



LIFE_PHIPP

ALTERNATIVE RECYCLING
OF WASTEPAPER AND HEMP
FIBRE INTO INNOVATIVE
THERMAL INSULATION
MATERIALS WITH IMPROVED
THERMAL CONDUCTIVITY

LAYMAN REPORT



LIFE17 ENV/LV/000335

Period of the project: 03.09.2018. - 30.06.2023.

Project implementer: SIA BALTICFLOC

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Co-funding of the Administration of the Latvian Environmental Protection

Fund of the State Regional Development Agency: 480 000 EUR

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Valsts reģionālās attīstības aģentūra

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LIFE PROJECT

Having been active in paper recycling for 10 years, SIA BALTICFLOC is the most experienced Latvian company in the industry. With a stable production process, the amount of paper waste processed at the factory currently reaches up to 200 t/month. Various innovative and ecological products are produced, which are exported to Lithuania, Estonia, Finland, Italy and Sweden. By recycling paper, the valuable cellulose fibre is obtained, from which the high-quality heat insulation material “Ekovate”, cellulose mulch and granules for hydroseeding, cellulose fibres and granules for SMA asphalt mixtures and ecological absorption material for efficient absorption of environmentally harmful products are produced.

When working with wastepaper for a long time, the company often finds itself in situations where very poor quality wastepaper is delivered to the production plant, which is not suitable for recycling and the production of new, high-quality products. For this type of raw material to not have to be taken to a landfill, the company SIA BALTICFLOC started looking for solutions to use it in the production process. This is how the recipe for a new heat insulation material and the idea for the LIFE project “Alternative Recycling of Wastepaper and Hemp Fibre into Innovative Heat Insulation Materials with Improved Thermal Conductivity” was created.

In this project, the company developed a technical solution, carried out a public procurement and installed a pilot production line for the production of an innovative product. The development of this product involves the recycling of low-end wastepaper, which is combined with high-quality hemp fibre to form soft heat insulation boards “BFlex”.



PROBLEM

In Europe, wastepaper is relatively well recycled - on average it is 70%. However, there is a portion of wastepaper that is buried or incinerated in landfills because it is not suitable for recycling.

Referring to the European Union Directive 1999/31/EC, the EU aims to reduce the amount of waste deposited in landfills through effective waste management and its use as production resources.

PROJECT GOALS

1. Promote the use of recycled paper and hemp fibre heat insulation material “BFlex” in building insulation.
2. Increase recycling of low - quality waste paper and avoid landfilling or incineration of paper fibre.

Along with the distribution of “BFlex” material in the market, reduce the demand for mineral wool in the market and so its negative impact on the environment. Thus, reducing the consumption of primary energy in the production of mineral wool, and the amount of persistent waste in the environment at the end of the life cycle of mineral wool.
- 3.
4. Along with the reduced demand for mineral wool in the market, its production will decrease, reducing CO² emissions from the production of mineral wool. Also, the amount of CO² will be reduced by encapsulating it in hemp fibre and recycled wastepaper.



MAIN ACTIVITIES

In order to achieve the goals and results of the project, certain activities are implemented:



1. Investigation of the target market and potential customers in Great Britain, Germany, Finland and the Baltic States.
2. Supplementing the permit of the State Environmental Service with the new data of the pilot production line.
3. Installation of a prototype pilot production line, which includes several sub-activities - development of technical sketches and specifications, procurement procedure, delivery of equipment, installation, testing, production of a sample batch.
4. Registration of patent documentation in the European and US markets.
5. Technology transfer to target markets, which includes several sub-activities, including the creation of two demonstration facilities in Latvia.
6. Determination of the properties of the innovative material "BFlex" in a certified laboratory and CE certification for the European and British market.
7. Development of a business plan.
8. Socio-economic impact assessment and product manufacturing life cycle assessment.
9. Introducing the new heat insulation material "BFlex" to the public and industry specialists and informing them.

TARGET MARKET SATURATION

Mineral wool, stone wool, polystyrene or polyurethane materials for building insulation dominate the market of heat insulation materials in Europe. Natural fibre materials occupy only about 5% of the market. However, when investigating the market and asking European natural fibre heat insulation manufacturers for their views on the market, the majority agreed that it is on a steady growth trend. Taking into account the rapid prices of energy resources, more and more attention will be paid to the insulation of buildings throughout Europe. The number of people who take care of the environment and microclimate in their residences and choose natural fibre heat insulation materials when insulating their property is also increasing.

During the market investigation, we identified a total of 136 participants, of which we interviewed 56 and identified 26 companies as potential future cooperation partners. During the entire LIFE_PHIPP project, several companies and industry professionals were approached, 50 of which showed interest in the new thermal insulation material and production technology.

**50
COMPANIES
RAISED
INTREST**



RESULTS OF TARGET MARKET RESEARCH

Target market country	Identified partners	Conducted face-to-face interviews	Identified potential cooperation partners	Market share of natural fibre heat insulation materials
United Kingdom	48	30	15	1,5 %
Germany	48	15	4	7 %
Finland	40	11	7	5 %



INNOVATIVE MATERIAL “BFLEX”

The mixture of wastepaper and other fibre in soft heat insulation boards is not an innovation, but innovative is a solution with specific raw materials. So far, no attempt has been made to create material from low-quality paper. At the very beginning of the project, the company applied for a patent for its idea and is currently the patent holder for the “BFlex” material in Europe and the United States.

“BFlex” consists of low-quality paper that would otherwise end up in landfilling or incineration for energy production. In both cases, the paper fibre immediately releases the CO² contained in it. On the other hand, by recycling this valuable raw material into thermal insulation material, the CO² is encapsulated in the material for another 50 years. As low-quality paper we identified in the project - beverage packaging, disposable cups (a composite material that does not only consist of paper, but also of aluminium and film), cardboard, laminated paper (magazines), wet wastepaper and wastepaper with a small admixture of other materials. Raw materials of this type can be added to “BFlex” up to 10% of the total amount of fibre. Another very important raw material is hemp fibre, which improves the performance of the material with its natural insulation properties and long, flexible fibre.

**DURING THE PROJECT,
12 320 KG
OF PAPER WASTE WERE
RECYCLED**

During the project, 12 320 kg of paper waste and 3 310 kg of hemp fiber were recycled. As a result, 331 m³ of thermal insulation material was produced.



In order to be distributed throughout Europe, “BFlex” has been tested in a certified laboratory in the Czech Republic, where performance characteristics are determined, and CE certification

TECHNICAL DATE

Thermal conductivity	0.038 W/mK
Fire reaction class	F class
Density	52,3 kg/m ³
Sound absorption	very high absorptivea - 0,90
Water vapor transmission	08.06
Specific airflow resistivity	5,9 kPa.s/m ²
Compressive strength	2,51 kPa
Deformation under compressive load and temperature	66,4 - 73 %

PROTOTYPE PILOT PRODUCTION LINE “BF TECHNOLOGY”

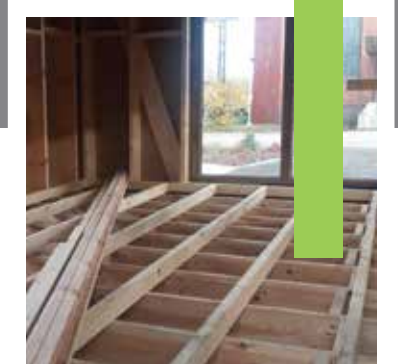


The main activity of the project was to create a pilot production line “BF Technology”, where heat insulation material could be produced from wastepaper and hemp fibre, in the form of soft plates “BFlex”. The production line consists of 14 machines and for their purchase and installation only public procurement was carried out to determine the most economically advantageous offer. After the delivery and installation of all machines, work began with line testing and formulation development of the new material. At the same time, a license manual was created that would allow other producers of natural fibre heat insulation materials in Europe to purchase this technology. The biggest challenge was the testing of the pilot production line and the creation of the formulation for the new material, because until now the company had not worked with production, where one of the production stages is heat treatment of the material in an oven up to 130 degrees Celsius. The next challenge was the preparation of hemp fibre, because the company had not worked with this raw material until now, and instead of one machine, a separate small hemp fibre preparation line had to be made.



INSULATION OF DEMONSTRATION BUILDINGS IN LATVIA

New material without certified laboratory data requires physical demonstration or installation in the building. In this way, we can find out the peculiarities of its installation and the potential customer can make sure of the physical properties of the material. As part of the project, we incorporated the new material “BFlex” in two demonstration buildings in Latvia. In both buildings, thermal energy consumption will be recorded using energy efficiency assessment methods. Data from the demonstration building on the building's thermal energy consumption will be recorded and compiled over a period of one year in order to determine the performance of the material. The first building is located in the territory of the SIA BALTICFLOC production facility and can be viewed upon prior application. The LIFE project notice boards are placed near both buildings.



**2 DEMONSTRATION
HOUSES
WERE BUILT DURING THE PROJECT**

PUBLIC ENGAGEMENT AND COOPERATION

In the LIFE PHIPP project, we have devoted a lot of attention to informing the public and industry specialists about the progress and results of the project. The total audience reached by the project is 6 344 806.

The project's website www.balticfloc.lv/life_phipp provides information about project news, there you can read various articles about sustainable construction, waste sorting, industrial hemp, etc. As well as getting more detailed information about project activities and achieved results.

MARKETING CAMPAIGN
REACHED AUDIENCE OF
6 344 806



Unique website visits
21 389



3 videos created that have been viewed a
64 380 times



Internet campaign reached audience of
1 157 539



13 networking events attended, reaching an audience of
354



12 international exhibitions were visited with a total visitors of
312 172



4 articles published in industry magazines with a total audience of
135 975



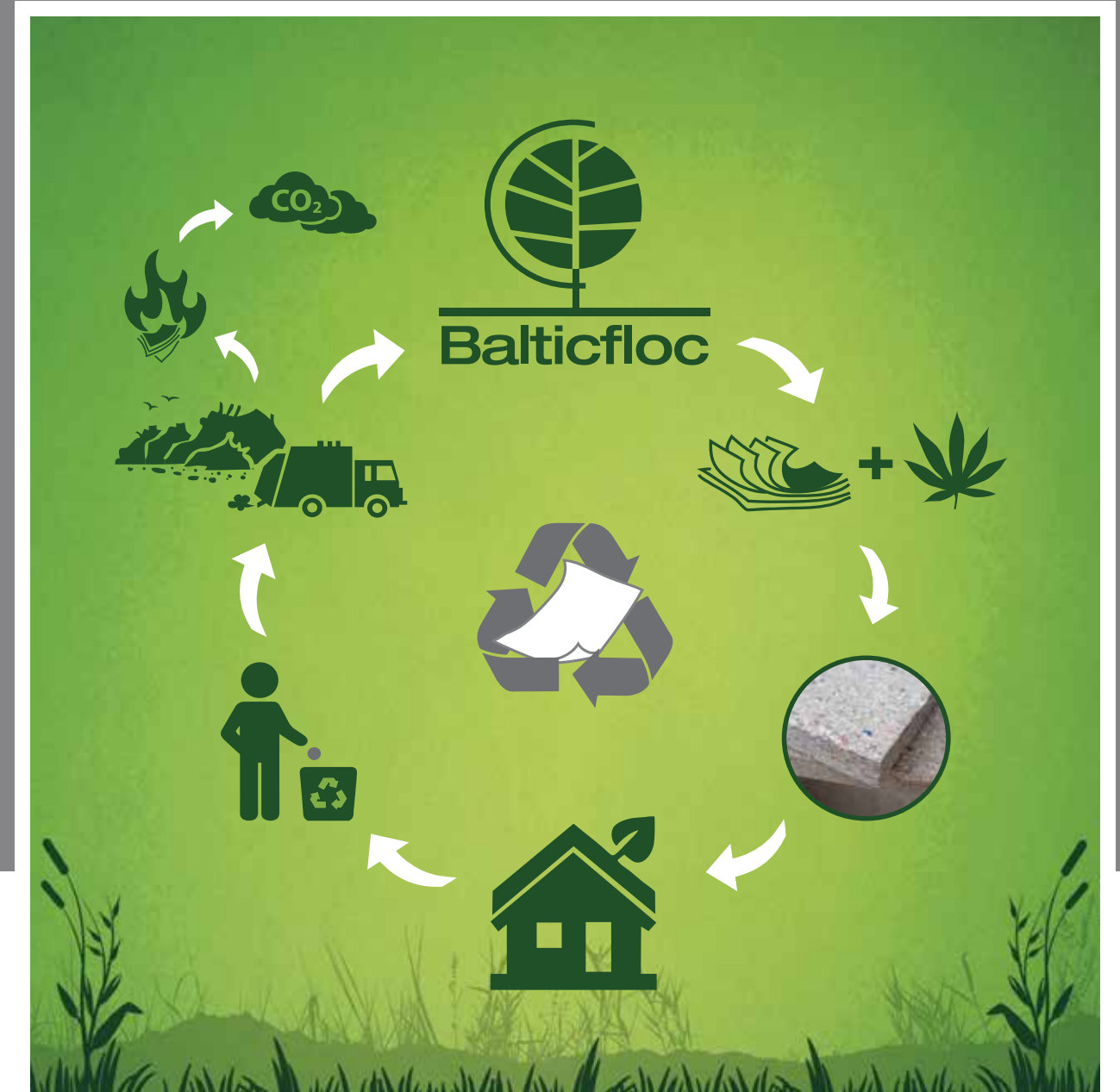
6 newsletters were sent out, reaching
217 subscription



10 blogs created, which have been read
8 698 times

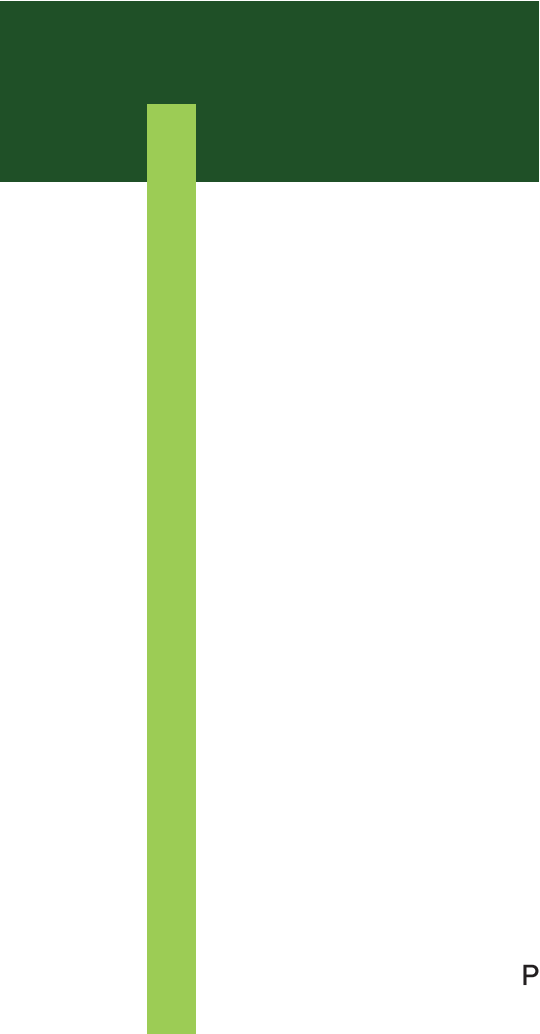


2 brochures created. The total prints reaches
800 pieces



LONG-TERM INVESTMENT

The LIFE PHIPP project is a unique project in Latvia, as it is the first LIFE project implemented by the company. Significant work has been done on the pilot production line and the development of the new material. With the help of the developed license, the technology and material can be implemented in other production plants throughout Europe to jointly reduce the amount of paper waste in landfills. We have developed recommendations for waste management in Latvia specifically regarding the collection and sorting of paper waste. The pilot production line will continue to operate, and we will try various other fibres and their combinations, such as textile waste and wood waste.



Find out more about the
Project LIFE_PHIPP (LIFE17 ENV/LV/000335)

balticfloc.lv/life_phipp

