

BLUE ECONOMY AQUACULTURE FORUM



The background is a solid dark teal color. On the left side, there is a large, stylized graphic of coral reefs. The coral is composed of various shapes, including circles, ovals, and irregular polygons, in shades of light blue, teal, and orange. The coral structures are layered, with some appearing in the foreground and others in the background.

BRIDGE
INSTITUTE



Seagrass, Engineered Reefs and Carbon Sequestration

The Blue Economy Aquaculture Forum

May 2023

Agenda

- 01 The Carbon, Biodiversity and Equality Opportunity
- 02 The Reef / Seagrass Solution
- 03 The Bridge Institute

#01



The Carbon, Biodiversity and Equality Opportunity

Loss of Biodiversity & Inequality



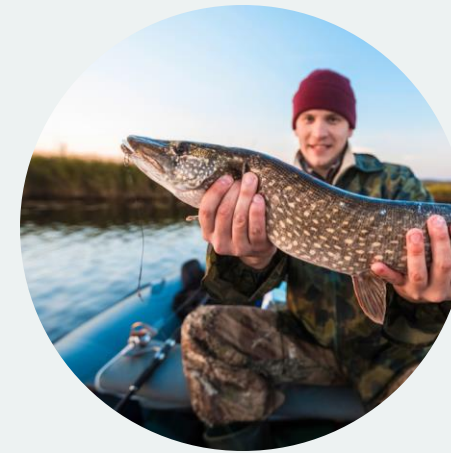
50%

of all coral reefs have already been destroyed.



25%

of all life in the oceans originates in healthy reef formations.



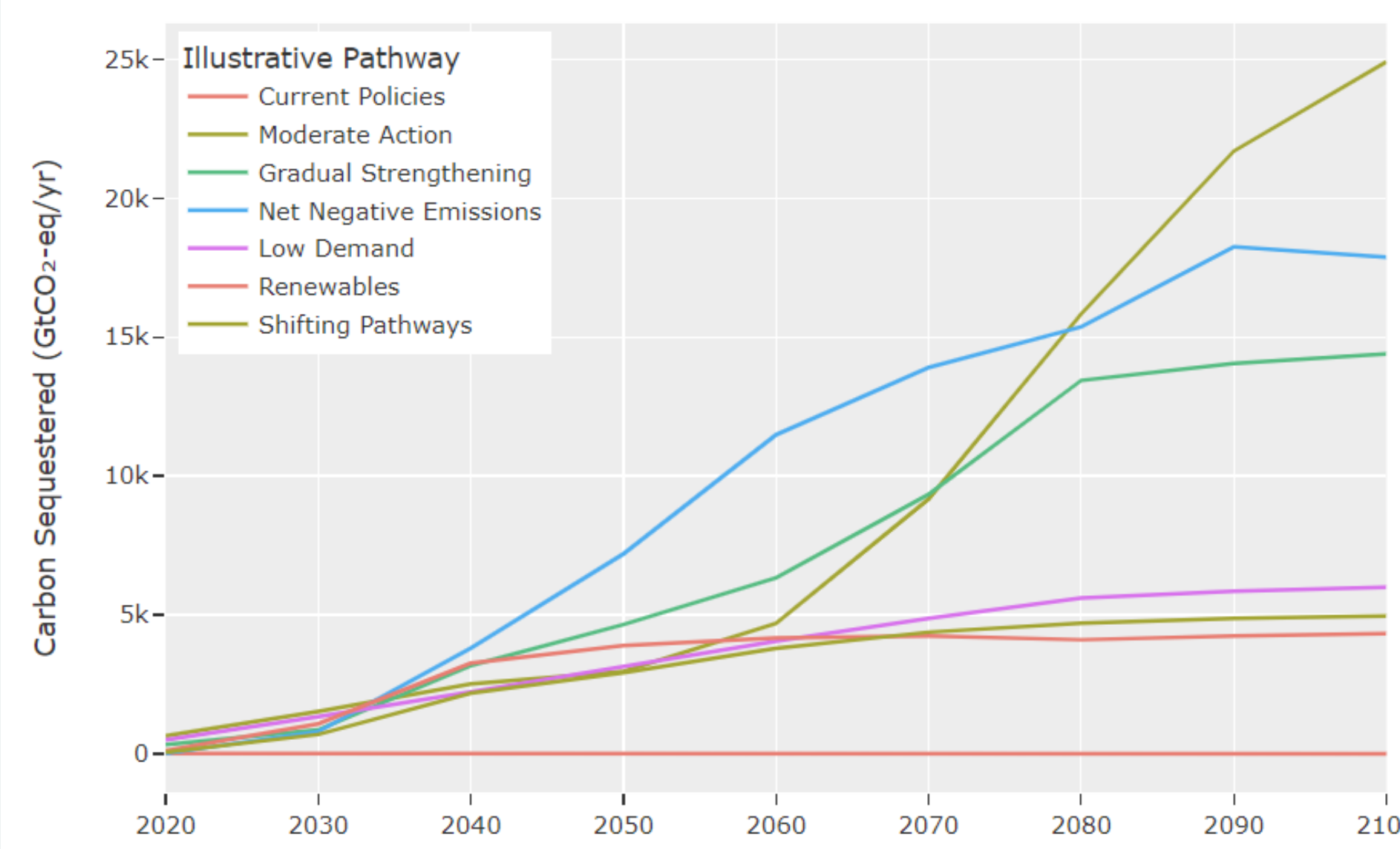
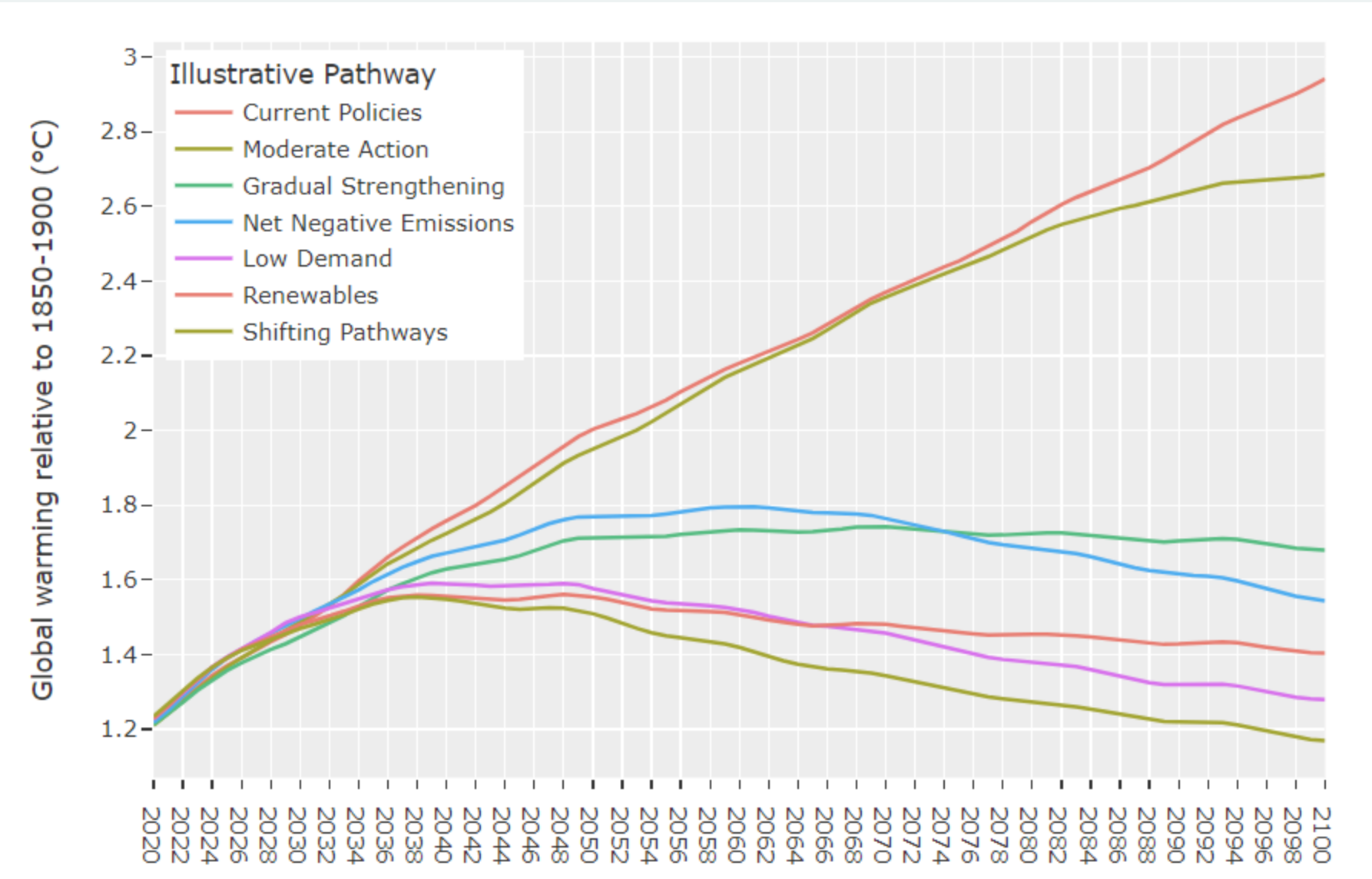
60%

of the world's population relies on seafood for their protein.



1 Billion

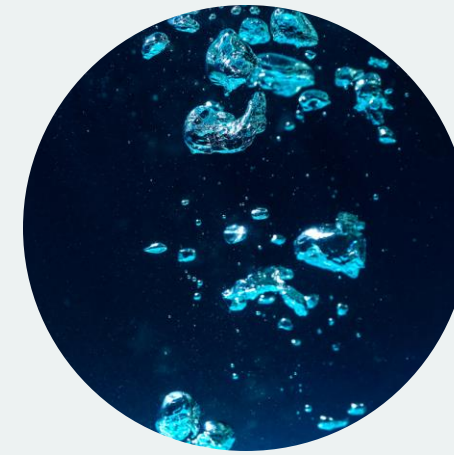
people depend completely on reefs for their livelihoods.



Reef systems' impact on Carbon Sequestration



Reefs are incubators of life in the ocean, attracting marine flora and fauna.



The ocean produces 70% of Earth's oxygen and absorbs 30% of the planet's CO₂.



Marine flora, like kelp and seagrass, absorbs 10-12x more carbon than tropical forests.



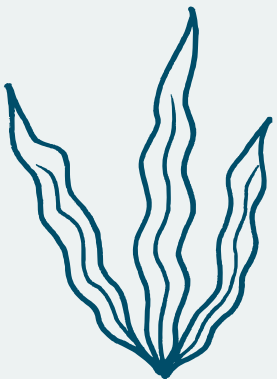
Reef loss will cause massive disruption to the climate and food chains.

Sequestration Capability



SOUTHERN YELLOW PINE

- captures: 10 mt of CO₂/hectare/year
- tree growth takes up to 12 years to become fully mature



GIANT KELP

- absorbs: 120 to 200 mt of CO₂/hectare/year
- grows to roughly 30 meters
- takes 107 days to grow to full maturity

CARBON SEQUESTRATION RATE OF RETURN

	Yellow Pine	Giant kelp
10-year CO ₂ yield/hectare:	32.5 mt	1,867 mt
Time to Full Sequestration Yield:	12 years	4 months

#02

The Solution

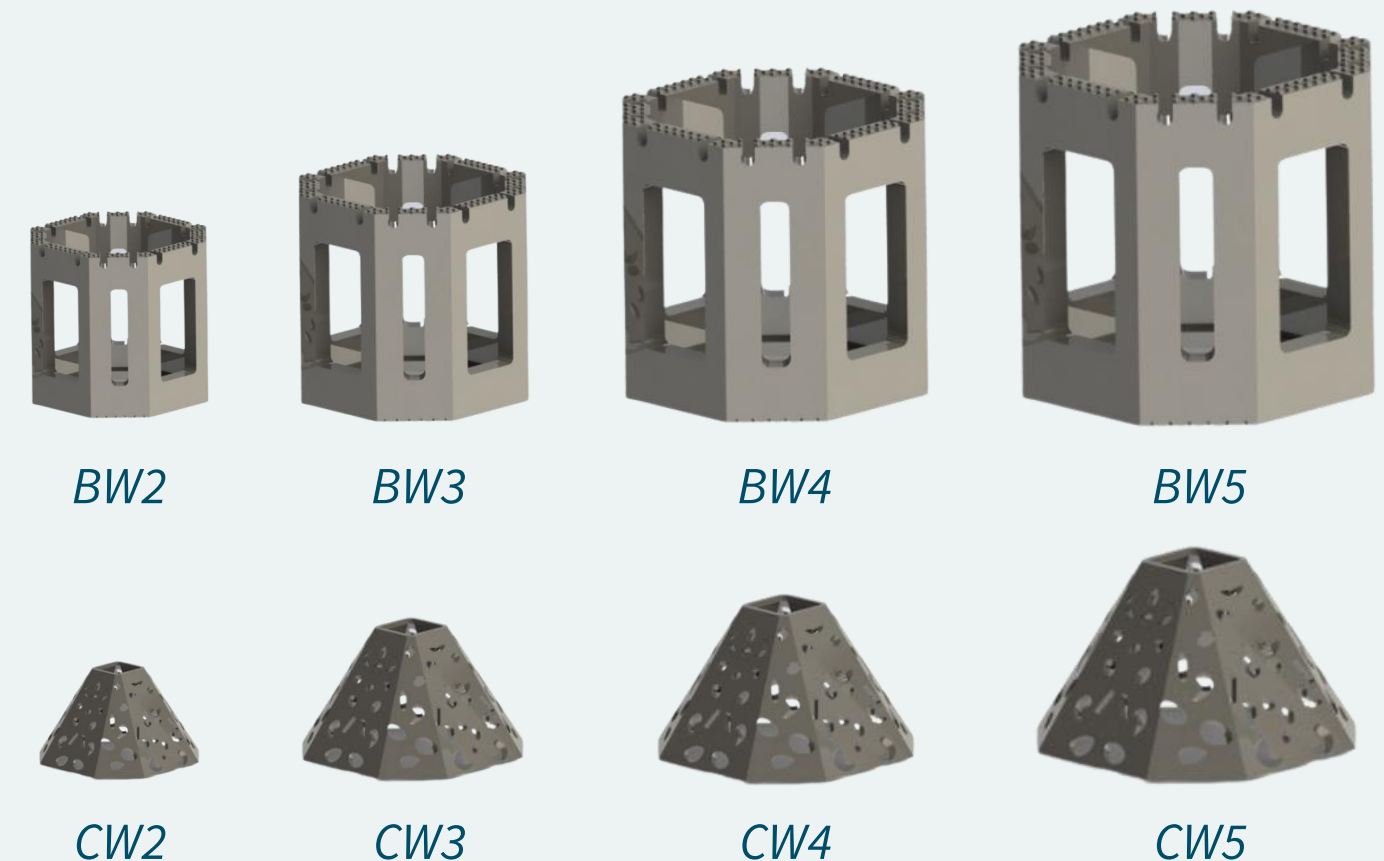


Engineered Reefs

- **Huge modular reefs** - providing durability, maximum growth surface and shelter for marine life
- **Stackable modules** - creating habitats at different depths
- **Locally manufactured** - using an **alternative sustainable concrete** made from residual waste streams, emitting 90% less carbon than normal concrete

The reefs attract marine life within the first two months, reaching its maturity after two years.

Basic Wave



Cone Wave

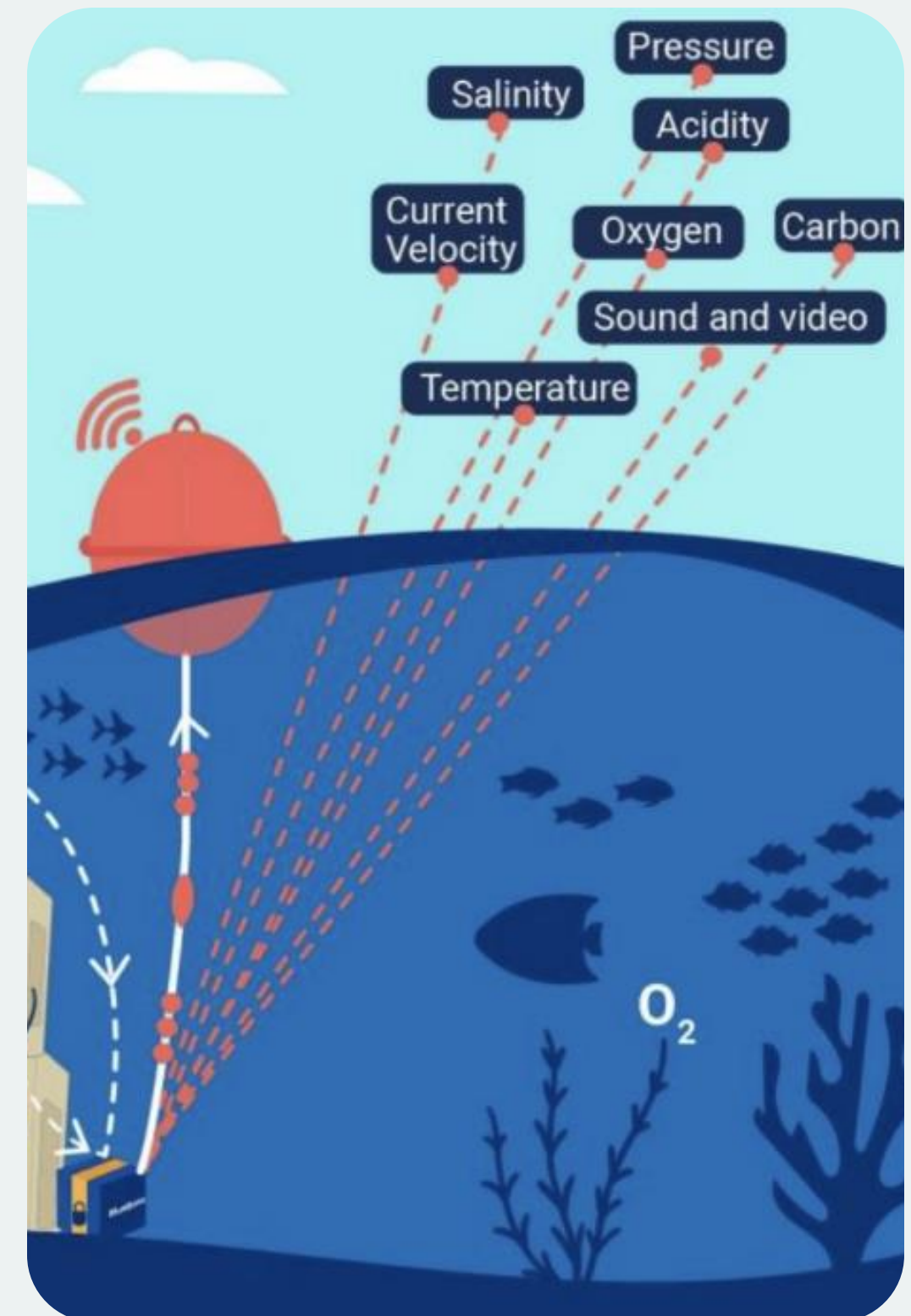
BluBoxx - Ocean Data Platform

The BluBoxx is totally customizable with **sensors** that measure, for example:

- salinity
- pH
- oxygen
- carbon
- temperature
- turbidity
- nutrients
- ...

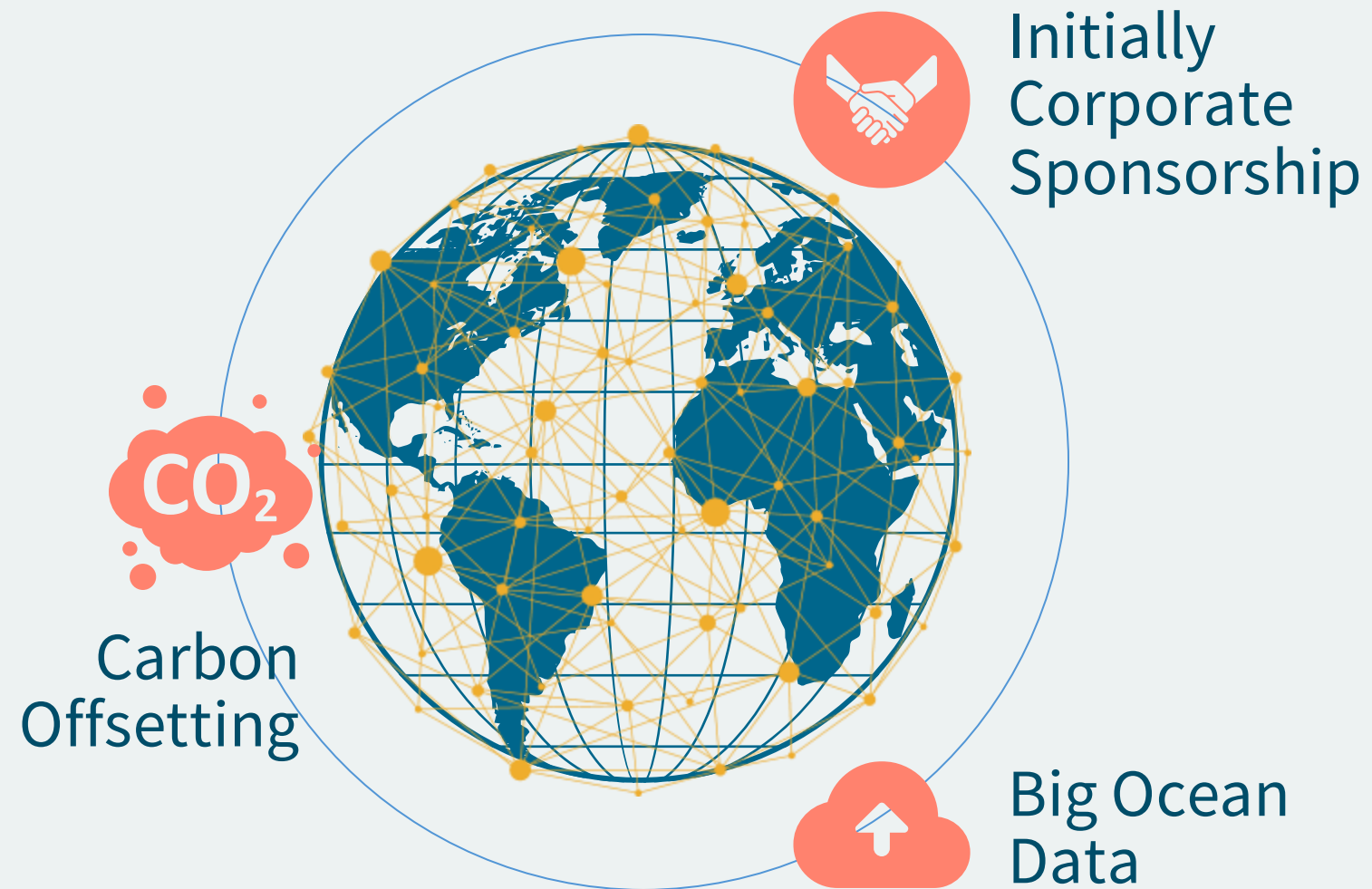
... and with **hydrophones**, **sonar** and **4K camera** devices, among many others.

The data collected is transmitted from the subsea sensor hosting box to the buoy on the surface, that then uploaded to the cloud.



Business Model

3 Main Revenue Streams:



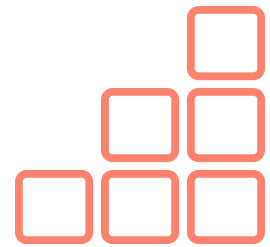
Carbon Offset Market Monetization Potential Upside

- Carbon Credit Offset price (Commodity Hedge Mkts)= €100/mt
- **Comporta Project**
Concession area = 52Km²/5200Ha
€13m per annum

PROJECT #1

Comporta Project

To become the biggest engineered reef on the planet



Proof of Concept

Area: 10,000 m²

Objective: R&D testbed

R&D license period: 36-60 months

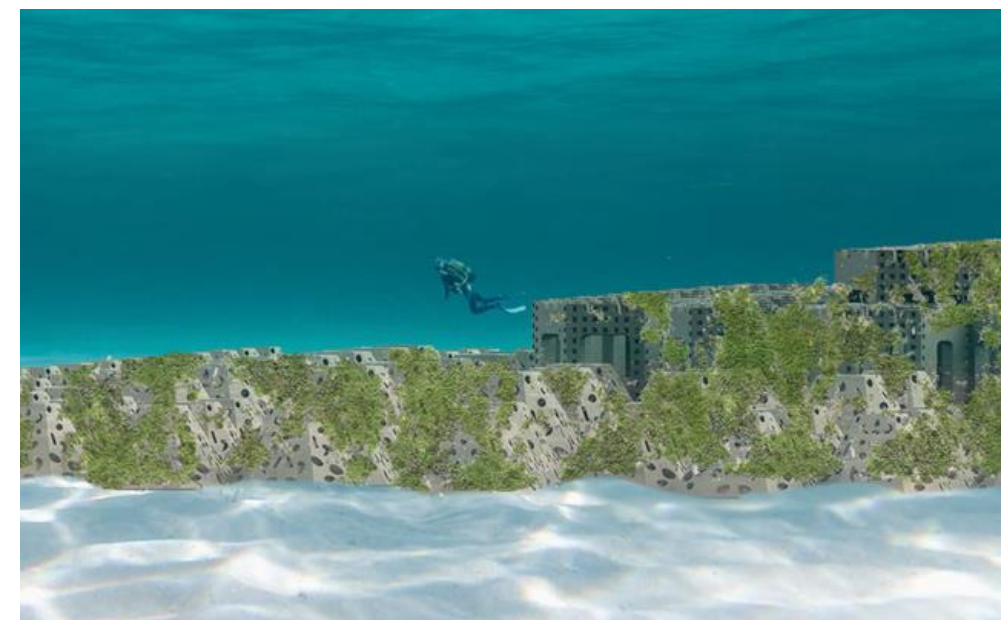


Concession

Area: 52 km²

Reef depth: 30 - 50 m

Concession period: 30 years



#03

**An Introduction to the
Bridge Institute**

The Nature of Systemic Challenges

1

“No one is in control”

2

“It’s up to us”

3

**“Everything is
connected”**

4

“We need coordination”

5

“To go far, go together”

6

**“We’re in it together, for the
long haul”**

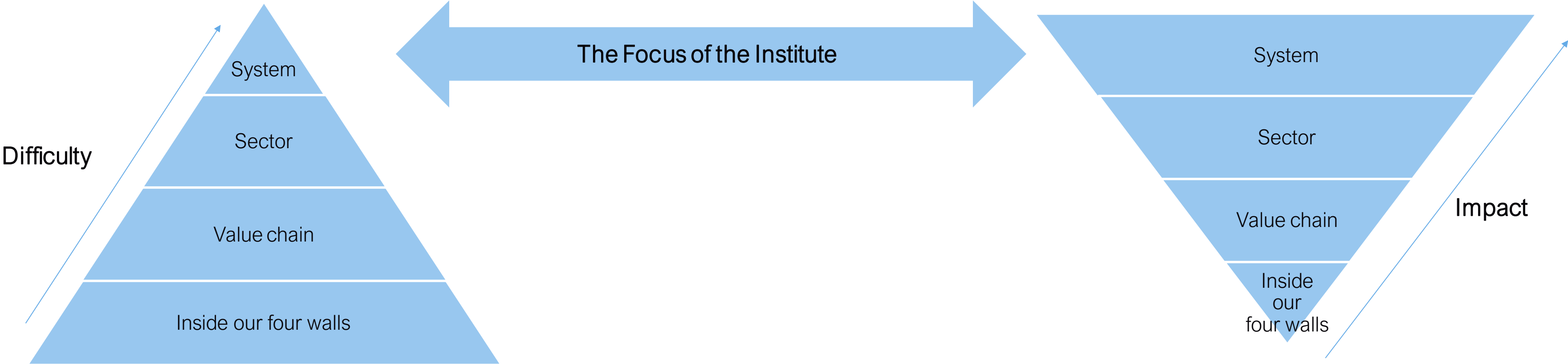
7

**“The system works for
some”**

8

**“There are multiple root
causes”**

What We Do: Bringing the Whole System Together





Example Programmes



Challenge: Child Marriage and Human Trafficking

Strategic Question

How does government, business and civil society come together to create a zero tolerance to child marriage?

Location
India



Challenge: Building a Better Future

Strategic Question

How can the people of Kashmir come together to build a more joyous, safer and prosperous future?

Location
Indian-Administered Kashmir



Challenge: Collaboration of the Education System

Strategic Question

How do we enable all the schools in the country to collaborate across the education sector, the business community and the local communities?

Location
United Kingdom



Challenge: Equality of Health

Strategic Question

How can the leaders of the government, business and civil society come together to enable healthy lifestyle and amplify availability and access to healthcare in the Philippines?

Location
The Philippines



Challenge: Climate Action in China

Strategic Question

How do we as a State-Owned Enterprise enable China to decarbonise the economy as part of the 14th Five-Year Plan?

Location
China



Challenge: The Singapore Foreign Workforce

Strategic Question

How do we create a new vision of the treatment of the 300,000 migrant workforce in Singapore?

Location
Singapore

Summary

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Thank you



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