UMBRELLA project presents:

THE SOUTH-BALTIC
SUCCESS STORIES SERIES

Discover the most outstanding South-Baltic projects achievements

The South Baltic success story – RBR: Reviving Baltic Resilience

Project title

RBR – Reviving Baltic Resilience.

The main goal

The main objective of the project is to highlight the proactive approach when working with environmental projects by showcasing successful proactive methods and technologies to

prevent hazardous and unwanted particles from reaching the Baltic Sea and at the same time to disseminate this knowledge to the South Baltic region by having a cross-border approach.

The main outputs of the project will be 4 different pilot cases (*Less particulates emission from the diesel engine (Poland), Landfill leachate cleaning (Sweden), Ecopile phytoremediation plant (Sweden) and Marine litter disposal (Lithuania)*) in all participating countries as well as a South Baltic Proactive Resilience institute/cluster. The purpose of this is to both show the approach/technologies in practice, but at the same time also to certify the cross-border knowledge exchange and durability of the method and pilot cases after the project has ended as well. The approach of the project is a 3-step process that includes technical analysis of the most optimal proactive technologies/solutions for each pilot case, the implementation of pilot cases and the evaluation of installed solutions from a technical, social and economic perspective.

Reviving Baltic Resilience

Objectives:

Facilitation of green technologies in order to decrease the pollution discharges in the South Baltic area

Results:

- Risk analysis & planning tool for green technologies
- South Baltic Proactive Resilience network
- Four Pilot Cases

Partners:

Gdansk University of Technology, Klaipeda University, IUC Syd (Industriella Utvecklingscentra), Linnaeus University, Municipality of Palanga, NSR AB (Nordvästra Skånes Renhållnings AB), Pomeranian Special Economic Zone Ltd.

Associated partners:

CleantechInn, IMCG, Liepaja University, KSRR, Port of Gdansk Authority SA

Interreg South Baltic

EUROPEAN UNION

https://chem.pg.edu.pl/rbr

Reviving Baltic Resilience

Partnership

- Lead Partner: **Gdansk University of Technology**, Faculty of Chemistry, Department of Chemical Technology. Address: ul. G. Narutowicza 11/12, 80-233 Gdańsk, Poland. tel: +48 58 347 23 52. Project leader: prof. dr hab. inż. Jan Hupka. Project manager: Andrzej Rogala.
- Partner: **Klaipeda University**, Faculty of Maritime Engineering and Natural Sciences, Natural Sciences Department, LT-92294 Klaipeda, Herkaus Manto str. 84, Lithuania. Project manager: prof. Olga Anne.
- Partner: **Linnaeus University**, Faculty of Health and Life Sciences, Department of Biology and Environmental Science, address: 391 82 Kalmar, 351 95 Växjö, Sweden. tel: +46(0)480-446106. Project leader: prof. William Hogland. Project administrator: Jelena Lundström
- Partner: **Pomeranian Special Economic Zone Ltd**. 81-703 Sopot, Władysława IV/9, Poland. Project manager: Anna Zielińska.
- Partner: **NSR**, 254 64 Helsingborg, Hjortshögsvägen 1, Sweden. Project manager: Amanda Widen, Communication: Maria Ledström, Pilot case: Samuel Svensson.
- Partner: **Municipality of Palanga**, LT-00153 Palanga, Vytauto str. 112, Lithuania. Project manager: Aušra Šikšnienė
- Partner: **IUC Syd**, 21119 Malmö, Anckargripsgatan 3, Sweden. Project manager: Mats Larsson

Four associated partners: Liepaja University, Latvia; Port of Gdansk Authority SA, Poland; CleantechInn, Sweden; IMCG (Innovation Management and Communication Group Sweden); KSRR (Kalmarsundsregionens Renhållare) Sweden.

Target groups of the project

The main target group is the municipalities in the region as well as their municipal companies and regional authorities that can implement similar solutions and promote the proactive prevention approach of RBR. As well, public stakeholders that would like to learn more about proactive prevention solutions and companies that can provide green technologies for the installations. The main target groups will be able to take part in the pilot cases created in the project through the institute/cluster, but also to initiate new ventures focusing on proactiveness.

Budget

1495000 Eur

Programme Co-financing

1189950 Eur

Duration

July 2017- June 2021

Slogan

Go proactive together!!!

Tips & tricks box

Always use opportunities to gain new knowledge and skills. Be open for challenges to go green and serve to environment/ nature. Discover the benefit that international cooperation gives you and your area – pilot cases, innovative ideas, experience to work in a multicultural team, contribution to decision making at a different level. Increase your self-believing and expertise. Use unique perspectives to improve your foreign language skill, to make in touch with other countries history, culture and traditions. Be ready to unlock your area advantages/disadvantages. Stay motivated and you will get exactly what you are looking for!!!

RBR – SUCCESS STORY with main events

01.07.2017 – START of THE PROJECT

Kick off meeting September 28th 2017

THE PROJECT STRUCTURE HAS BEEN ESTABLISHED AND WORKPLAN DISCUSSED AND CONFIRMED

SECOND Project Meeting in Klaipeda: Palanga Pilot Case plan presentation January 25-26 2018 – THE PLAN OF THE PP8 PILOT CASE AND PROJECT PROGRESS DISCUSSION:

THIRD Project Meeting in Helsinborg: NSR Pilot Case plan and development September 20-21 2018:

Crossborder seminar nr 1 – during Linnaeus Ecotech Conference 2018 – OFFICIAL PRESENTATION OF FIRST RESULTS AND PROJECT DISSEMINATION

FOUTH PROJECT MEETING: Gdańsk, Poland, 9-10 May 2019, LP Pilot Case final plan, PP4 Pilot Case presentation

Fifth Project meeting August 27 – 30 2019 Project Meeting in Klaipeda/Palanga – PP8 : LP, PP7 and PP8 Pilot Cases presentations, idea of shift PP4 Pilot Case to PP7

The beginning of 2020 – CORONAVIRUS SPREAD ACROSS THE EUROPE – timetable changes, new routinges in the project, numerous online meetings.

SIXTH Project Meeting Sweden PP4 (ONLINE) JULY 13th , 2020 – project progres discussion, official shift of Phytoremediation Pilot Case from PP4 to PP7.

Participation in ONLINE LInnaeus ECO-Tech Conference 2020, 23-25 November, 2020 – presentations of RBR results, Pilot Cases and discussions about potential new cooperation with stakeholders.

ADDITIONAL Project meeting – 30.03.2021 – presentations of final results, discussion about Green Technologies Cluster, preparation for two online Crossborder Seminars

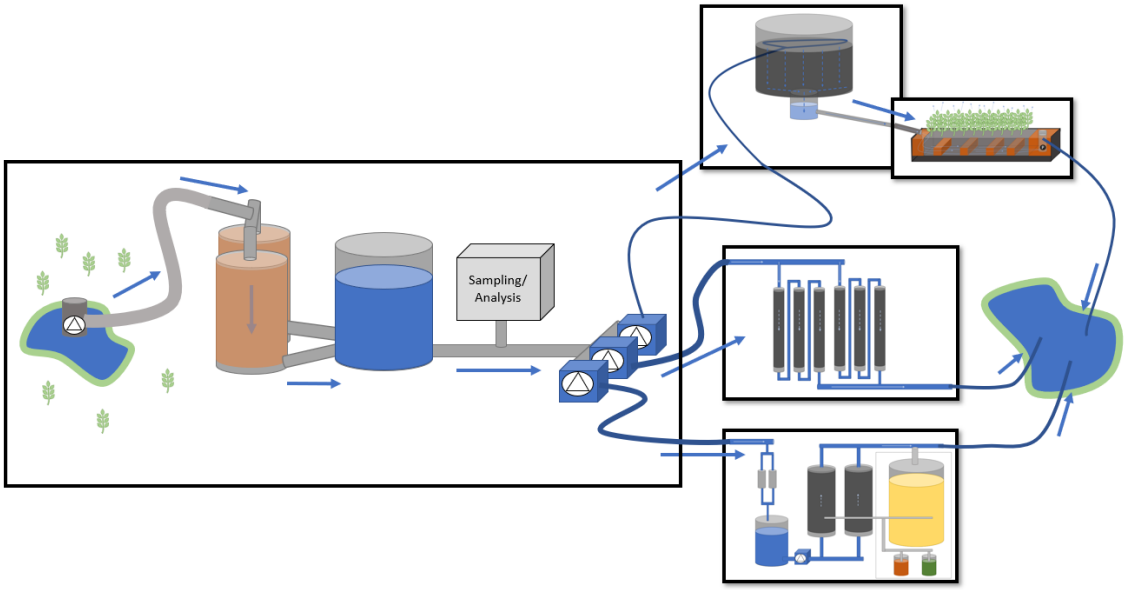
SECOND CROSSBORDER SEMINAR (ONLINE) – LITHUANIA (KLAIPEDA/PALANGA), Dissemination of the experience of international project RBR in the seminar “Baltic Marine and Near-Shore Pollution”. 17-05-2021

THIRD CROSSBORDER SEMINAR (ONLINE) – POLAND (GDAŃSK) – presentations of project results, dissemination and discussions with potential stakeholders during BSR WATER online summer conference, June 9th, 2021

FINAL PILOT CASES:

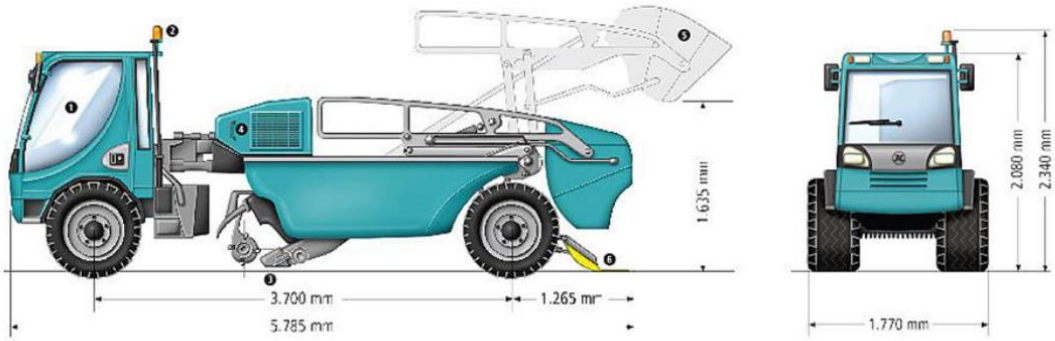
LP – DME ENGINE installed in the floating laboratory PHOTON:

PP7 – 1 – leachate treatment



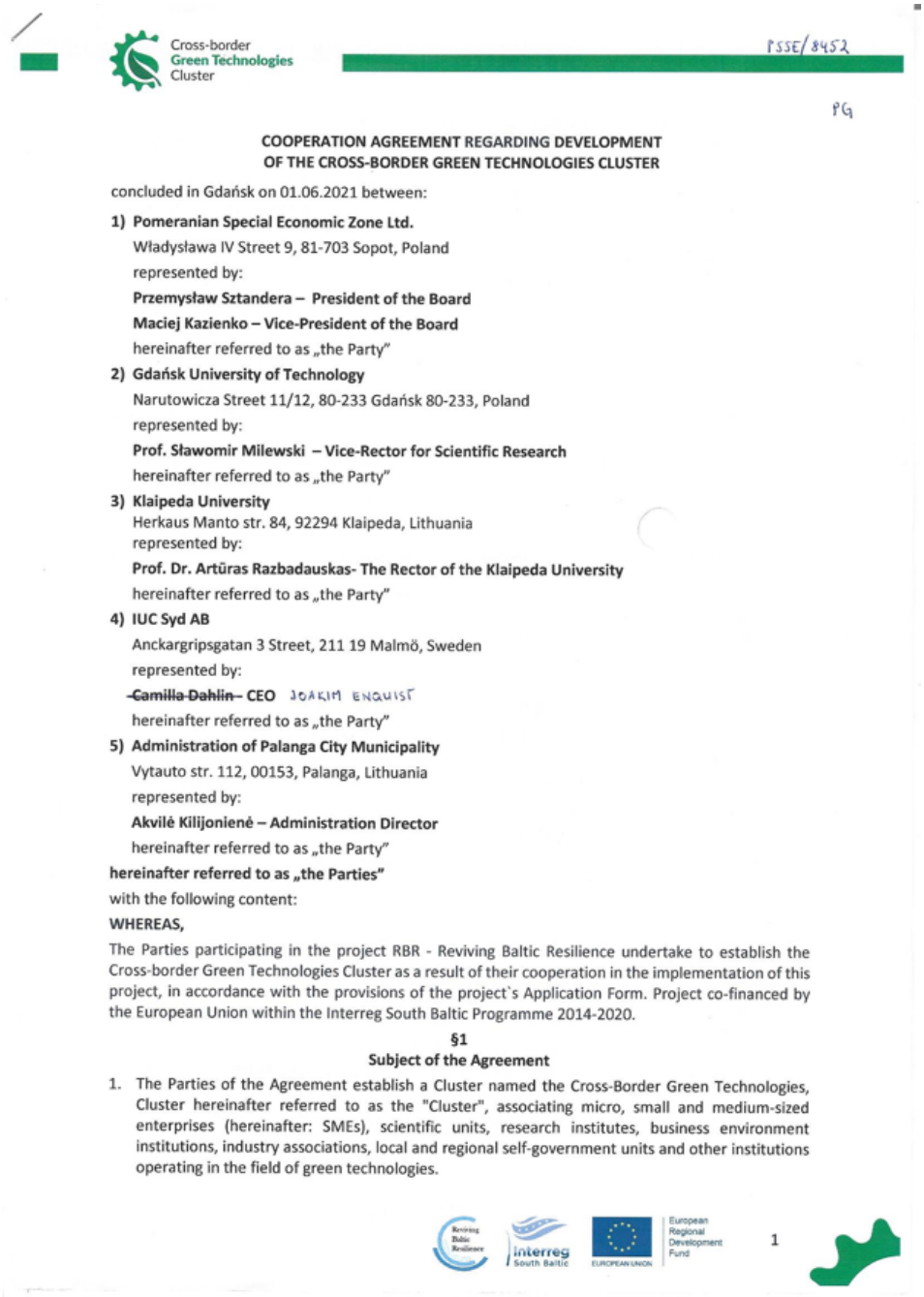
PP7 – 2 – phytoremediation technology for oiled soil treatment

PP8 – technology to decrease microplastics and nutrients emission to the Baltic Sea



PILOT CASES

ESTABLISH OF GREEN TECHNOLOGY CLUSTER - 01.06.2021



Cross-border Green Technologies Cluster

PSSE/8452

PG

COOPERATION AGREEMENT REGARDING DEVELOPMENT OF THE CROSS-BORDER GREEN TECHNOLOGIES CLUSTER

concluded in Gdańsk on 01.06.2021 between:

1) **Pomeranian Special Economic Zone Ltd.**
   Władysława IV Street 9, 81-703 Sopot, Poland
   represented by:
   Przemysław Sztandera – President of the Board
   Maciej Kazienko – Vice-President of the Board
   hereinafter referred to as „the Party"
2) **Gdańsk University of Technology**
   Narutowicza Street 11/12, 80-233 Gdańsk 80-233, Poland
   represented by:
   Prof. Sławomir Milewski – Vice-Rector for Scientific Research
   hereinafter referred to as „the Party"
3) **Klaipeda University**
   Herkaus Manto str. 84, 92294 Klaipeda, Lithuania
   represented by:
   Prof. Dr. Artūras Razbadauskas- The Rector of the Klaipeda University
   hereinafter referred to as „the Party"
4) **IUC Syd AB**
   Anckargripsgatan 3 Street, 211 19 Malmö, Sweden
   represented by:
   ~~**Camilla Dahlin – CEO**~~ JOAKIM ENQUIST
   hereinafter referred to as „the Party"
5) **Administration of Palanga City Municipality**
   Vytauto str. 112, 00153, Palanga, Lithuania
   represented by:
   Akvilė Kilijonienė – Administration Director
   hereinafter referred to as „the Party"

hereinafter referred to as „the Parties"

with the following content:

WHEREAS,

The Parties participating in the project RBR - Reviving Baltic Resilience undertake to establish the Cross-border Green Technologies Cluster as a result of their cooperation in the implementation of this project, in accordance with the provisions of the project`s Application Form. Project co-financed by the European Union within the Interreg South Baltic Programme 2014-2020.

§1
Subject of the Agreement

1. The Parties of the Agreement establish a Cluster named the Cross-Border Green Technologies, Cluster hereinafter referred to as the "Cluster", associating micro, small and medium-sized enterprises (hereinafter: SMEs), scientific units, research institutes, business environment institutions, industry associations, local and regional self-government units and other institutions operating in the field of green technologies.

Reviving Baltic Resilience | Interreg South Baltic | European Regional Development Fund

1

Reviving Baltic Resilience Team

Go proactive together!!!

PHOTO DOCUMENTATION:

PILOT CASE 1 – DME ENGINE – LP

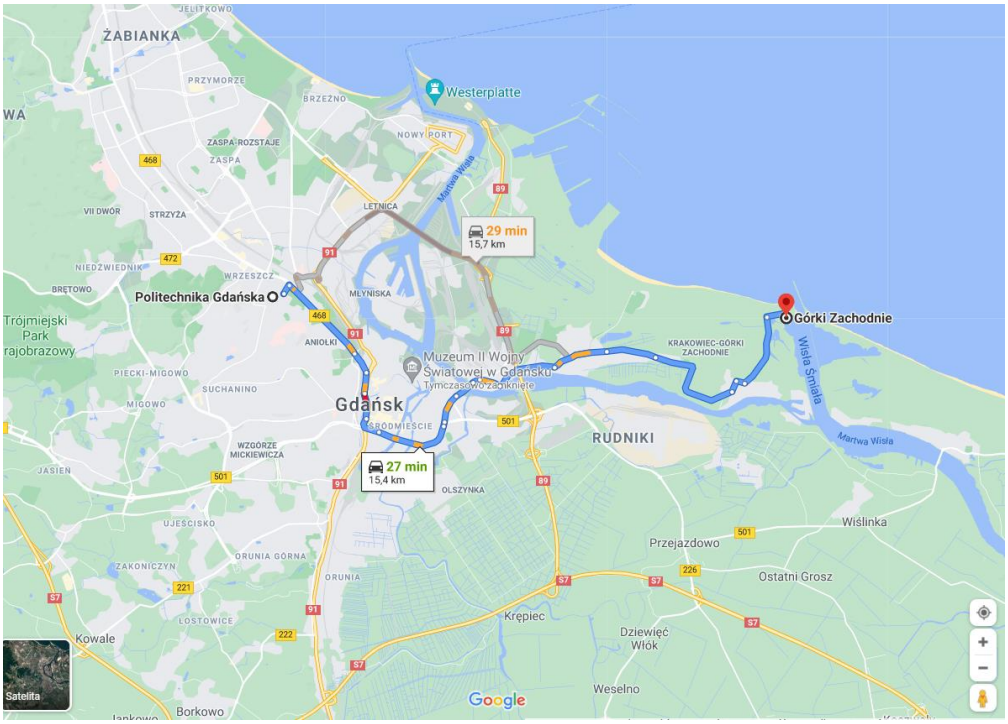


Fig. 1. Location of Pilot Case and Leader Partner in the regional map

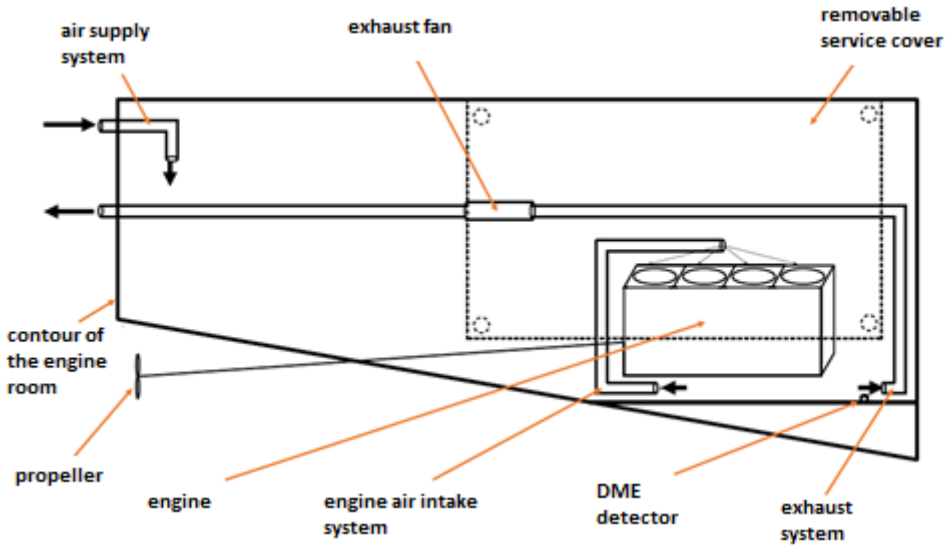


Fig 2. Diagram of the ventilation system at PHOTON

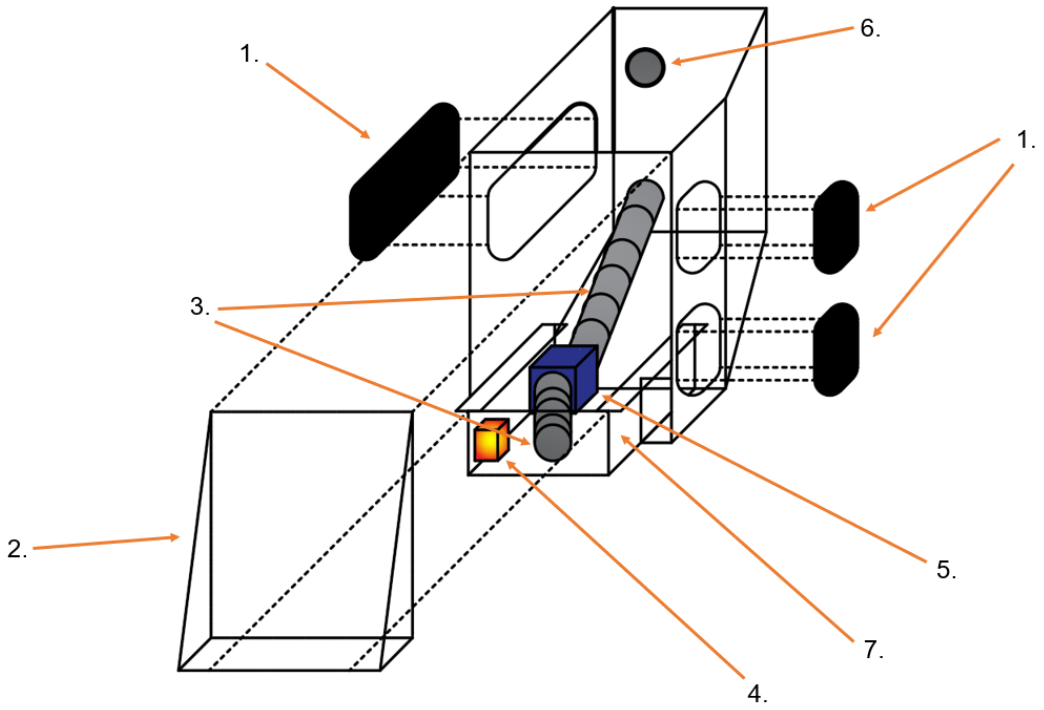
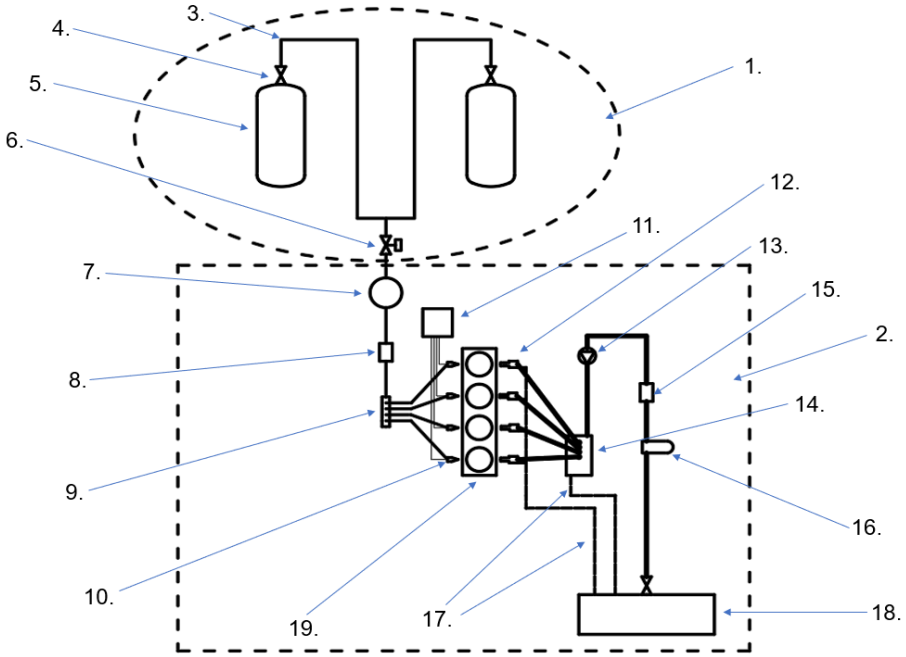


Fig. 3. Diagram of the reconstruction of the engine room at PHOTON

1. Service openings covers,
2. A tight hatch closing the engine room,
3. Ventilation pipe of the exhaust system,
4. DME detector,
5. Extraction fan,
6. Fresh air supply vent,
7. The foundation of the engine.



Rys. 4. Diagram of the concept of a dual-fuel engine installation on the PHOTON unit

1. The installation area on board the vessel,
2. The installation area below the deck of the vessel,
3. Line of DME distribution cables,
4. Manual valve in the DME tank,
5. DME tank,
6. Solenoid valve cutting off the gas supply under the deck,
7. Reducer, evaporator,
8. Gas phase filter,
9. Common injector rail,
10. Gas injectors in the engine's intake manifold,
11. Controller of the gas fuel system,
12. ON injectors,
13. Electric pump ON,
14. ON injection pump,
15. ON fuel filter,
16. Fuel separator ON,
17. ON return wires,
18. ON tank,
19. motor.

Fig 8. Overall view on Floatin Laboratory Photon

Fig 9. DME/mixed fuels injection system and the modification of Photon engine

Fig 10. Dual system, steering and air system elements of Pilot Case

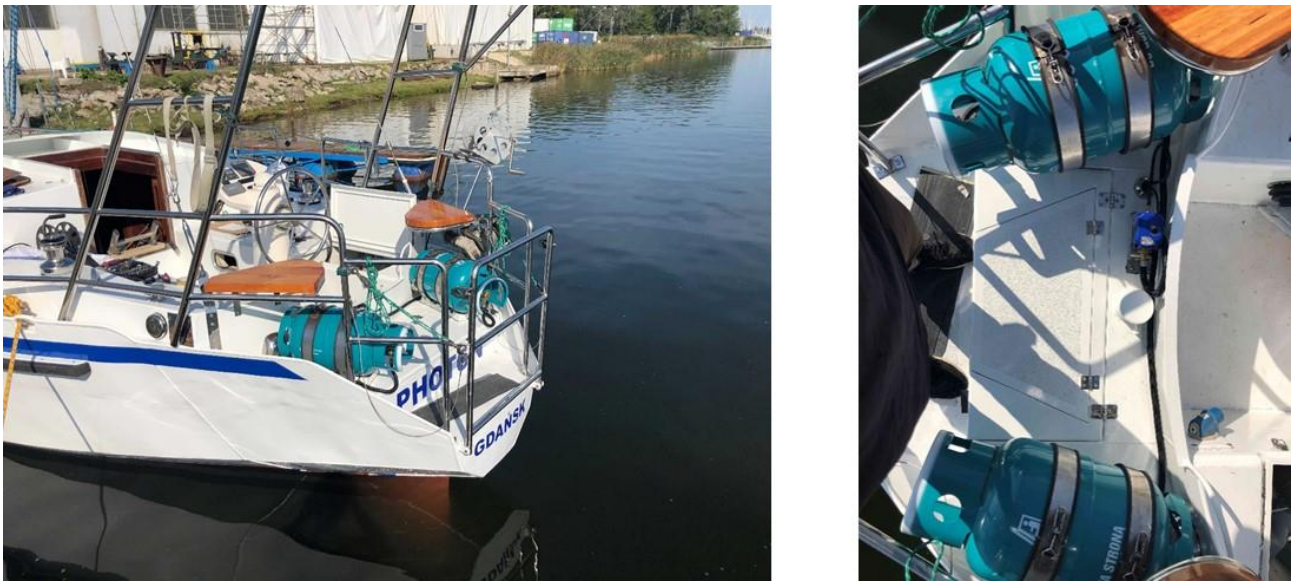


Fig 11. DME tanks elements of Pilot Case

Fig 12. Heavy pressure pump – element of installed Pilot Case

PILOT CASE 2 – LANDFILLS LEACHATES CLEANING – PP4

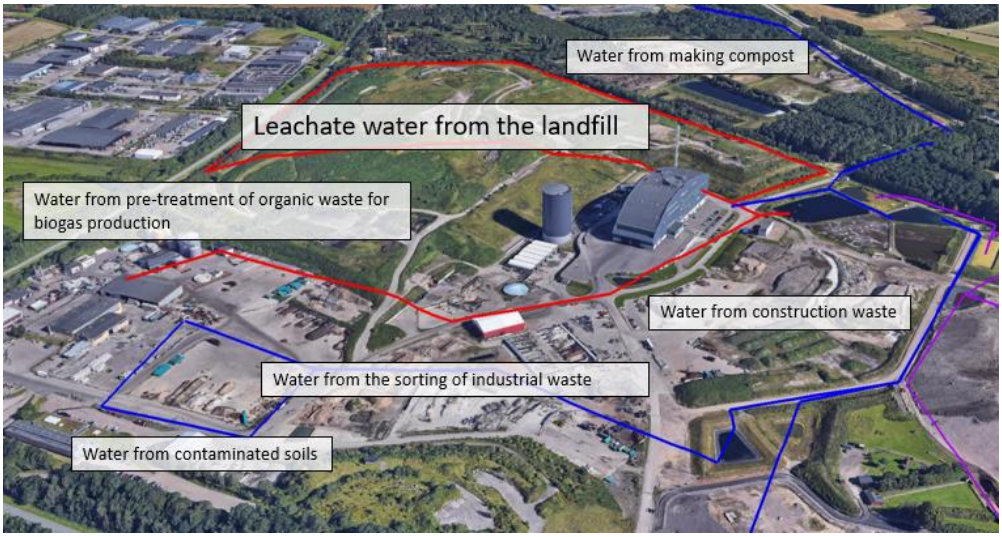


Figure 1 The layout of the Filborna area with major flows of water that effects the water characteristics. (Provided by Project Partner)

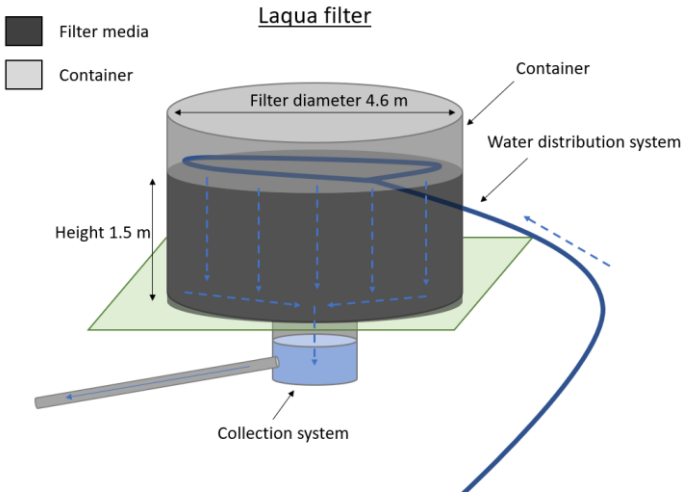


Figure 3 ***Schematic of the Laqua filter. The system contains a distribution system, the filter media, surrounding container, and collection system.***

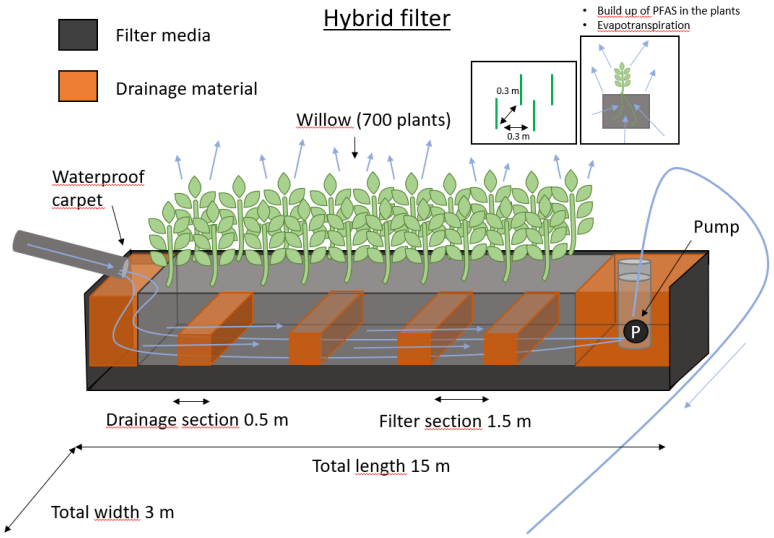


Figure 4 Schematic of the Hybrid filter. The system contains a distribution system, filter media, a surrounding waterproof carpet, drainage material, planted willow and a pump

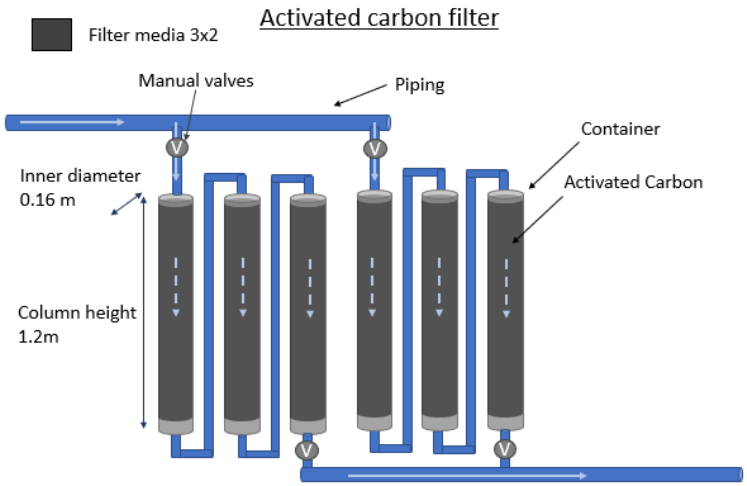


Figure 5 Schematic of the Cornelsen activated carbon filter. The system contains water distributing pipes, two separate sections of columns with corresponding valves, coloumn , the filter media, surrounding container, and collection system Apateq

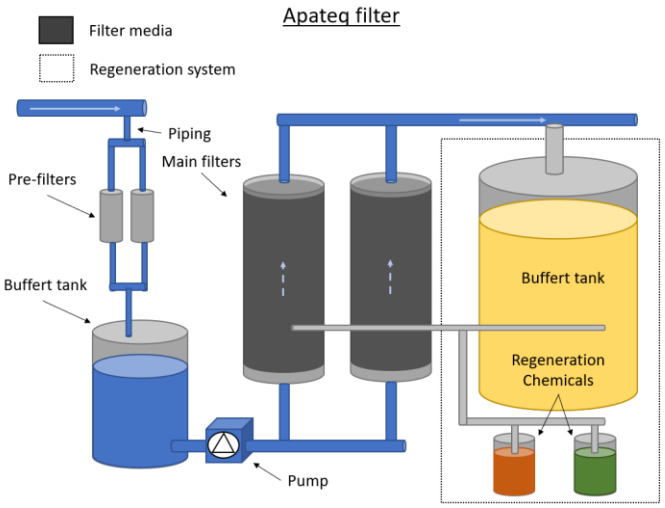


Figure 6 Schematic of the Apateq filter.

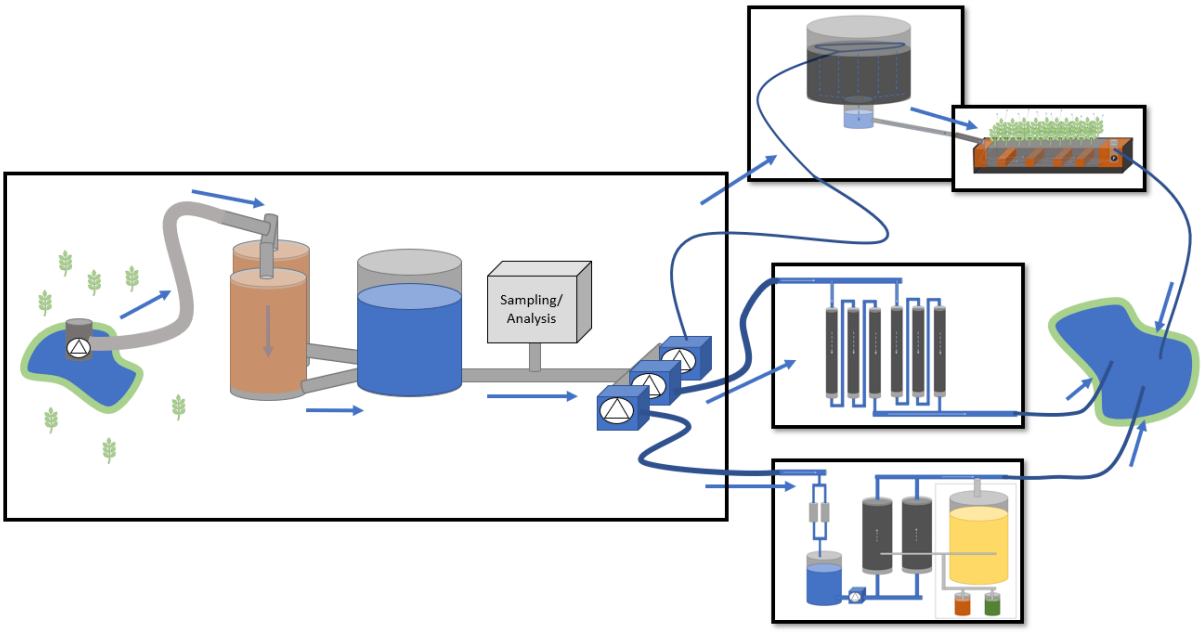


Figure 7 The complete pilot setup.

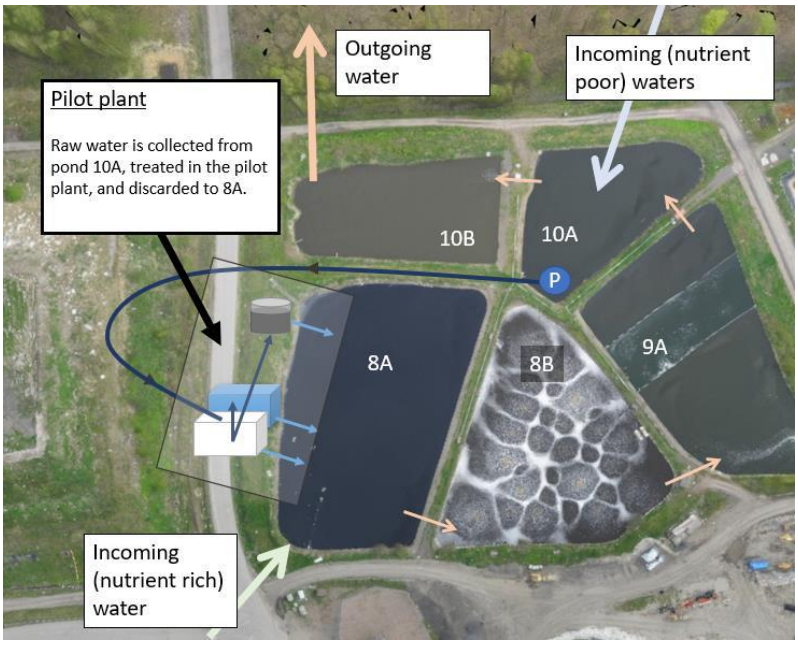


Figure 8 Over all layout of the water treatment system.

1.5 Photo documentation

Figure 9 Construction of Laqua 2 system

Figure 10 Finished system

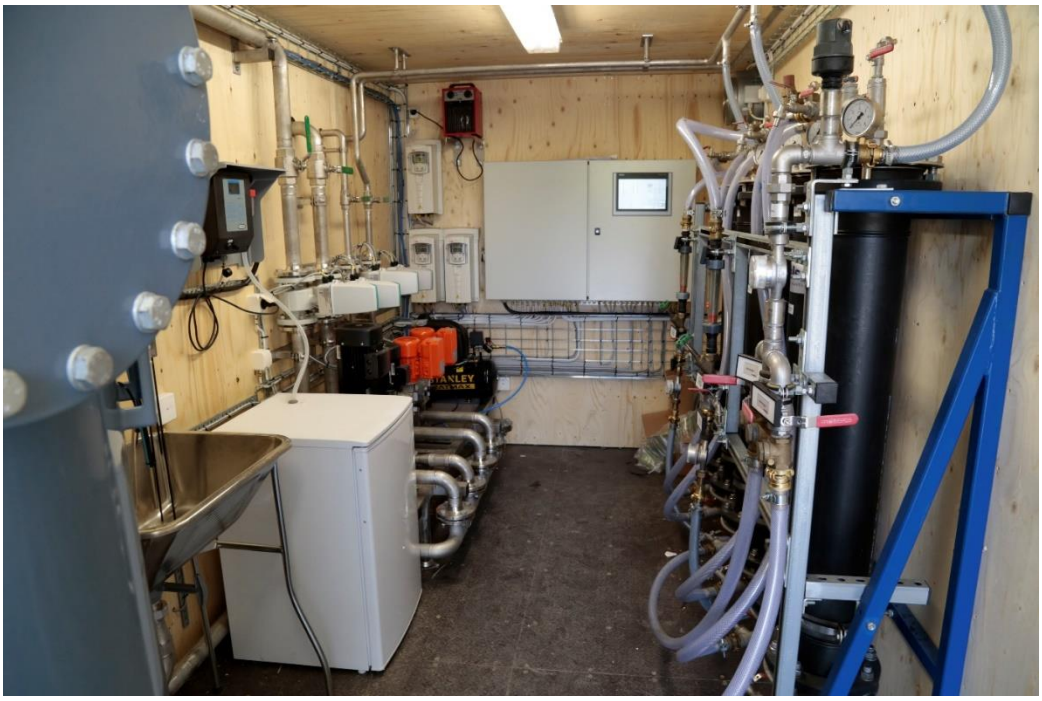


Figure 11 Picture of inside the Pre-treatment container, sandfilter (left), sampling and pumps (left), control system (mid), Cornelsen GAC-filter (right)

Figure 12 Sampling equipment and pumps.

Figure 13 Sand filters

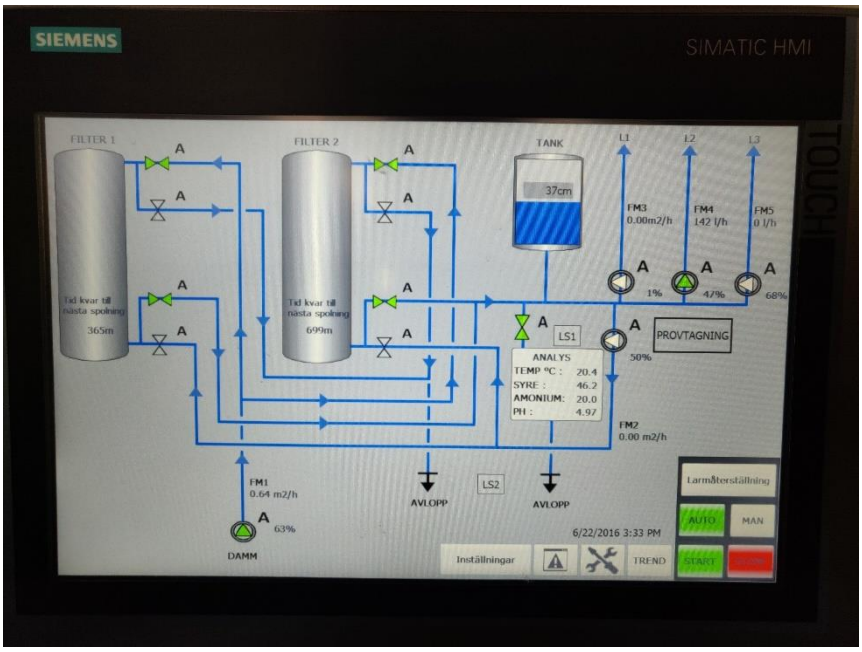


Figure 14 Control panel

Figure 15 Picture of cleaning the water storage container.

Figure 16 Clear outgoing sample.

PILOT CASE 3 – PHYTOREMEDIAION PP4

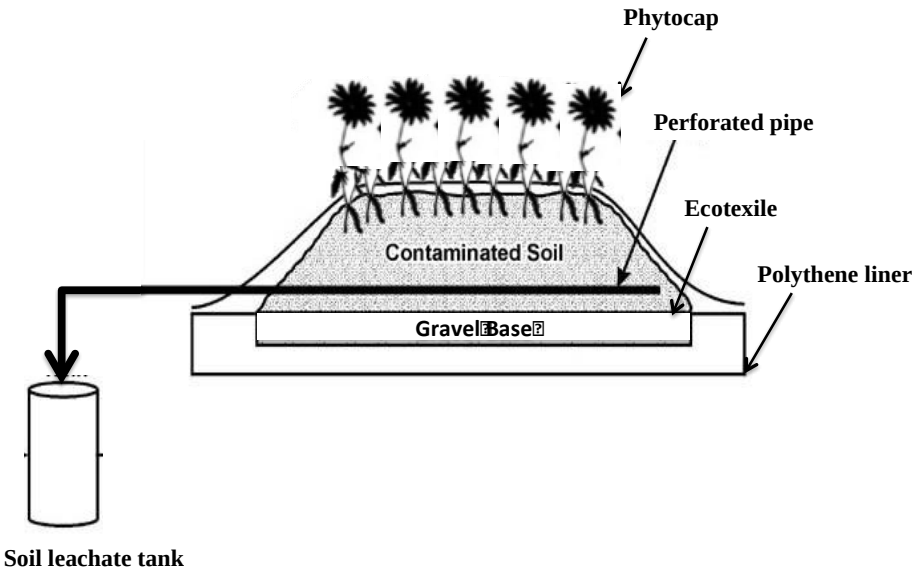


Figure 3 Scheme of an ecopile as pilot trial, which will be scaled up to greenhouse scale.

Parts of the greenhouse:

- New doors: 1 B3500xH3500 mm, 1 B800xH2200 mm
- Truss: 2 x 6.40 m
- Standing side: 4 m from terminal block
- Section: 10 sts 4 sts
- Ventilation: valve shutters size 2 x 997 x 825 mm including ventilation motors 2 pcs type rails
- Living space: 512 m^2
- Ceiling glass: 4 x 997 x 1650 mm
- Load calculation: 30 kg of snow / m^2 and 15 kg of hanging / m^2
- Concrete blocks and 400 mm high socket elements

Figure 6 Air purification system formed by 1 m3 IPC container with bark filter.

The project is based on the idea of scaling up the test lots for treatment oil polluted soil used by

Figure 7 *Construction of hybride filter (ground work)*

Figure 8 *Construction of hybride filter (brick material)*

Figure 9 ***Contruction of the Hybride filter***

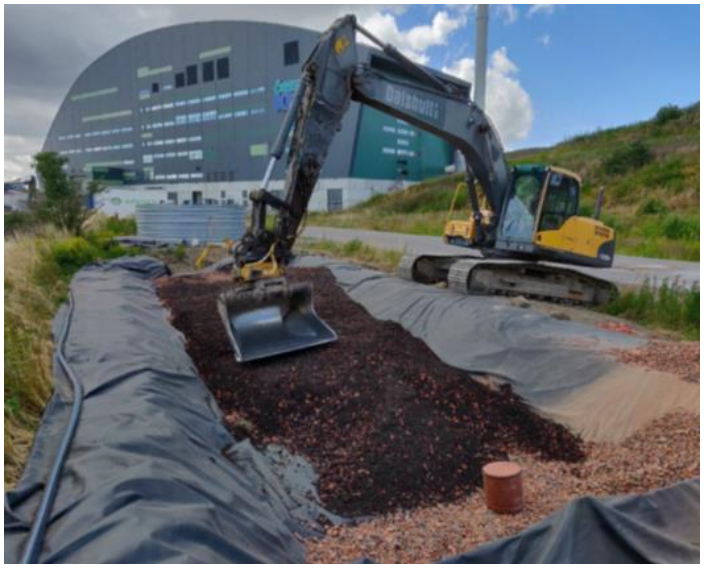


Figure 10 Contrtruction of the hybride filter

Figure 11 ***Contruction of hybrid filter, planting of Salix***

Figure 12 Hybrid filter after planting- 2019-07-08

Figure 13 *Hybrid filter 2019-08-14, approximately two weeks after planting of Salix*

Figure 14 *Improvement of the water dispersing system in the hybride filter*

PILOT CASE 4 – MICROPLASTICS AND NUTRIENTS EMISSION PREVENTION PP8

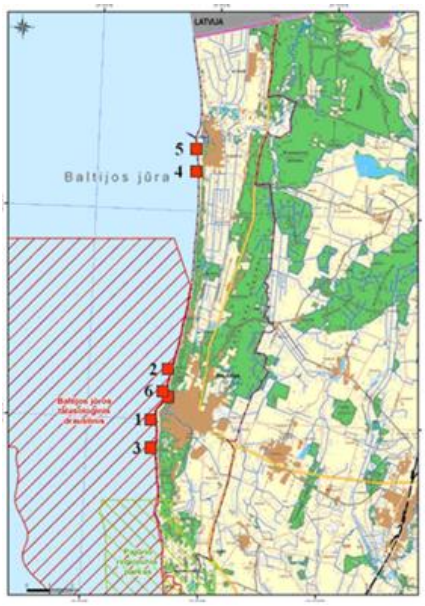


Fig. 1. Location of Pilot Case in the Regional Map

Performance data

max. cleaning performance	15,000 m²/h / 3.5 acres/h
Road legal	yes
Top speed	32 km/h
Working depth up to	20 cm

Engine

Number of cylinders	4
Torque	120 Nm/ 2,000 rpm
Displacement	1,498 cm³
Type	Kubota, turbo diesel
Power	33.0 kW (45 hp)

Attachments

Front hitch with 3-point mounting (Cat. II required): mowing unit, scraper, blade, road sweeper

Fig. 2 Basic mechanical data (Provided by Project Partner)

Fig. 11 Pilot case overal view (Provided by Project Partner)

Fig. 12 Pilot case overal view (Provided by Project Partner)

Fig. 13 Pilot case „parking place" (Provided by Project Partner)

Fig. 14 Palanga beach after Pilot Case use (Provided by Project Partner)