

Blue bio-economy in Lithuania

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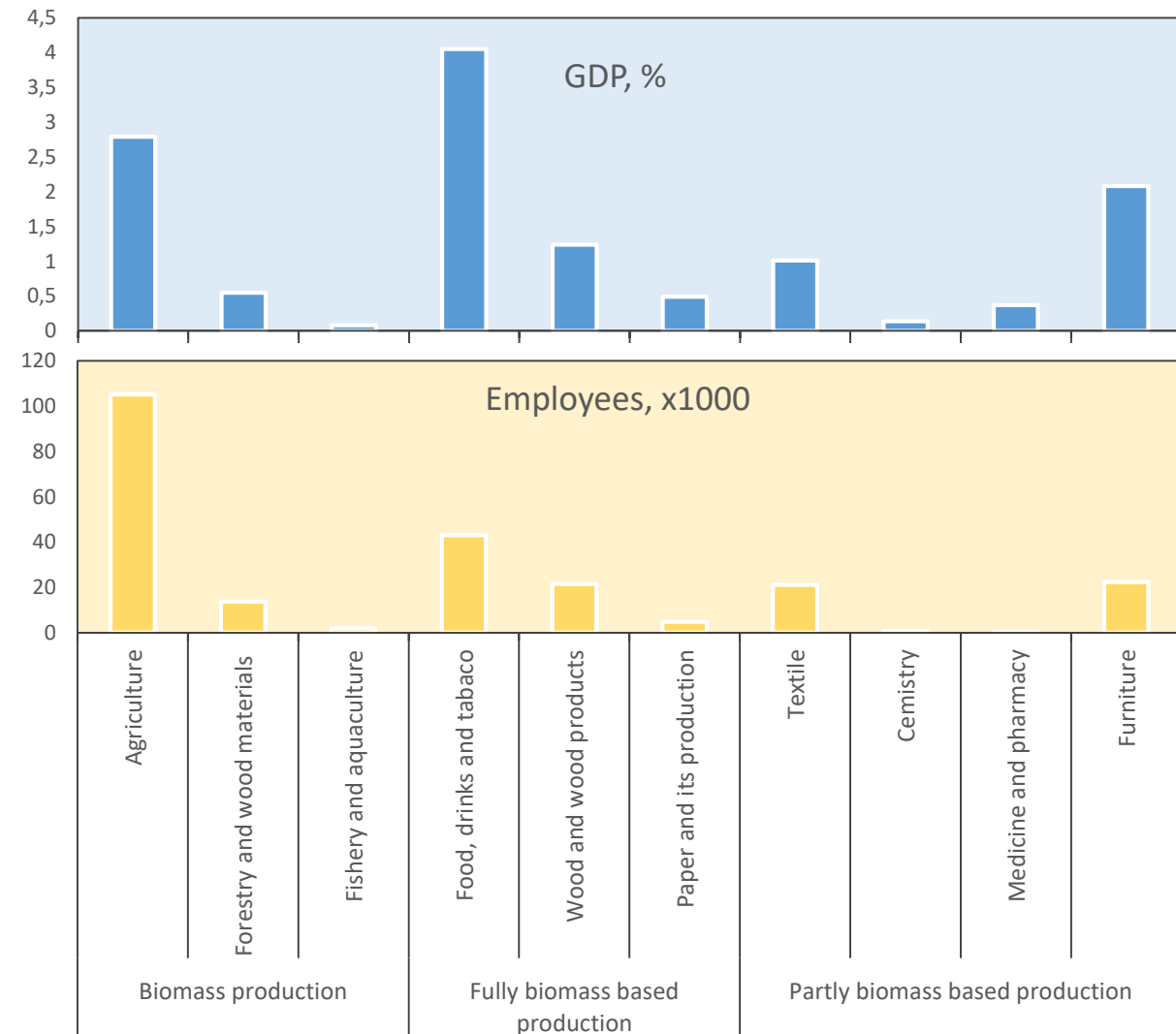
Klaipeda
University

Marine Research
Institute

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 countries to start communication and preparation for National Bioeconomy Strategies
- In Lithuania, bioeconomy is historically 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:

- Development 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



Klaipėda 2030

2030
KLAIPĖDA

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 mitybinių 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

Strategic Directions

Growth areas

Vision

Klaipėda,
2030:
Globally-acknowledged
city of blue economy
and fast solutions

Marine economics



- Integrated complex of the port, logistics and industry
- Development of LNG technology and its use
- Marine and wellness tourism
- Active tourism

Bioeconomics



- Production of innovative bioproducts
- Production and use of renewable energy
- Biomass and waste recycling
- Biotechnology development and adaptation for aquaculture

Advanced industrial economics



- Production of electric equipment and means of transport that create high added value
- Development of automation solutions and their application in logistics, transport and industry.

Creative and service economics



- Centres of professional services
- Creative industries and digital creation
- Summer office for Lithuanian and foreign businesses

Favourable conditions for business, investors and talents

- High public service quality, fast and efficient decision-making
- Integrated programme for attracting and servicing investors
- Developed ecosystem for Small and Medium Enterprises
- Talent attraction and retention programme, which ensures a critical mass of highly-qualified employees

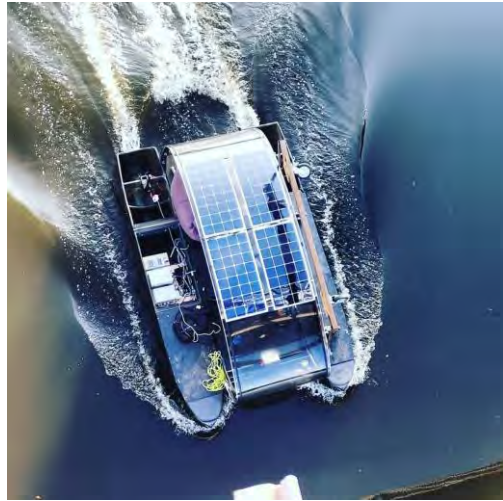
Innovative system of education and science, which meets the needs of the future economy

- The most international institution of high education in Lithuania, taking the lead in the fields of marine industries, energy and biotechnology
- General education system, which meets the needs of local and incoming talents
- Developed and innovation-oriented education, science and business cooperation ecosystem
- Modern professional retraining and qualification improvement system

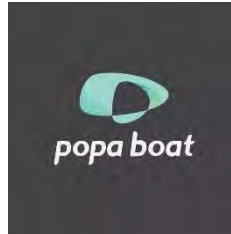
Attractive, inclusive and accessible regional centre



INNOVATIONS IN ELECTRIC PUBLIC TRANSPORT



Fully solar powered sustainable catamaran for ridesharing in urban waters.



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

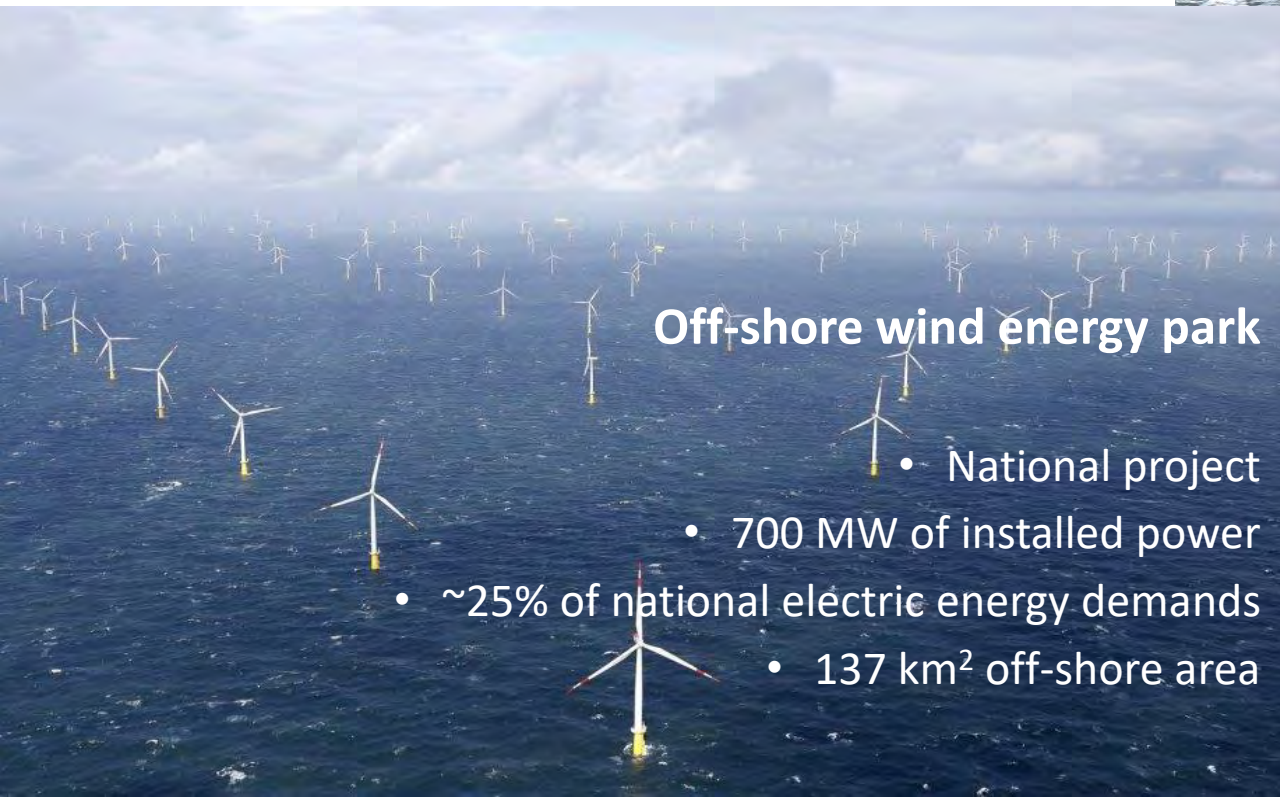
It is introduced into public transport system of Klaipeda



MARINE ENERGY

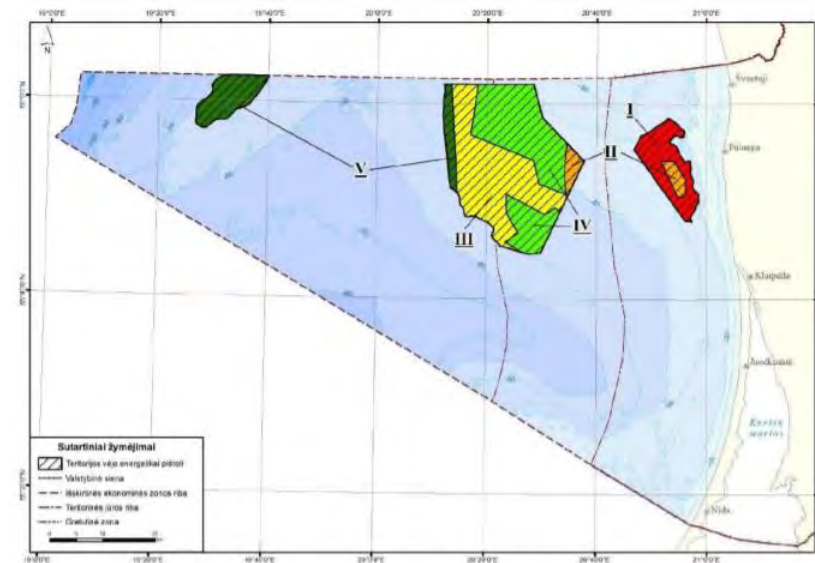


Longitudinal
wave electric
power
generator
(A. Pašilis,
patented)



Off-shore wind energy park

- National project
- 700 MW of installed power
- ~25% of national electric energy demands
- 137 km² off-shore area



BLUE BIOTECHNOLOGY IN KLAIPEDA UNIVERSITY



BIOLOGY AND MARINE BIOTECHNOLOGY BACHELOR STUDIES

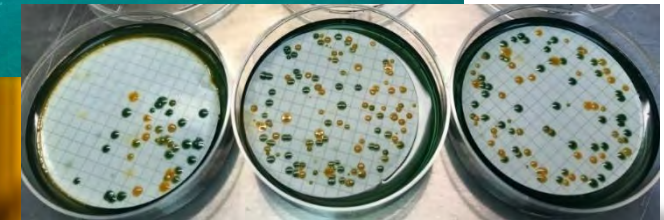
ECOLOGY AND ENVIRONMENTAL SCIENCES MASTER STUDIES WITH AQUACULTURE PROFILE

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”



Klaipėdos
universitetas

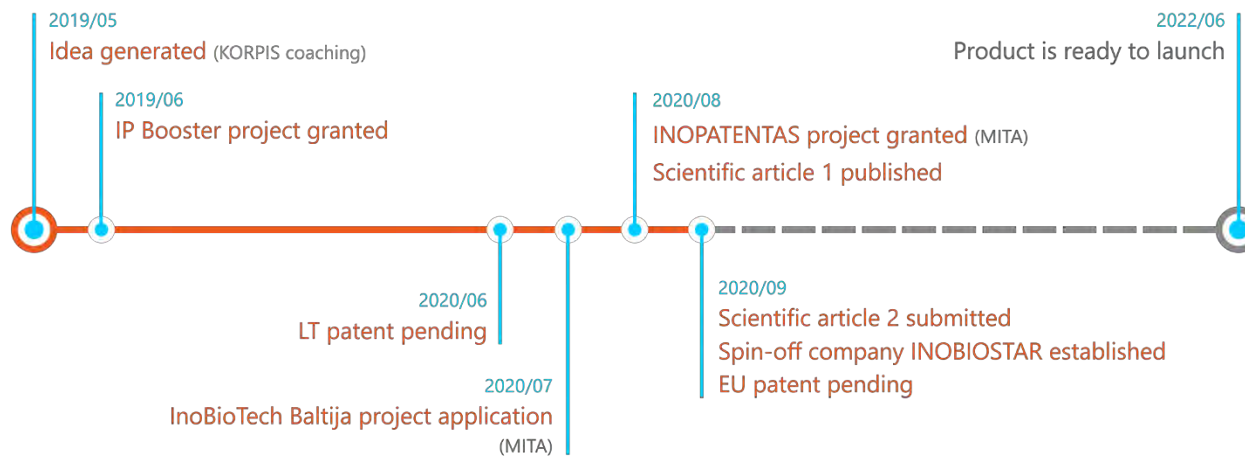
30
metų



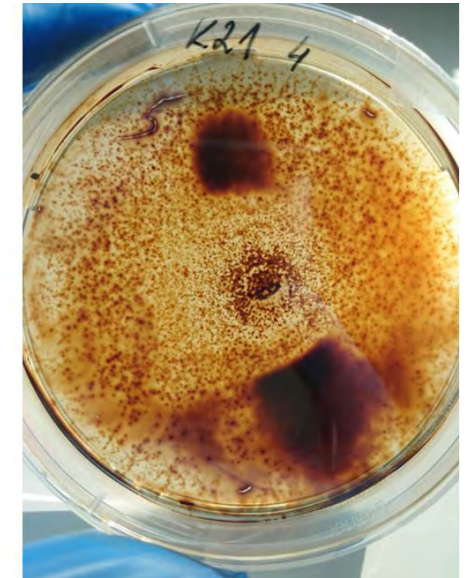
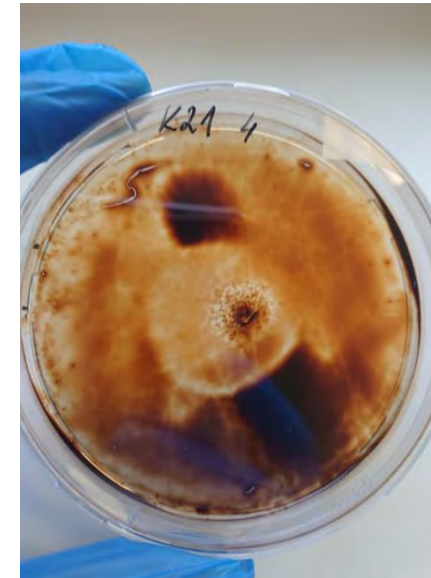
BLUE BIOTECHNOLOGY IN KLAIPEDA UNIVERSITY



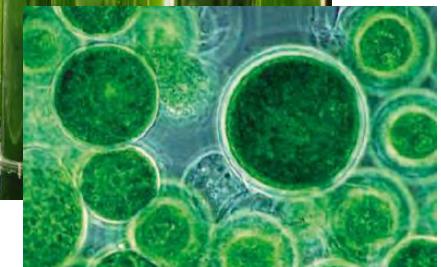
METHOD FOR PETROLEUM HYDROCARBON BIOREMEDIATION USING FUNGI, EU PATENT PENDING



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



Fungi strain on water agar experiment day T2 and day T8



BLUE BIOTECHNOLOGY IN LITHUANIA



- Lithuanian Biotechnology Association

- White and red biotech

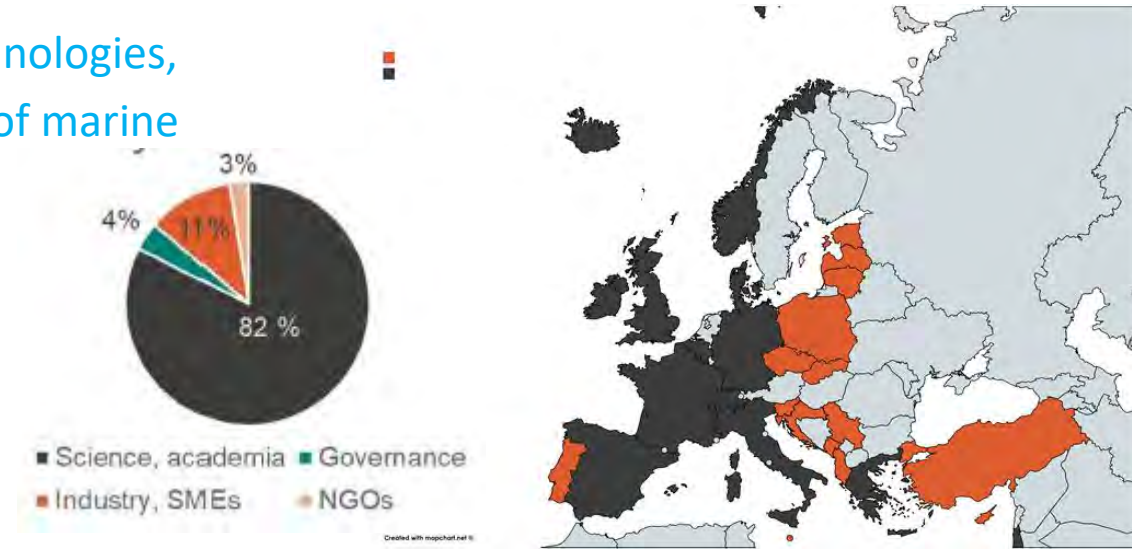
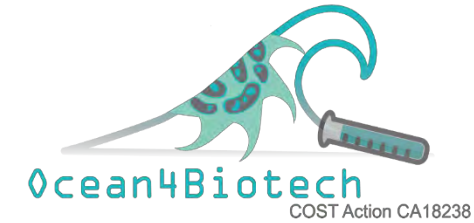


- JSC Biomè considers Baltic Sea mollusk shells as an attractive resource for biomedical industry. The main goal is to apply ground mollusk shells for the preparation of 3D polymeric scaffolds for bone tissue engineering in odontology and orthopedics.
- SME Ekogina and JSC Spila produce different *Spirulina* cyanobacteria and *Chlorella* 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
- Lithuanian partners:
 - Life Sciences Centre of Vilnius University
 - Biotechnology Institute
 - Marine Research Institute, Klaipėda University



Ocean4Biotech

“European transdisciplinary networking platform for marine biotechnology”
October 2019 – September 2023

LITHUANIAN AQUACULTURE



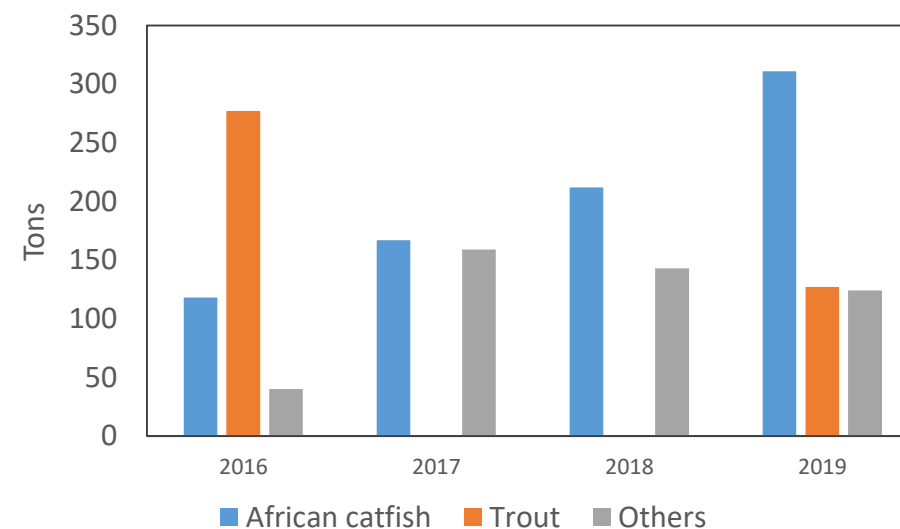
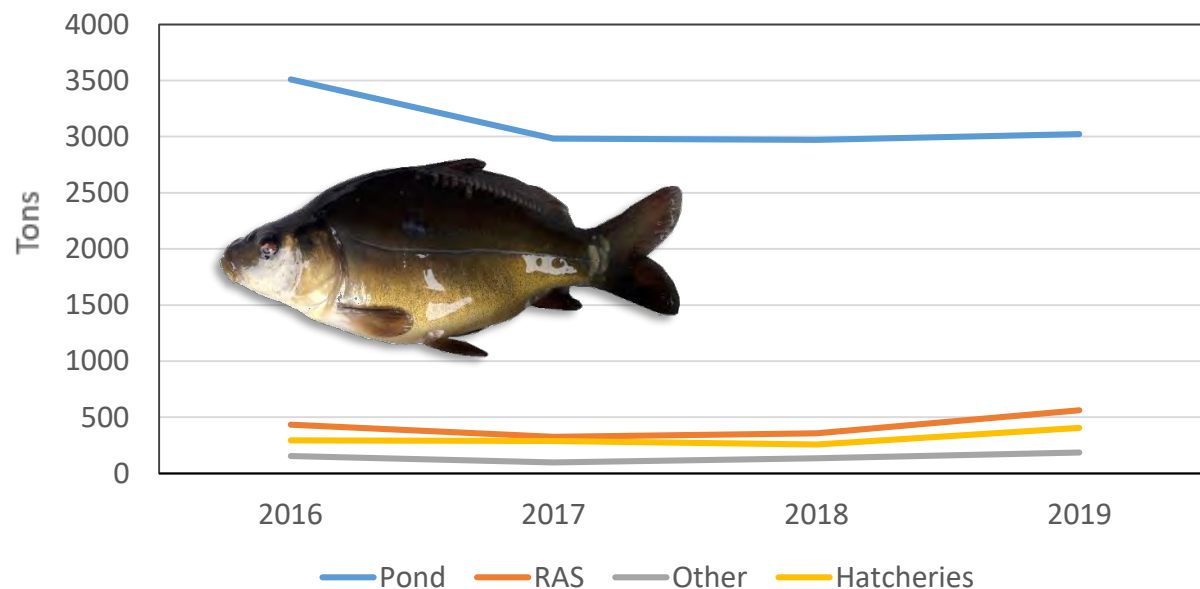
- **Pond aquaculture**

- 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

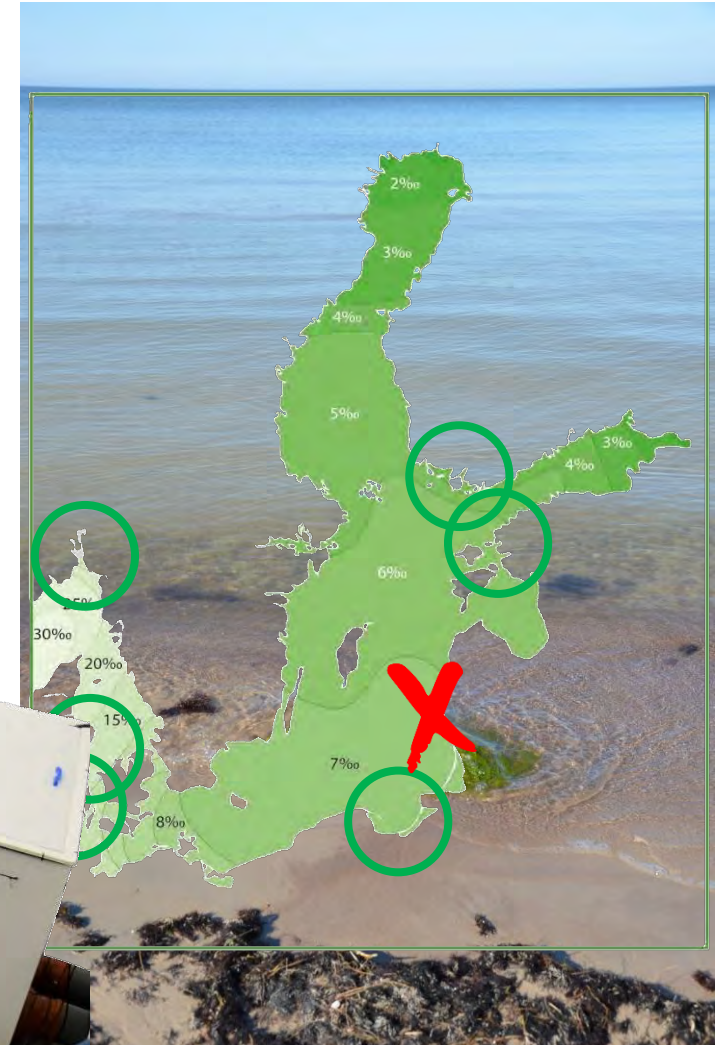


MARINE AQUACULTURE IN LITHUANIA?



- 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

- ***Aquaponics***

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



KLAIPĖDOS MOKSLO IR
TECHNOLOGIJŲ PARKAS



COASTAL FISHING TOURISM

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



European
Regional
Development
Fund

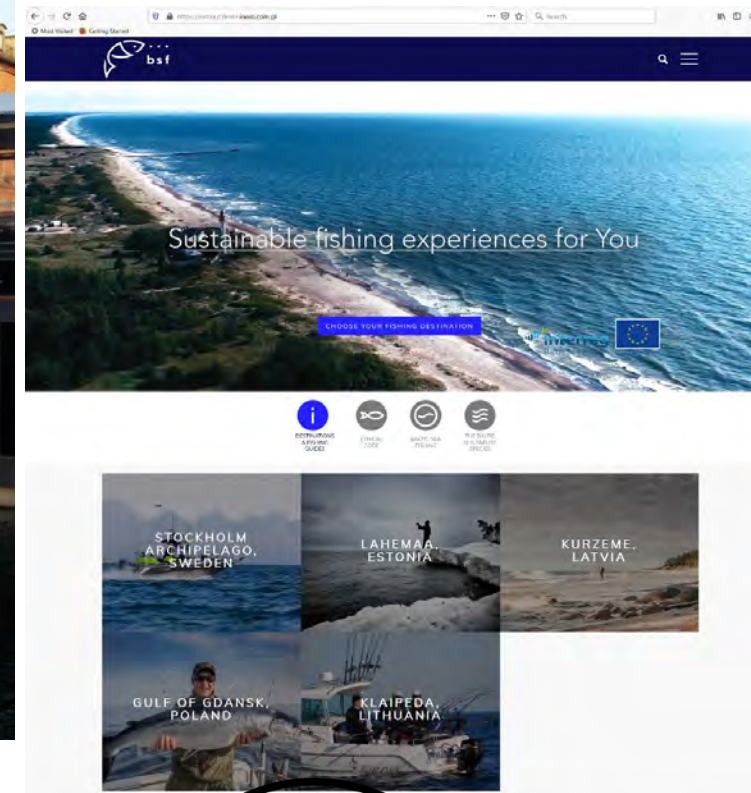
Coastal angling tourism – a development chance for the south Baltic region



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



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



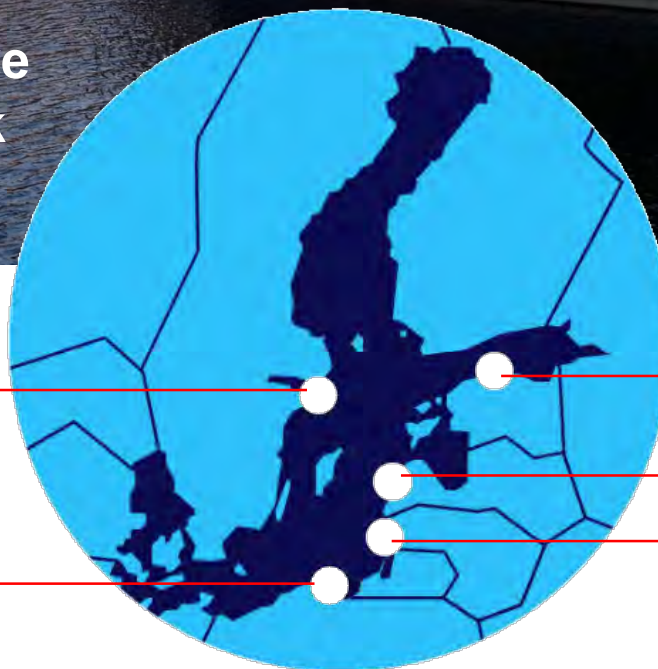
Stockholm
Archipelago

Lahemaa

Kurzeme

Klaipėda

Gulf of
Gdansk



SOME FISHING IN THE UNIQUE
BALTIC SEA

The coastal, unspoiled Baltic Sea waters are unique in a global scale, allowing you to find fresh fish and other types of marine origins, swimming here side by side. The natural area destination you choose - the archipelago in the coastal parts of the sea is sandy beaches in the east and south - you will always find a quick access to the wilderness. Let our professional fishing guides, skilled in everything from safety and safety to ecological concerns perfectly adjust the trip to your needs. Contacted fish with us!

[Read more](#)

A photograph of a fish, likely a trout or salmon, leaping out of a shallow, rocky stream. The fish is captured mid-jump, with its body arched and its tail fin visible. The water is clear, revealing the smooth, light-colored stones on the stream bed. The background shows a forest floor with fallen leaves and some green vegetation.

For sustainable fishing stocks – sustainable best practice management!

Thank You for the Attention!

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