Blue bio-economy in Lithuania

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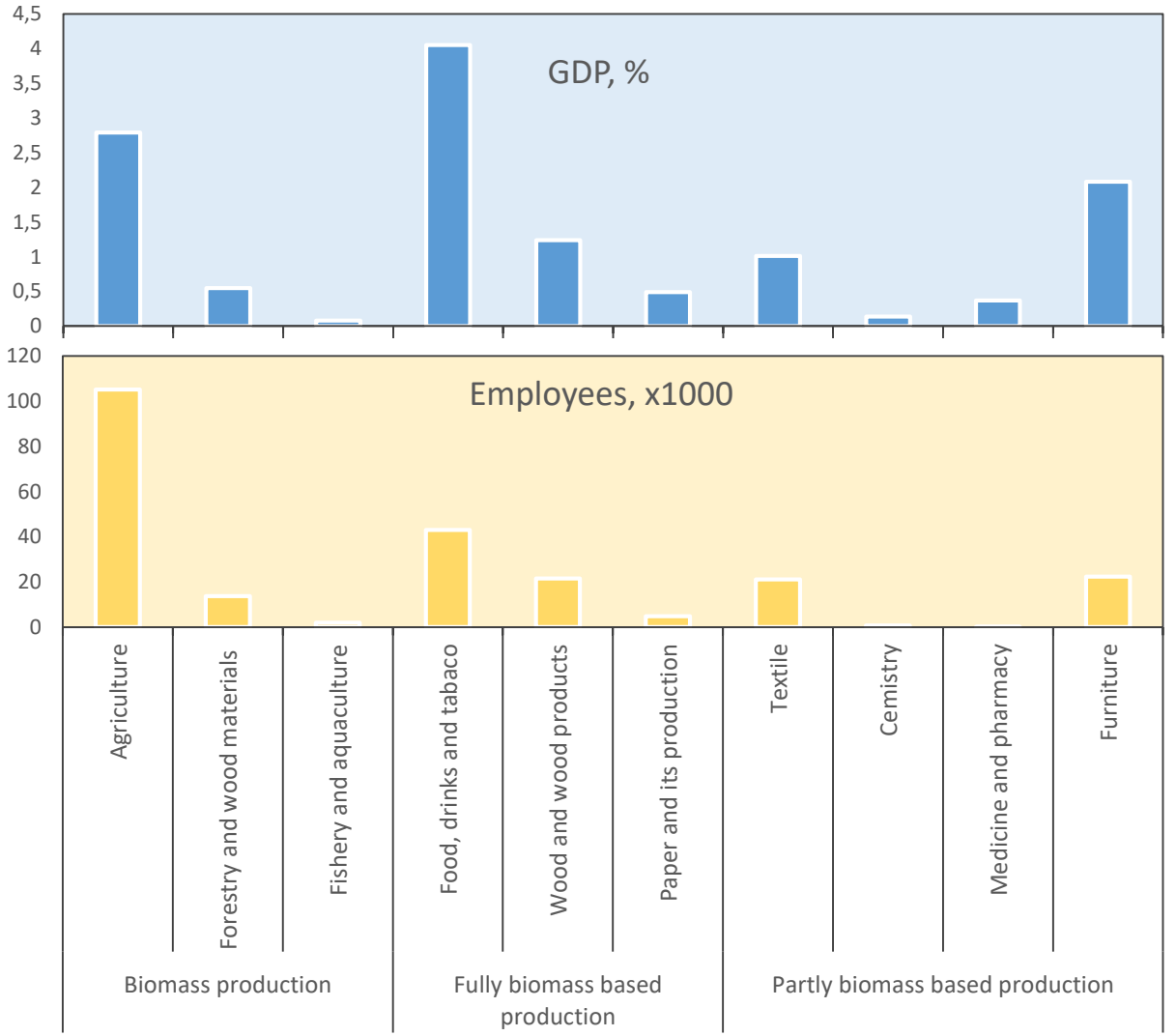
BIOECONOMY IN LITHUANIA

- European Bioeconomy Strategy (updated in 2018) → National strategies are adopted by 9 countries (2019 data), mostly western European countries, plus Latvia
  - The Agenda was initiated for the other 11 Mid and East Europe contries to start communication and preparation for National Bioeconomy Strategies
- In Lithuania, bioeconomy is historicaly very significant sector of economy
- Since the modern state history agriculture and forestry was important part of industry
- **Lithuanian Bioeconomy Development Feasibility Study in 2017**
  - In 2014 bioeconomy sector created 4,7 billion Eur or 12,8 % of Gross Domestic Product
  - According to 2015 data in the sector worked 234 400 employees or 17,6 % of labour force
  - Lithuanian bioeconomy sector is oriented into export, and according to 2016 data 9,9 bln. Eur or 43,7 % of export constituted bioeconomy production



BIOECONOMY IN LITHUANIA: DEVELOPMENT PERSPECTIVES

Most promising and attention requiring fields:

- Developement of Biomass value chain potential
  - Biomaterials export
  - Biomaterials import
  - Use of biowastes
- Ecological and functional food
- Environment-friendly bio-based wood, textile, and chemistry products
- Industrial symbiosis
- Use of biowastes for biogas and biofuel production
- Bioplastics and plastic biodegradation solutions
- Biotechnological tools in bioindustry
  - Molecular biology tools
  - Industrial enzymes
  - Microorganisms
- Other bioeconomy breakthrough directions
  - Artificial intelligence systems
  - Block chain technology

BLUE FORWARD STRATEGY FOR KLAIPEDA 2030

In 2030 Klaipėda will be known as a city of blue growth, and the most attractive place to live, work, make investments and enjoy leisure time in the Baltic sea region.

Klaipėda
Bursting with unsaturated potential in bioeconomy

BLUE FORWARD STRATEGY FOR KLAIPEDA 2030

BIOEKONOMIKA

#2 KRYPTIS

BIOEKONOMIKOS KLASTERIS

chemijos | medienos | biotechnologijų verslai | mokslo įstaigos

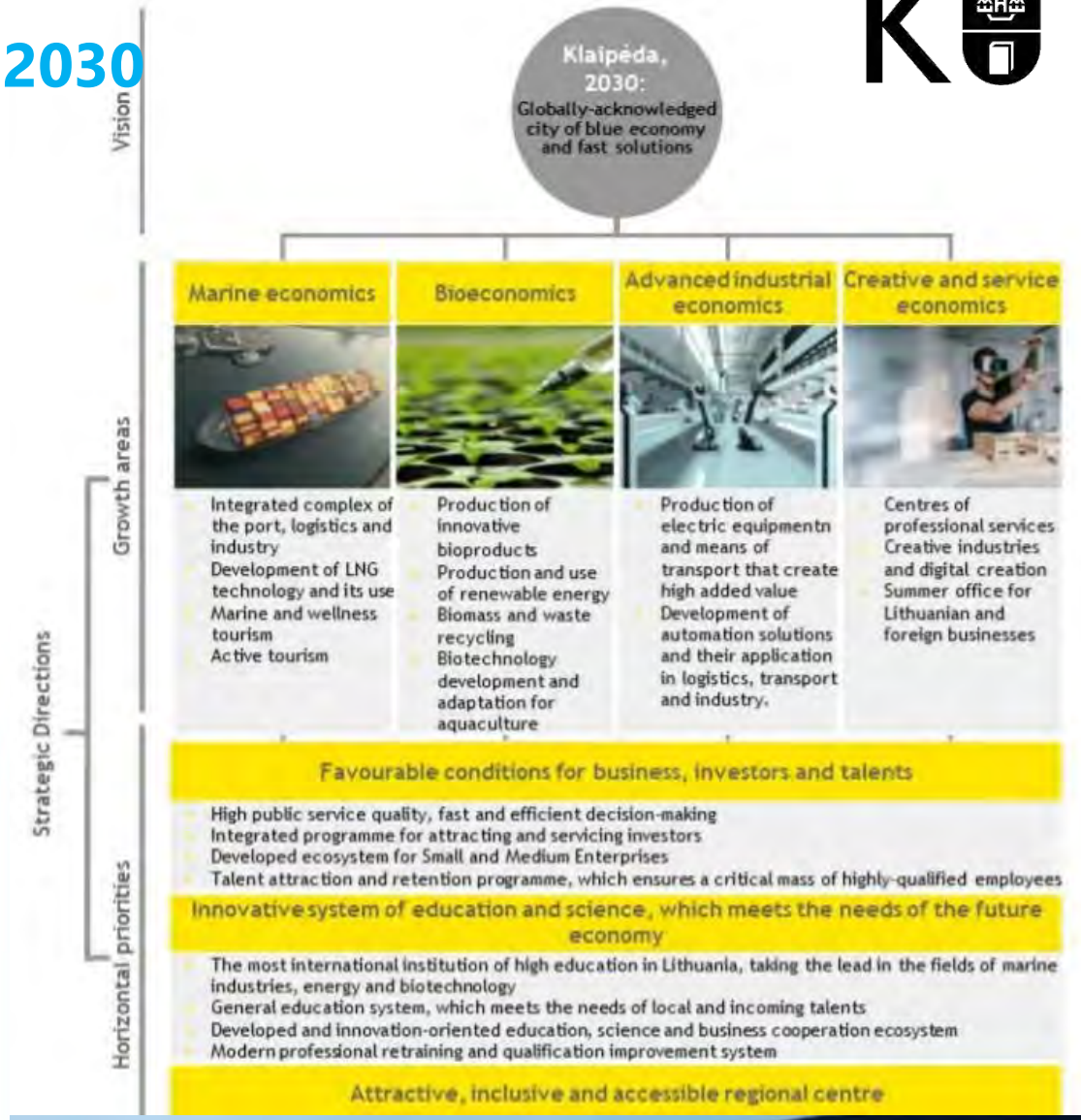
- švariųjų technologijų tyrimai ir taikymas, bioproduktai
- atliekų tvarkymo ir perdirbimo technologijos

MĖLYNOSIOS TECHNOLOGIJOS

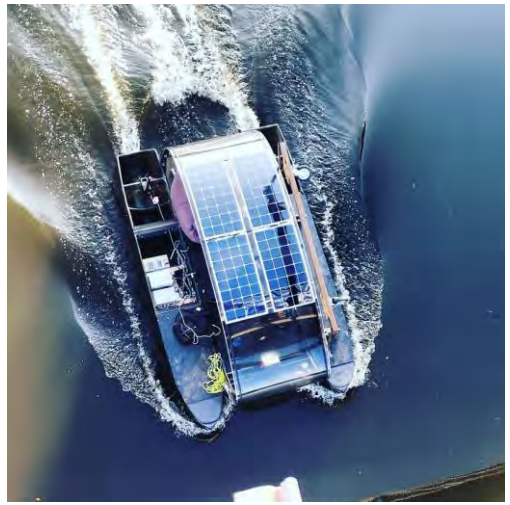
- Klaipėdos mokslininkai dalyvaus Baltijos jūros baseino mėlynųjų technologijų tyrimų programose
- mokslas ir verslas kartu vystys regiono akvakultūrą
- kurs jūros biotechnologijas

ATSINAUJINANTI ENERGIJA

- pirmausime Lietuvoje pagal naudojimą ir gamybą
- jūros, žemės gelmių ir biomasės ištekliai naudojami tvariai



INNOVATIONS IN ELECTRIC PUBLIC TRANSPORT



Fully solar powered sustainable catamaran for ridesharing in urban waters.

popa boat

DANCER

Dancer is the lightest electric bus in operation. Dancer's fully composite body is made with the significant use of recycled PET plastic.

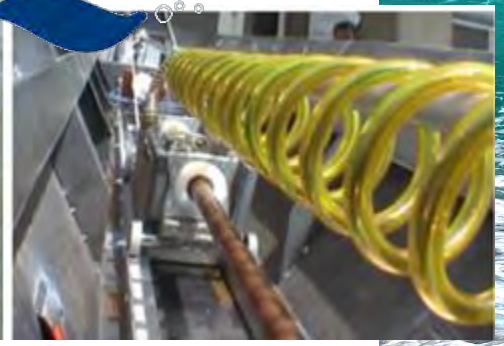
The Golden A' Design Award

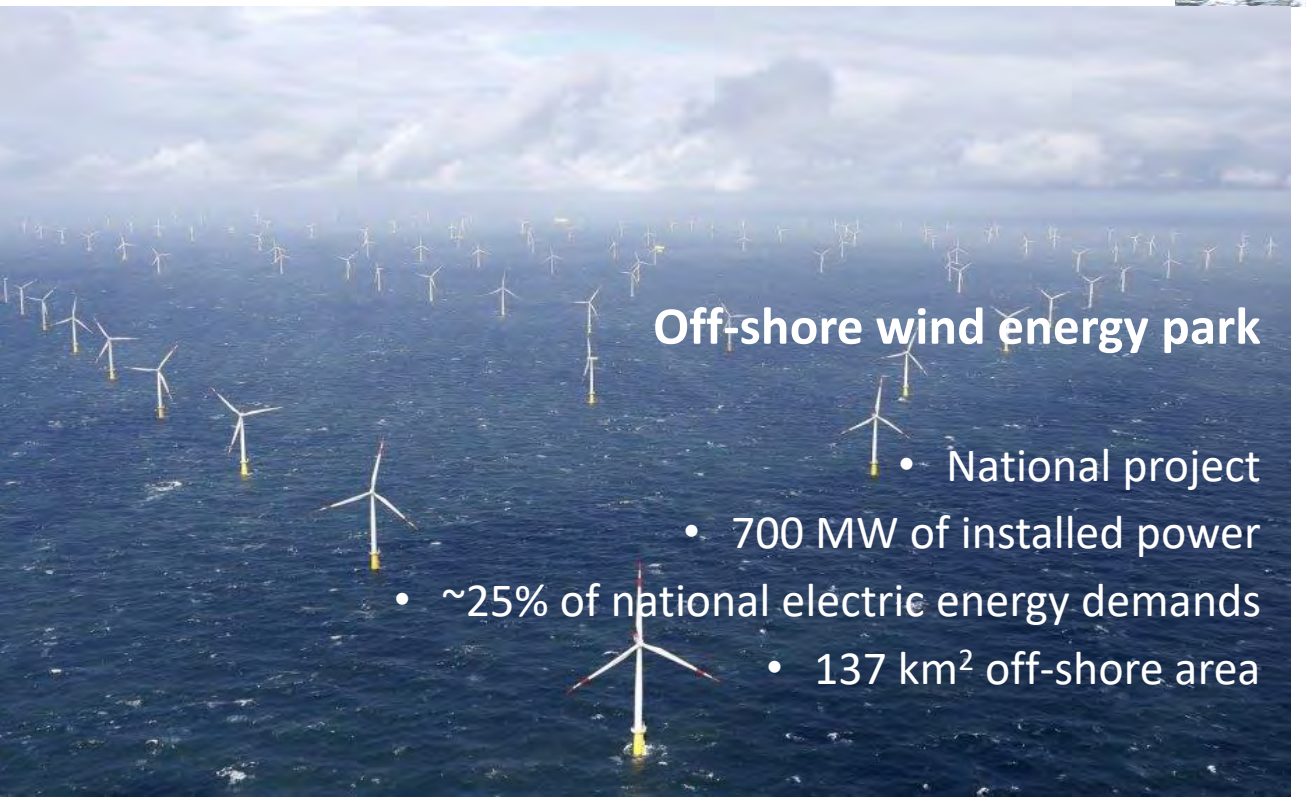
It is introduced into public transport system of Klaipeda

A'DESIGN AWARD
WINNER 2020
GOLD

MARINE ENERGY

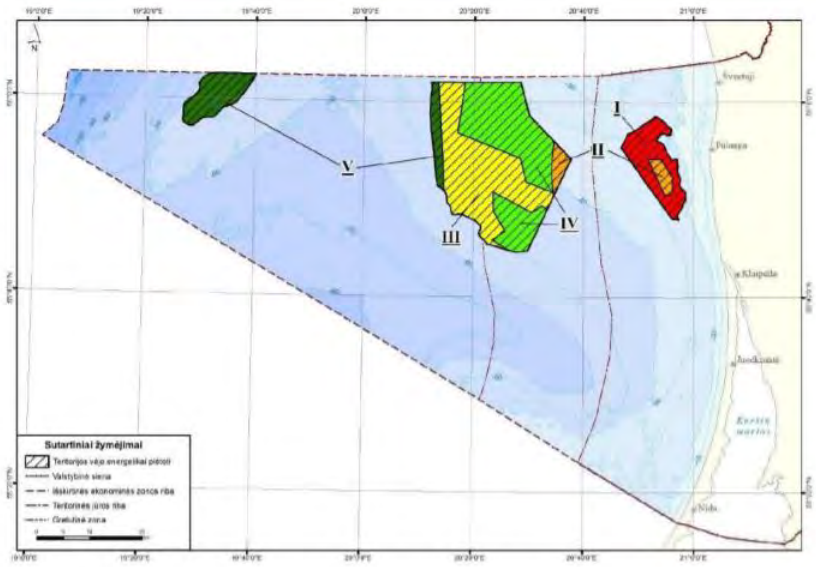
Longitudinal wave electric power generator (A. Pašilis, patented)





Off-shore wind energy park

- National project
- 700 MW of installed power
- ~25% of national electric energy demands
- 137 km^2 off-shore area



BLUE BIOTECHNOLOGY IN KLAIPEDA UNIVERSITY

BIOLOGY AND MARINE BIOTECHNOLOGY BACHELOR STUDIES

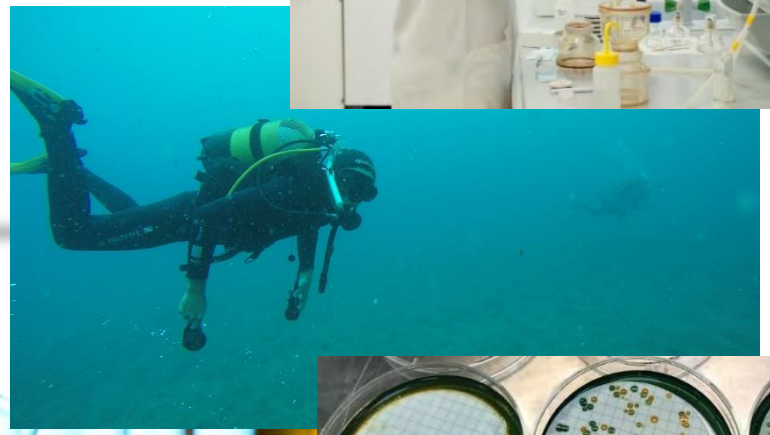
ECOLOGY AND ENVIRONMENTAL SCIENCES MASTER STUDIES WITH AQUACULTURE PROFILE

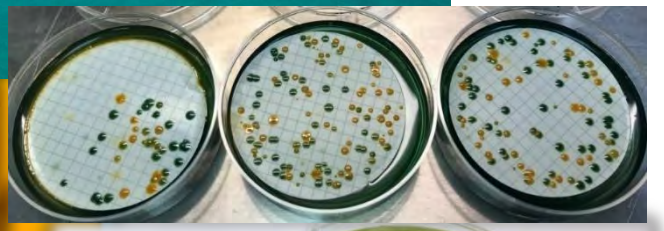
PHD PROJECTS

Donata Overlingė “Potential biotechnological exploitation of secondary metabolites produced by cyanobactereae”

Lukas Oliver Ritzenhofen “Mussel cultivation in the Baltic Sea“

Mirco Haseler “Meso- and microplastic in the Baltic coastal environment”

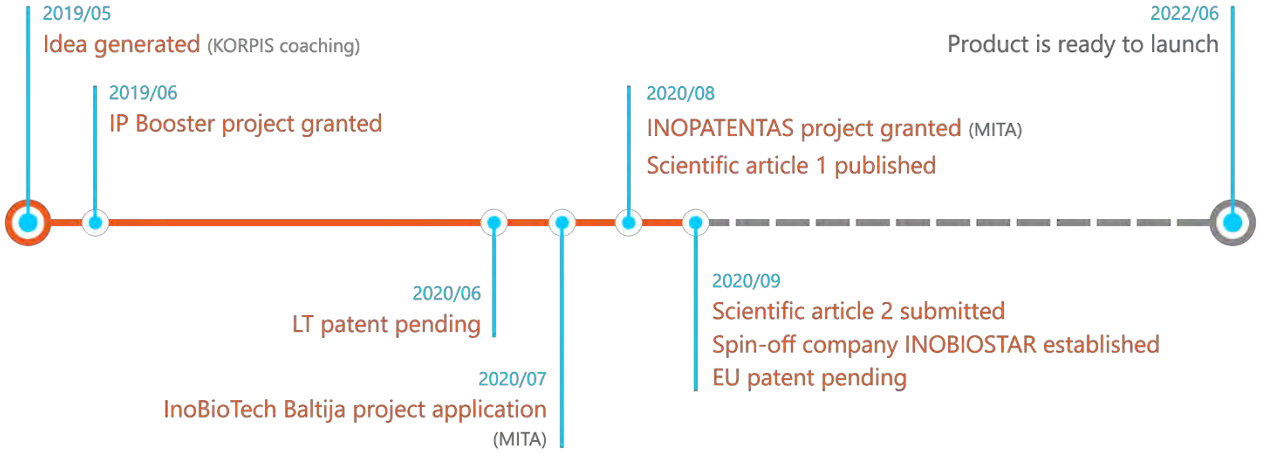


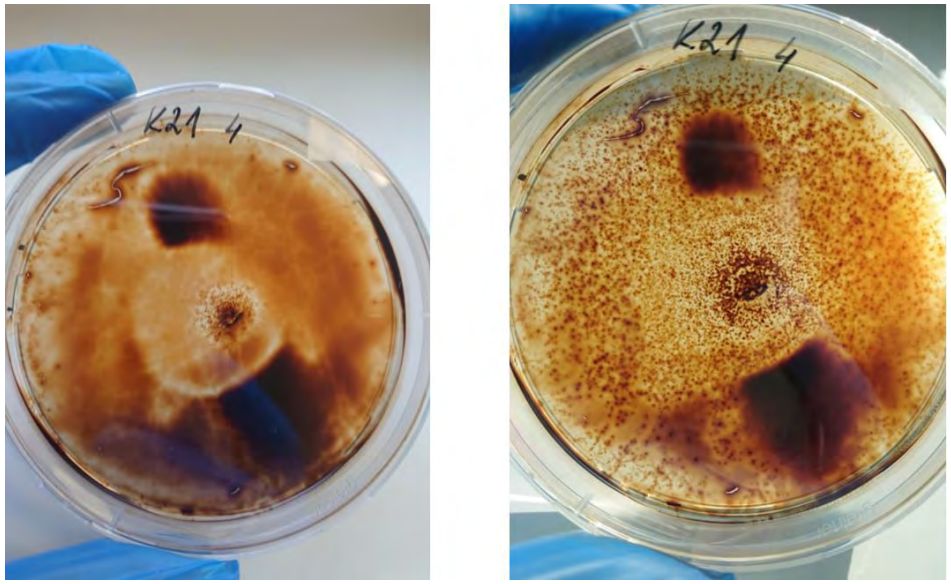


BLUE BIOTECHNOLOGY IN KLAIPEDA UNIVERSITY

METHOD FOR PETROLEUM HYDROCARBON BIOREMEDIATION USING FUNGI, EU PATENT PENDING

inobiostar





Fungi strain on water agar experiment day T2 and day T8

GREEN ALGAE *HAEMATOCOCCUS PLUVIALIS* GROWTH AND STRESS CONDITIONS OPTIMISATION FOR WATE-BURNING FACTORY

BLUE BIOTECHNOLOGY IN LITHUANIA

- **Lithuanian Biotechnology Association**
  - White and red biotech

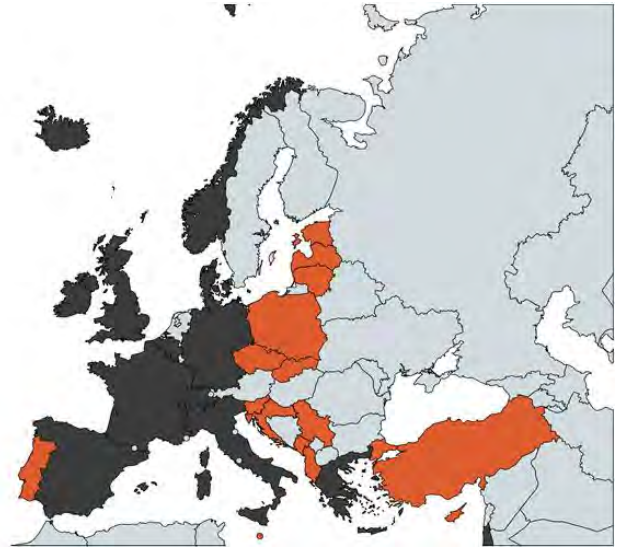
- JSC Biomė considers Baltic Sea mollusk shells as an attractive resource for biomedical industry. The main goal is to apply ground mollusk shells for the preparation of 3D polymeric scaffolds for bone tissue engineering in odontology and orthopedics.

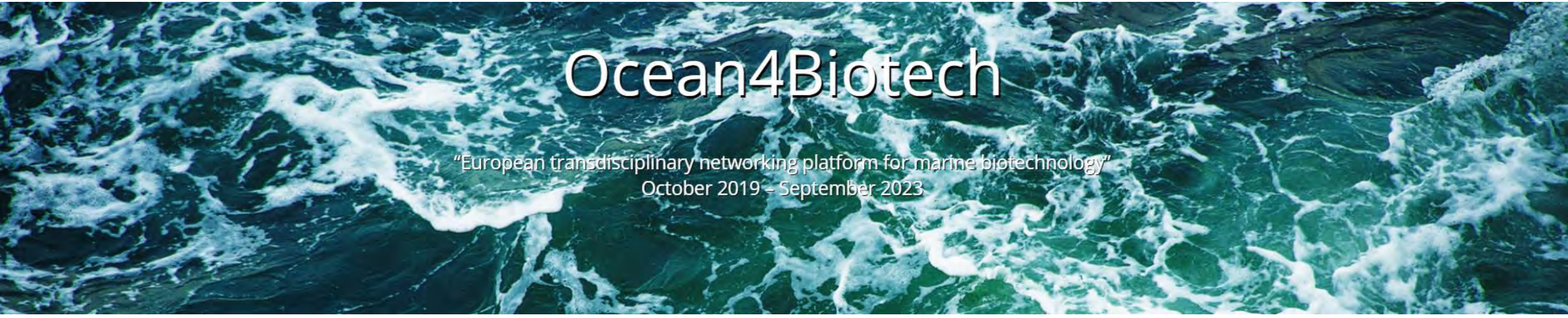
- SME Ekogina and JSC Spila produce different *Spirulina* cyanobacteria and *Chlorela* green microalgae based nutraceutical products from imported raw materials

COST ACTIVITY Ocean4Biotech

- The **overall aim of Ocean4Biotech** is to:
- bring together experts in the field of marine biotechnology,
- provide a platform for sharing experience, knowledge and technologies,
- design a roadmap for a more efficient and rapid development of marine biotechnology research in Europe and beyond.
- 28 European countries
- Lihtuanian partners:
  - **Life Scences Centre of Vilnius University**
  - **Biotechnology Institute**
  - **Marine Research Institute, Klaipėda University**

Ocean4Biotech
COST Action CA18238

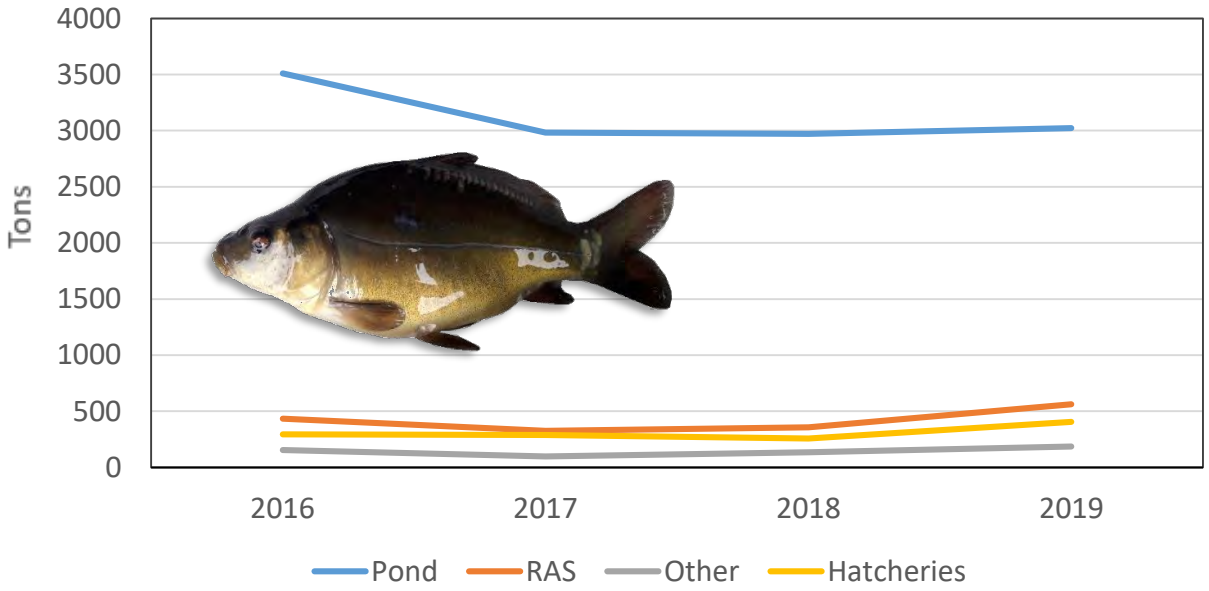


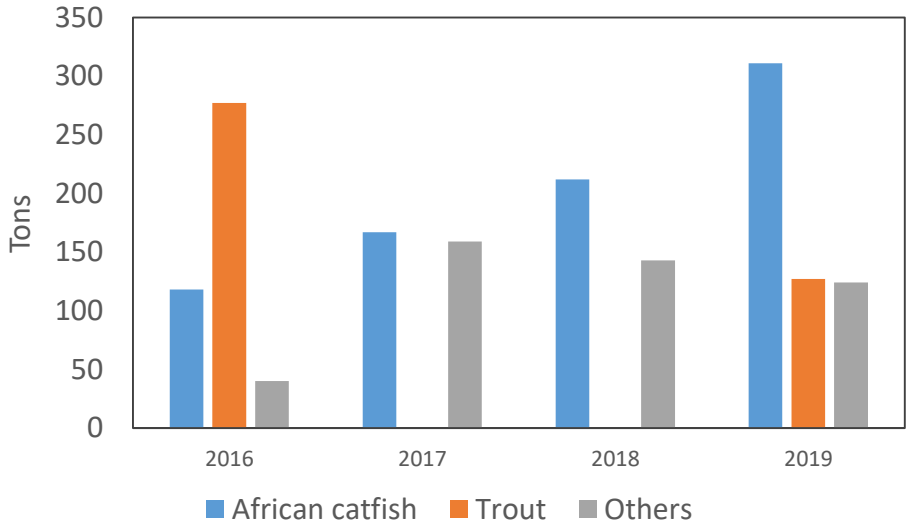


LITHUANIAN AQUACULTURE

- **Pond aquaculture**
- Species: carp, grass carp, silver carp, tench, catfish, pike, sturgeon, rainbow trout, pikeperch

- **RAS aquaculture**
- Species: rainbow trout, African catfish, Arctic charr, whiteleg shrimp, eel, sturgeon, tilapia

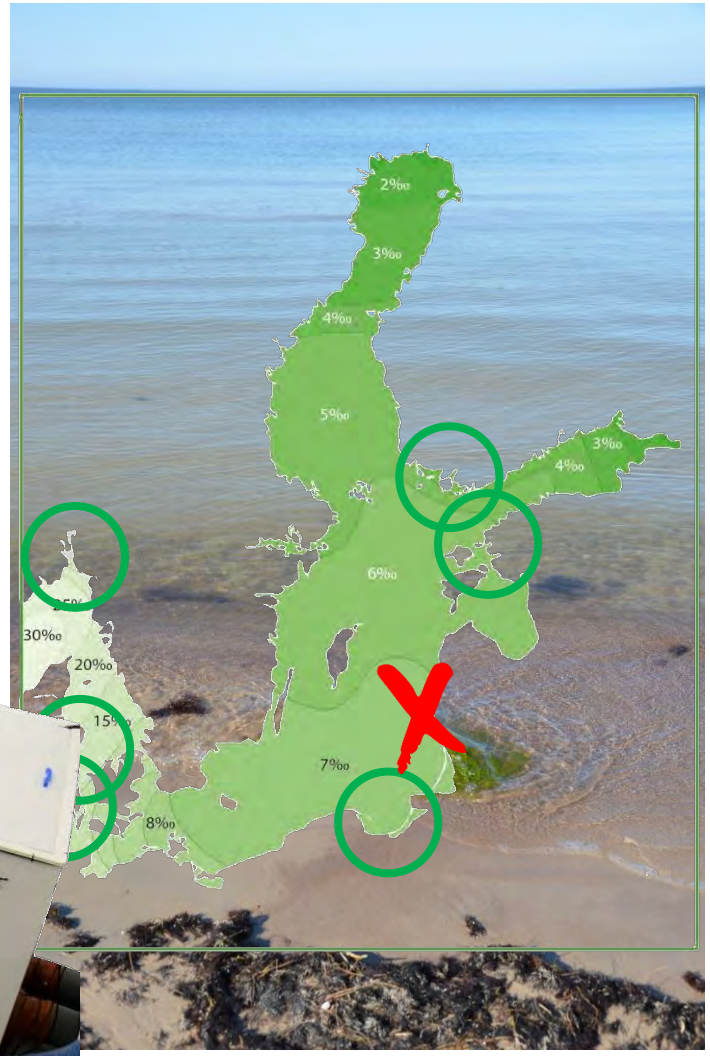




MARINE AQUACULTURE IN LITHUANIA?

- Low salinity for the algae and mussel farming

- Challenges for fish mariculture in Lithuanian marine waters:
  - Exposed coast - rough hydrological conditions and short wave period
  - Low salinity
  - Environmental constraints
    - High eutrophication and commitments to Helcom
    - Bioinvasions

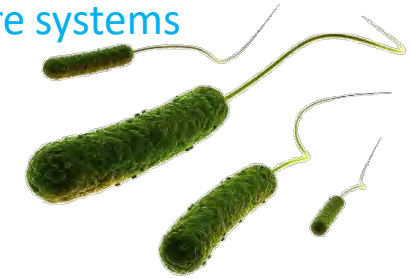


Solution – land-based marine aquaculture!

INNOVATIVE AQUACULTURE

- ***Marine recirculating aquaculture technologies***
  - Marine RAS and shrimp pwater for freshwater fish cultivation
  - Geothermal water and energy production competences
  - Baltic Sea brackish otential in aquaculture

- ***Probiotic application in aquaculture***
  - Effects on fish and functioning of aquaculture systems
  - Patocenic microorganisms control efficiency
  - Application methodologies



KLAIPĖDOS MOKSLO IR TECHNOLOGIJŲ PARKAS

aqua VIP

- ***Aquaponics***
  - Developement of integrated multi-trophic system concept (fish, freshwater shrimp and vegetables)

COASTAL FISHING TOURISM

- **One of priority sectors of blue economy**
  - Extends tourism season
  - Diversify fishery sector and creates sustanable jobs in rural areas
  - Annual growth by 7 %
  - 10 times higher economic effect than traditional fishery

Catch Coastal Angling Tourism

Interreg South Baltic

EUROPEAN UNION
European Regional Development Fund

Coastal angling tourism – a development chance for the south Baltic region

RETROUT

Interreg Baltic Sea Region

EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND

Development, promotion and sustainable management of the Baltic Sea Region as a coastal fishing tourism destination

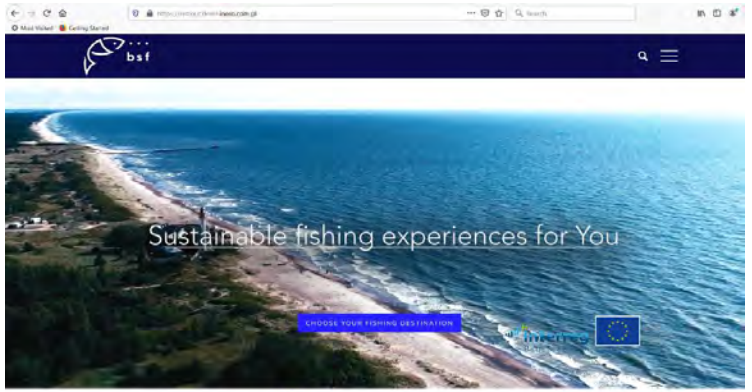
Interreg
Baltic Sea Region

EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND

RETROUT

Klaipėda – coastal fishing tourism destination, one of five BALTIC SEA FISHING network destintions

www.balticseafishing.com



baltic sea fishing

For sustainable fishing stocks – sustainable best practice management!

Thank You for the Attention!

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