

## Blue Economy Sector:

*Macroalgae based blue-biotech*

## Business Location:

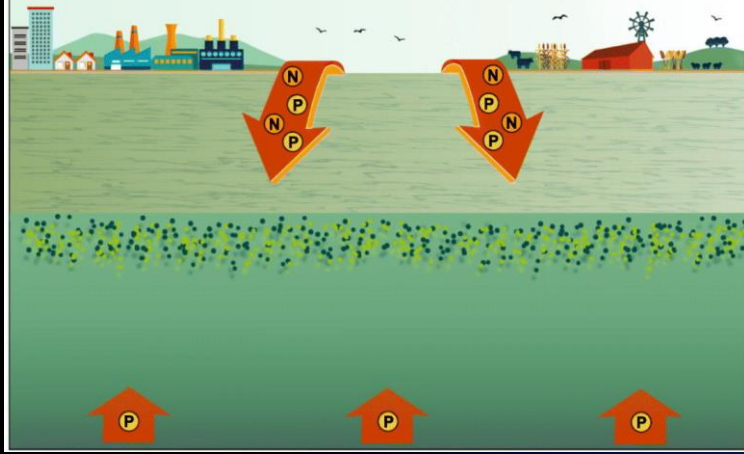
*Start up and University in Samsun*

## Product / Services Offered:

- *Monitoring and collection of the seaweed population in black sea*
- *Production of biocompounds (agar, alginate etc) from macroalgas collected or cultivated in black sea*
- *Macroalgae farming practices on marine integrated platforms in black sea*



The Black Sea is widely considered as the world's most polluted sea. It holds double the level of marine litter found in the Mediterranean and suffers from extensive eutrophication – high levels of phosphorus, nitrogen, and other plant nutrients. The poor water quality has had a serious impact on fish stocks and species diversity is under severe threat.



- Rivers pass inside the agricultural areas brings plant nutrient to the black Sea, which cause macro-microalgae overgrowth and eutrophication
- Macroalgae biomass accumulated in the coast of cities are collected by municipality and disposed of as waste.
- These macroalgae biomass can be used to produce biologically important compounds

## Blue-biotech products

Agar-Agar  
Alginate  
Cellulose  
Laminarin



Gracilaria



Cyrtosoria



Gelidium

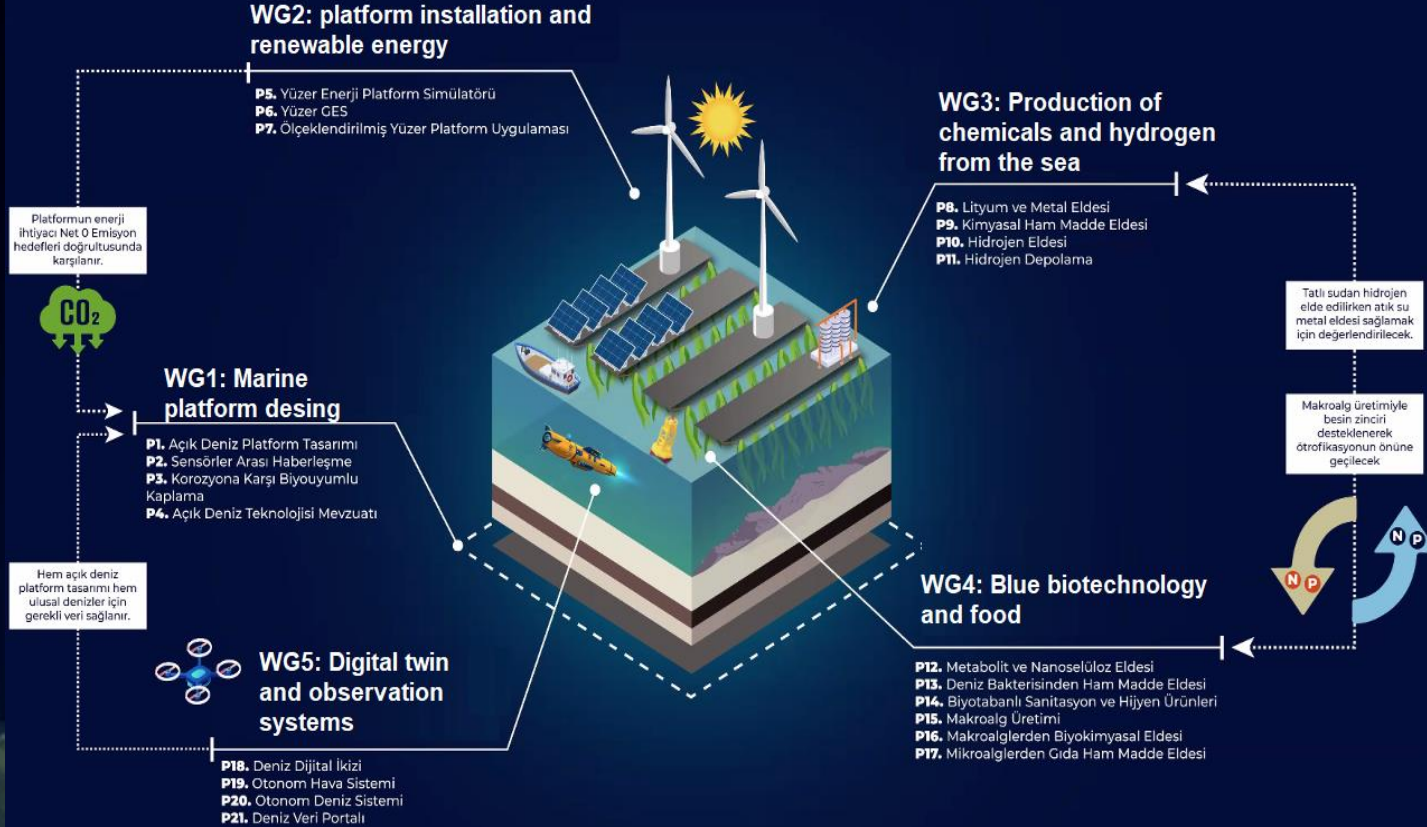


# BLACK SEA ACCELERATOR

for a sustainable Blue Economy

- 4 Institutions
- 3 Universities
- 7 private companies
- 17 project
- Budget: 5 milyon

## BLUE-TECH; OFFSHORE ECONOMY PLATFORM IN TURKISH SEAS

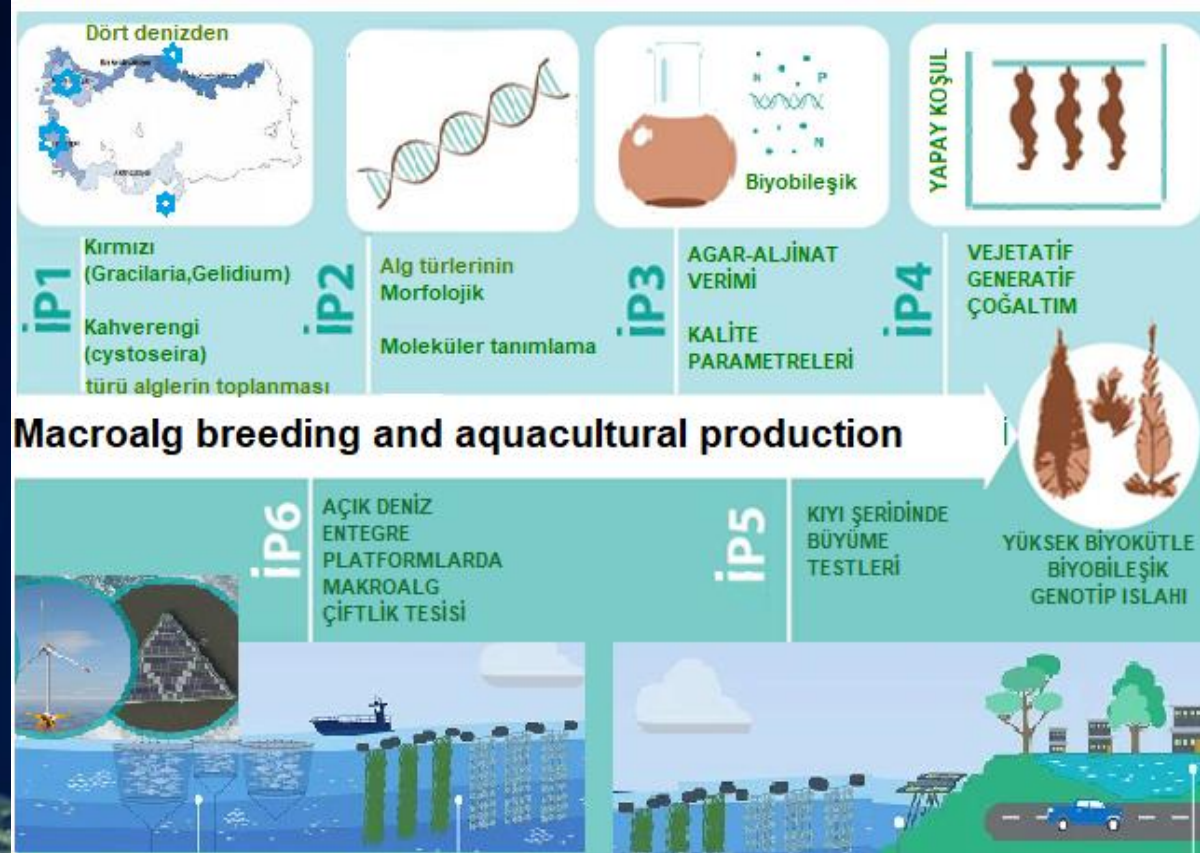




# BLACK SEA ACCELERATOR for a sustainable Blue Economy



## BLUE-TECH; OFFSHORE ECONOMY PLATFORM IN TURKISH SEAS



- Collection of macroalgae species
- Selection of best genotypes
- Vegetatif and generatif production
- Aquaculture in coast and platform

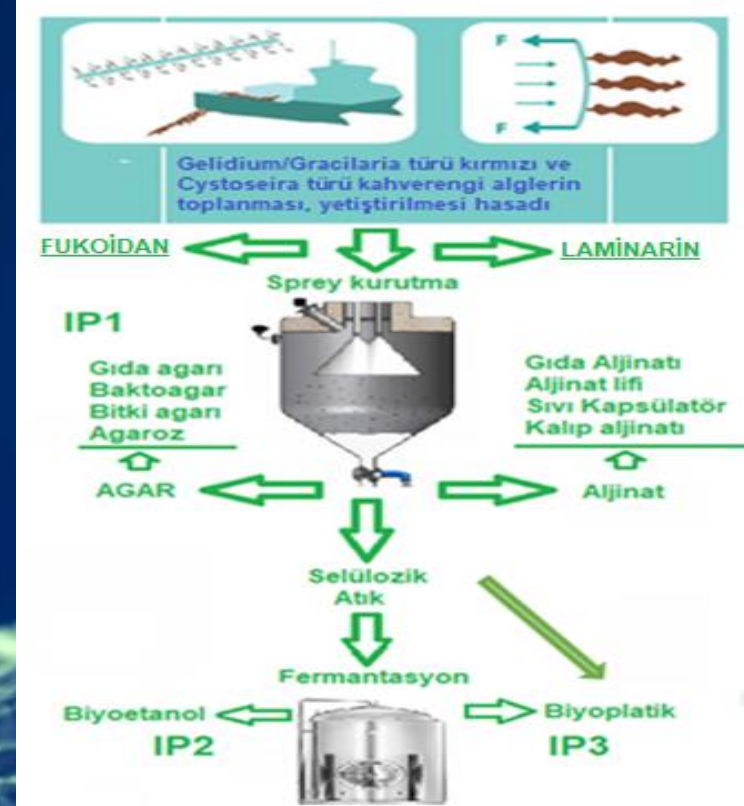
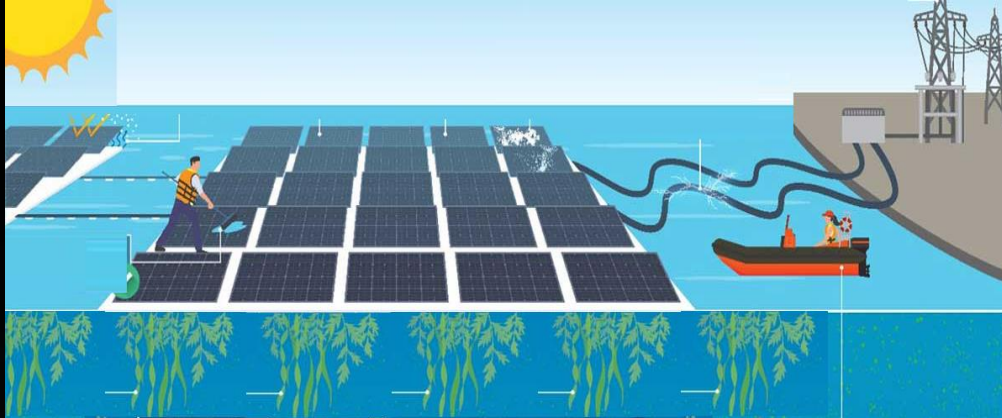
# BLACK SEA ACCELERATOR

for a sustainable Blue Economy



## BLUE-TECH; OFFSHORE ECONOMY PLATFORM IN TURKISH SEAS

- Test of Macroalgae farming under and around solaray systems
- Chemical production from collected and cultured macroalgae



# BLACK SEA ACCELERATOR

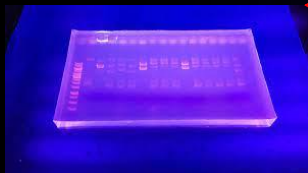
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Food

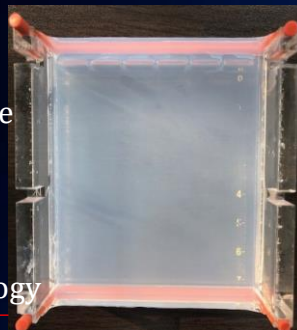


Agriculture



Biotechnology

agar



Microbiology



## Blue-biotech products



*Gracilaria*



*Gelidium*

Agar-Agar  
From  
Black Sea' Red Algae



# BLACK SEA ACCELERATOR

for a sustainable Blue Economy

## Blue-biotech products

### Alginate

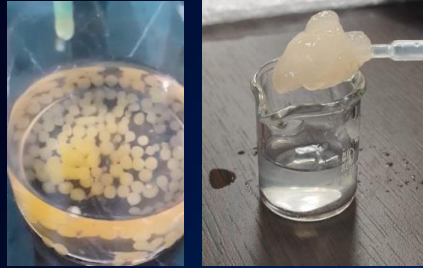
### Alginate From Black Sea' Brown Algae



*Cytosoria*

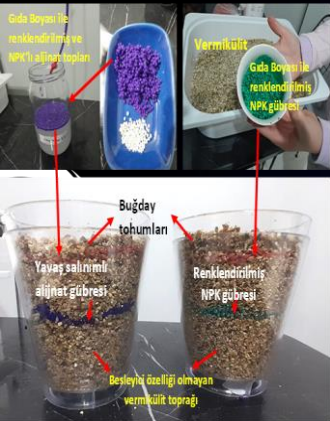
- Encapsulation of solution
- Food (juices, gels)
  - Agriculture (fertilizers)
  - Polimer for textile

Food



AGRICULTURE  
Biodegradable, slow  
relase liquid fertilizer

TEKSTİLE FİBER



# BLACK SEA ACCELERATOR

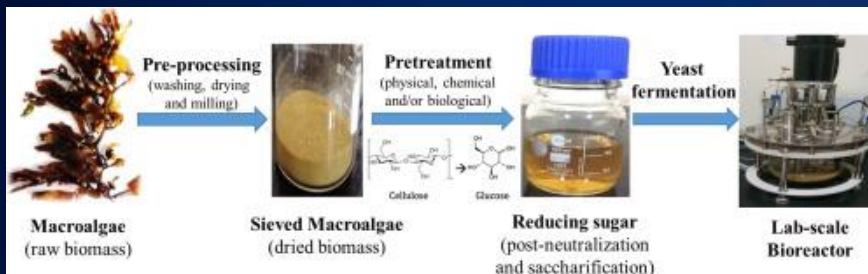
for a sustainable Blue Economy

## Macroalgae cellulose-based biochemicals and bioproducts



*Gracilaria*  
**AGAR**

*Cytosoria*  
**ALGinate**



Cellulose  $\xrightarrow{\text{Hydrolysis}}$  Sugar  $\xrightarrow{\text{Fermentation}}$  Biyoetanol

WASTE Sea water

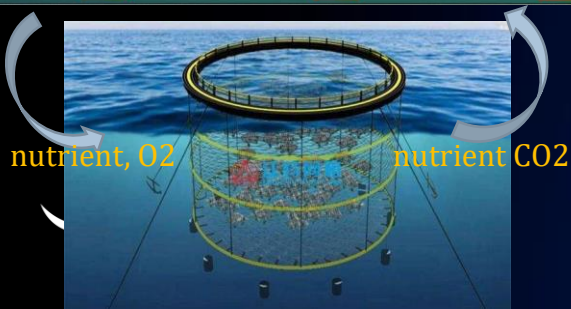




# BLACK SEA ACCELERATOR

for a sustainable Blue Economy

The informed development of the sea-based farming of macroalgae raises as a promising internal measure to close the nutrient loop and effectively mitigate eutrophication in the Black Sea



## Economical Impact

Macroalgae based products

- Agar-based products
- ✓ Nutrient agar
- ✓ Microbial agar
- ✓ Plant agar
- ✓ Agarose



*Gracilaria*



*Cyrtosoria*

## Environmental Impact

Cultivated seaweeds

- absorb large quantities of pollutant (N, P, heavy metals etc.)
- produce large amount of O<sub>2</sub>
- have excellent effect on decreasing eutrophication.

## Social Impact

Cultivated seaweeds

- create new job opportunities for fisheries
- New source of income for people live in coastal region

Alginate-based products

- ✓ Microbial agri-fertilizer
- ✓ Degradable agri-fertilizer
- ✓ Polymer fiber for textile
- ✓ Food stabilizer

## Visions and Strengths:

- *Monitoring the change of macroalgae population and biodiversity to select the best genotypes and locations for seaweed farming*
- *Establishment of seaweed cultivation and harvest system in black sea*
- *Production of the biotech compounds (agar, alginate, cellulose etc.) from cultivated and wild-type seaweed*

## Hopes from the Accelerator:

- *Financial support for the establishment of macroalgae based farming practices in Black sea,*
- *Scientific collaborations for bilateral national or international projects to improve macroalgae based farming systems*