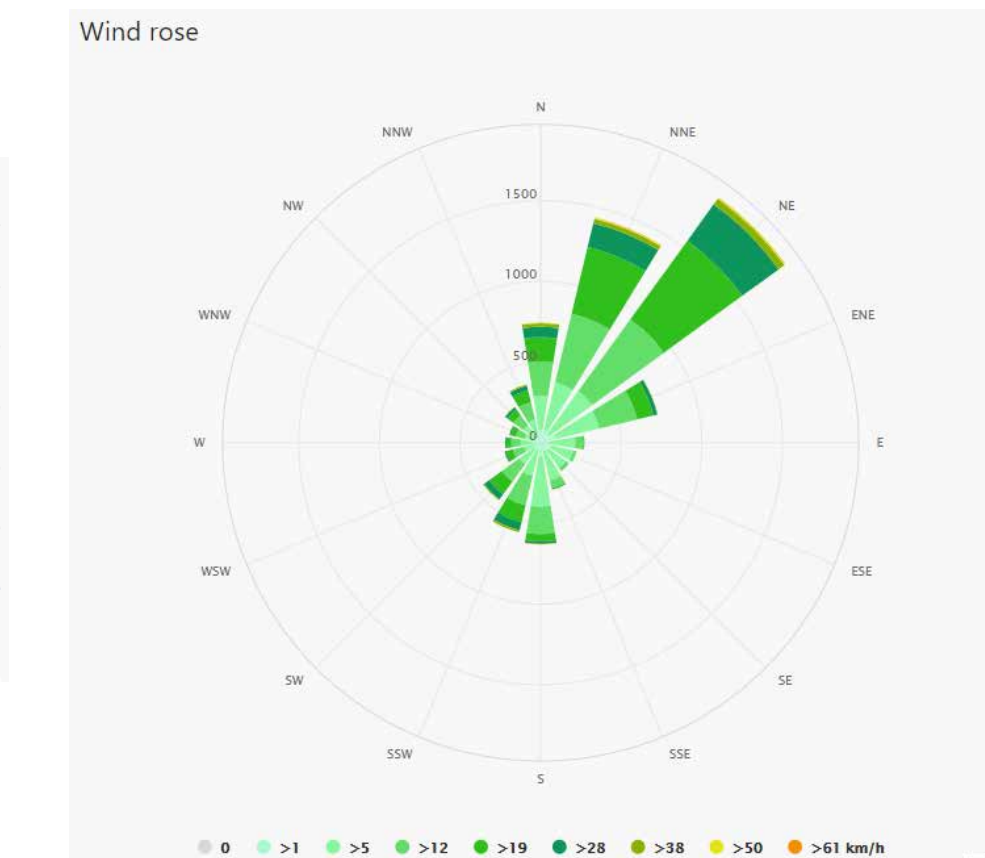
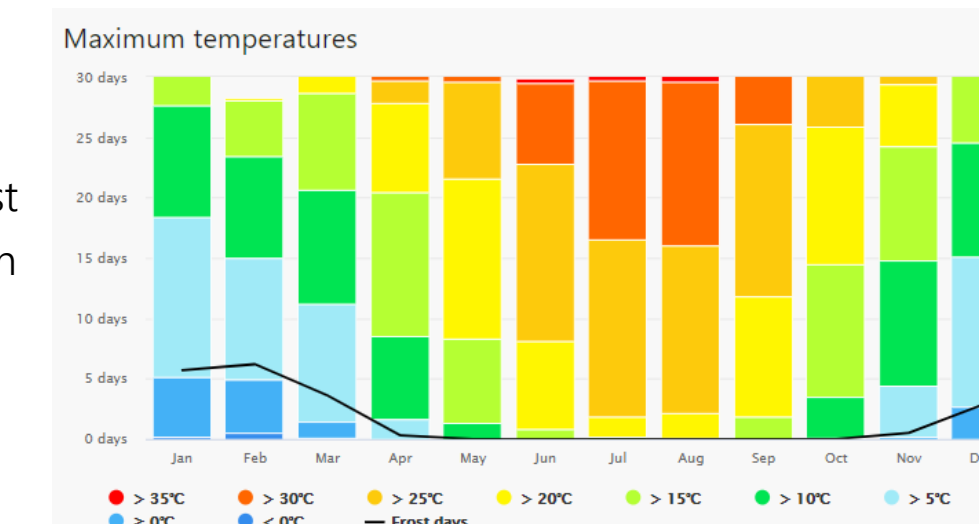
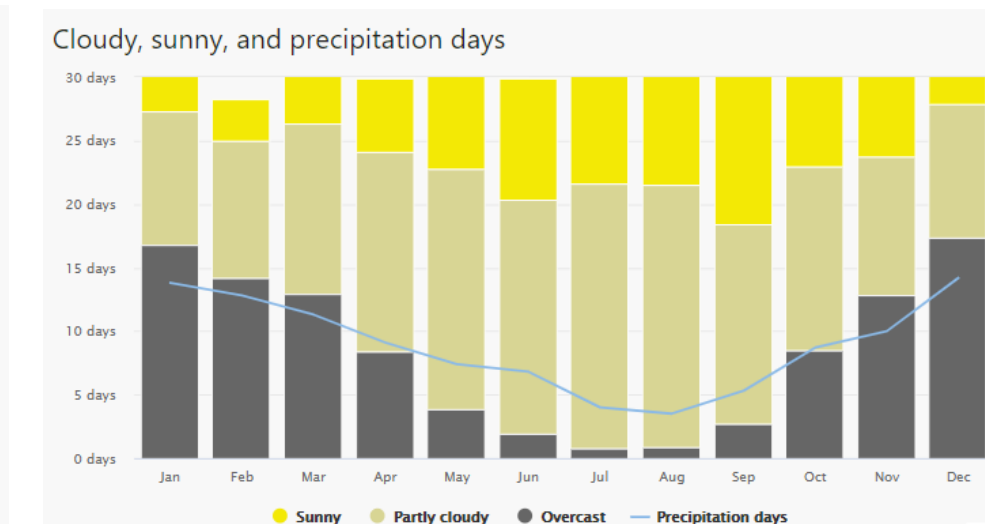
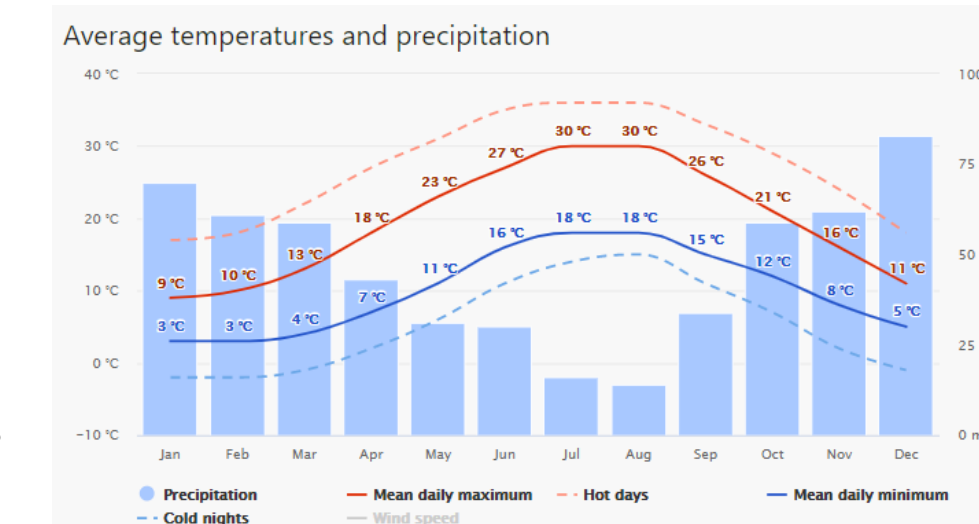
# ANALYSIS

## CLIMATE

The climate of Marmara Region shows a transition feature between Marmara climate, Terrestrial climate, Black Sea climate and Mediterranean climates. During Summer months Istanbul is warm and humid, during winter months it is cold and wet.

Average rainfall is 787 milliliters 35% of the rainfall occurs in winter, 23% in spring, 14% in summer, and 28% in autumn. During winter time, It occasionally get some snow but it is not long than 10-12 days in a total period . The temperature difference is 14 degrees (57 Fahrenheit) with average relative humidity of 76% annually.

The wind direction is generally from northeast with 3,2 meters/second (11 feet/sec) average, which also dominate the stream of Bosphorus.



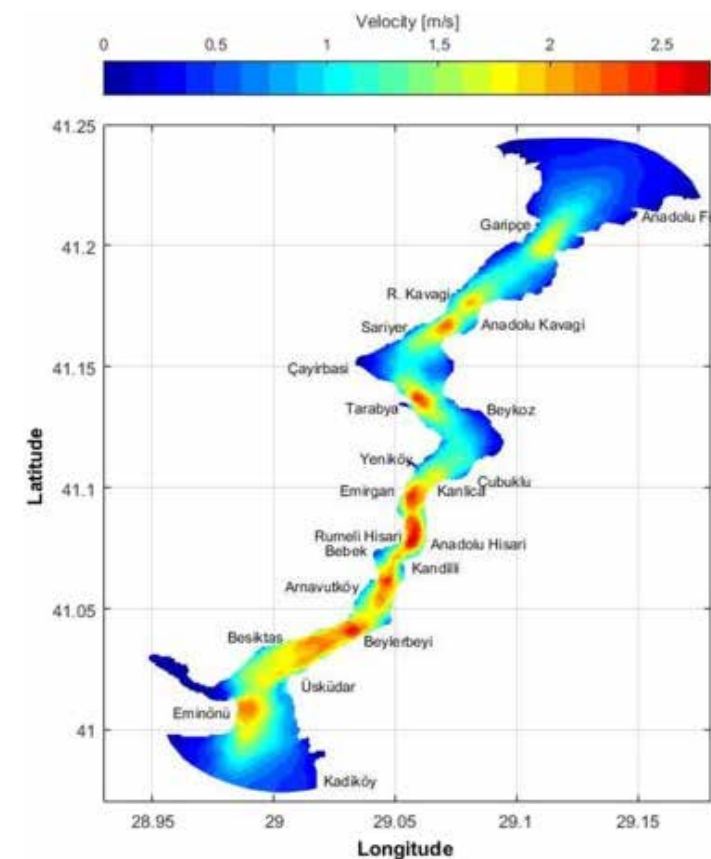
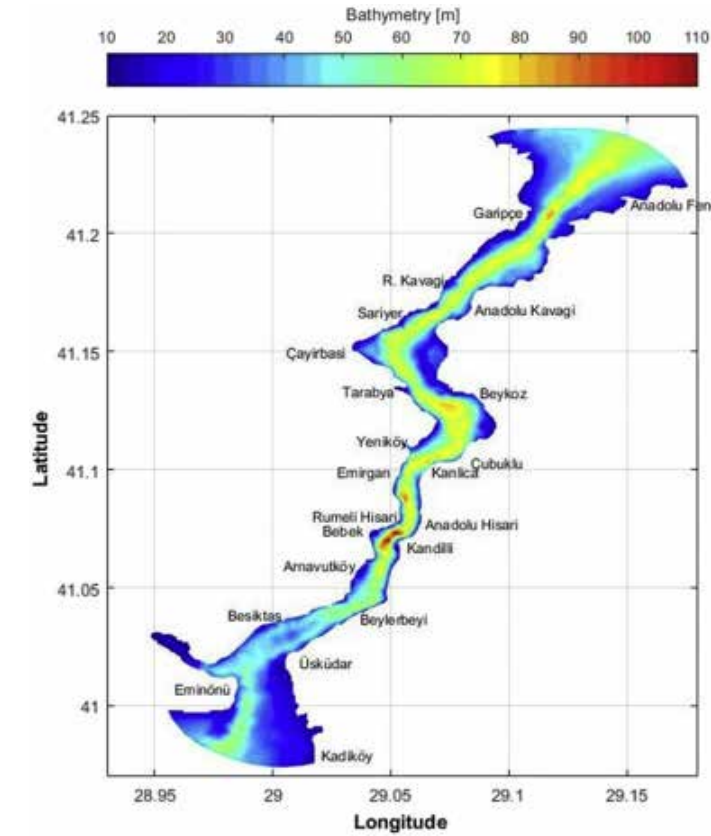


# THE BOSPHORUS STRAIT

The Bosphorus Strait is about 31.7 km long. The width of strait is 4.7 km (the maximum width) at the northern entrance and 2.5 km at the southern entrance. It is known as the narrowest strait in the world and the narrowest part is only 698 meters at Kandilli-Rumelihisari-Bebek.

The depth of the bosphorus changes from 30 to 60 m . Maximum depth is 110m at Kandilli. At coastal lines, the depth starts from 10 m but in Goden Horn region it starts from 0m.

The current speed may reach up to 7-8 km per hour. Its narrow and twisted nature and location the makes the Strait geomorphologically and geologically important.



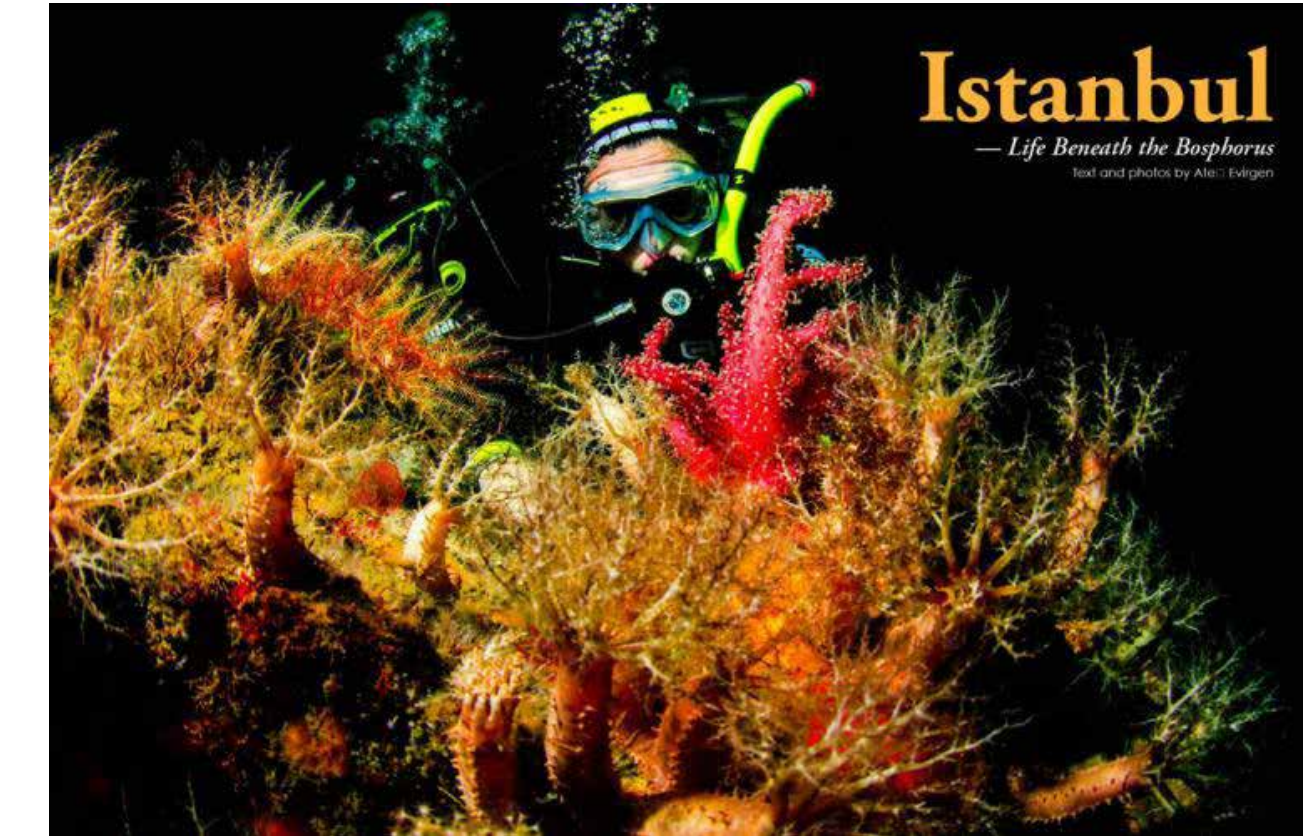
# MARINE ECO-SYSTEM

Fishes coming from the Mediterranean and the Aegean are forced to pass through this strait in order to be thoroughly lubricated in the waters of the Black Sea, rich with nutrients, to later ovulate. This journey makes the Istanbul Straits one of the most dynamic regions of the world for fishing.

Those mitigation helps to meet with different kinds of sea creature, and create unique habitat.

Most famous of these fishes are the northern bluefin tuna (*Thunnus thynnus*), Atlantic bonito (*Sarda sarda*), blue fish (*Pomatomus saltator*), Atlantic mackerel (*Scomber scombrus*), chub mackerel (*Scomber japonicus*), and horse mackerel (*Trachurus trachurus*).

However, Scuba divers and underwater photographers says that since bosphorus has a busy sea traffic, strong currents and pollution, some species are in danger right now.



## INTERACTION OF THE SEA OF MARMARA AND THE BLACK SEA

The Black Sea contains the largest anoxic marine environment in the world. Because of the great depth of the Black Sea and the relatively low salinity (and therefore density), water inflow from rivers (Danube, the Dnieper and the Dniester) and the Mediterranean Sea, freshwater and seawater mixing is limited to the uppermost 100 to 150 m and the water below this interface (called the pycnocline) exchanges only once every thousand years. Therefore, there is no significant gas exchange with the surface, and as a result decaying organic matter in the sediment consumes any available oxygen. Moreover, downbelow it is impossible to see any living creature.

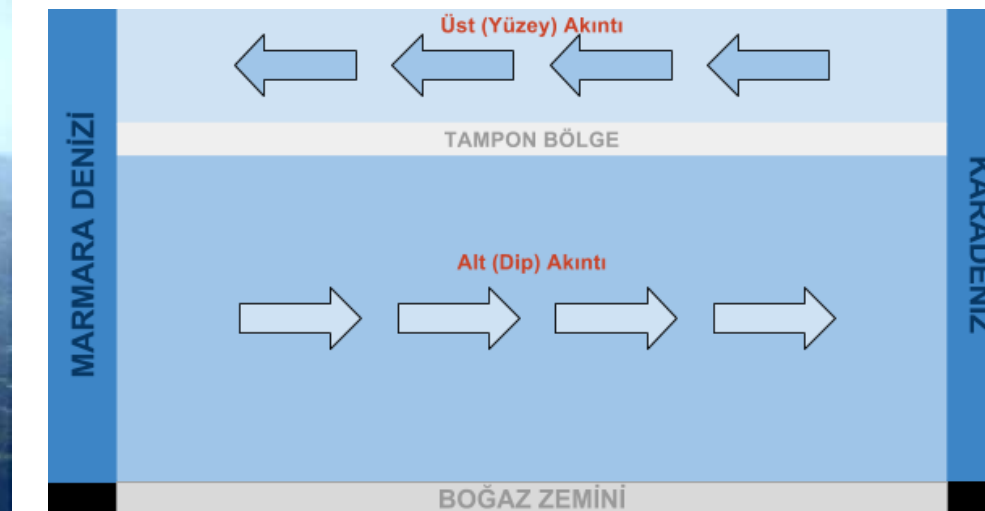
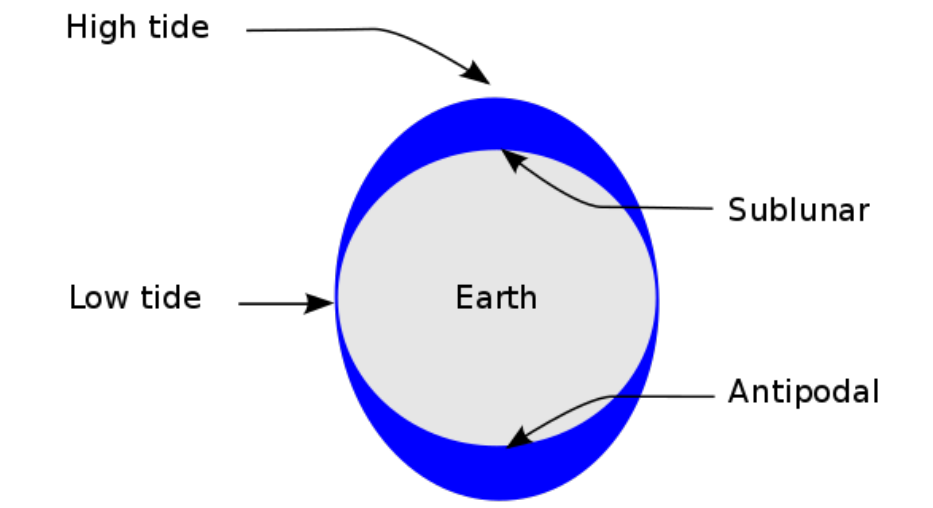
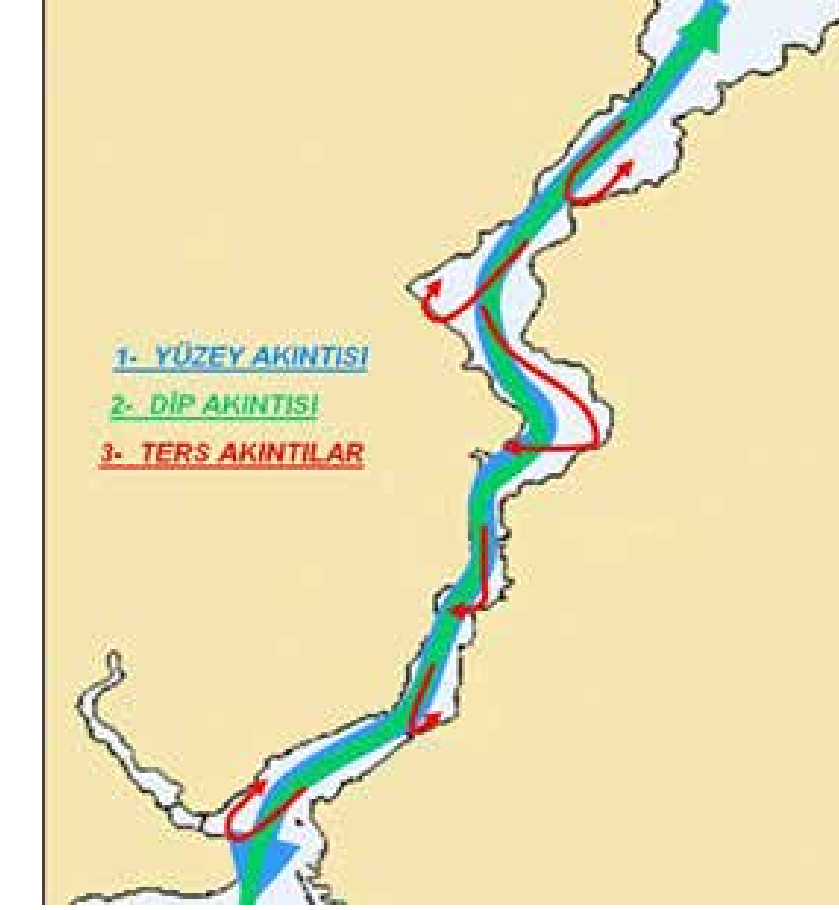
Since the Black Sea is connected to Marmara Sea, the Aegean Sea the Bosphorus is affected from this anoxic environment. This water flow affects the marine life in Strait.



## FLOW OF WATER

Current develops under hydrological conditions such as precipitation, evaporation and stream input etc. in the Bosphorus similar to other straits. The strength of the current is affected by precipitation to the Black Sea and stream inputs.

This stream is the "surface currents". In the bottom, in the opposite direction of surface currents, a deep current occurs due to the difference of salinity between the two seas. Surface currents both in terms of volume, as well as the speed are more than that of the deep currents. The speed of surface currents may reach up to 6-7 knots while the speed of the deep current was measured at a maximum of 3 knots. And at some points as a result of strong winds, some surface current occurs in a reverse direction and makes maneuvering and cruising capabilities of the ships difficult.



# TYPOLOGIES

The Bosphorus is an old site, which contains different layers. For instance lots of mansions, palaces, mosques are located in that area. Moreover, there are some roadways, pedestrians paths with parks and kiosks along with the coastal line

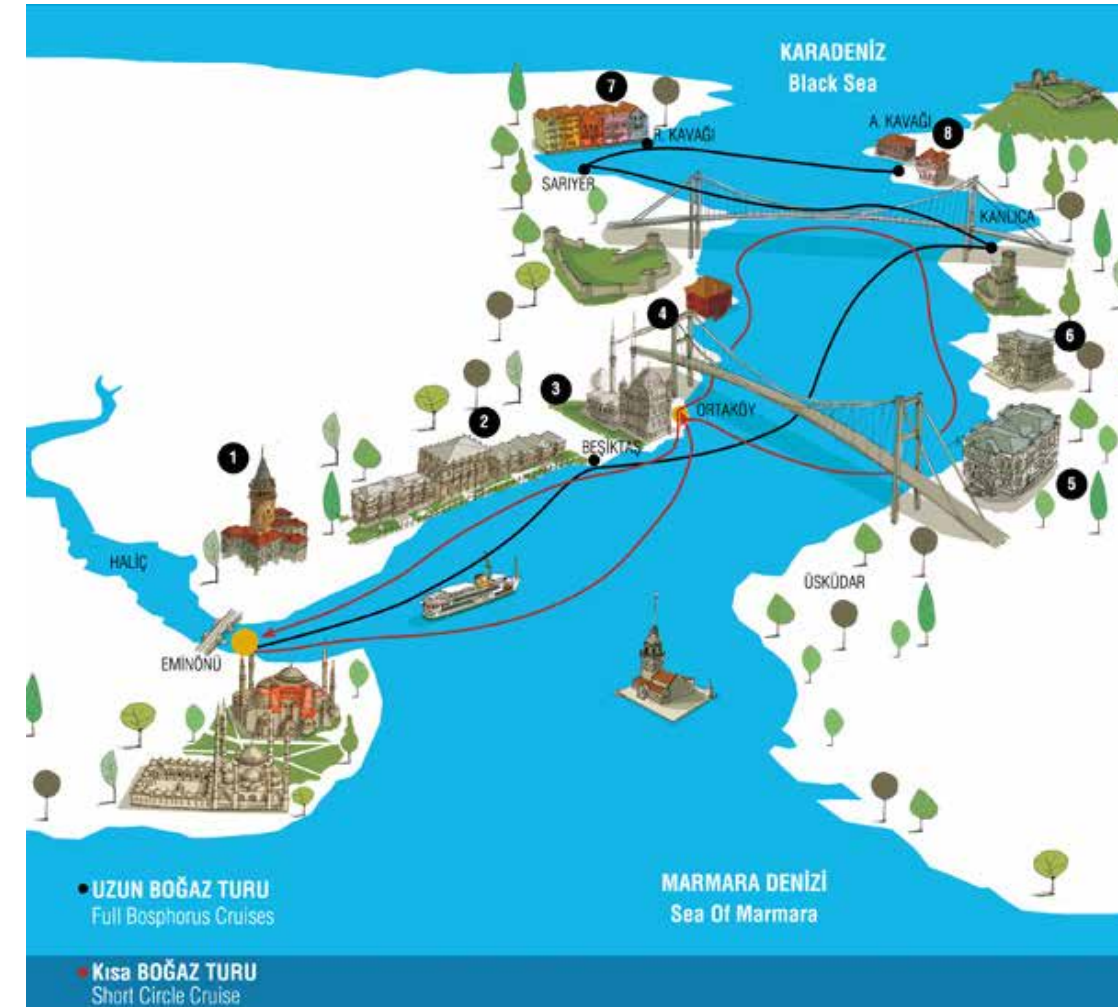


# VESSEL'S CIRCULATION

The Bosphorus is one of the busiest maritime passages in the world. With nearly 43,000 vessels passing through in 2017, the Bosphorus sees nearly three times the traffic of the Suez Canal.

The natural waterway cuts through Turkey's Istanbul and divides the country between two continents – Europe and Asia. It is a corridor for commuters, travellers, merchant vessels, and residents who are looking to escape the hustle and bustle of an overflowing city.

Under these circumstances, it is important to give an importance the circulation of vessels while designing a floating prototype.



Şehirhatları  
August 2008

## Istanbul Traditional Ferryboat Docks



## EUROPE



# LITERATURE REVIEW

## SMARTH GROWTH

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Smart growth is an approach of development that encourages communities to craft a vision and set standards for development and construction which respond to community values of architectural beauty and distinctiveness, as well as expanded choices in housing and transportation. It seeks to create interesting, unique communities which reflect the values and cultures of the people who reside there, and foster the types of physical environments which support a more cohesive community fabric.

By creating high-quality communities with architectural and natural elements that reflect the interests of all residents, there is a greater likelihood that buildings (and therefore entire neighborhoods) will retain their economic vitality and value over time.

**Foster Distinctive, Attractive Communities with a Strong Sense of Place,  
Mix Land Uses,  
Provide a Variety of Transportation Choices**

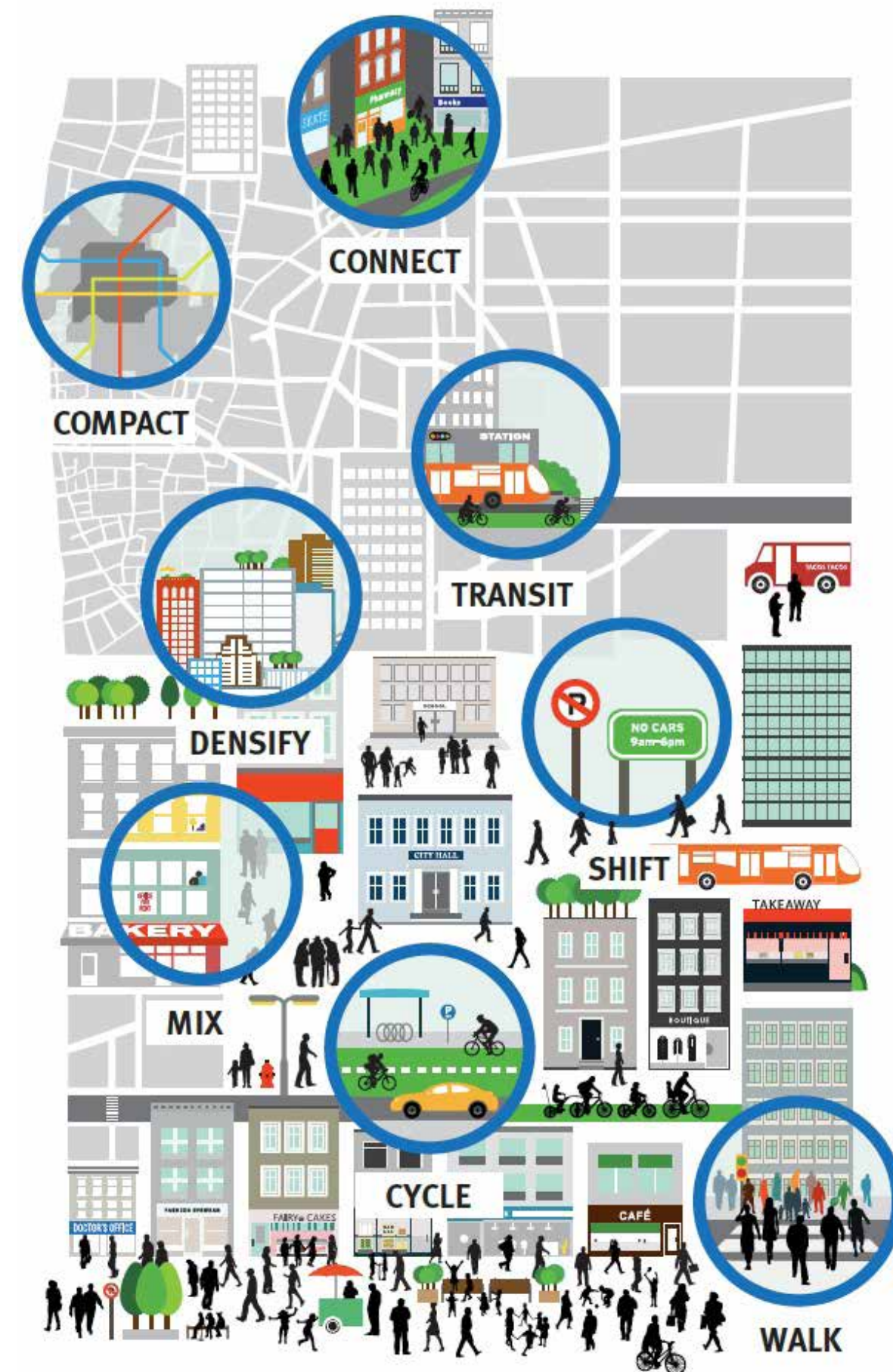
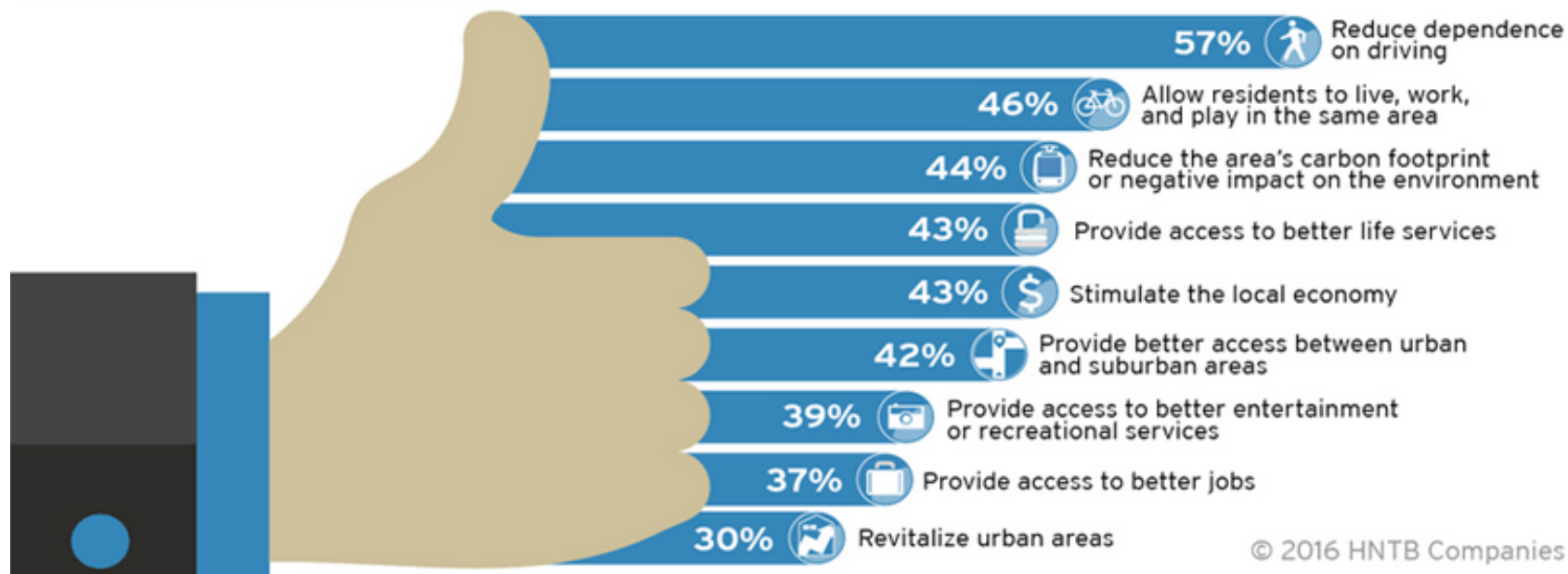


# TRANSPORTATION ORIENTED DEVELOPMENT

In urban planning, a transit-oriented development (TOD) is a type of urban development that maximizes the amount of residential, business and leisure space within walking distance of public transport. It promotes a symbiotic relationship between dense, compact urban form and public transport use. To sum up It is an approach which supports city development from the nodes that has an transportation quality.

## BENEFITS OF TRANSIT ORIENTED DEVELOPMENT

Americans believe transit oriented development provides an array of benefits ranging from lifestyle to environmental to economic.



# ARCHITECTURE FOR DISASTERS

A shelter to live, learn, heal, gather, work ;

from individuals  $\longrightarrow$  to communities

In this approach, It is specifically focused on how architecture can be use as a tool to solve the problems that can be occured after a disaster. It is emphasized that the first step is focusing on individuals' lives, then the community.

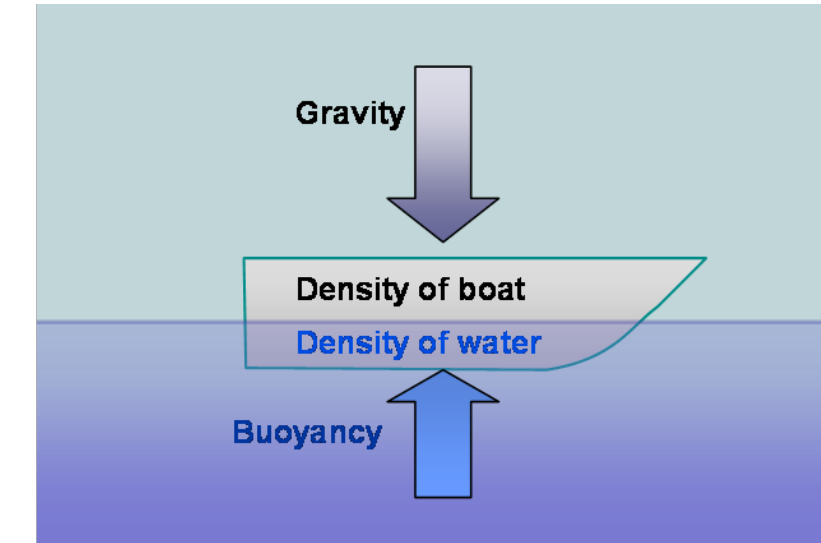
First of all the different building systems should support all aspects of life after a disaster. The exact needs of people should be determined and design their environment according to this. It has to give a chance to self-construct their community and their lifestyle. With flexible spaces and provided resources should be implemented as possible.



# UNDERSTANDING PHYSICS

## NAVAL ARCHITECTURE

### Archimedes's principal

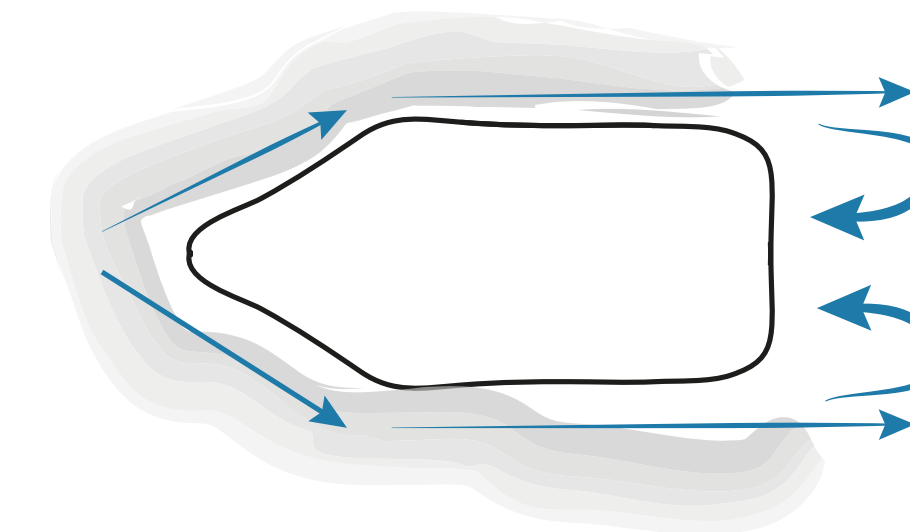


“Archimedes’ principle states that the upward buoyant force that is exerted on a body immersed in a fluid, whether fully or partially submerged, is equal to the weight of the fluid that the body displaces. Archimedes’ principle is a law of physics fundamental to fluid mechanics.” (Wikipedia)

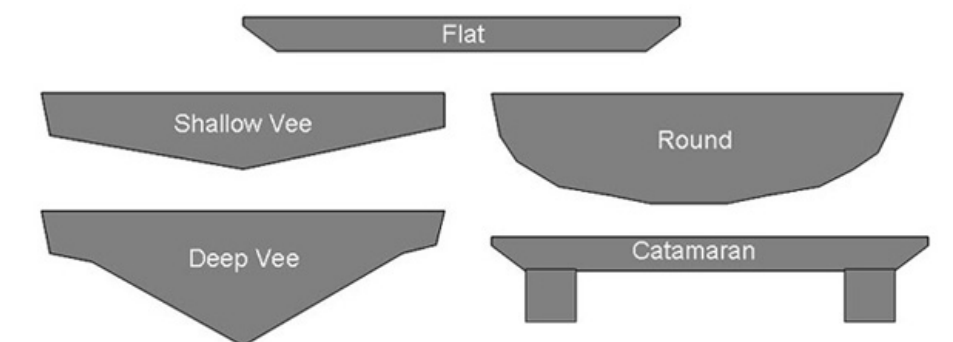


### Hull Design

The friction creates drag forces, that is proportional with the wet area, therefore designers try to minimise this area with rounded design.



### Hull Types



## Common Materials in Naval Architecture:

### Steel:

high strength, durability, resistance to abrasion, and relatively low cost. From sustainability aspect; minimal construtonal waste, recyclable at the end of its life cycle

### Aluminium:

lightweight, can travel faster due to reduced weight, corrosion resistance, imperviousness to magnetism. From sustainability, aluminium is recyclable

### Fibre-reinforced plastic (FRP):

light, speedy, strong, watertight, durable, and corrosion-free. completely recyclable and have no adverse effects on the marine ecosystem

### Polyethylene:

Versatile material, advanced chemical and impact resistance, low maintenance, and greater buoyancy. not as structurally stiff as aluminium or fibreglass and cannot withstand high temperature without deforming. polyethylene boats are moulded (like FRP) as opposed to fabricated (like aluminium). This implies that complex designs are possible



## Innovative Designs in Naval Architecture

*The Flip Ship Research Ship*



*Pioneering Spirit*



*Megayacht Adastra*



*Magnus Sailing*

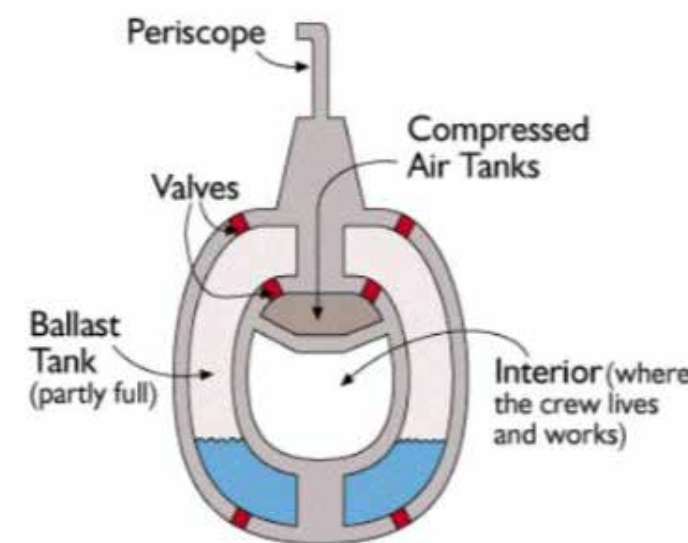
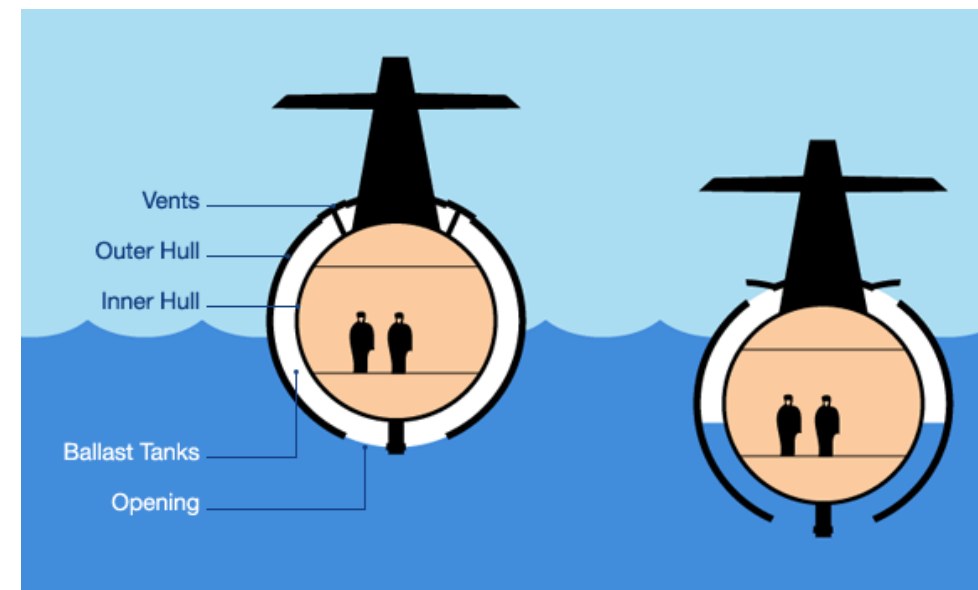


# SUBMARINES

A submarine vehicle, that moves underwater, that has been either used for research or military purposes. This structure has ability to submerge and surface depending on the need of user. The shape of submarine is either tear drop or aerofoil, which are aerodynamically most appropriate shapes as these allow submarine to smoothly propagate in the water. This shape nullifies the water resistance generated by the water.



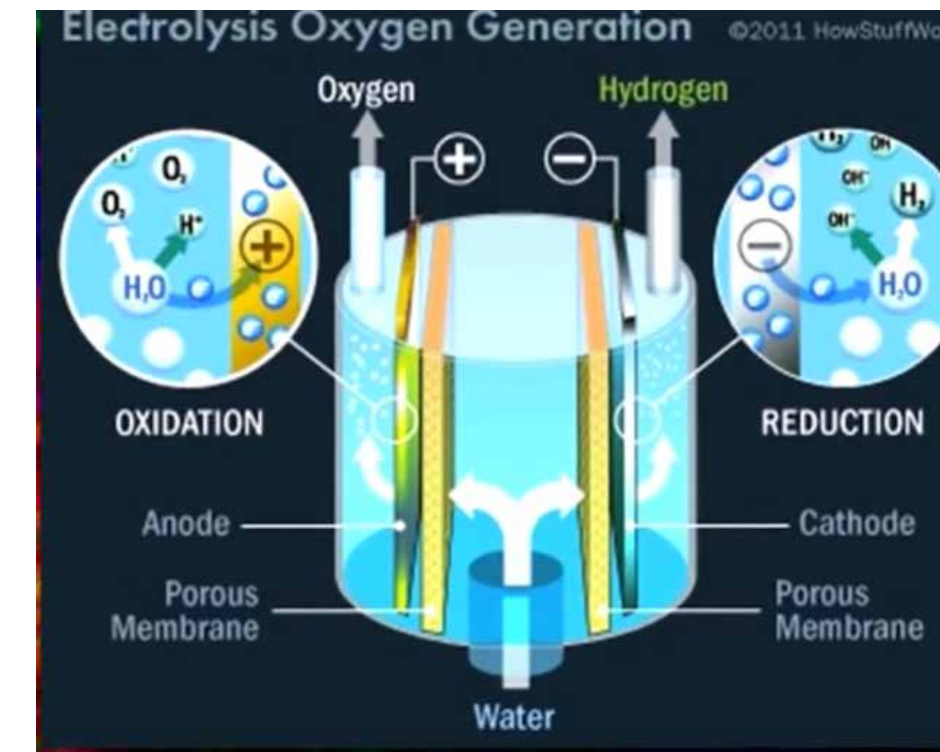
## Ballast system:



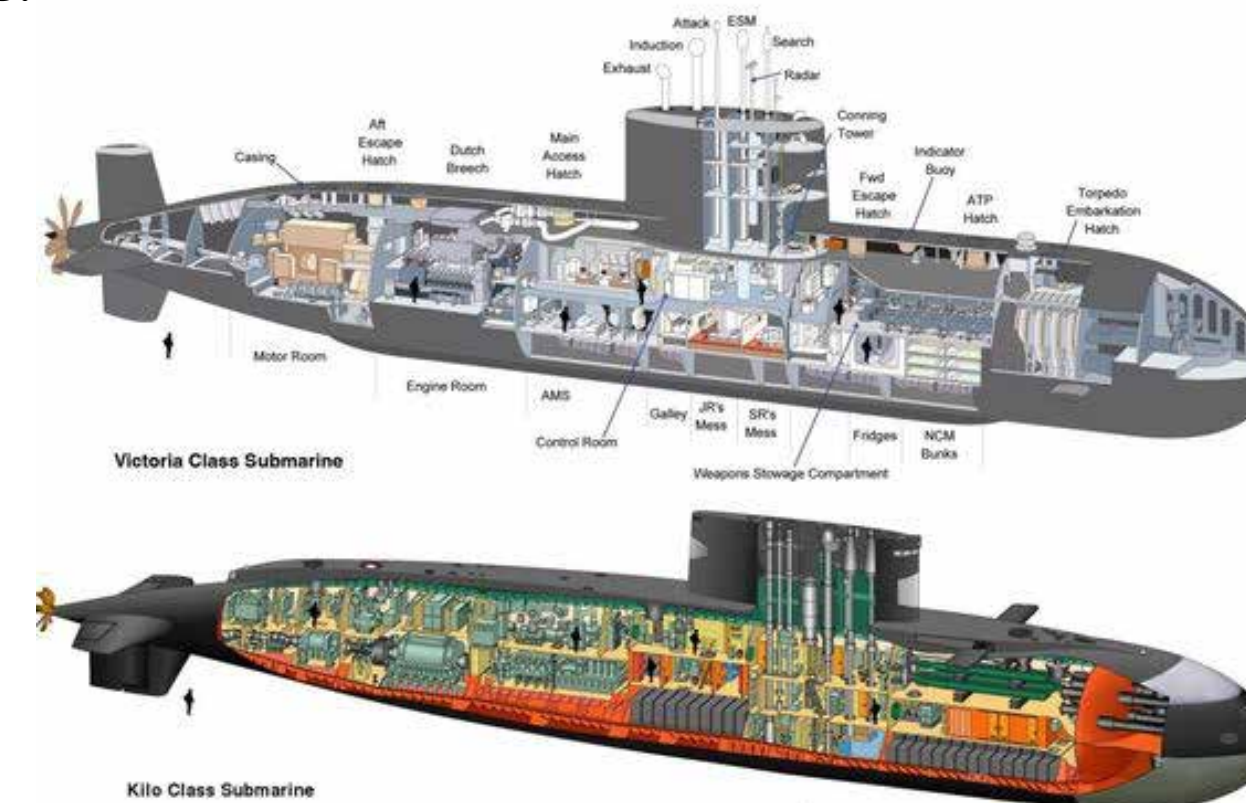
## Materials:

A submarine hull has two major components, the light hull and the pressure hull. The light hull (casing in British usage) of a submarine is the outer non-watertight hull which provides a hydrodynamically efficient shape. The pressure hull is the inner hull of a submarine that maintains structural integrity with the difference between outside and inside pressure at depth. Materials of the hulls are created by high strength alloyed steel.

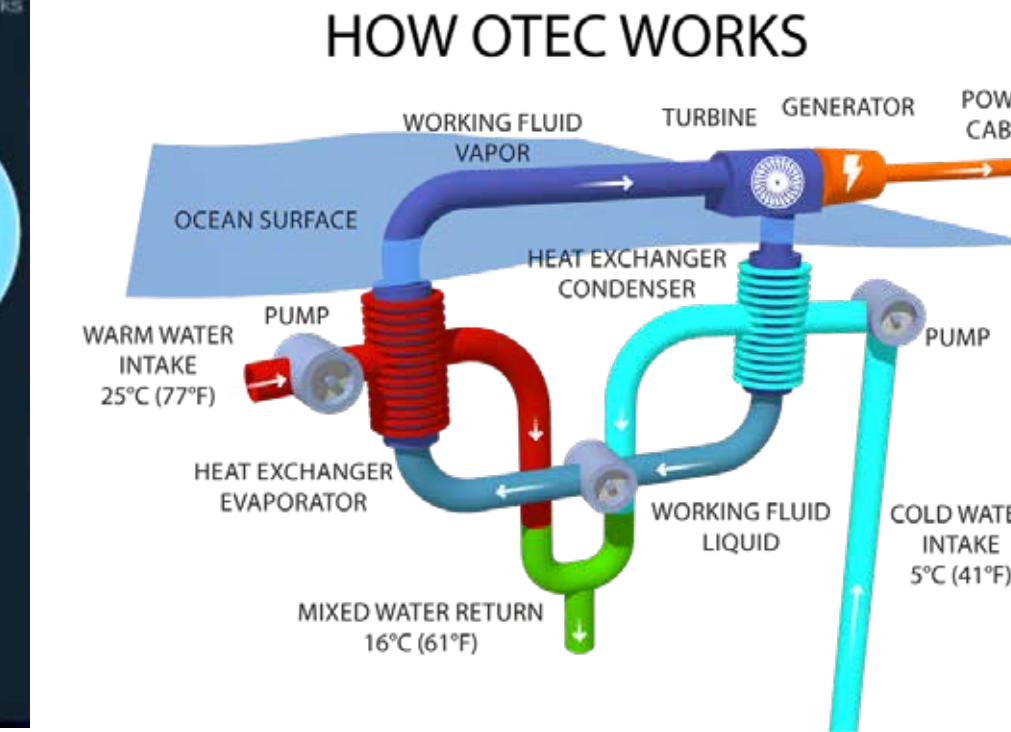
## Technologies: O2 Generation



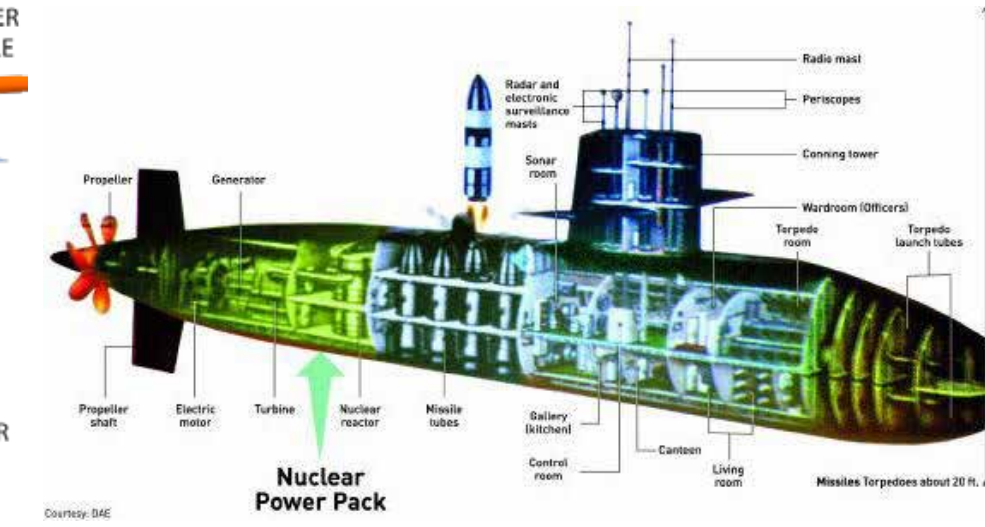
## Structure:



## OTEC Technology



## Nuclear Energy



## Components of submarine structure:

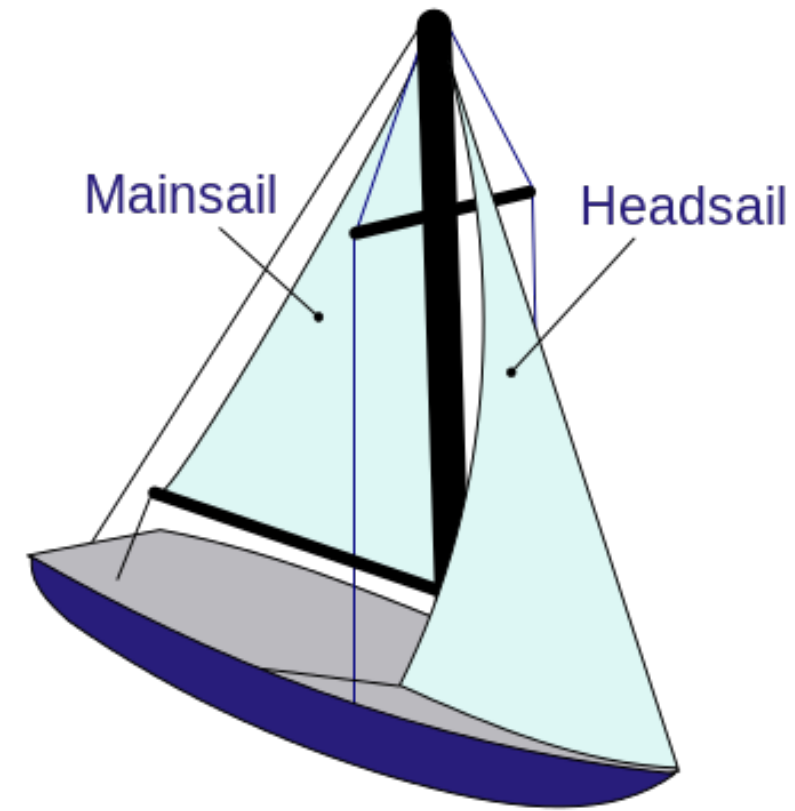
- Inner Hull
- Outer Hull
- Ballast Tank



# SAILBOAT

A sailboat or sailing boat is a boat propelled partly or entirely by sails and is smaller than a sailing ship. Distinctions in what constitutes a sailing boat and ship vary by region and maritime culture.

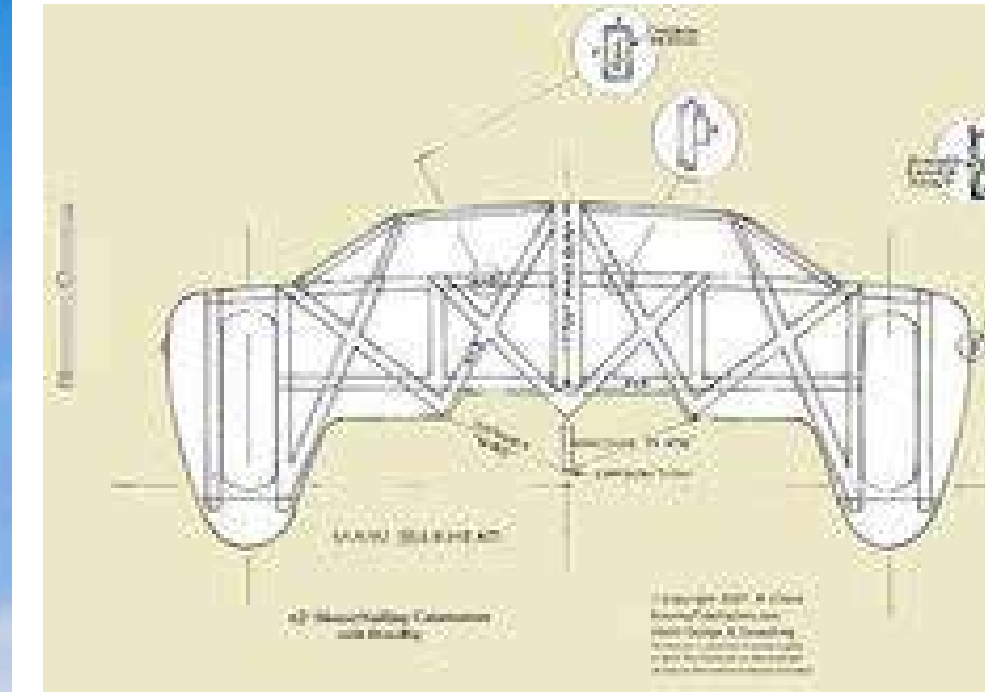
Traditional sailboats are monohulls, but multi-hull catamarans and trimarans are gaining popularity.



# CATAMARAN

Catamarans are a type of sailboat that has 2 hulls rather than one. It is one of the most stabilized types in all sailboats since all weight is divided into two hulls. Moreover, the surface of the hull that touches the sea level is less, so that it can travel faster.

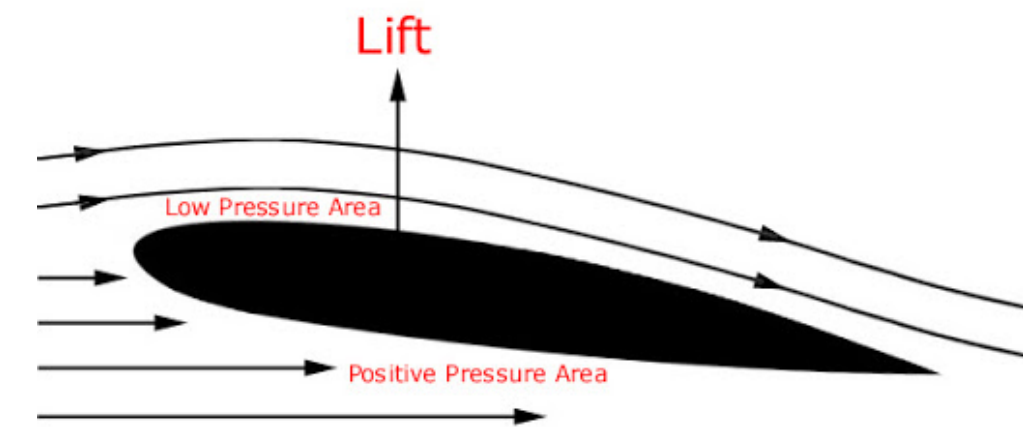
Furthermore, the trampoline structure it has allows water to move. Hence, Catamarans can deal with waves by allowing water to circulate.



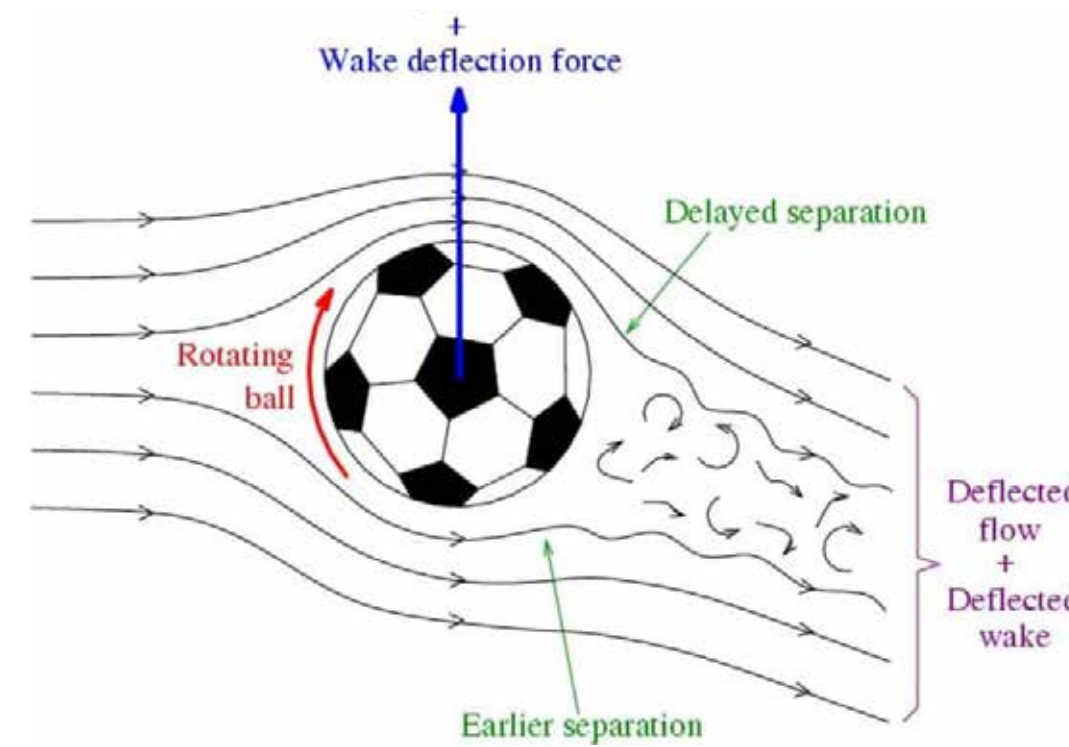
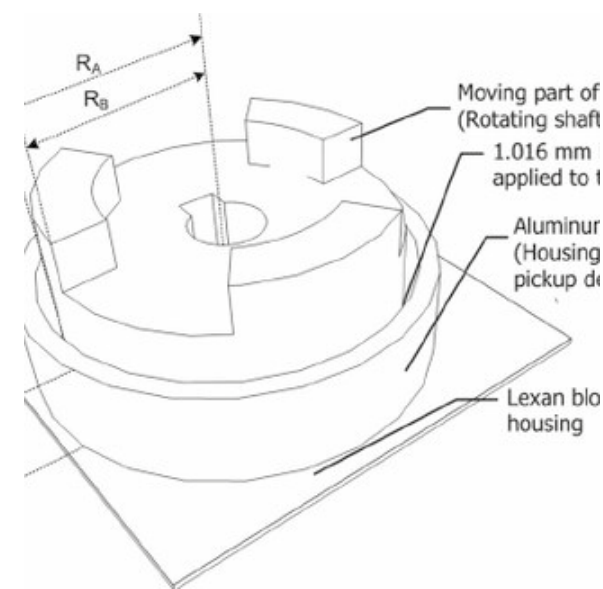
# ROTORSHIP

"A rotor ship is a type of ship designed to use the Magnus effect for propulsion. The ship is propelled, at least in part, by large powered vertical rotors, sometimes known as rotor sails. German engineer Anton Flettner was the first to build a ship that attempted to tap this force for propulsion, and ships using his type of rotor are sometimes known as Flettner ships."

## Main Principle

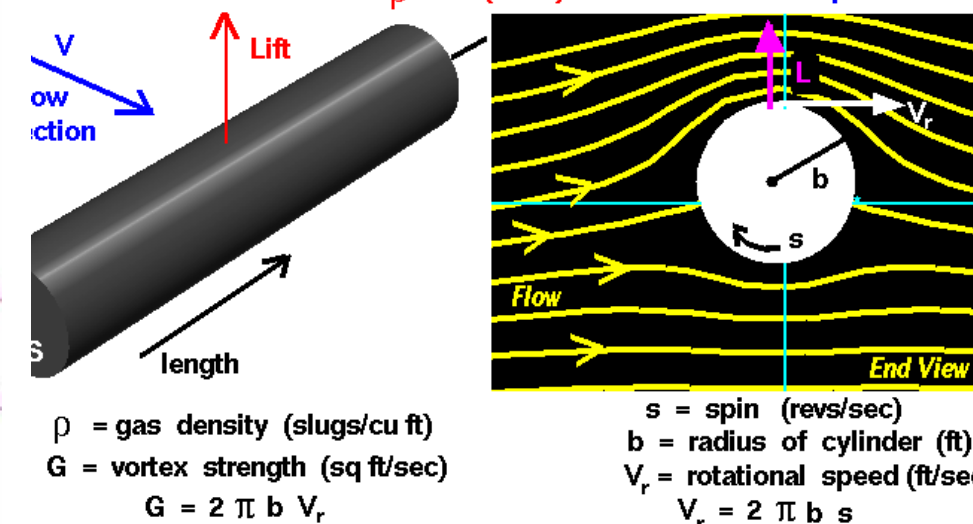


## Magnus Force



## Lift of Rotating Cylinder

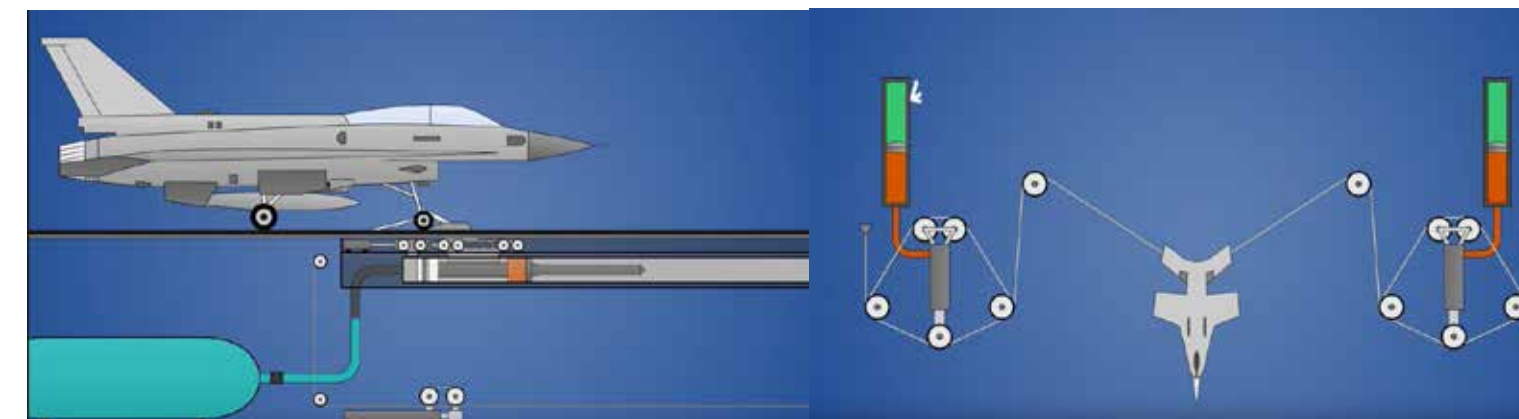
**Kutta-Joukowski Lift Theorem for a Cylinder:**  
Lift per unit length of a cylinder acts perpendicular to the velocity ( $V$  in ft/sec) and is given by:  
 $L = \rho G V$  (lbs/ft)



# AIRCRAFT CARRIER

"An aircraft carrier is a warship that serves as a sea-going airbase, equipped with a full-length flight deck and facilities for carrying, arming, deploying, and recovering aircraft"(wikipedia)

## Catapult system:



# OFFSHORE OIL PLATFORM

An oil platform, offshore platform, or offshore drilling rig is a large structure with facilities for well drilling to explore, extract, store, and process petroleum and natural gas which lies in rock formations beneath the seabed. These platforms could be work as an island or they may float.

Deep water rigs float on large bunkers that can be filled and emptied of water as ballast. The bunkers are connected to the drilling platform with large columns which are hollow. The rigs have dynamic positioning systems, as well as anchoring webs which prevent catastrophic movement during storms. To get to a lease block, the platforms are towed by oceangoing tugs.

Sea going vessels have empty spaces inside (empty tanks and void spaces) which cause them to float. Total load is controlled by adding or discarding sea water ballast in strategically located tanks.



## Olympos Drilling Platform

LOCATION: 130 miles south of New Orleans  
HEIGHT: 40 storey height  
WEIGHT: 120,000 tons  
DECK AREA: 130 m<sup>2</sup>  
CREW: 192 people  
FLOOR: 4 floors for accommodation

### FACILITIES

Kitchens  
Rooms  
Control Rooms  
Game Rooms  
Fitness Rooms



## Types of Oil Drilling Platforms:



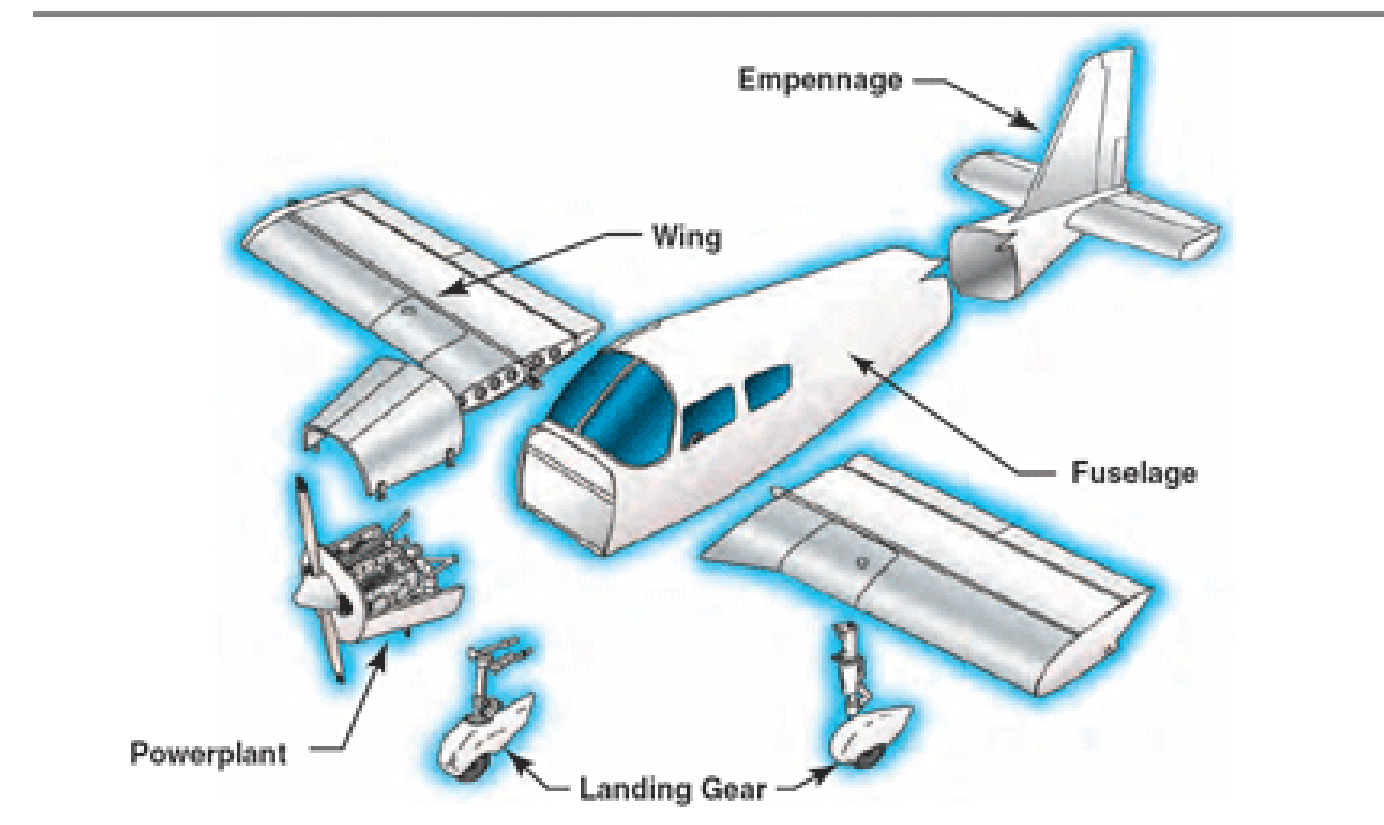
# AIRCRAFTS

## Main Principle : Bernoulli's law

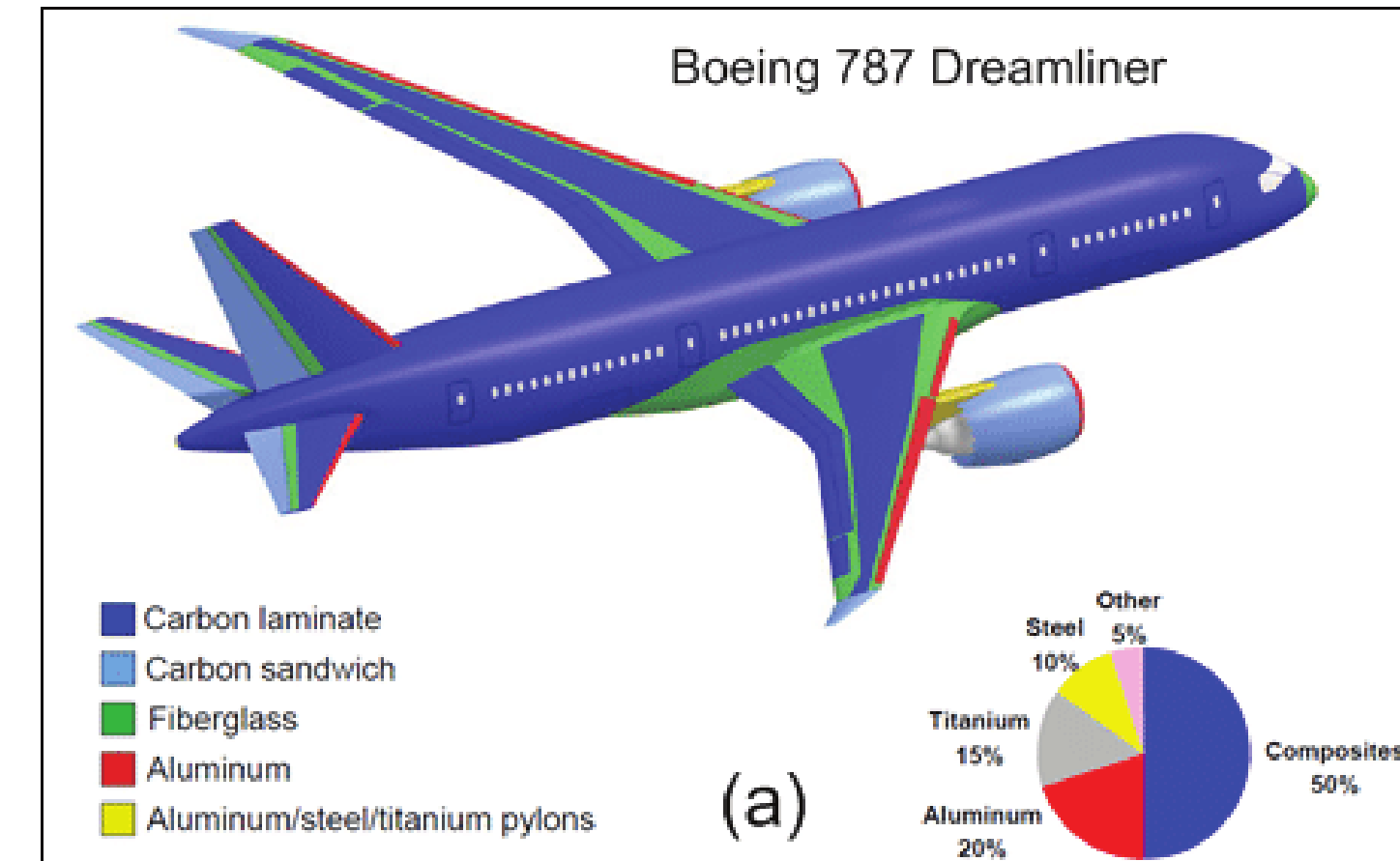
"According to a principle of aerodynamics called Bernoulli's law, fast-moving air is at lower pressure than slow-moving air, so the pressure above the wing is lower than the pressure below, and this creates the lift that powers the plane upward."



## Parts:



## Materials:

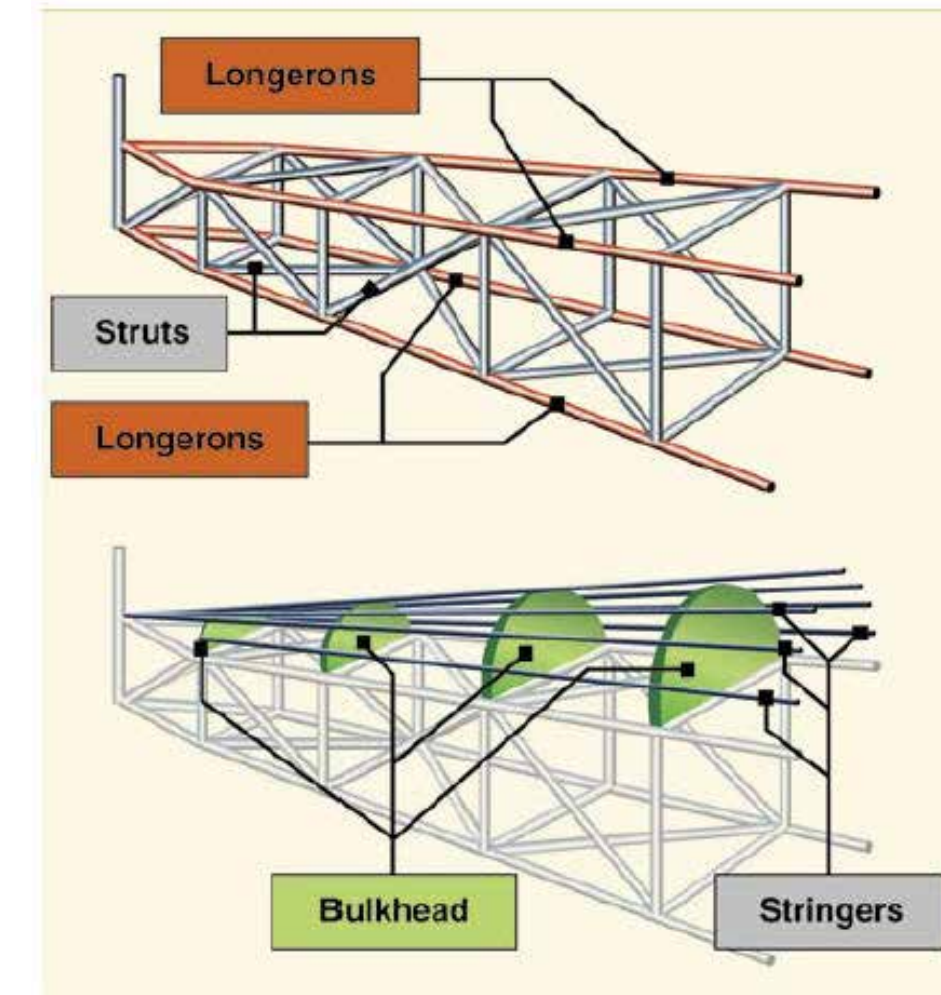


## Structural details:

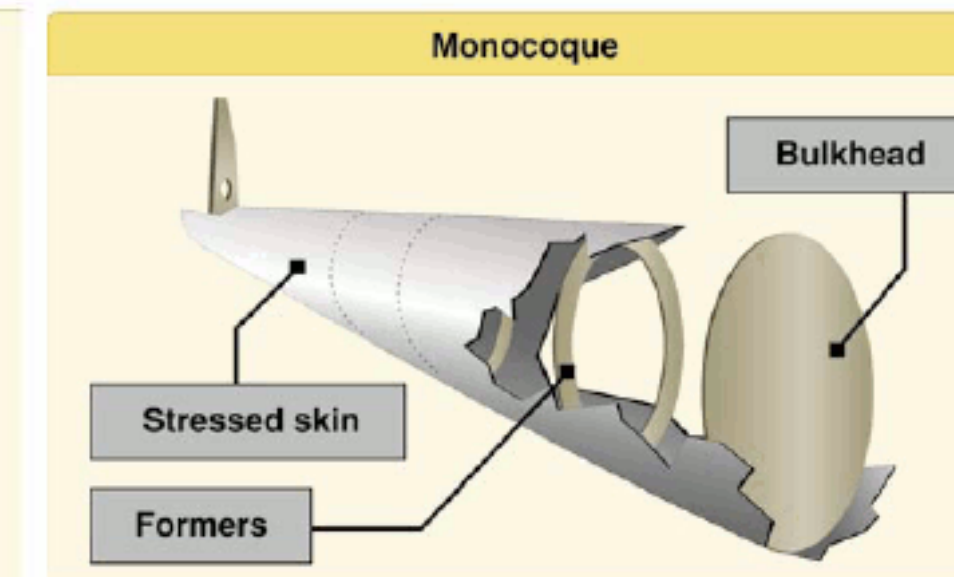
"The main function of aircraft structural elements are: to transmit and resist applied loads, to provide an aerodynamic shape, to protect personnel, payload, and systems from environmental conditions, and the construction of aircraft fuselages evolved from the early wood truss structural arrangements to monocoque shell structures to the current semimonocoque shell structures"

## Fuselage structural details:

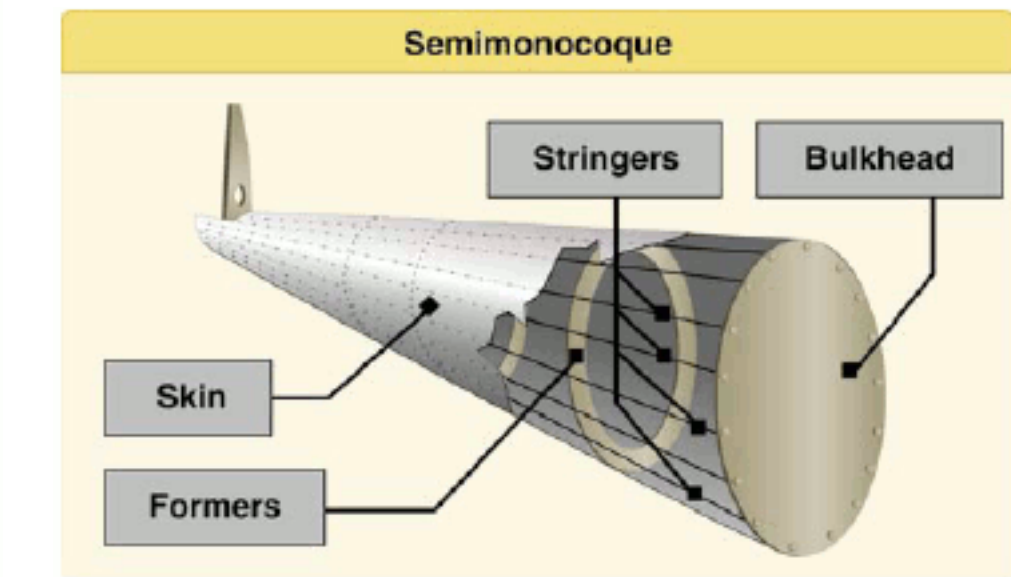
- Truss Structure:



- Monocoque Structure:



- Semi-monocoque Structure:



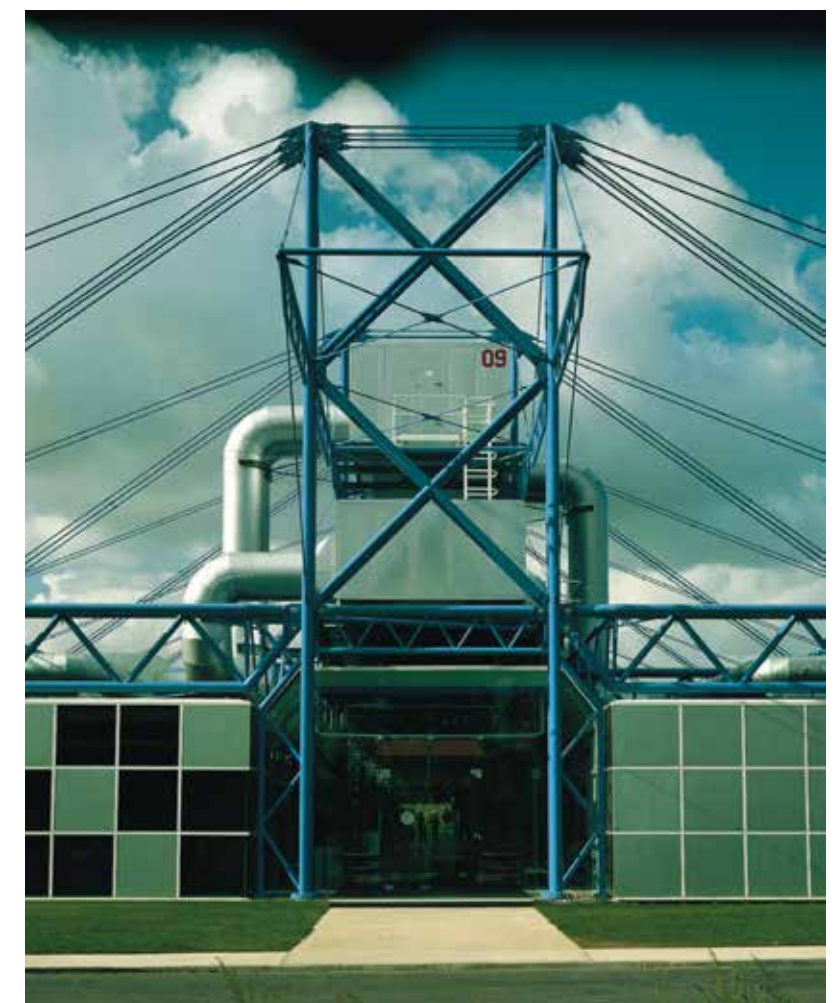
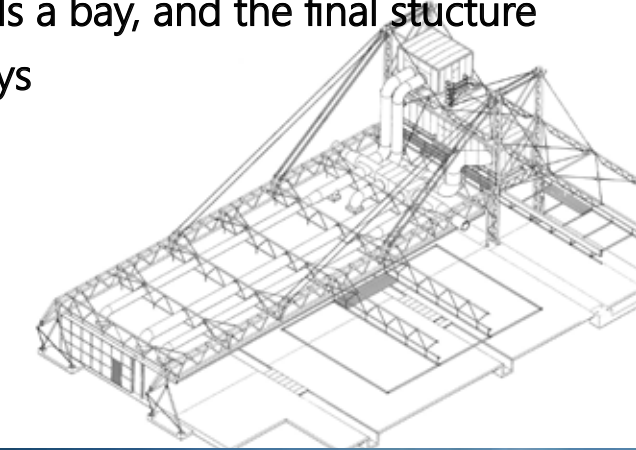
# CASE STUDIES

## INMOS MICROPROCESSOR FACTORY

Designed by Richard Rogers  
In Newport, England

It is a modular factory design. It is occured one hall that connects two wings at each side. n the case of the factory, this emanates from nine blue-painted towers made from tubular steel that are positioned along the centre of its roof.

Each module calls a bay, and the final stucture consist of 16 equal bays



## MILLENNIUM DOME

Designed by Richard Rogers  
In London, England

The Millennium Dome is a huge exhibition to celebrate the beginning of the third millennium. The dome structure is used to create an uninterrupted volume and stabilized with 9 steel columns that carry the dome with tensile structure.

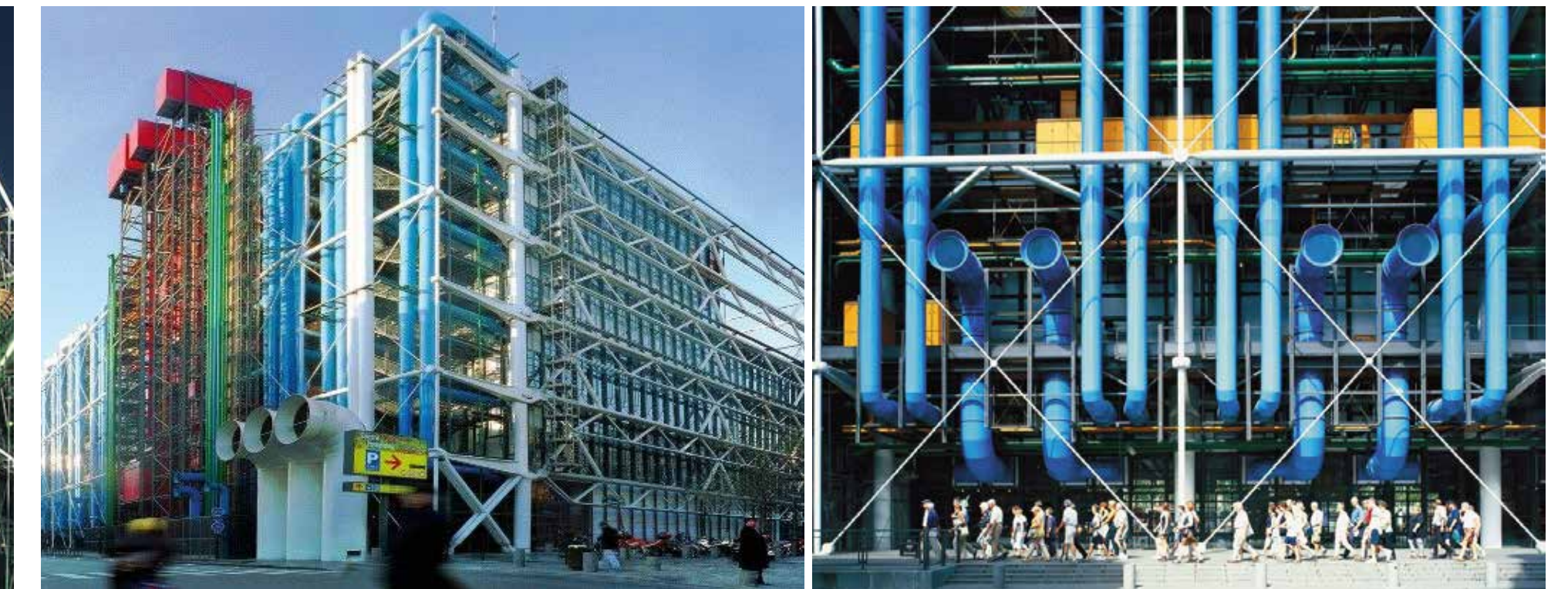


## CENTRE POMPIDOU

Designed by Renzo Piano, Richard Rogers  
In Paris, France

It is a museum in Paris, that exhibits the structure elements to the outside. In order to do in a clear way, some elements are colored according to its function. For instance circulation layer is in red.

This kind of a structure is used in order to have an uninterrupted place in the inner part, and having a free plan for the museum.

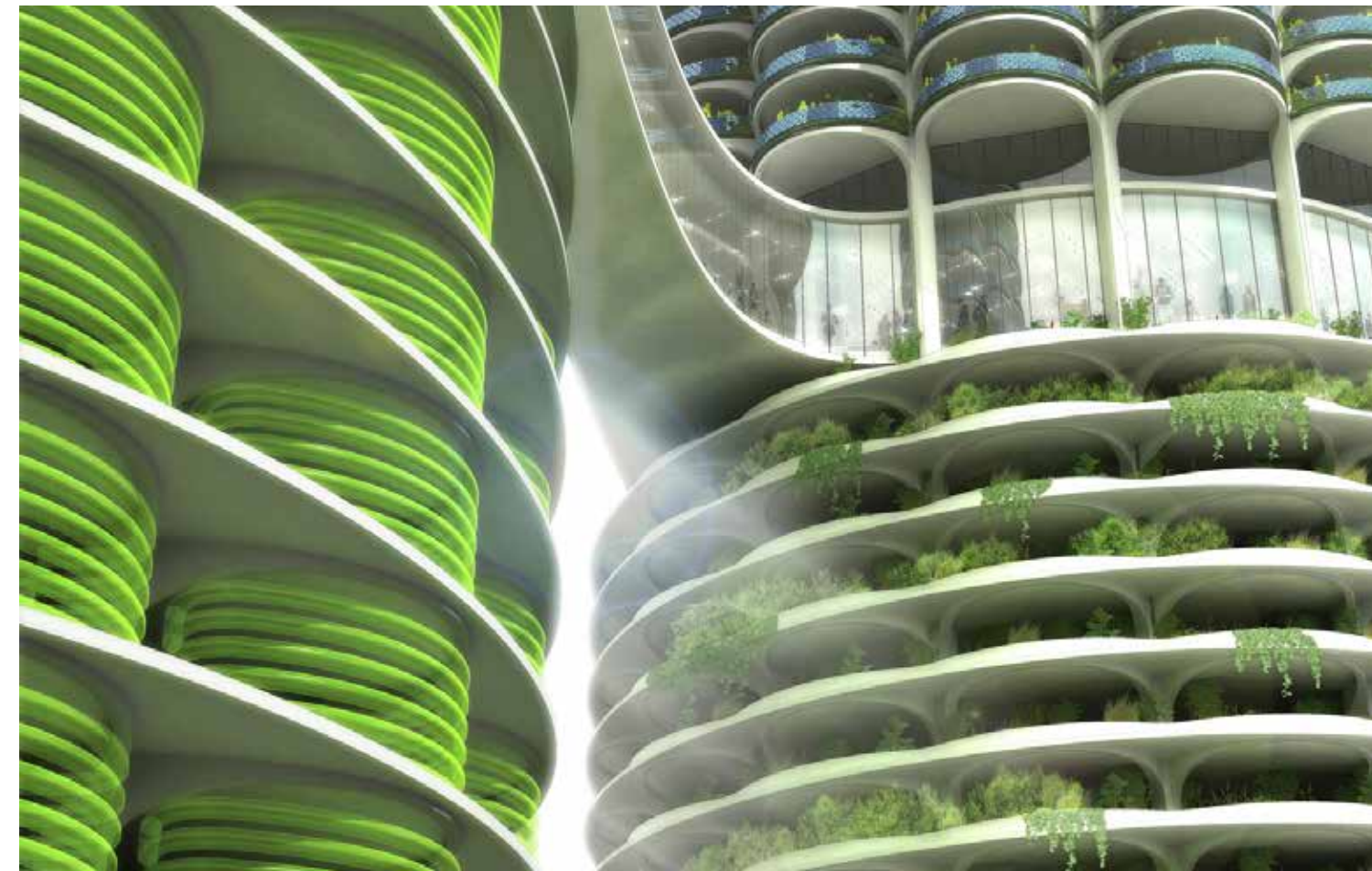
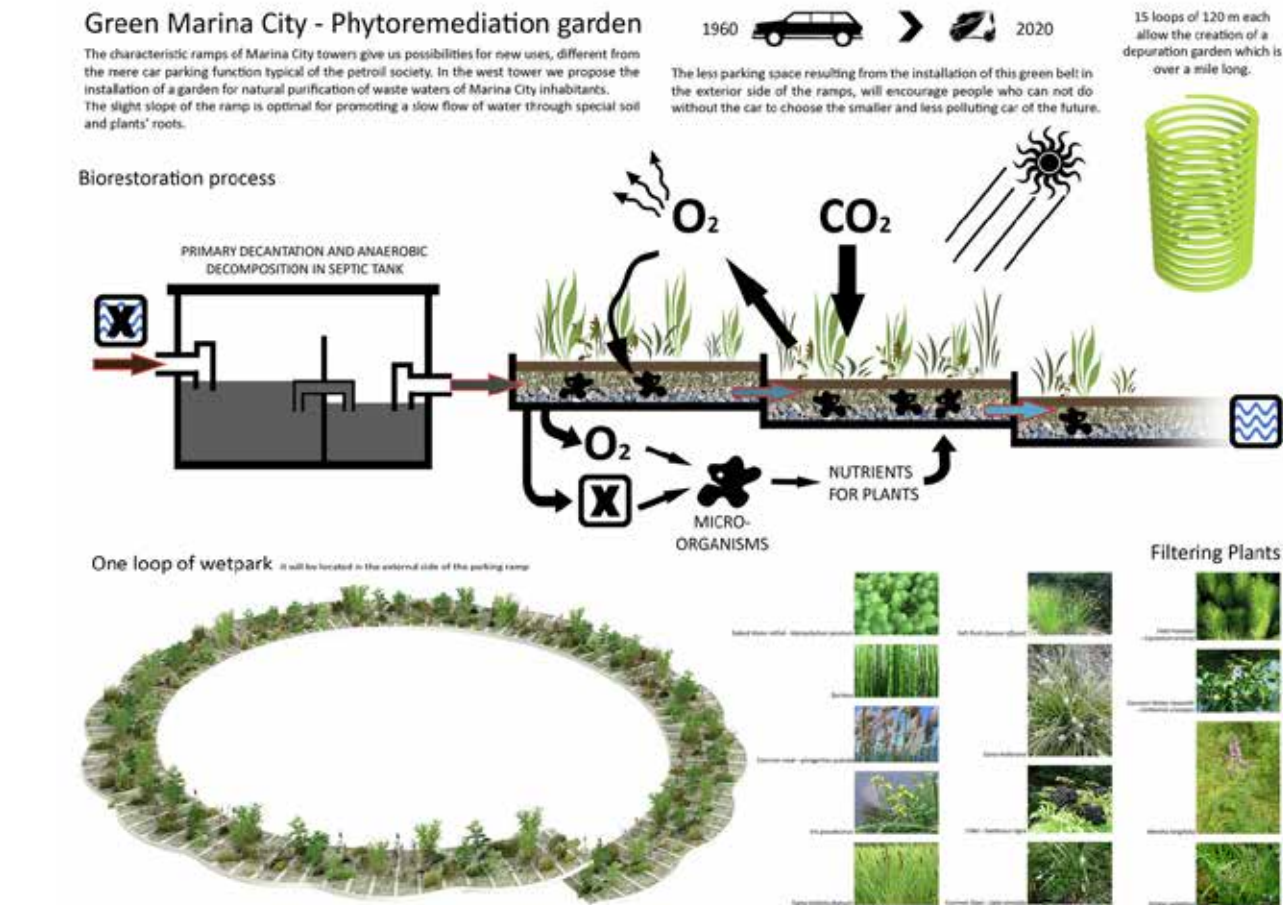


# ALGAE GREEN LOOP

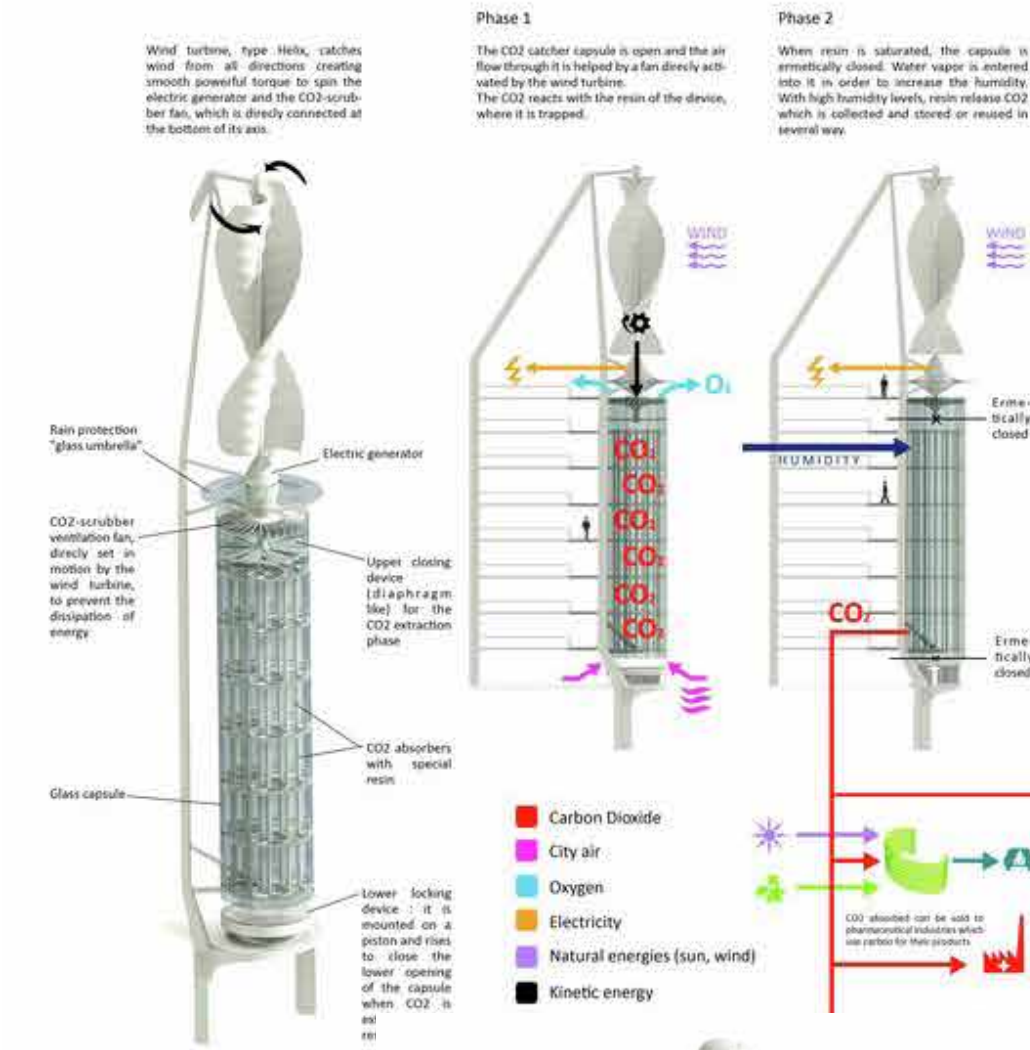
Designed by Influx Studio  
Chicago, USA

This project aims to develop Chicago's economy with clean energy. This design introduces a new sustainable model which allows closed loops in terms of providing clean energy, reducing and absorbing CO2 emissions, and finally, allowing sustainable economic growth. Algae technology is for to clean polluted air, to create energy onsite, allow food production, and to process all waste water to be reused.

Also, by using differently elevated wetlands on the sides of parking area, the water gets cleaned step by step.



## Carbon Scrubbing Devices



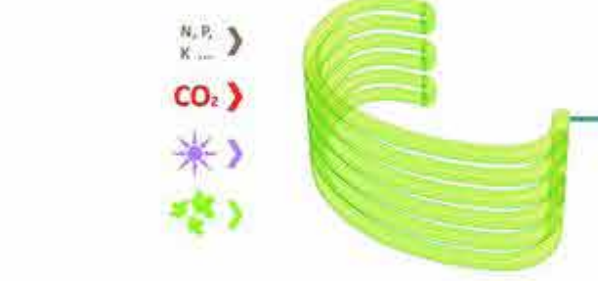
## Integrating the system with Algae

A portion of the carbon dioxide caught in the CO2 scrubbers is directly reused in the bioreactors to produce biofuel. Algae and CO2 capture technologies complement each other; algae bioreactors require pure CO2 that is normally difficult to produce and at the same time it allows to use what is otherwise expensive to store.

### Algae Bioreactors

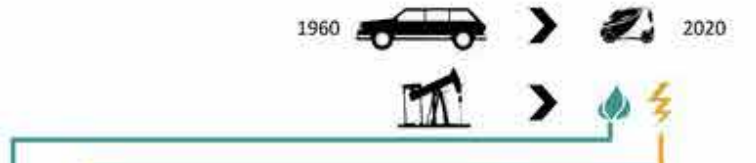
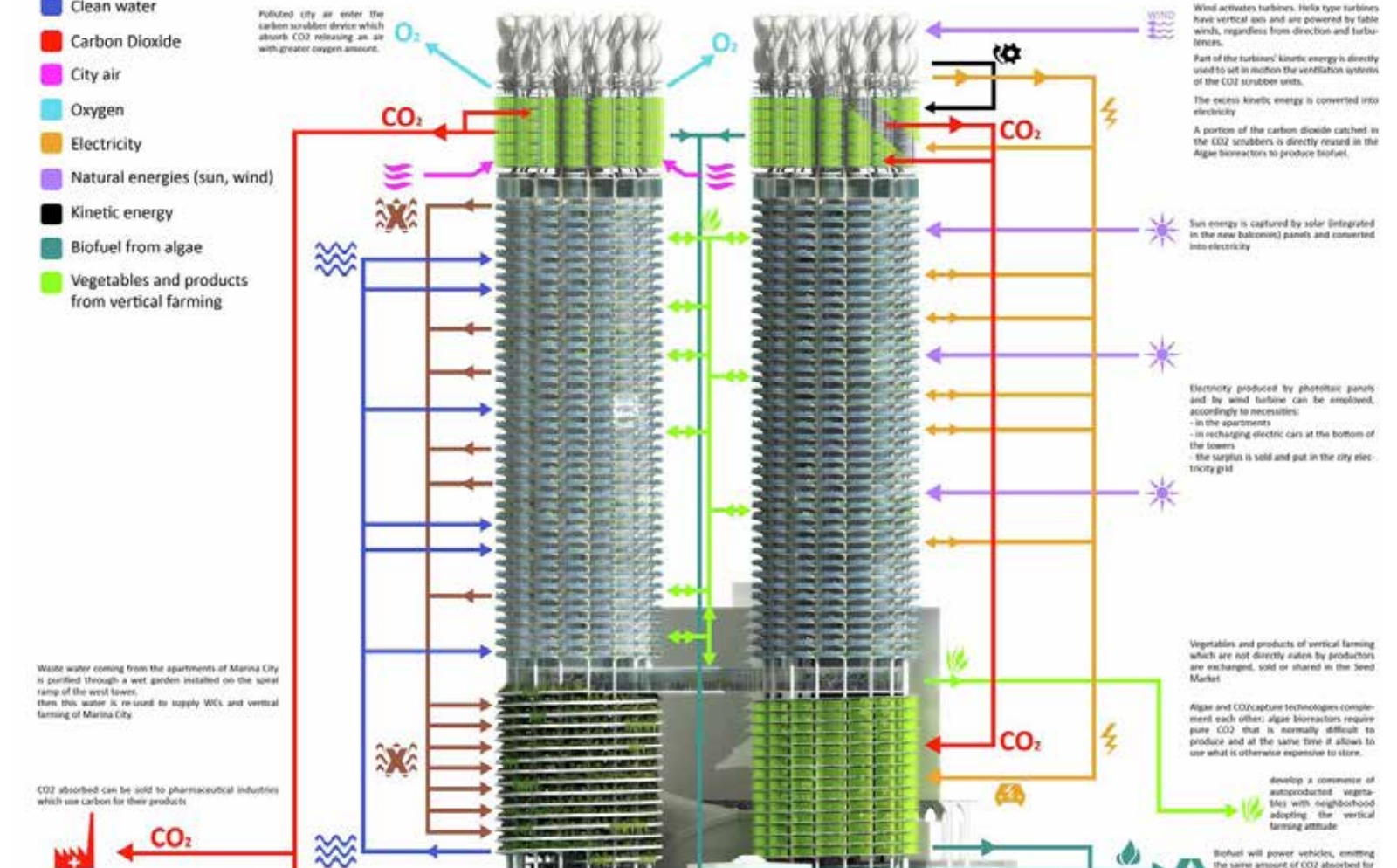
We propose to install in the parking ramp of the east tower and around the carbon scrubbers at the towers' top a series of Algae Bioreactors, in order to produce biofuel. This method has the advantage that don't need extensive plantation. The production of biofuel from algae consists in filling a transparent pipe with a suitable crop of algae, nutrients, water, and carbon dioxide. In these closed system microalgae develops rapidly. A cycle can last from some days to some weeks, during which the microorganisms consume nutrient and CO2, for growing, producing carbohydrates and fats (from which biofuel is generated). Each tonne of microalgae absorbs two tonnes of CO2!!! For best performance, bioreactors need a source of pure CO2 who is difficult to find and produce.

The Green Marina City project marry different technologies so that the defects of one become the other's strengths. Indeed, the carbon scrubber technology at the top of the towers will supply Bioreactors the needed CO2, solving the problem of transport and storage of captured CO2.



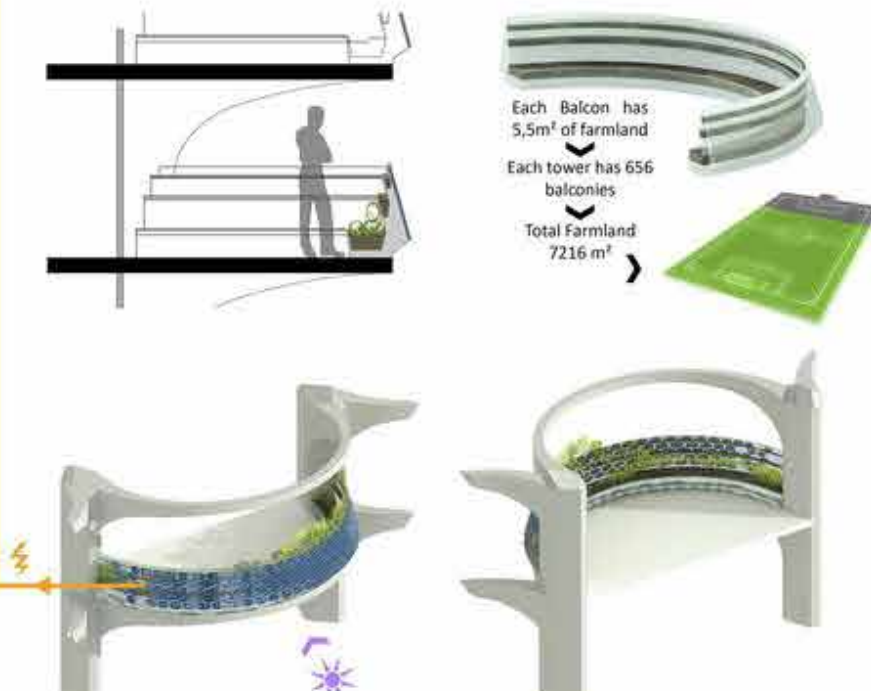
### Green Marina City - Global operating principles

- Waste water
- Clean water
- Carbon Dioxide
- City air
- Oxygen
- Electricity
- Natural energies (sun, wind)
- Kinetic energy
- Biofuel from algae
- Vegetables and products from vertical farming



### Vertical Farming

Characteristics Goldberg balconies will be implemented with special shaped elements who are both a space for growing plants and vegetables, and a support for photovoltaic panels. This vertical farming is a solution to reduce extensive plantations and cost (money but also pollution) for transport. This will also enhance the community life, with exchange of products, seeds, advices. We propose the creation of a public level, the SEEDS & VEGETABLES MARKET: this is a bridge between the two towers but also among people.



## THE HALLEY VI ANTARTIC RESEARCH STATION

Designed by Hugh Broughton Architects, AECOM  
Antartica

This is a modular design that occurred by 7 modules. The red one is located at the center and used as a socializing zone, and the blue ones at sides are the units they live, work, produce some energy, etc.

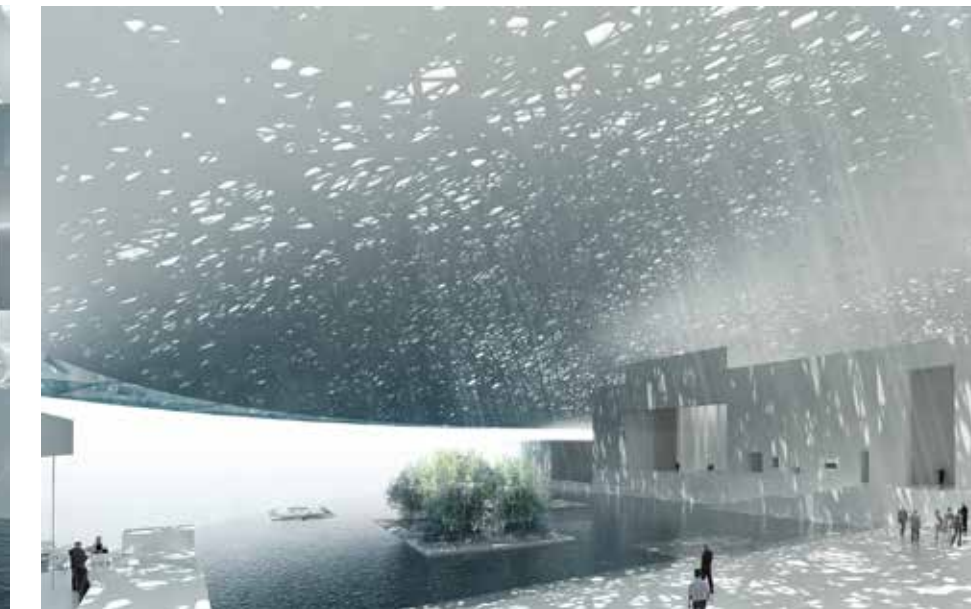
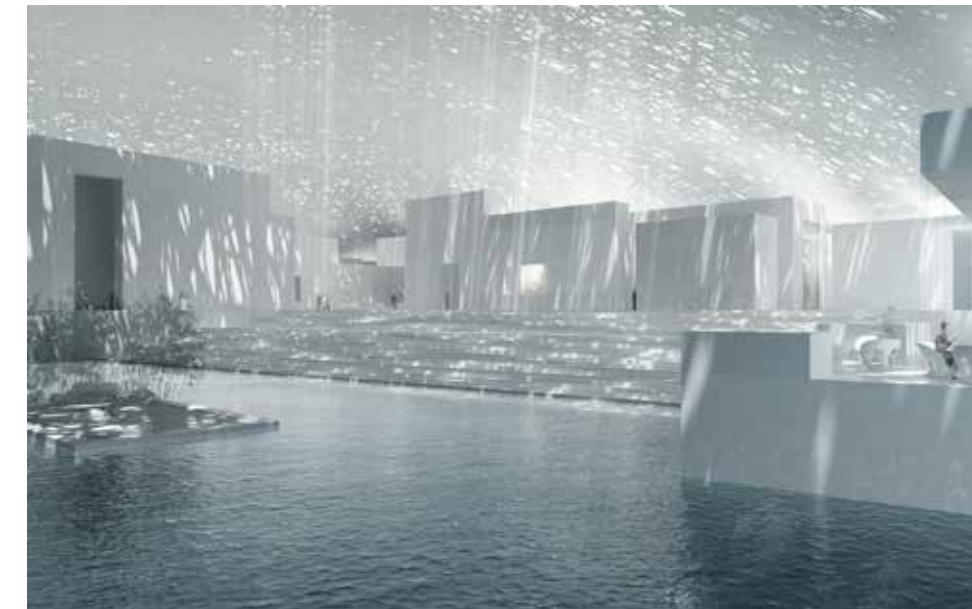
The interesting part of this design is how it is standing. Since the level of snow is changing during the year, the footings are arranged themselves accordingly.



## LOUVRE MUSEUM

Designed by Jean Nouvel  
Abu Dhabi, United Arab Emirates

It is a project that created with a relationship of volumes and their covering, dome structure. The dome structure is not only used as a major symbol of Arab architecture, but also as a shading element. With 5 different structural layers different shades can be created, and protect the place underneath from hot, humid climate. At night, this protected landscape is an oasis of light under a starry dome.





## MARINE CITY, IN 70'S

Designed by Kiyonori Kikutake  
For Research Purposes

Marine City Project, 1958 for a population of 50,000 is based on six cylindrical towers, the reversed version of Tower-shaped Community. The cylindrical towers as well as the spheres connected by the curved horizontal cylinders support the continuous 'Floating Platforms'. The most important part about this case study is how the designer is created a basic concept with the rings.

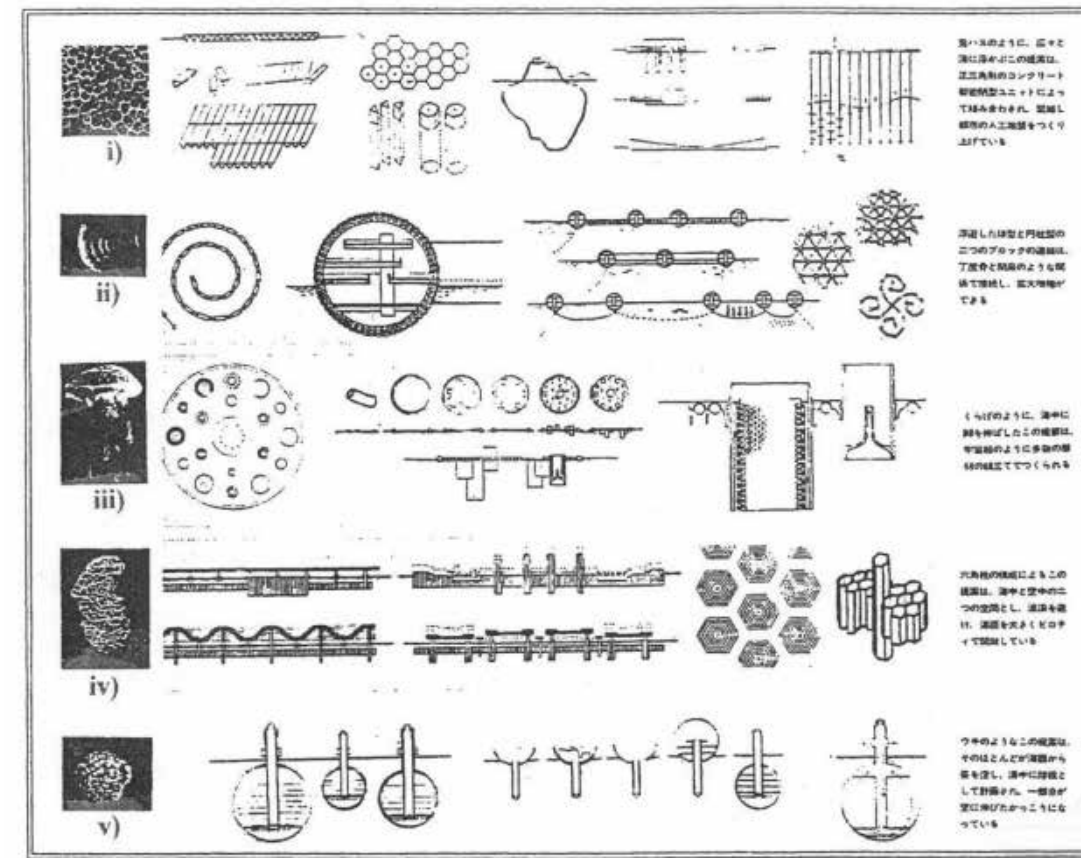
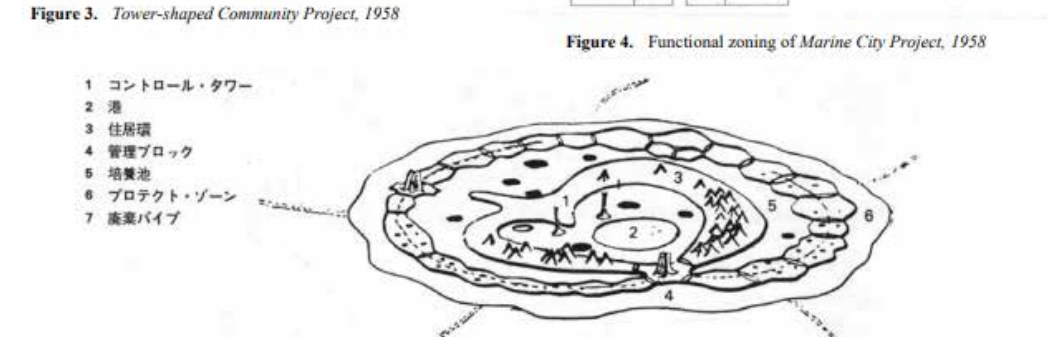
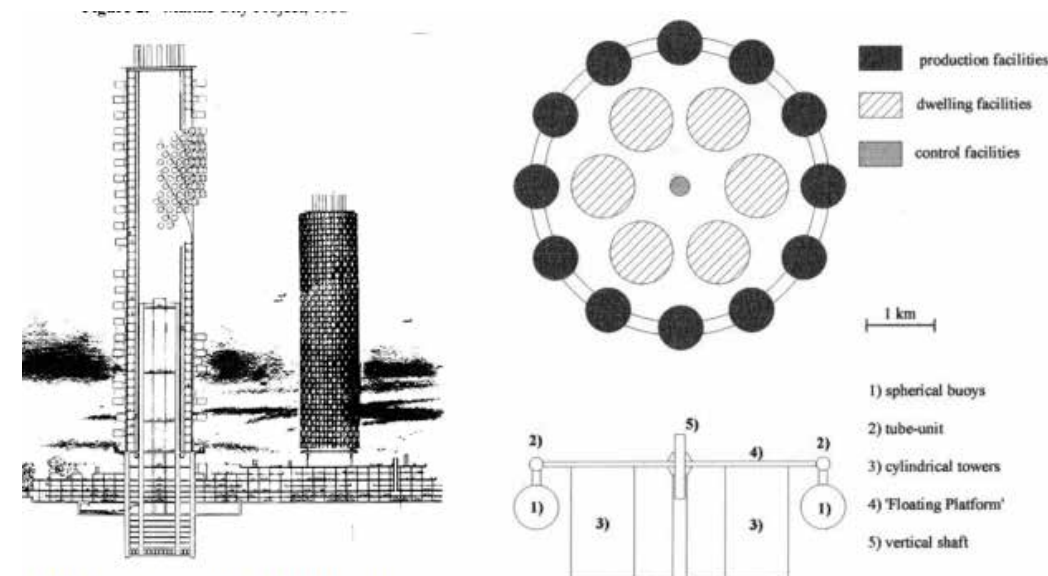
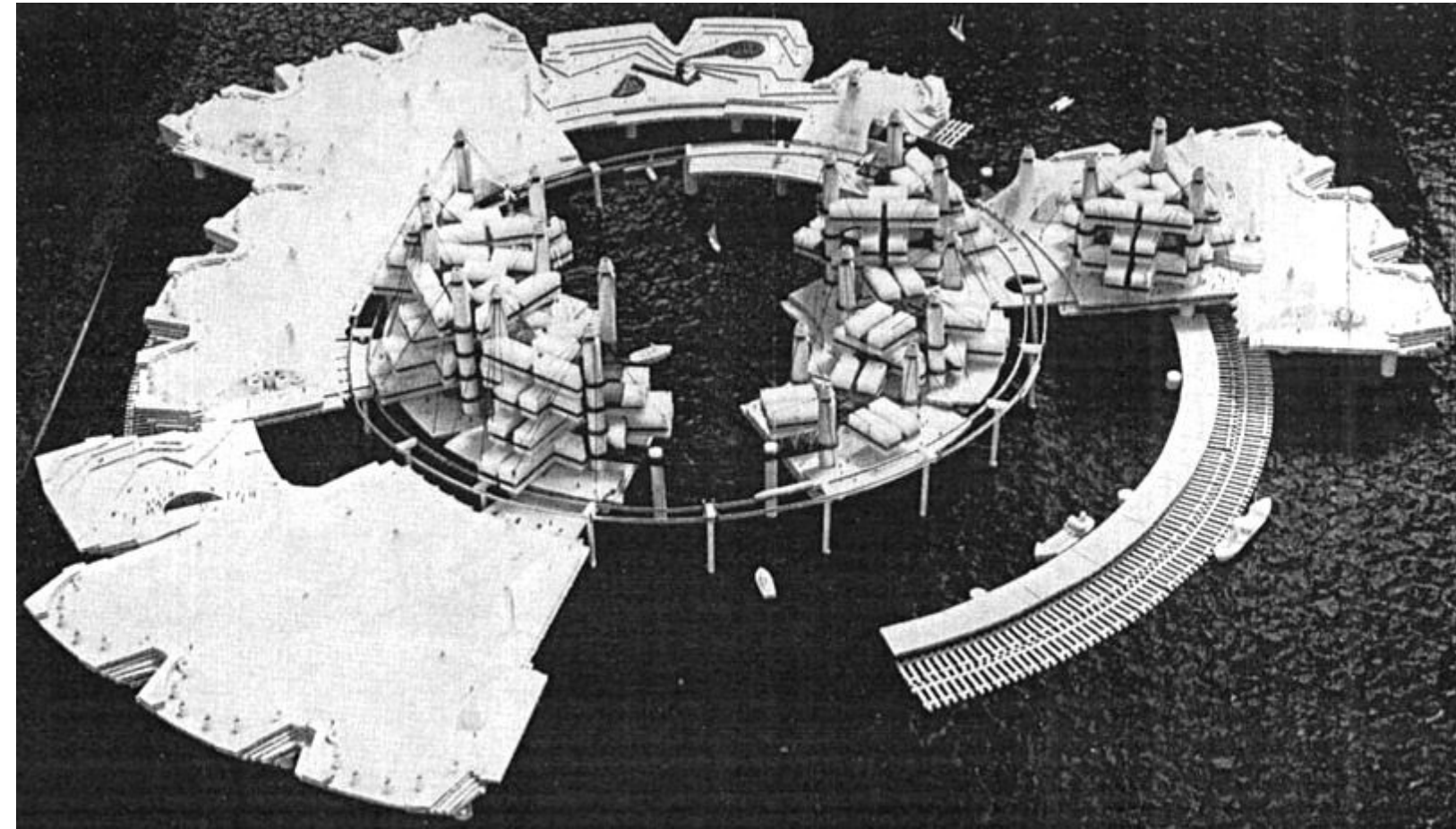


Figure 1. Basic Types of space formatics for 'Marine City'

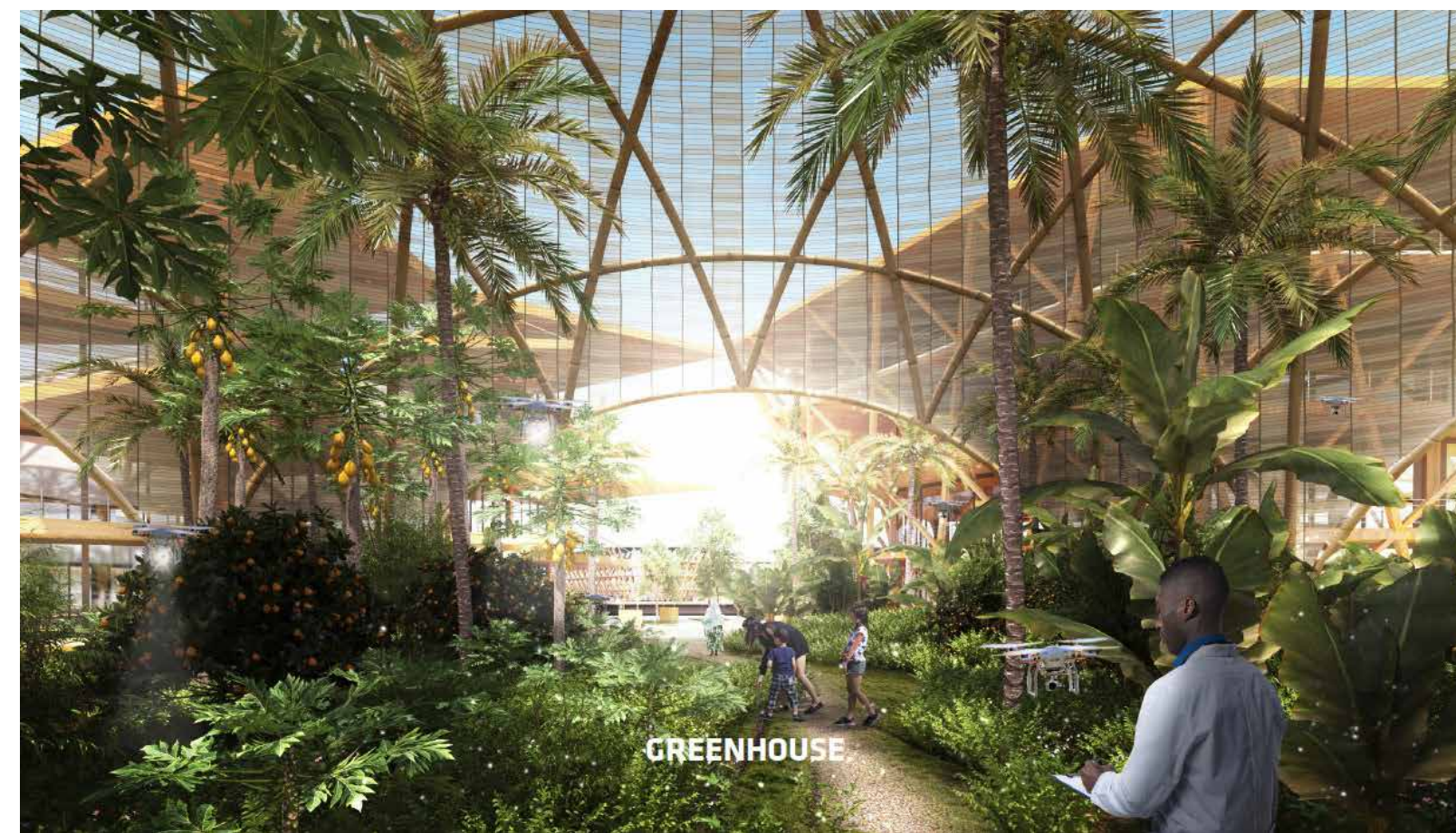
## OCEANIX

Designed by BIG & UNhabitat  
Prototype proposal



This is a design focusing on creating a floating city, to deal with lower incomes, changing sea level and pollution. It occurs with an interaction of multiple units. One unit, which is for 300 residents, is also self-sustained. When 6 units are coming together, they create a village. And each village has its own function, unique identity at the center. For instance one of them is used for spiritual activities, the other village is used as a bazaar, commercial functions. When 6 of the villages with different functions are coming together they create city for 10,000 people.

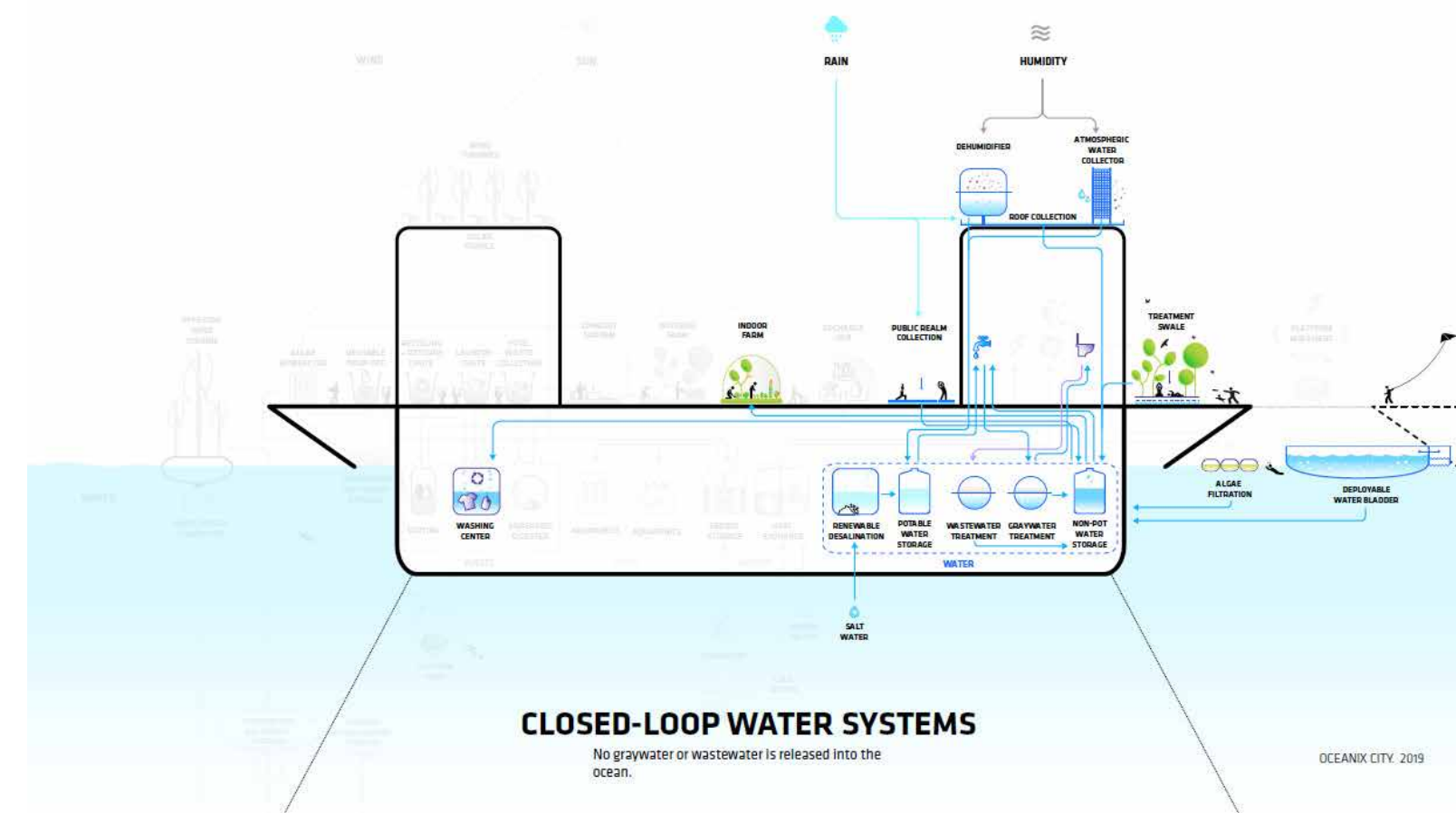
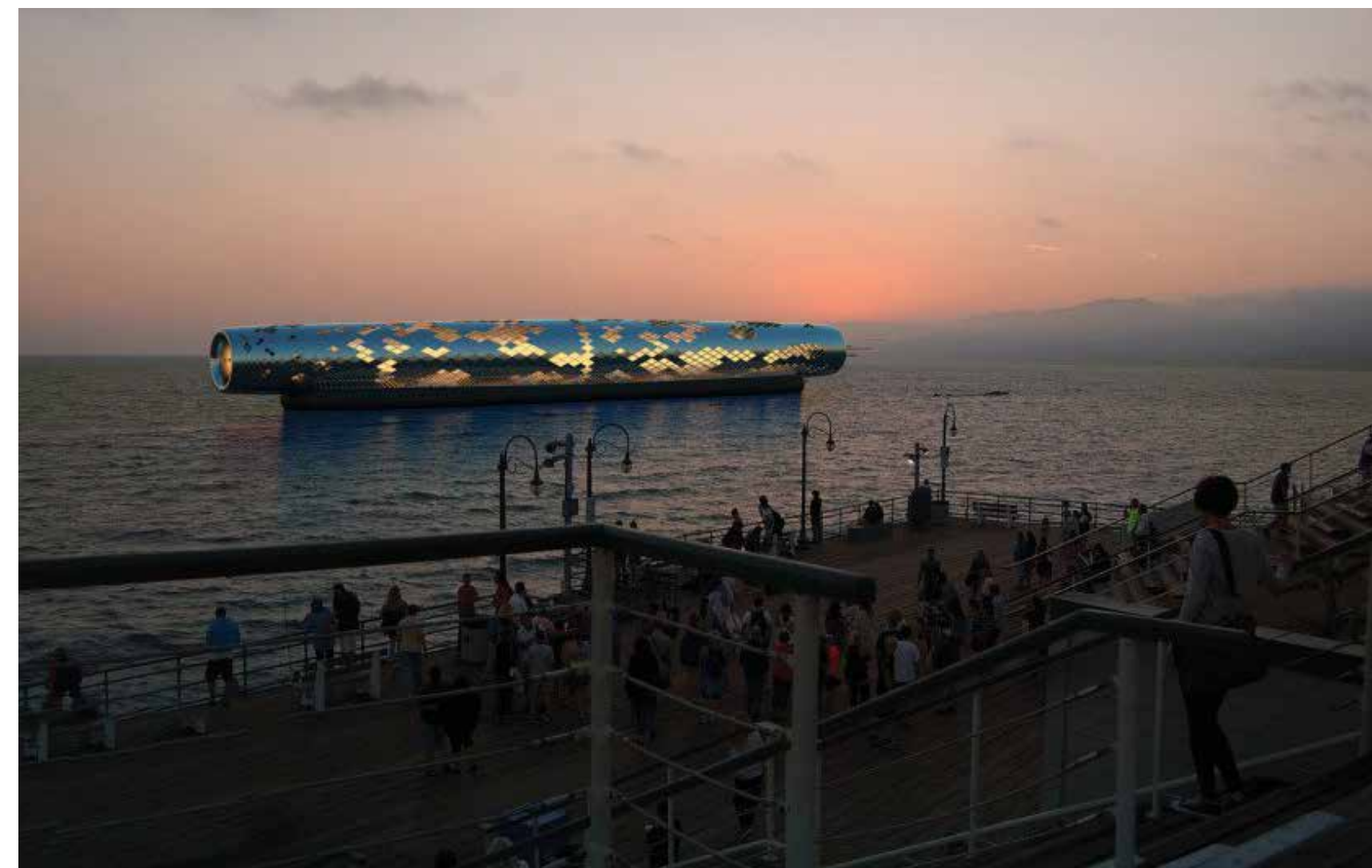




## THE PIPE

Submission to the 2016 Land Art Generator Initiative design competition for Santa Monica

It is designed as a public space, which included thermal baths, hut-thubs, and as a pipe that desalinate the water. With electromagnetic field that is created by using the solar panel inside, the ions are attached to this magnetic area, and gets purified



# BLUE21

## Designed by DeltaSYNC For Research Propose

Infusion of sustainable features like hydroponic growing systems, bio-fuel production through floating algae, and protected fish and seafood habitats will result in "cyclical metabolism" hence making the floating ecosystem altogether more logical. To top it all, this could be "plugged in" at various existing city deltas and also act as the treatment plant for the local waste materials and CO2 emissions that result in city pollution.



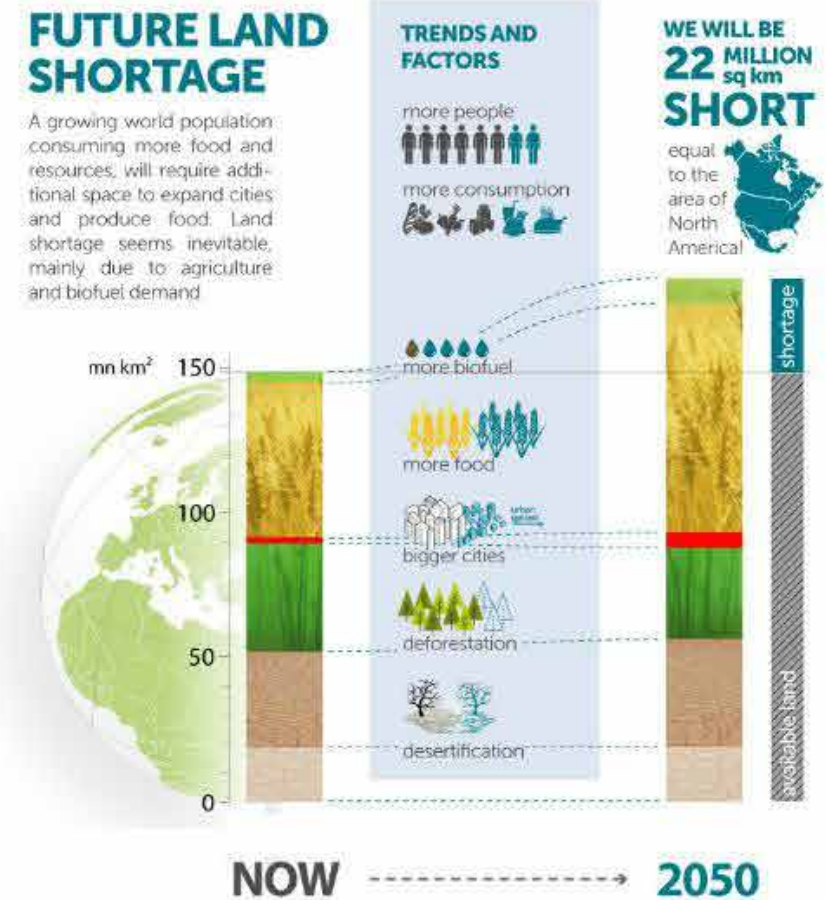
# REGEN VILLAGES

## Designed by ReGen Denmark

The project imagines a community of buildings that produce all their own food and energy – a model that aims to tackle a wide spectrum of global issues, from the food and



## WHY IS IT TIME FOR A BLUE REVOLUTION?



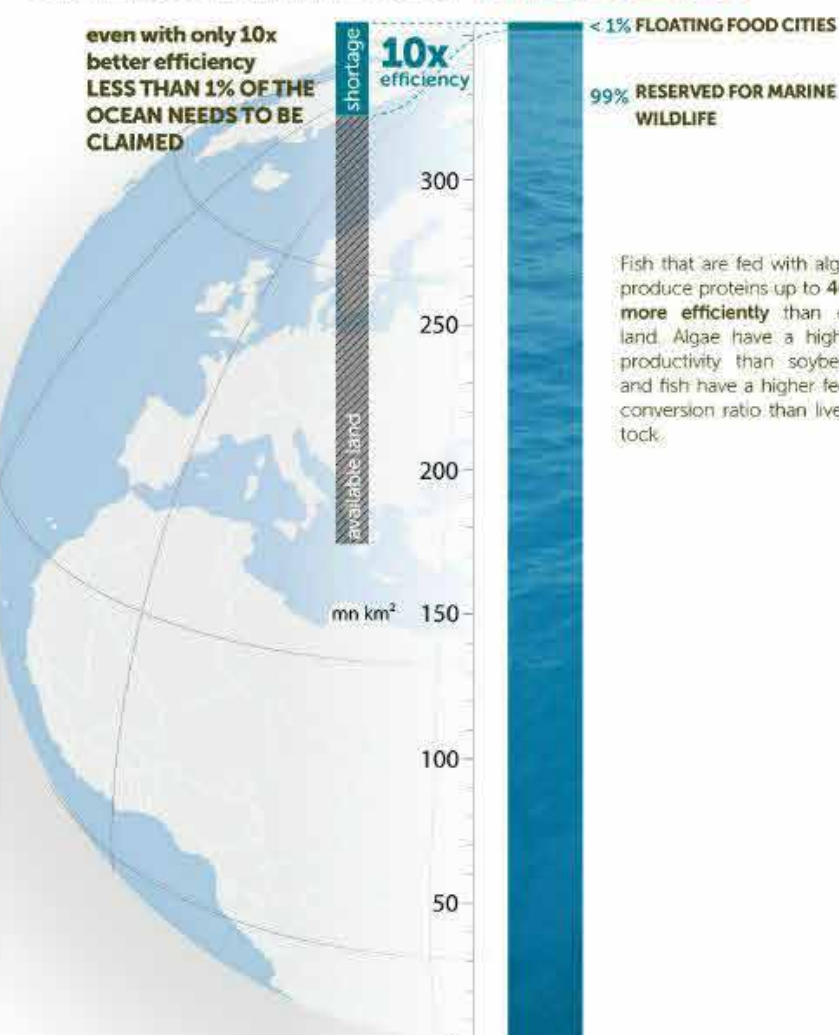
## HOW ARE WE GOING TO GET THIS SPACE?



## ON WATER WE CAN BE MORE EFFICIENT



## CREATING NEW SPACE ON LESS THAN 1% OF THE OCEANS



## BIODIVERSITY MUSEUM IN PANAMA

Designed by Frank Gehry  
In Panama

This is one of the sculptural buildings' of Gehry's. It is designed as a biodiversity museum. By using the colorful canopies, he tried to handle with the hot climate in Panama, and create an accessible public space.



## OMEGA CENTER FOR SUSTAINABLE LIVING

Designed by John Todd Ecological  
Design  
New York, USA

The Omega Center for Sustainable Living may be the most beautiful wastewater treatment plant in the world. Invented by Dr. John Todd, the building is powered by solar and geothermal power, so it requires no additional power to operate. It is not using any chemicals to treat the water, with the plants the grey water is getting cleaned in each step.



How does this living machine work?



# DESIGN

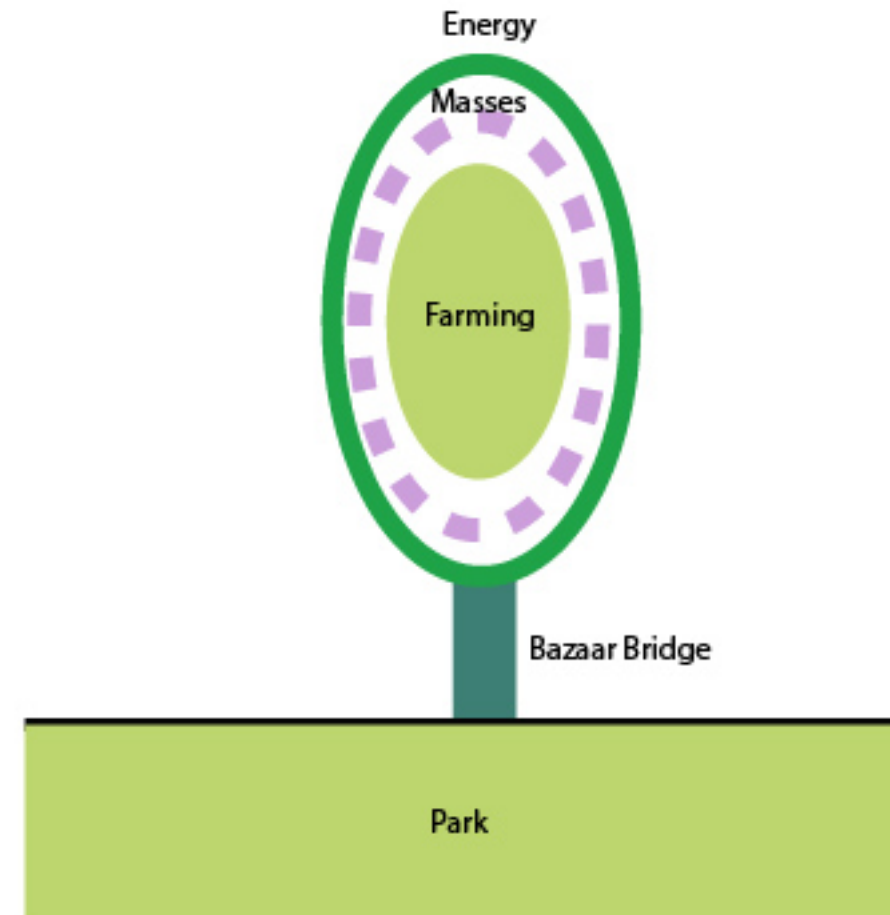




Mobile prototype,  
that can travel all around the world



Focused on Bosphorus



Conceptual areas

Oasis ii is a disaster relief vessel that can travel all around the world in order to help people, develop their economy.

For a starting point, Bosphorus is selected and appropriate areas for berthing. For this purpose, the greenery areas, parks will be used, and the prototype itself will work as an extension greenery with a farming unit inside.

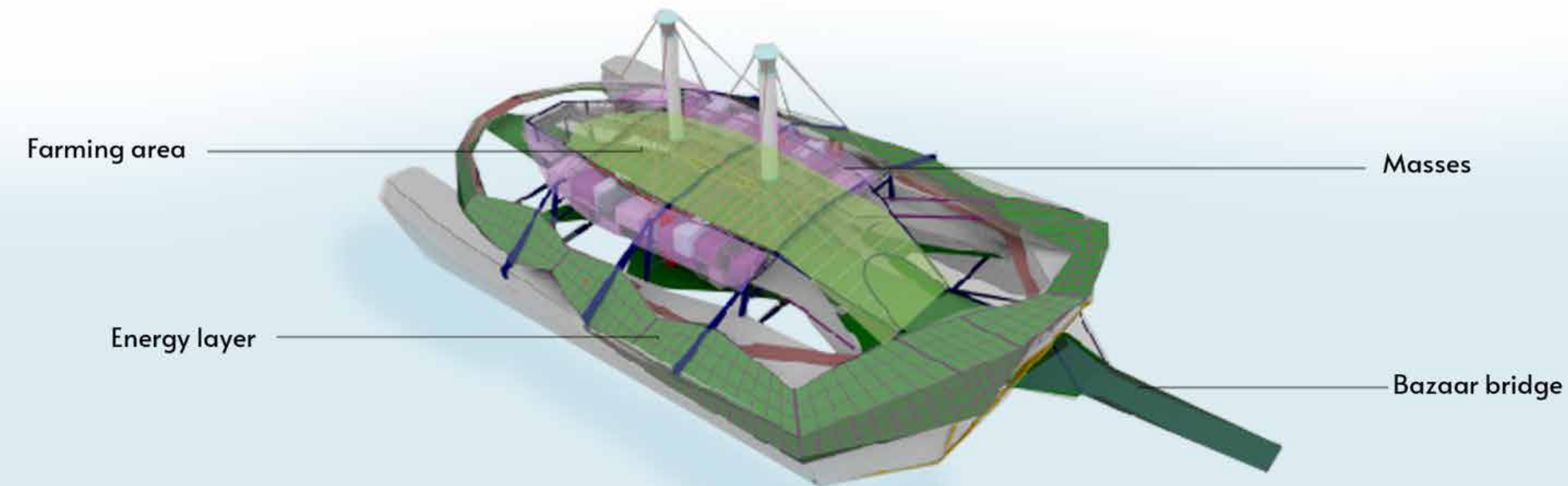
The prototype has this basic concept; The outer layer is an energy layer, which works as a buffer zone, then the masses come, and in the heart of the prototype farming unit is located. When the prototype is berthed, the bazaar bridge will be opened and connected to the coastal line.

## Before disaster,

- Touristical area
- Farming zone that people can grow their own foods and learn how to do that
- Marine labs, aquariums to see the situation

## After disaster,

- Gathering area
- Shelter
- Water & Food provider



## ECONOMICALLY

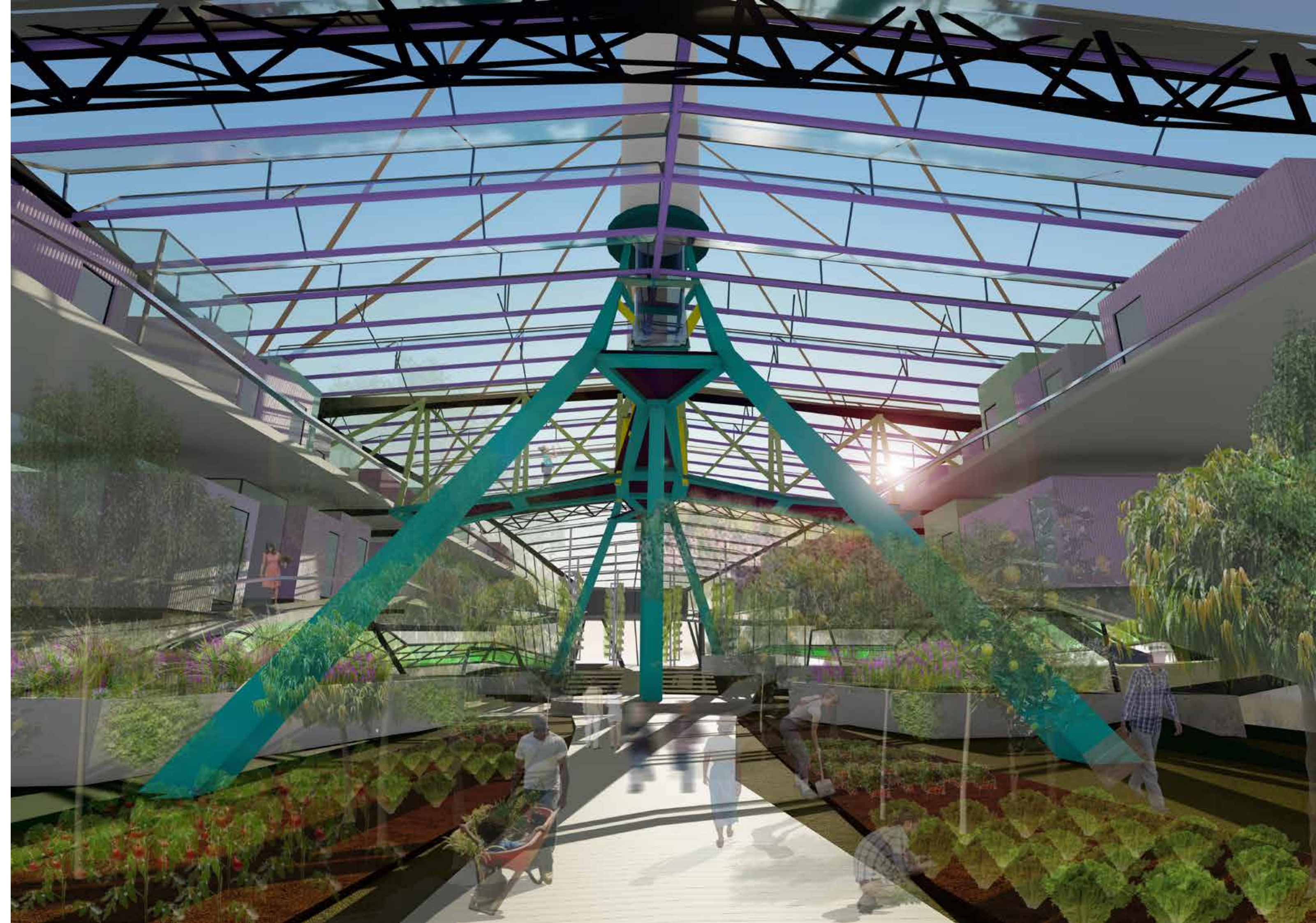
- In Farming areas (Ocean farming, Greenhouse) the food that will be used in the prototype will be grown and sold with a bazaar line on the bridge part
- Desalinate the water, used it and sell it
- The energy that prototype needs is produced and with the batteries it will be sold
- With hotel rooms, prototype helps to develop touristical economy of the city

## ENVIRONMENTALLY

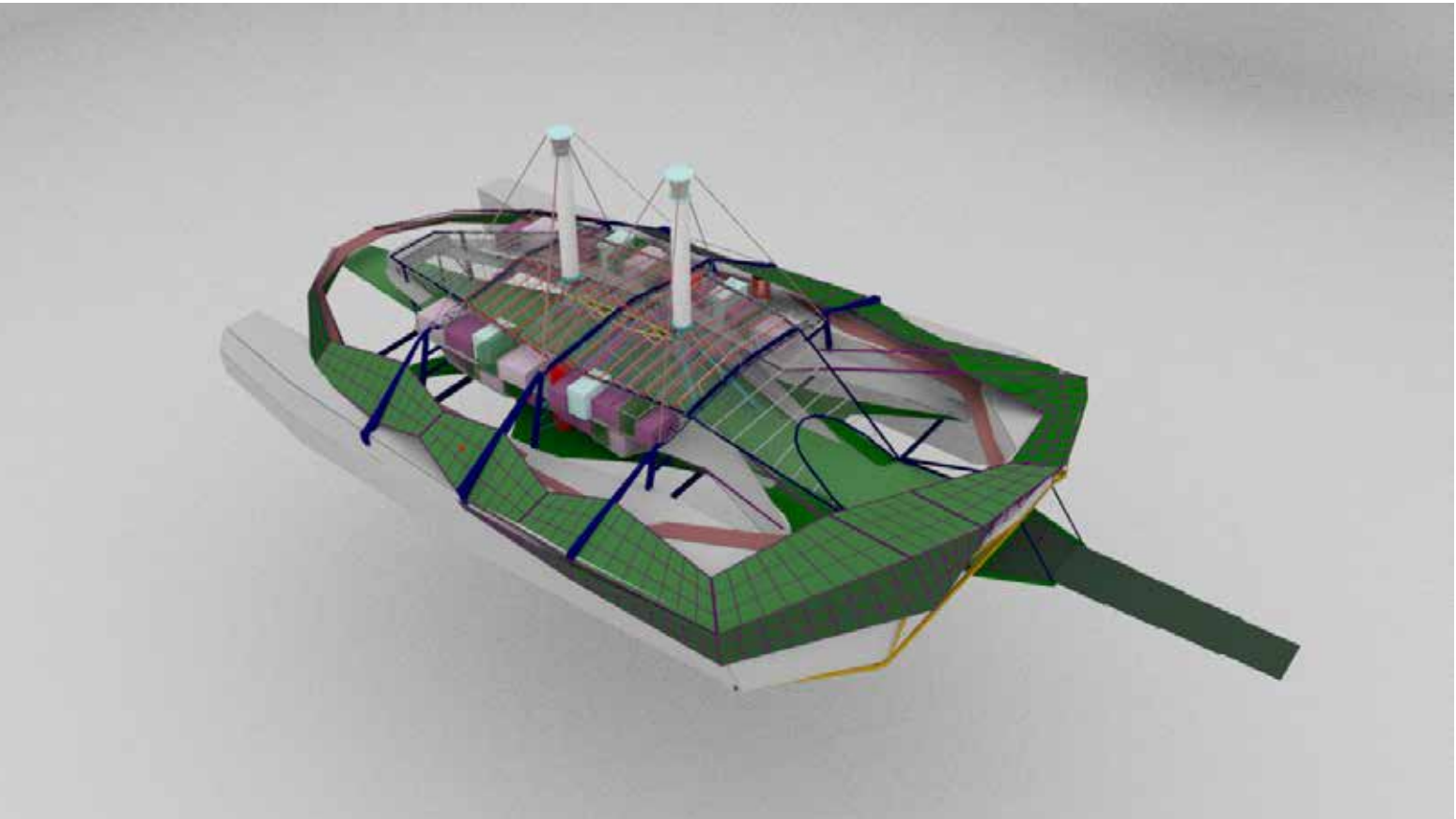
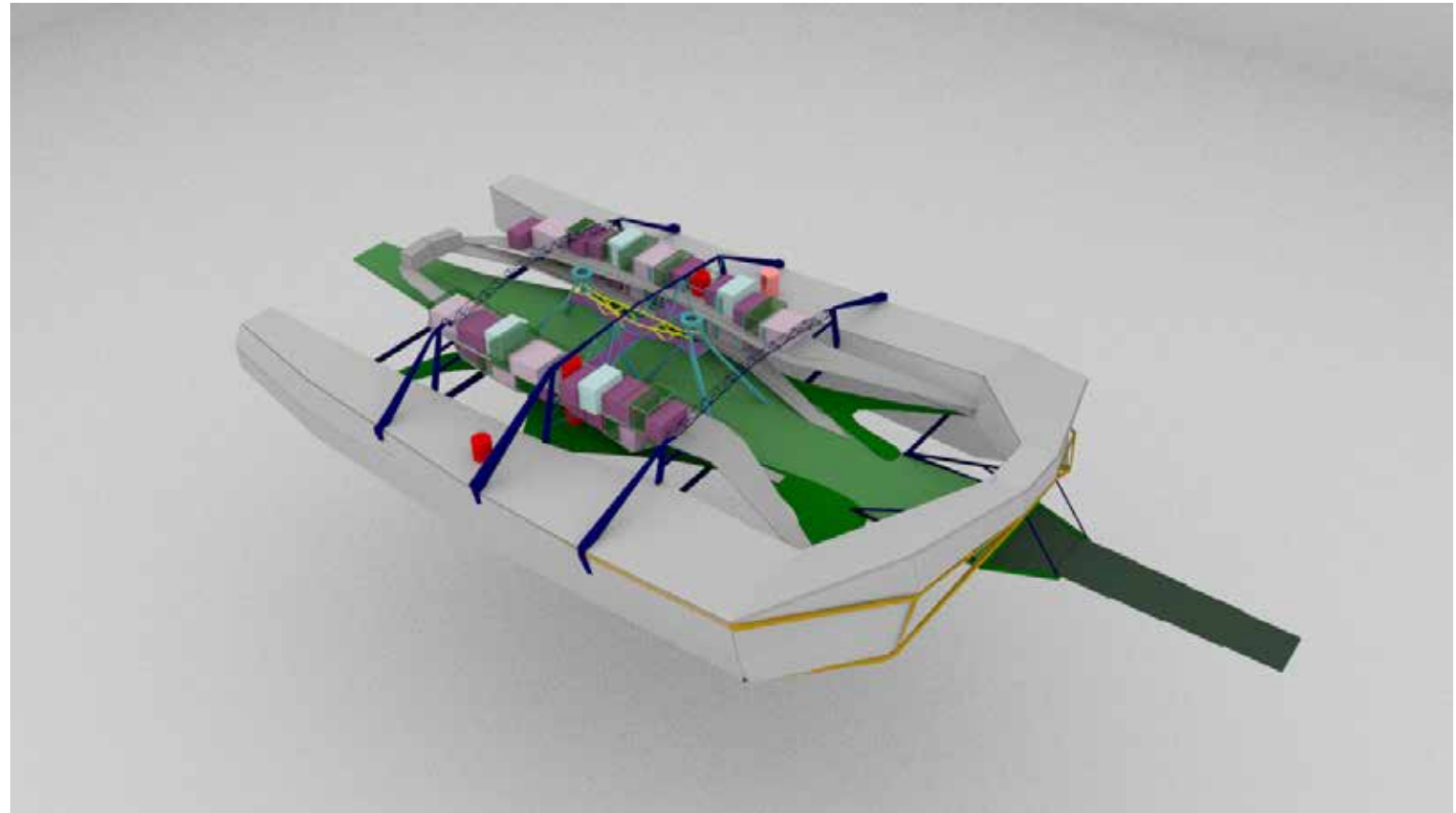
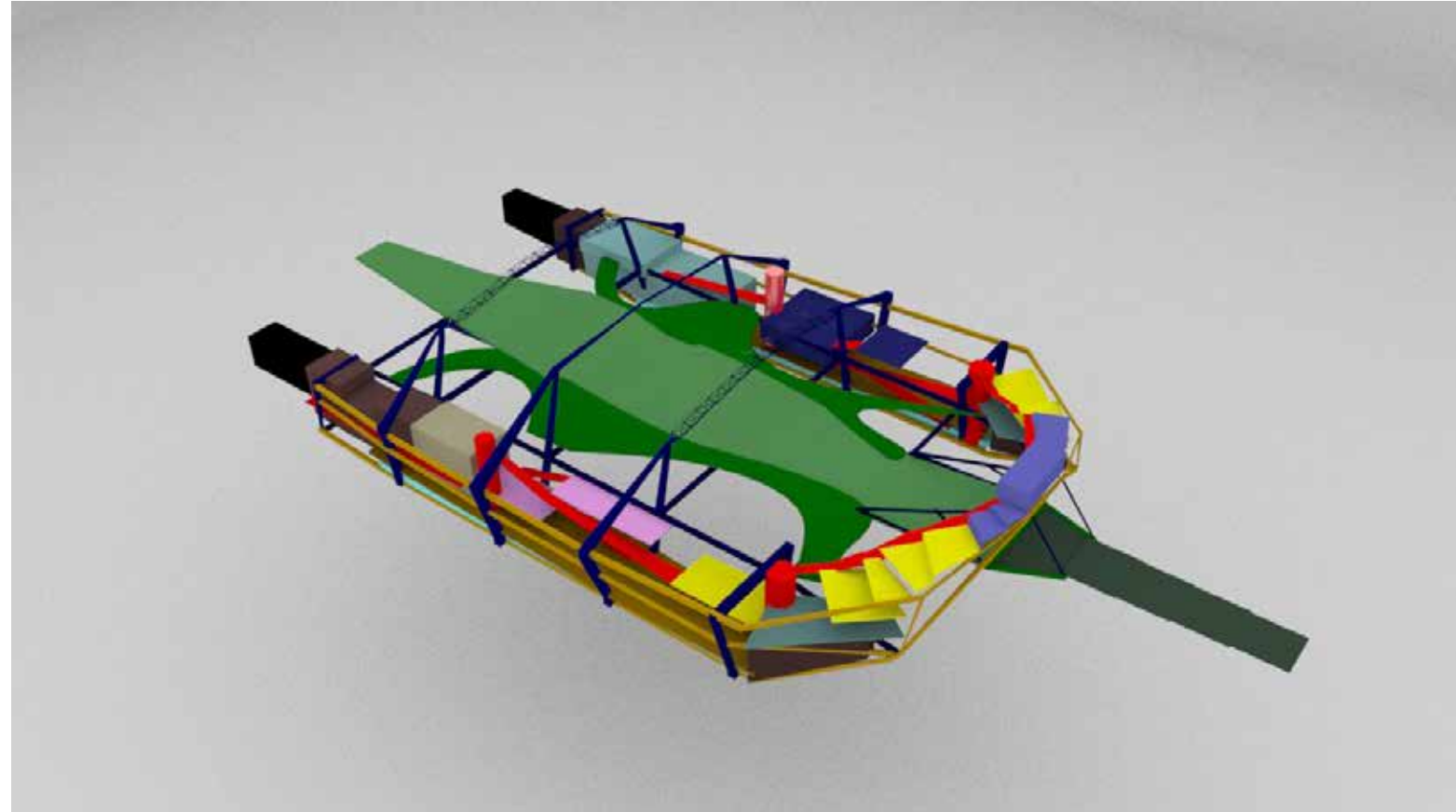
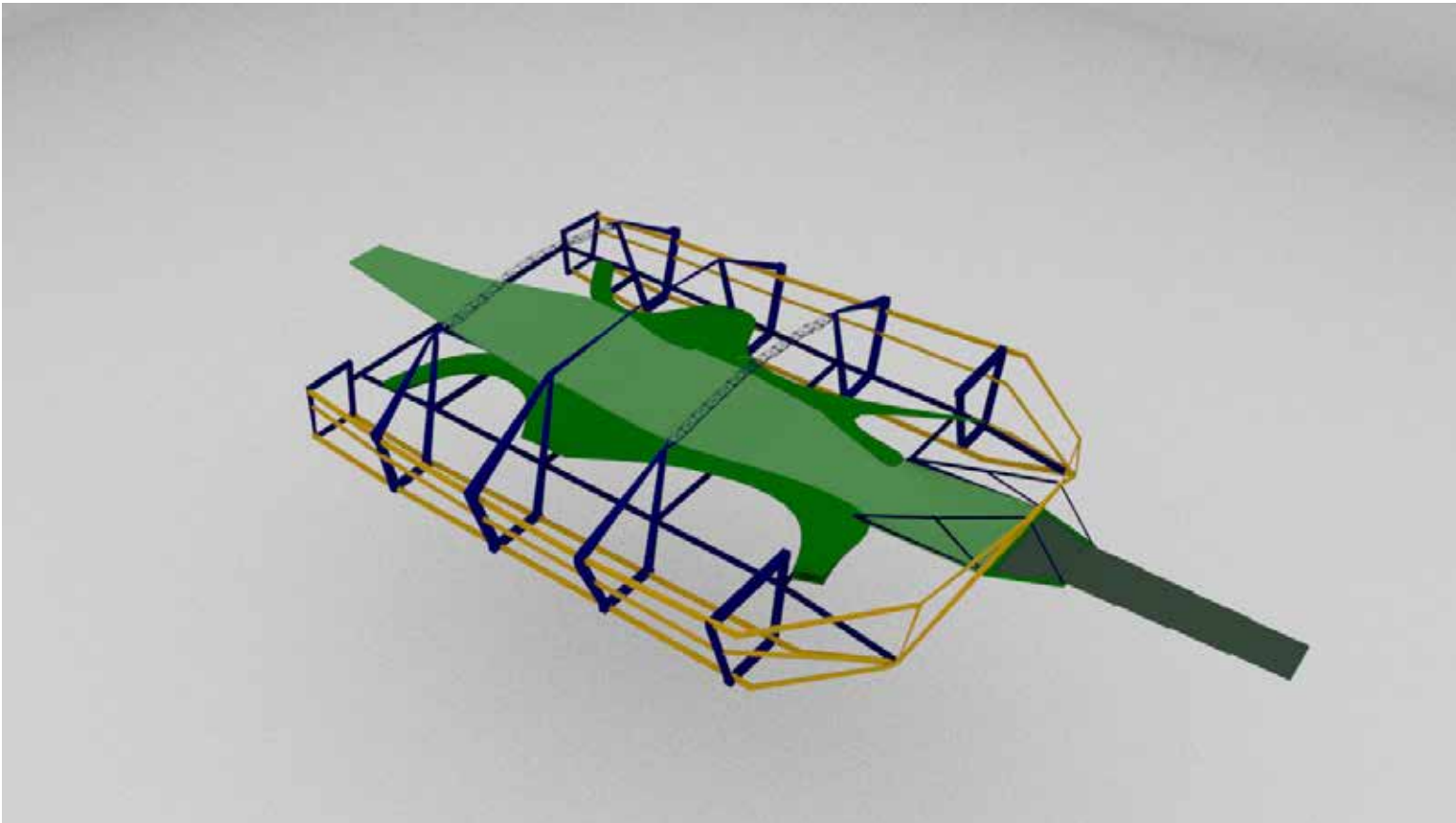
- With biorock material and ocean farming it help marine regeneration and also cleans the water
- With marine research labs the new technology will be developed
- It reduces CO2 emission by producing its own energy and the offering that it has

## SOCIO-CULTURALLY

- A protected gathering area
- A zone for shelters
- A place to learn about farming, marine life



# HOW ALL THE PIECES ARE COMING TOGETHER?







## STRUCTURE

Since the Catamaran types are one of the most stabilized dedesigns, Oasis's structure is created as an abstraction of it. Steel hulls(blue ones) are used as a main strcutral element for the pantoons  
 Truss is the one which connects pantoons to each other and carries the greenhouse roof  
 Tensile Cables is used to stabilize rotor cylinders.

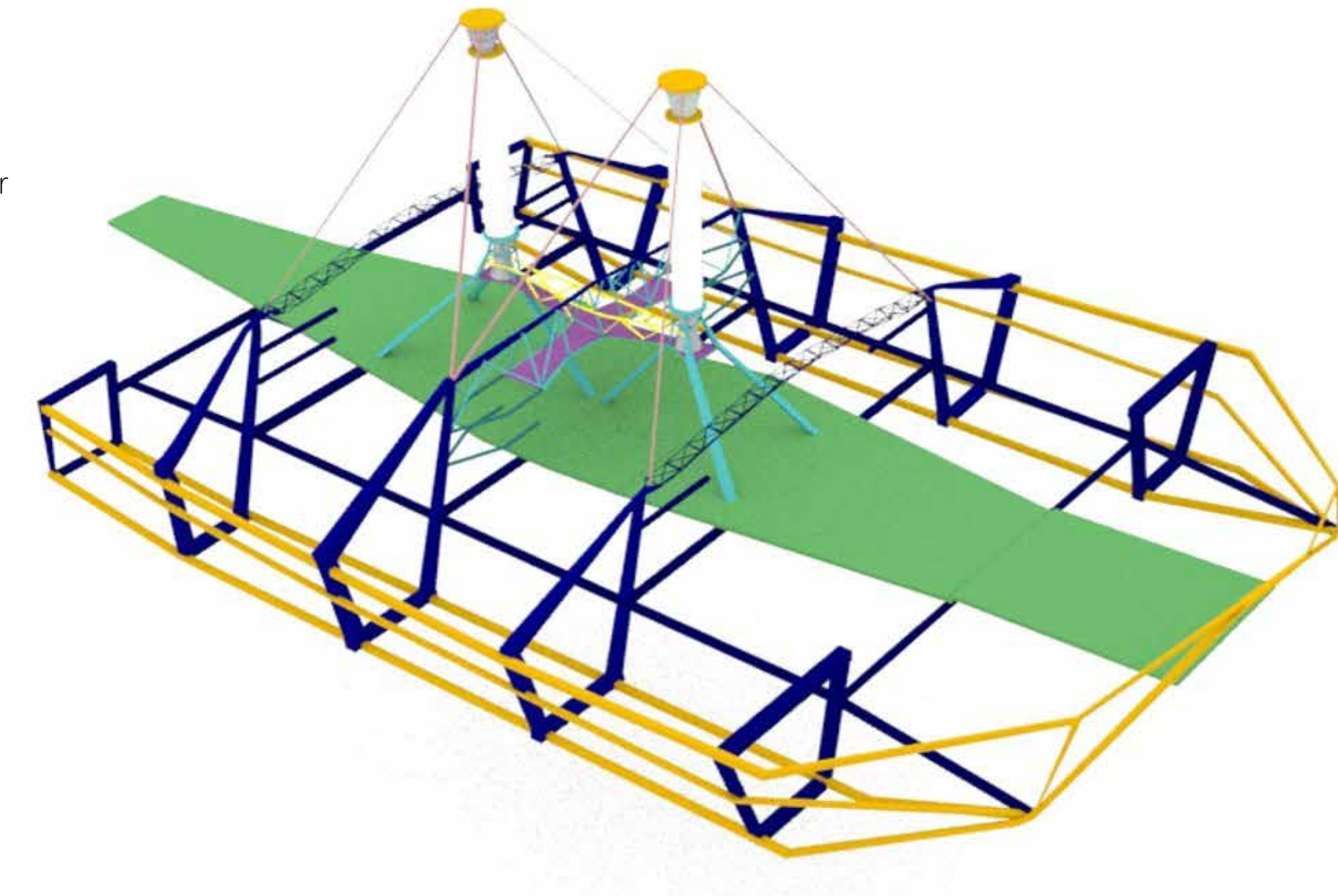


## MATERIAL SELECTION

CARBON FIBER HULL DESIGN



RECYCLED CONTAINERS



# KEY PROPERTIES & SYSTEMS



WATER



STABILIZATION  
SYSTEMS



MARINE  
REGENERATION



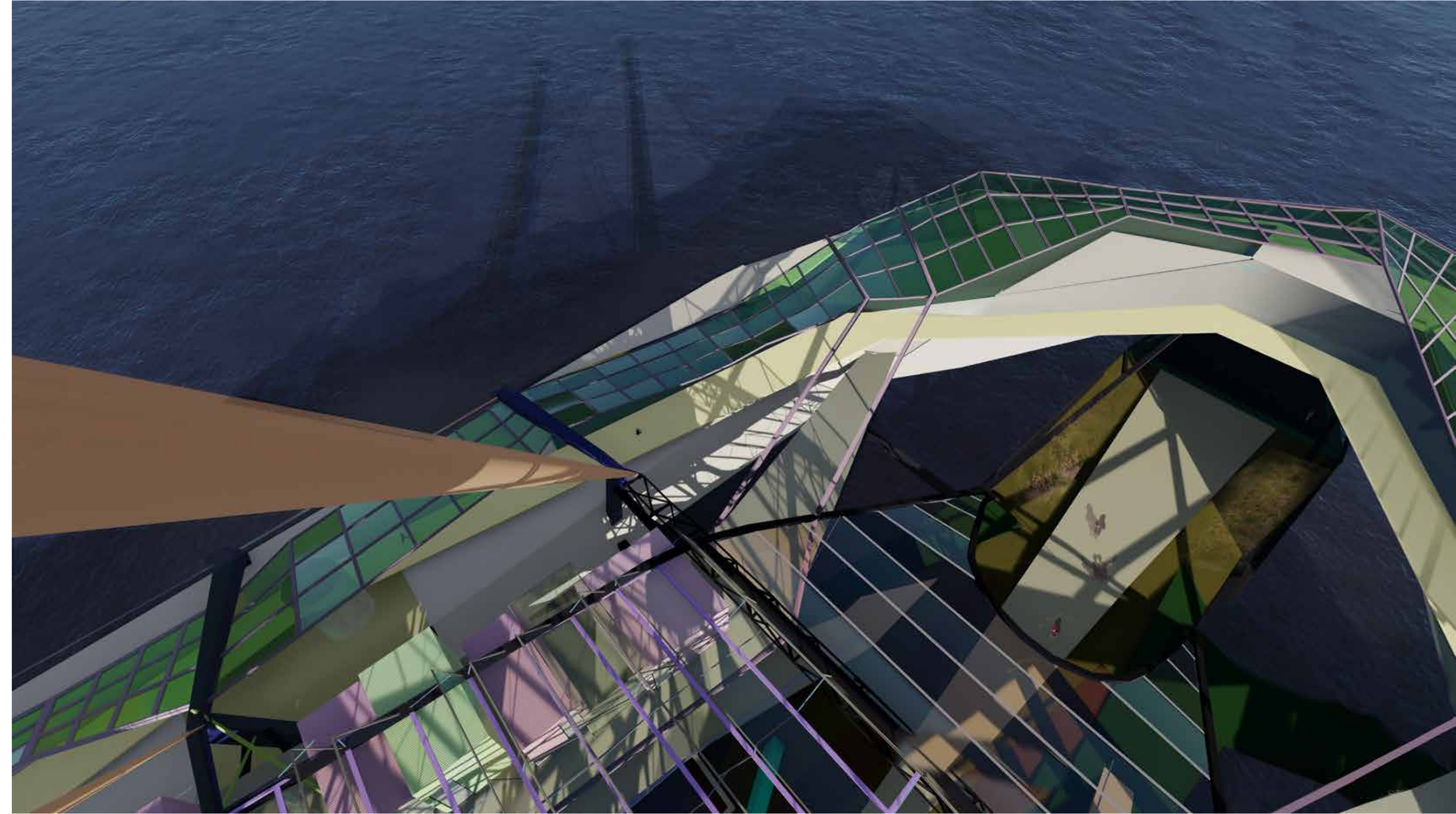
ENERGY

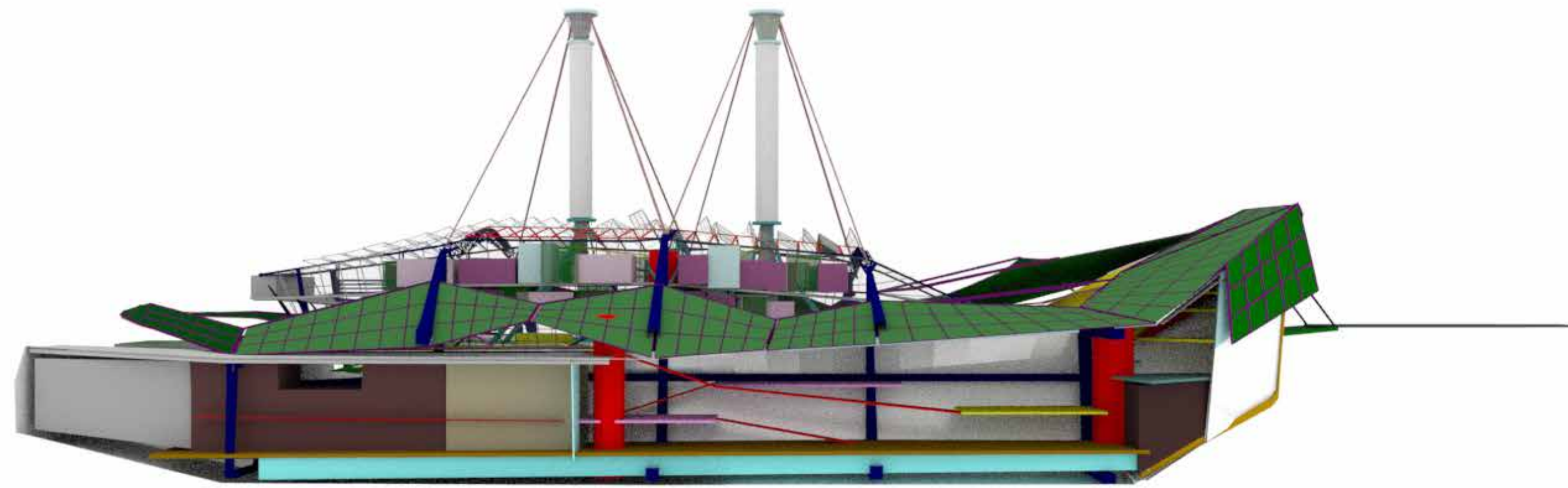
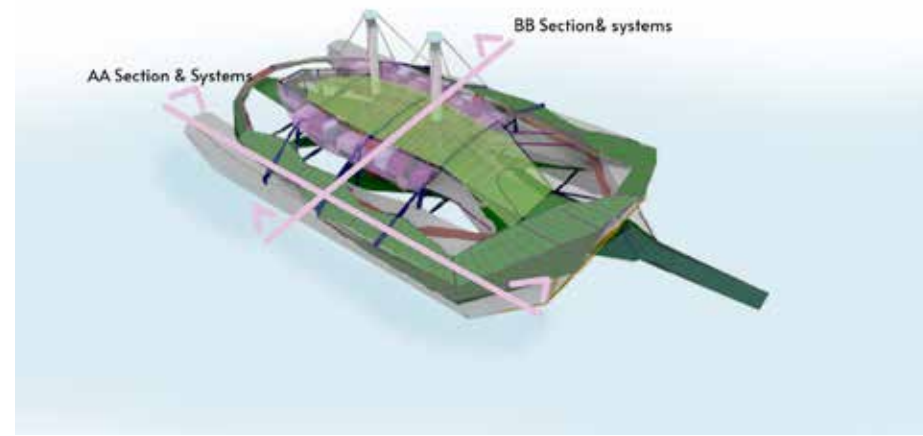


FOOD

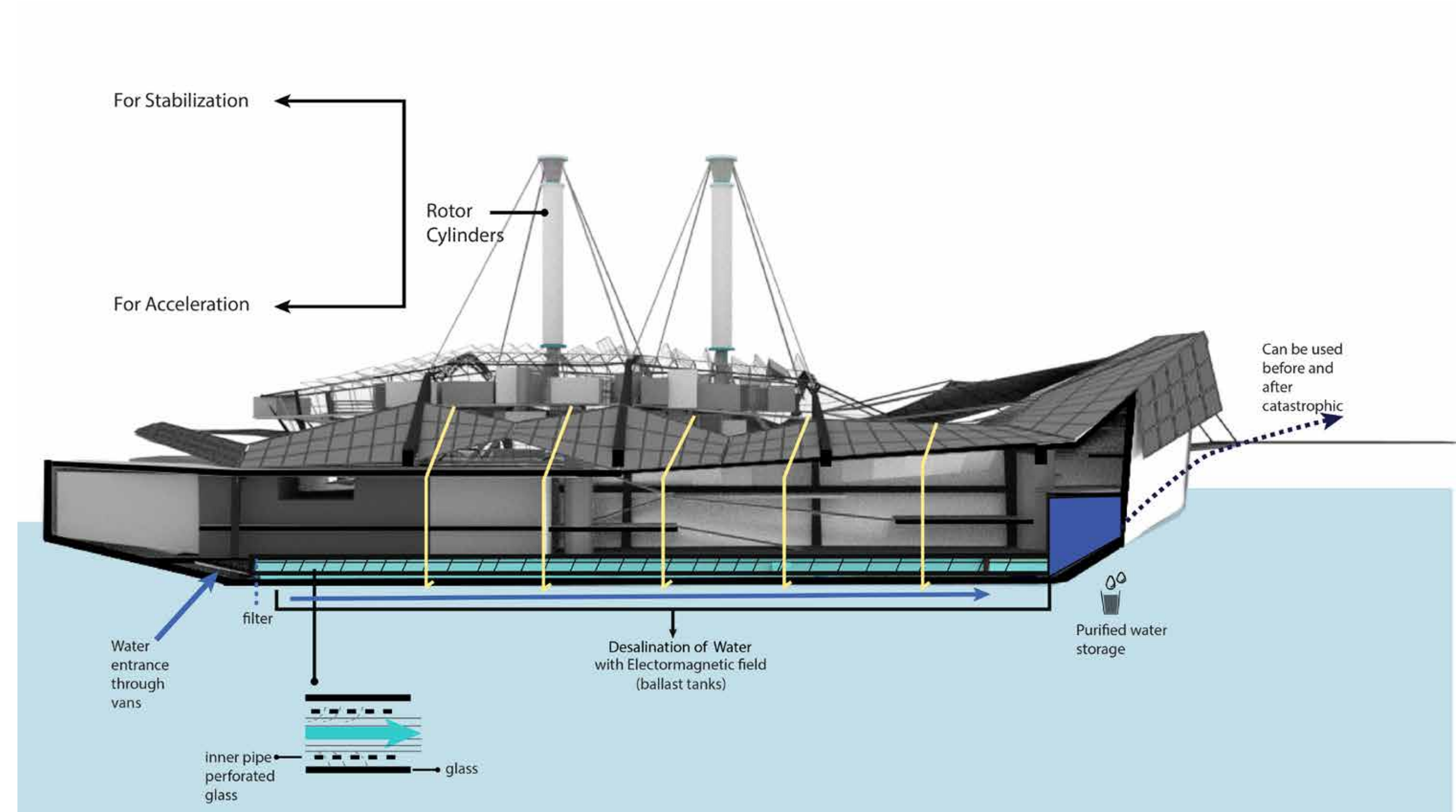


WASTE SYSTEMS



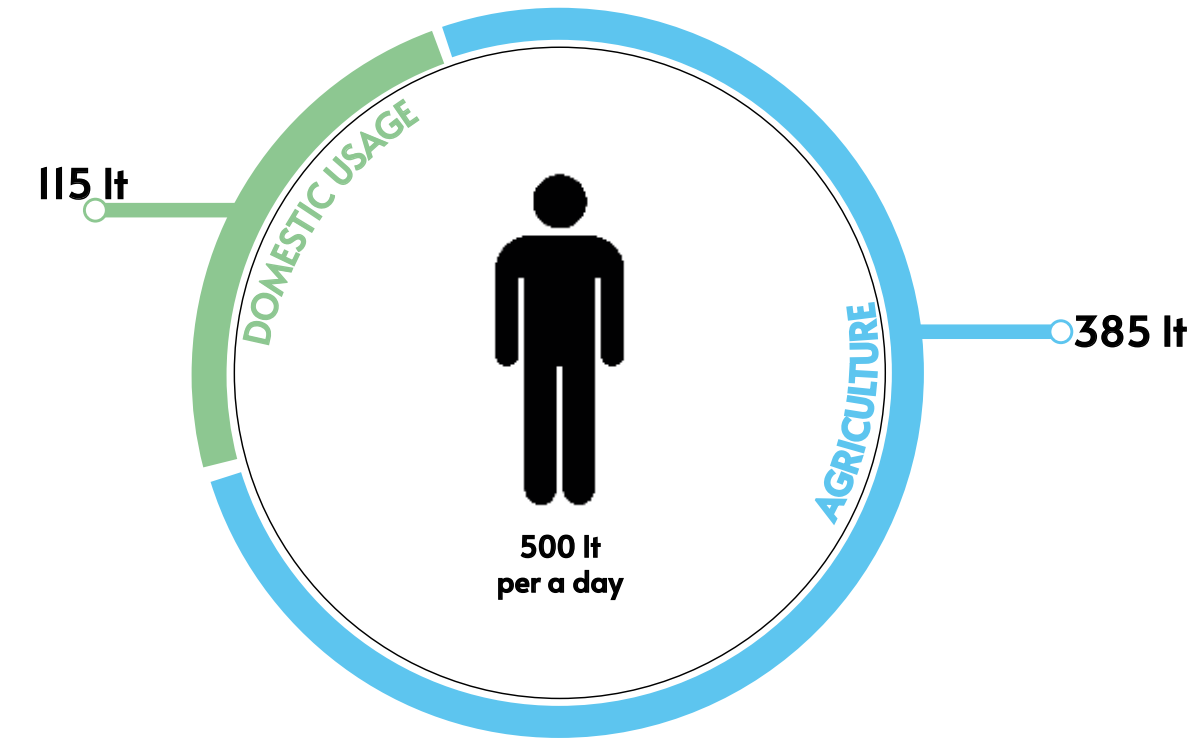


AA SECTION





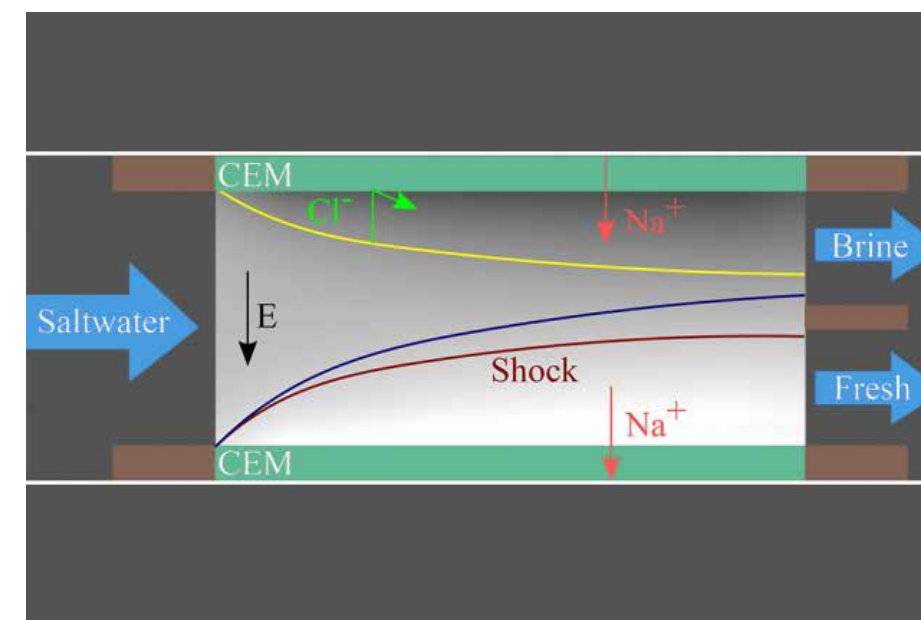
How many liters does each person need for a day?



## ELECTRO-MAGNETIC FIELD DESALINATION

With electromagnetic field that is created under the pantoons part, water will get purified along with it. Ions will stick to the perforated glass surface, and at the end it will be stored.

Thanks to this easy and fast system, clean water can be accessible in any circumstance.

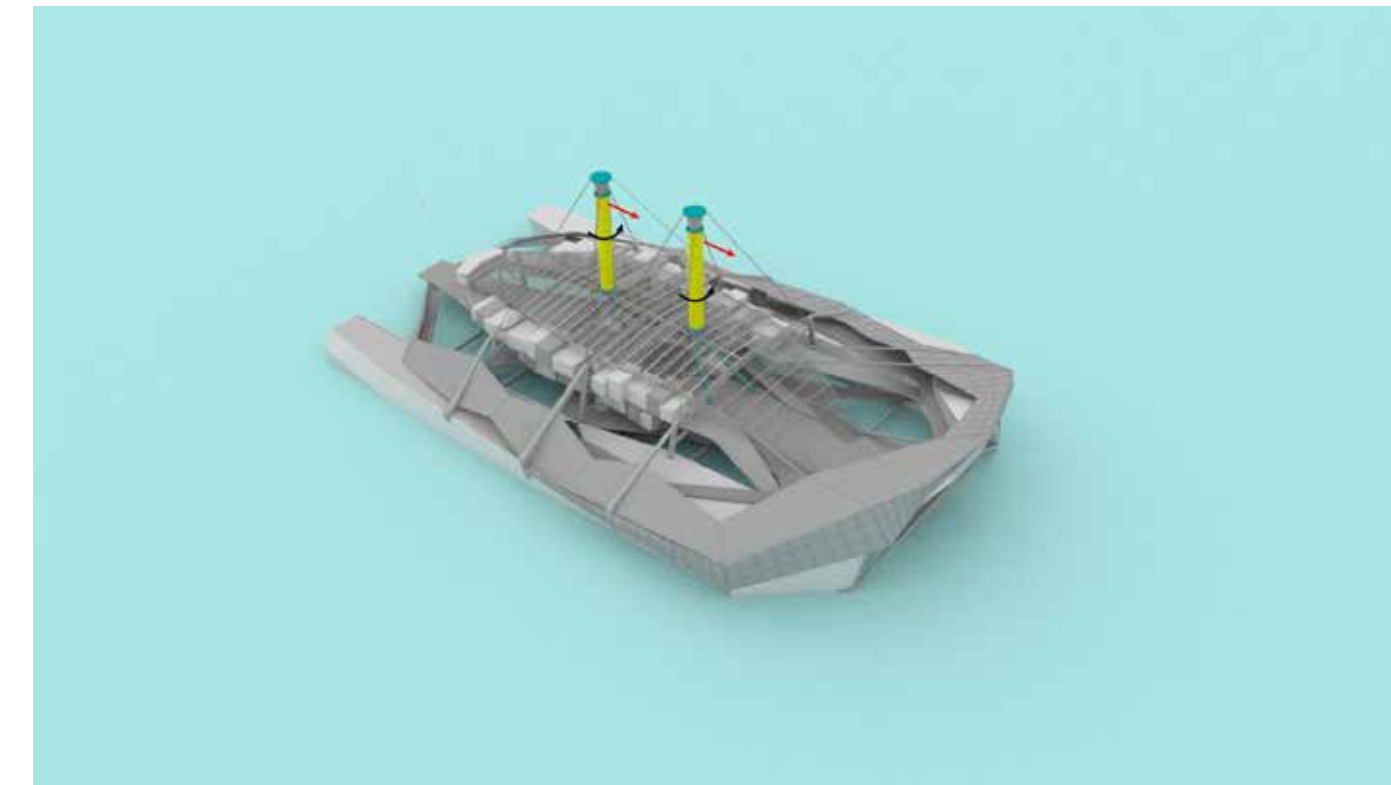


## ROTOR CYLINDERS

This is a system, which uses simple airfoils principle. The cylinder turns around with the help of a motor, and creates different air pressures at the sides. At the side of the where wind is moving faster, it creates low pressure., at the where it is moving slower, it creates high pressure. as a result of these difference lifting occurs towards to where the pressure is low.

When, the prototype is immobile and at anchor , these structures are used as a stabilization element, by rotating temselves in different directions. When the mobilzation is needed, these cylindrical structures are used as element that provides acceleration.

### FOR ACCELERATION

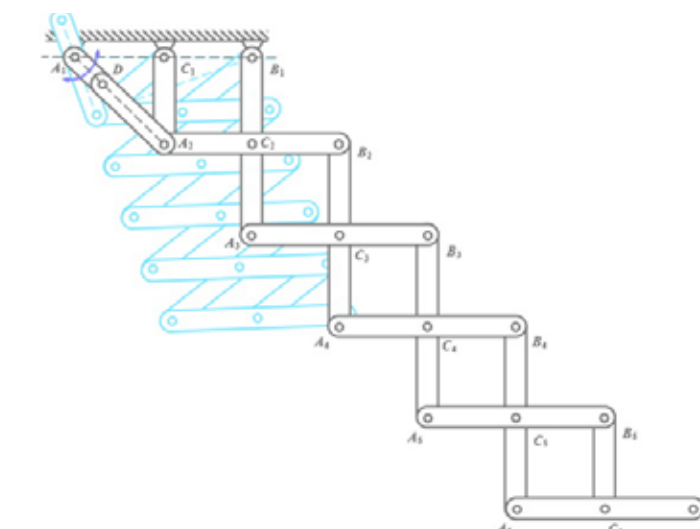
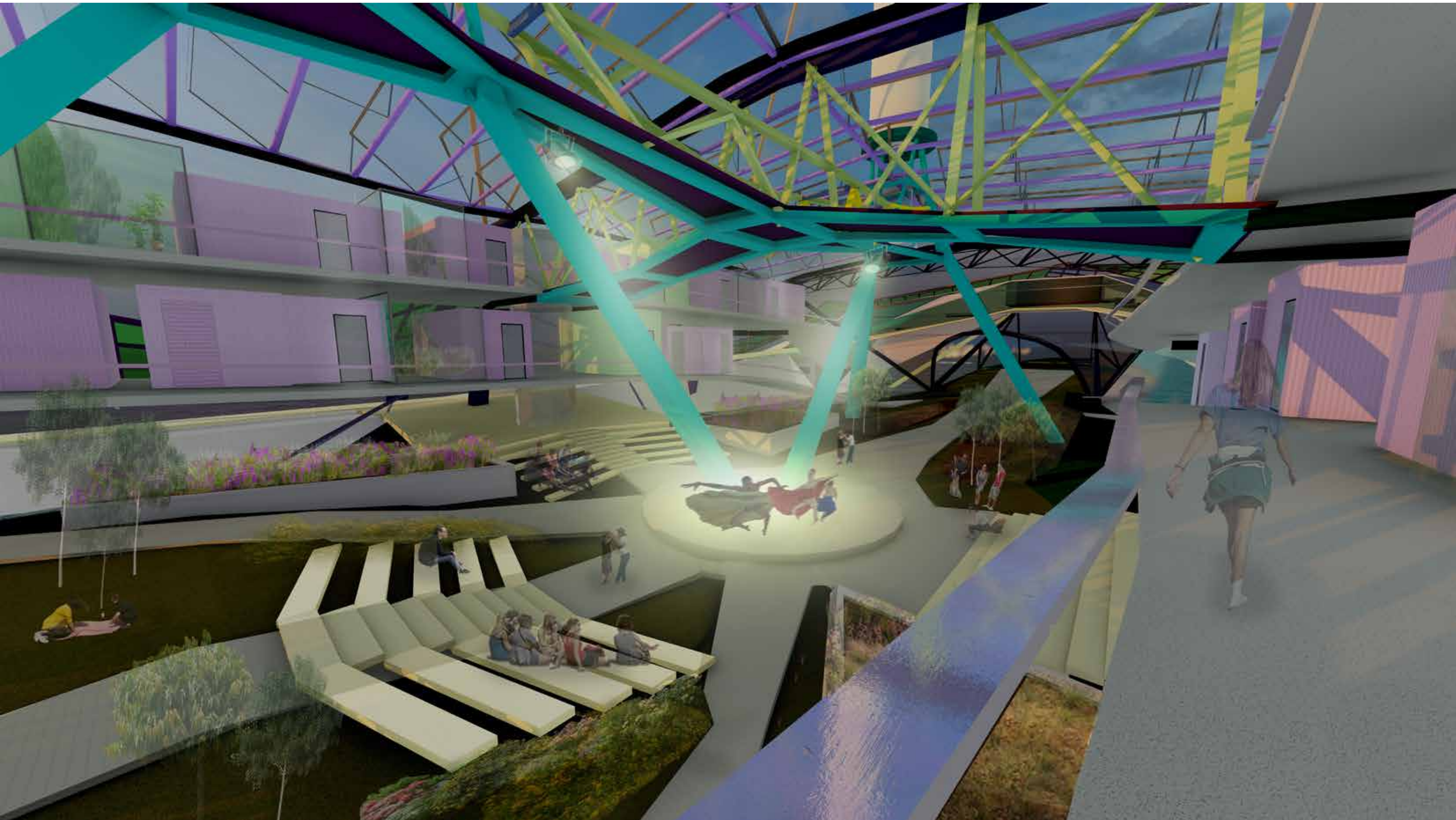


When rotor cylinders turn in the same direction, it affects the velocity of wind. Each side will have different velocities and also pressures. So, as a result of high pressure, Oasis will be lifted by it, and starts to accelerate.

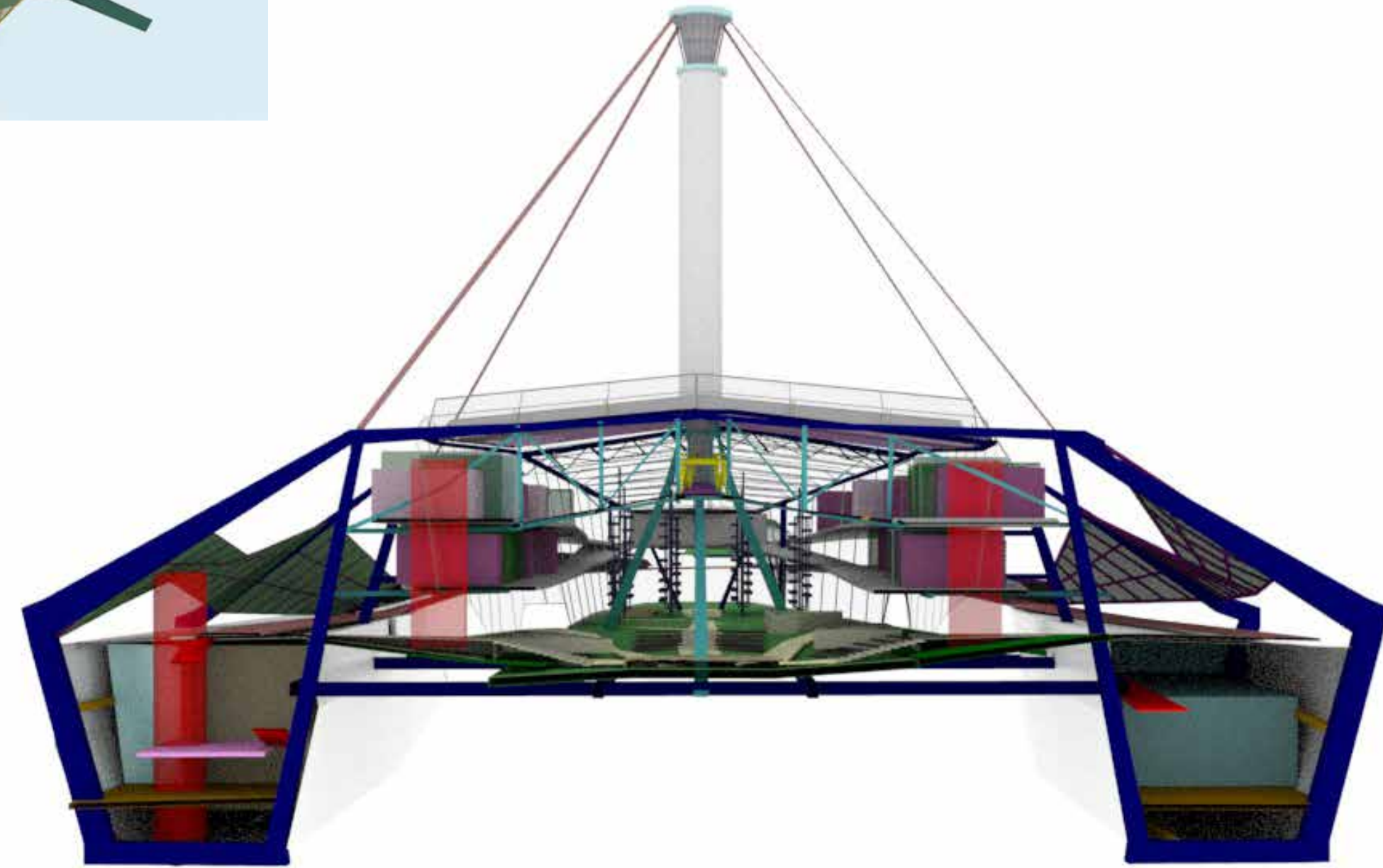
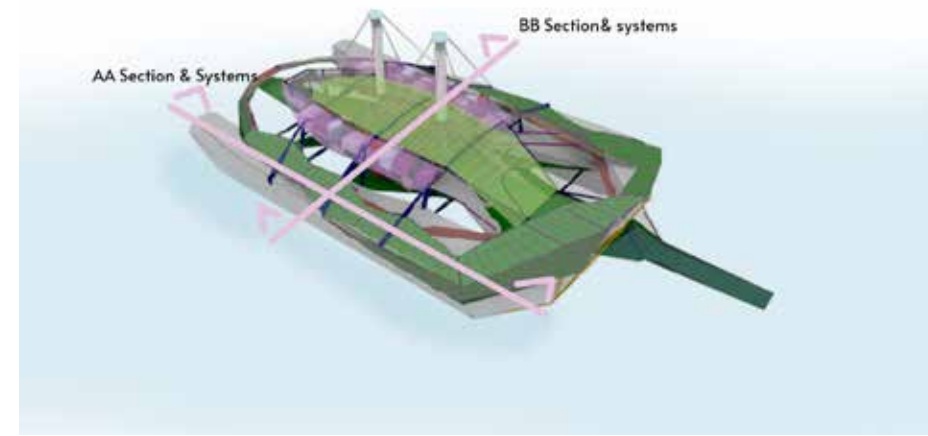
### FOR STABILIZATION



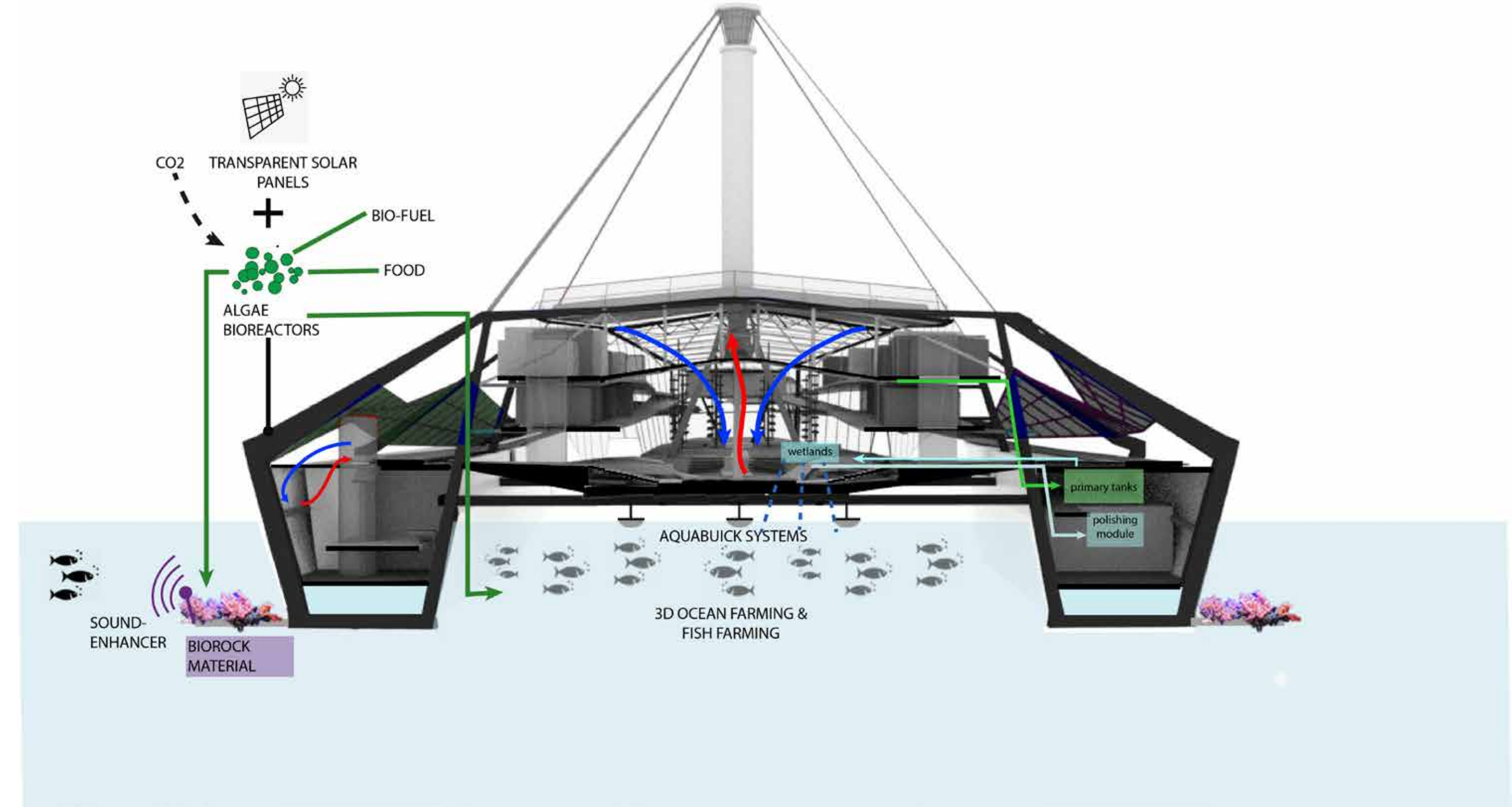
When rotor cylinders turn in the opposite direction, it affects the velocity of wind. Each side will have different velocities and also pressures. But this time, since they are rotating in different directions high pressure sides are also different in each one. So that, Oasis tried to be lifted in opposite directions, and stabilize it.

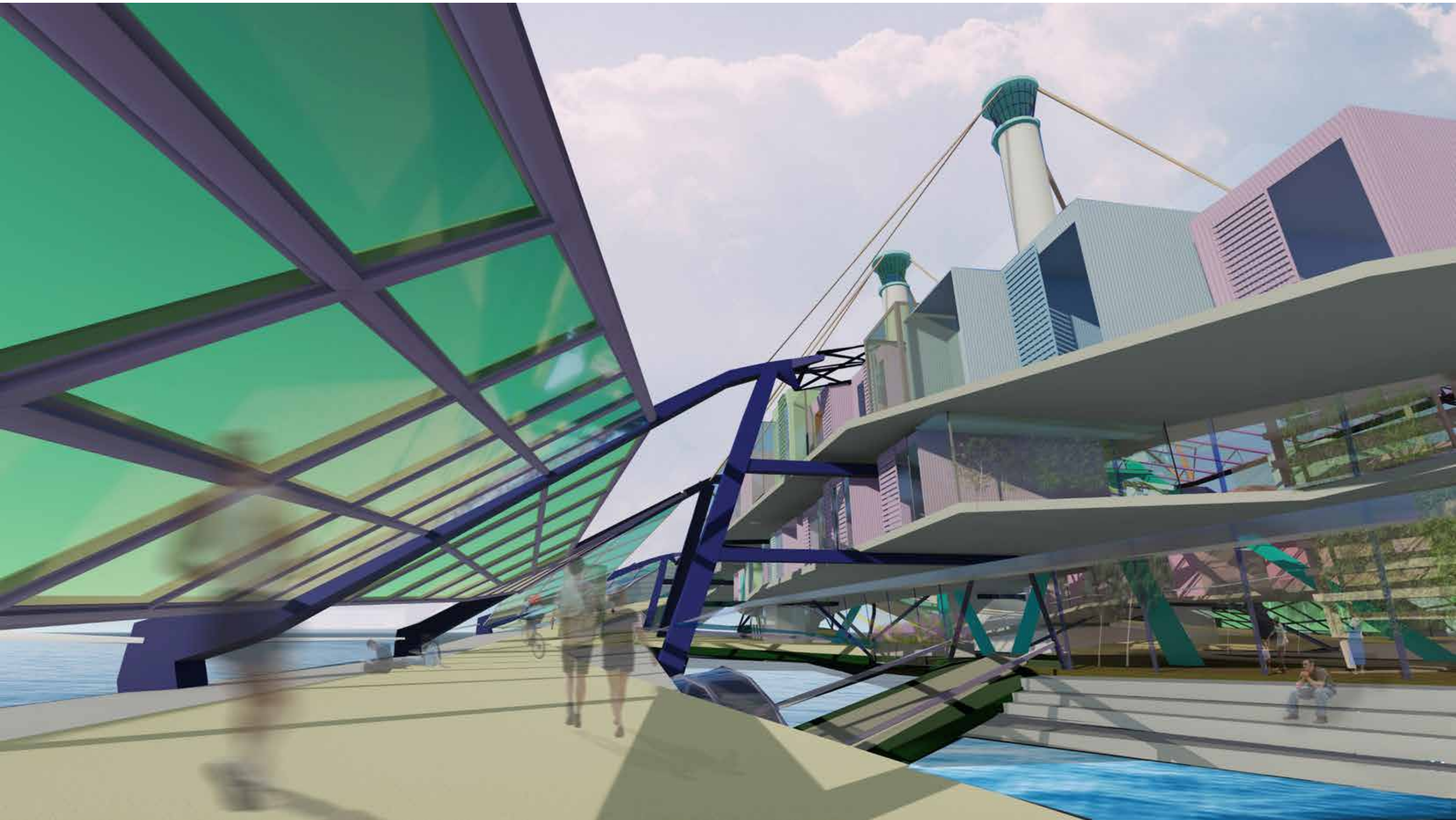


In normal time, Oasis hosts different events with an open auditorium. When catastrophic thing happens, the deployables stairs are folded, the stage is lowered down to have a huge gathering space to used as a healing space, and accomodate more people.



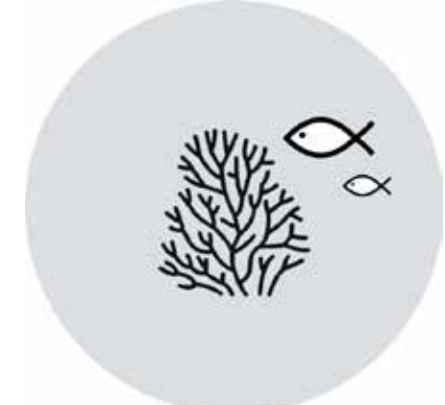
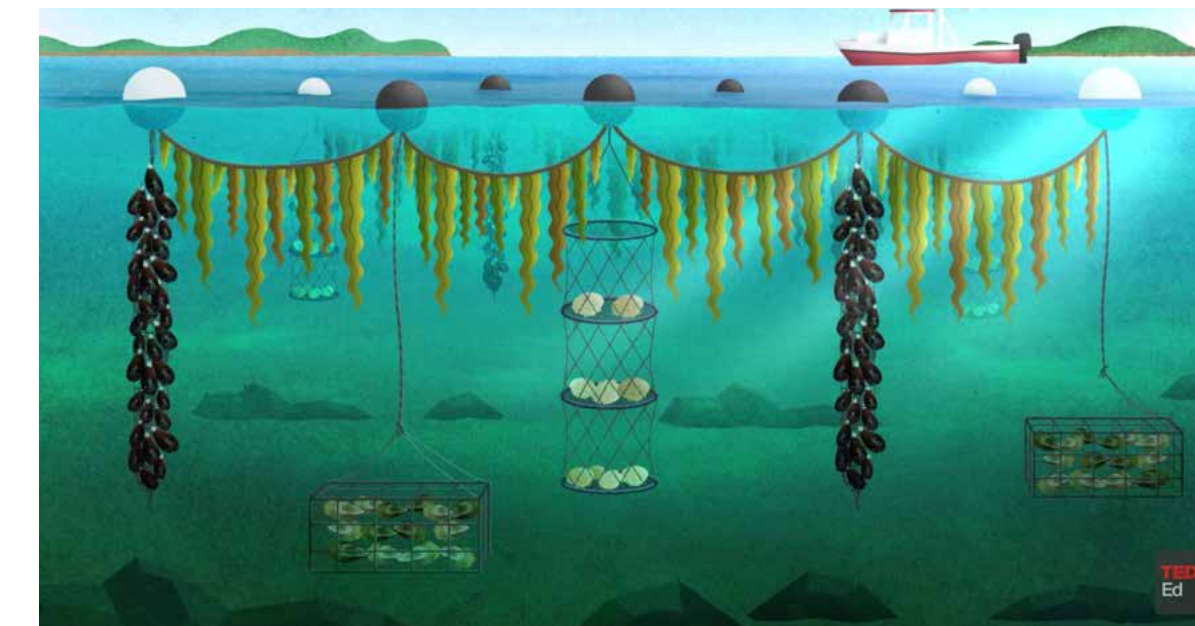
BB' SECTION





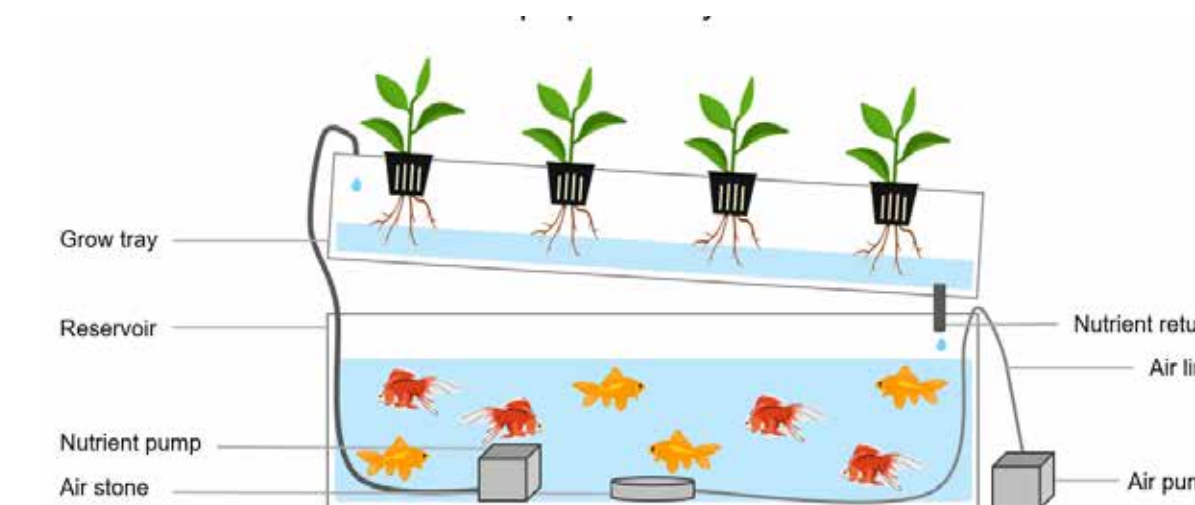
## OCEAN FARMING:

Seaweed, oysters and mussels are filtering the water. Oysters using nitrogen, while seaweeds synthesizing CO<sub>2</sub> to get their energy.



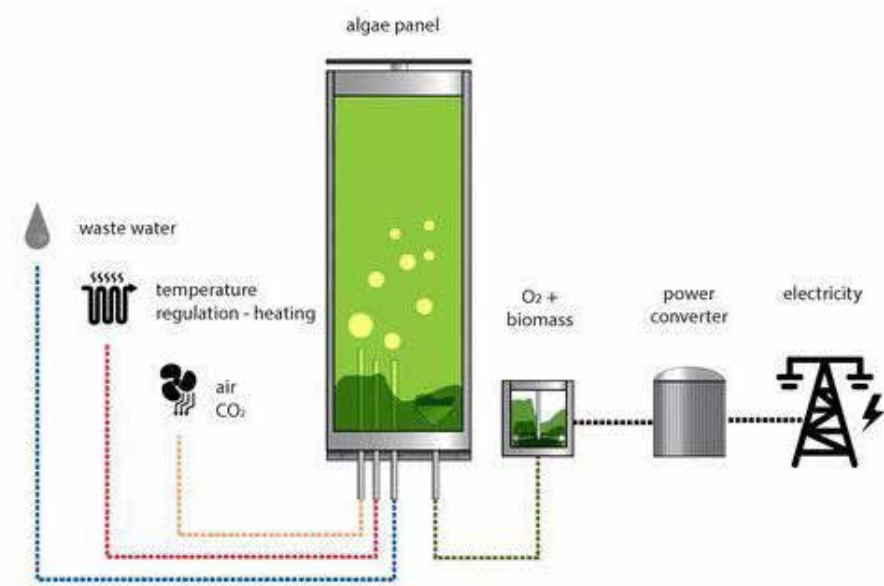
## AQUAPONICS:

Vertical farming part works as a aquaponic system. All the nutrient water at the bottom of the plants go to the fish farming area under the deck part.

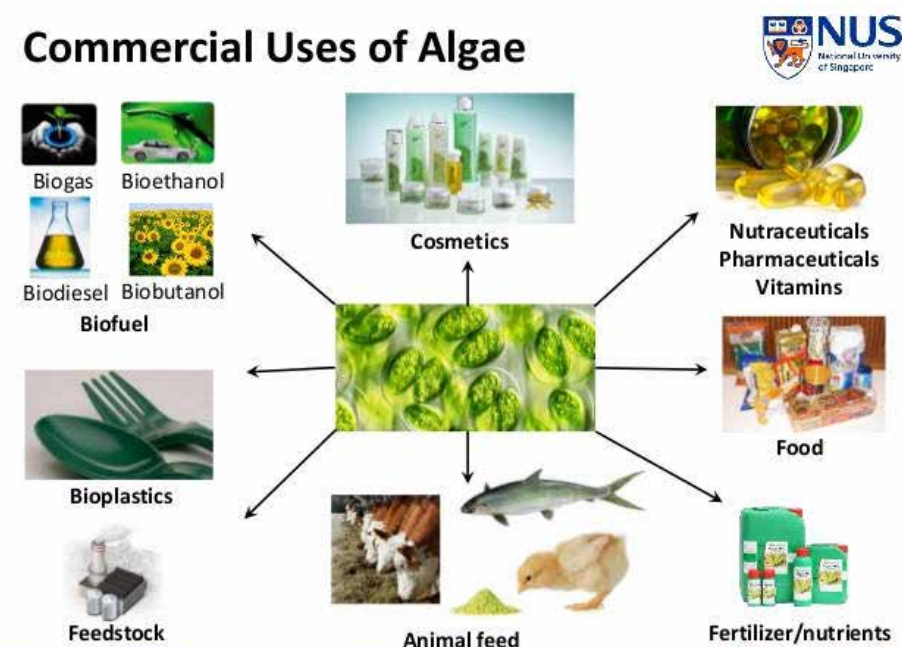




### ALGAE BIOREACTORS:



### Commercial Uses of Algae



### THE BEST VEGETABLES AND FRUITS TO GROW IN AN OPERABLE GREENHOUSE

#### VEGETABLES

Leafy Greens



Microgreens



Cucumber



Tomatoes



Peppers



#### FRUITS

Citrus



Grapes



Strawberries



Raspberries



### TRANSPARENT SOLAR PANELS:



### AQUABUICK SYSTEMS:

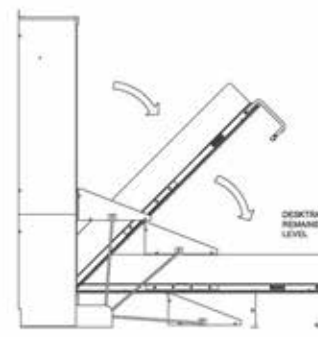
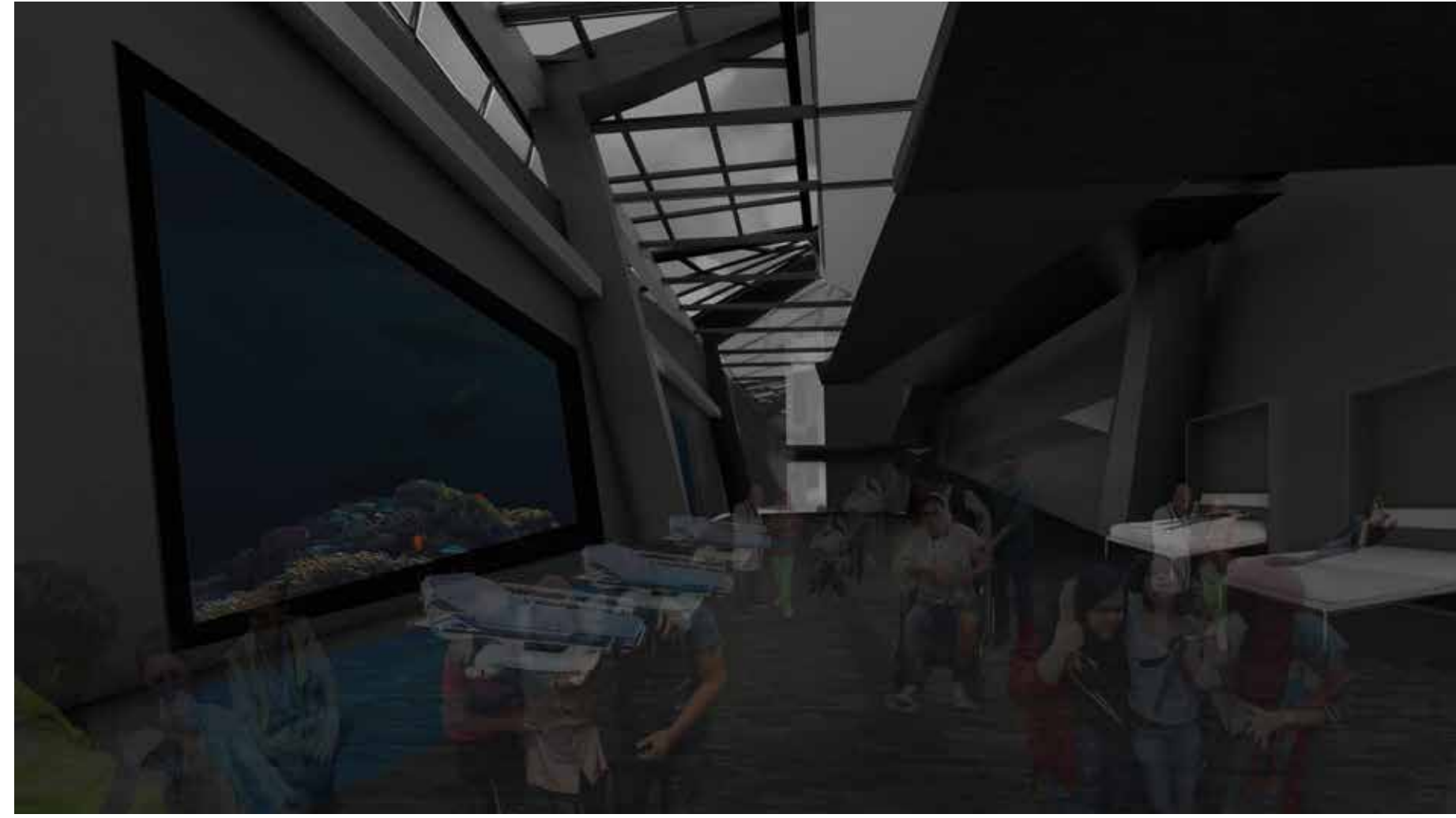




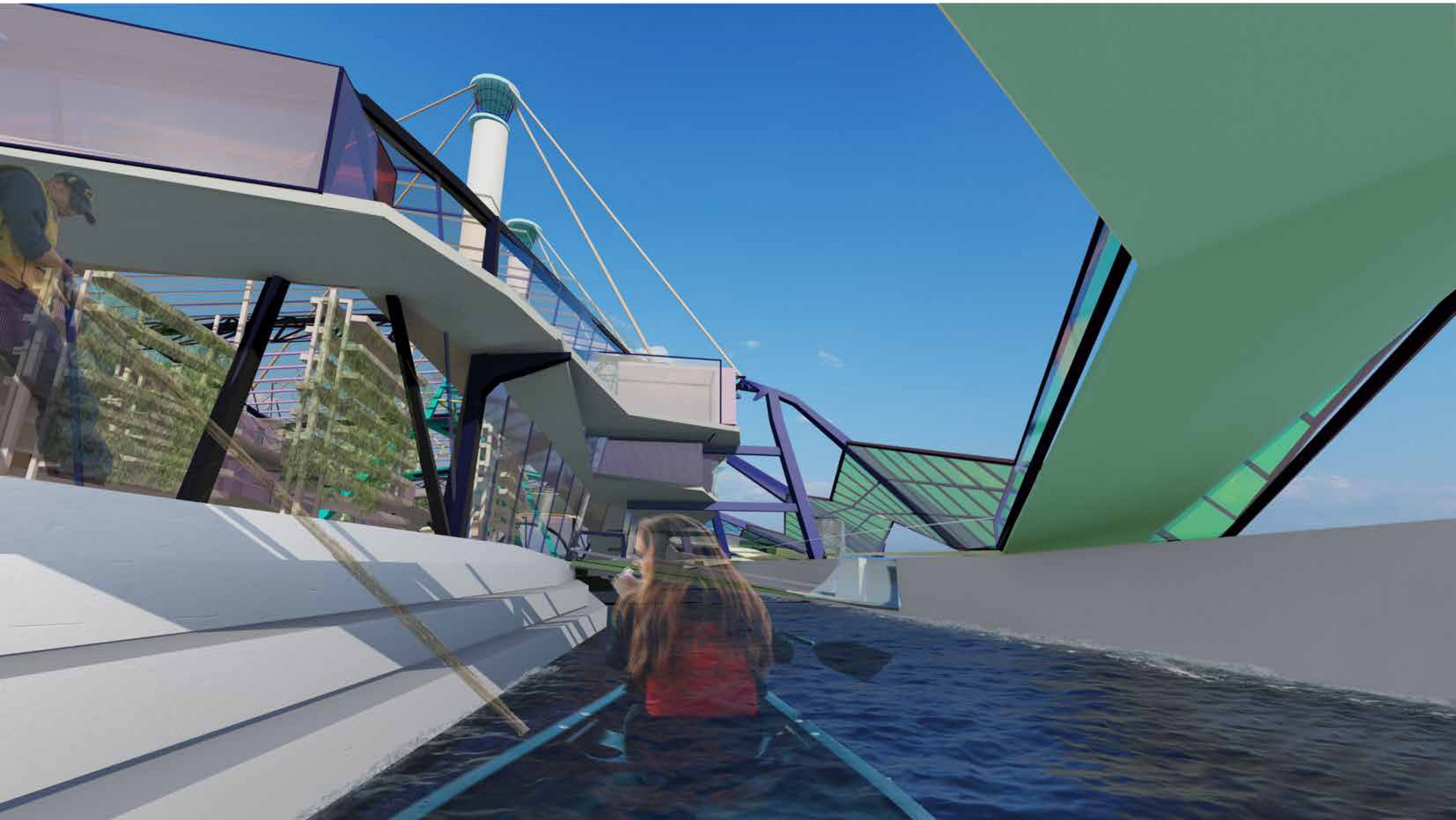


### BIOROCK MATERIAL

This is a material that creates a safe living environment to coral reefs. At the bottom of the pantoons steel cages are attached. When electricity is given to this steel cage CaCO3 molecules, that gives life to corals, sitck to it. In the Oasis, first bleaching corals are put on this cage. Then, with the help of sound enchancers, which mimics the healthy corals'sound, fishes will come and ea eat the redundant algaeas on bleaching corals, so that with the adequate amount of algaeas corals will be healty again, and support the marine around the Oasis



With the help of Murhy beds, pantoons will be adapted to use as a cliniques in a catastrophic situation.



And, with the Oasis,  
people all over the world  
get a chance to live  
happily ever after...

THE END

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