

**NanoBioPack™**

# **BUSINESS PROPOSAL FOR BIODEGRADABLE PACKAGING**

Prepared for  
**Be Green Packaging, LLC\***

Prepared by  
**Valeria Varanchuk**  
**varanchukv@gmail.com**

**Dmitry Bobrov**  
**bobrovd@gmail.com**

**November 25, 2020**

\*-Be Green Packaging designs, manufactures and distributes Cradle to Cradle™ certified, tree-free, compostable, biodegradable packaging for the food and consumer packaging industries that is safe for people and healthy for the planet.

# Executive Summary

**NanoBioPack™** is a biodegradable thermoplastic polymer for the manufacture of rigid packaging from renewable raw materials based on polyhydroxyalkanoates (PHA) of microbial origin.

## Problem

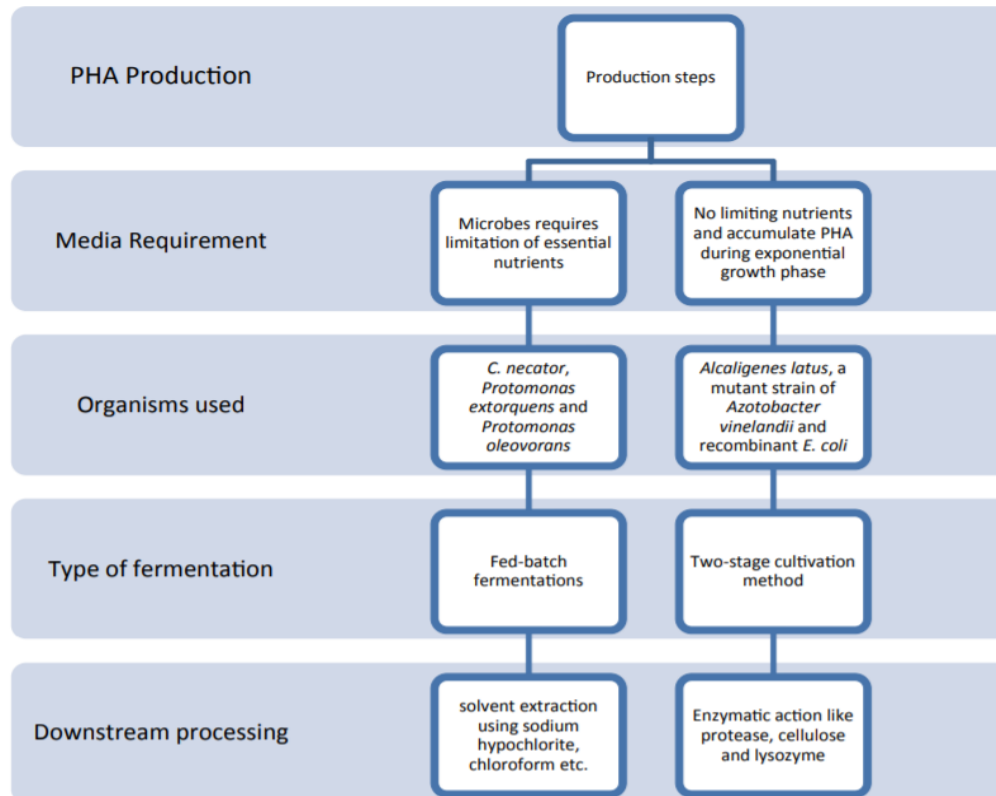
The growing demand for solid biodegradable packaging from renewable raw materials (from **55%** to **71%** of plastic in the world, and **59%** in the EU goes to the production of solid packaging) does not correspond to the current production capacity (EU, market of 700 million people - **15.2 million tons** plastic packaging annually, plans a full transition to recyclable plastics by 2040) - as a result, *there is free space in the growing market.*

The production of biodegradable plastics, which would be similar in mechanical properties to the modern generation of plastics, is currently cost-effective biotechnologically. Which, however, is more expensive than production from hydrocarbon raw materials (the space-time yield of such syntheses is several times lower).

## Solution

- The use of genetically modified strains of *E. Coli* allows the production of PHA **20%** faster than *Pseudomonas* strains and **32%** faster than *Alcaligenes eutrophus*.
- As a raw material, tops obtained from **corn waste** are required - a cheap and 100% environmentally friendly raw material. A promising source of raw materials today is also cereal starch (wheat, rye, barley).
- The endurance of modified *E. coli* strains allows them to withstand polymer concentrations 10% higher than current producer organisms.
- Taking into account these factors, the space-time output of PHA increased by **1.42 - 1.71** compared to competitors.

# Technology



Since PHA is obtained by direct fermentation, their production does not require a series of technological stages: synthesis of monomers, polymerization, addition of plasticizers and modifying components.

# Target Market

- The current production of polymers based on all biodegradable plastics is **4 million tons/year**.
- The EU's demand for solid plastic packaging is **61.8 million tons/year**, the world is **359 million tons/year**.
- From 30% to 50% - solid plastic packaging, which can potentially be replaced by PHA.
- *Unsatisfied demand* - from 18.5 to 180 million tons / year.
- The projected revenue by 2024 for the entire industry is **\$ 560 billion**, and the potential revenue from an intervention in the PHA market is from **\$ 29 to \$ 280 billion**.

# Funding Required

DESCRIPTION	PURPOSE	AMOUNT
Registry	The total fee for registering the Business in the United State of America	\$750
Construction & Organization Costs	Design and building of the new branch	\$5,000.00
Equipment Cost	Necessary equipment for the new branch's daily operations	\$20,000.00*

\*- Or you can simply reorient one of your plant fiber based biodegradable packaging production lines, thereby cutting costs.

## Team

### **Dmitry Bobrov**

General Manager

Dmitry manages the overall business and ensure that services are rendered according to the established requirements and specifications. He is qualified as a biopharmaceutical chemist.

### **Valeria Varanchuk**

Technical expert

Valeria is a specialist in the field of organic synthesis, the main executer of technical process. She is qualified as a research chemist.

### **Vitaly Bakhmat**

Sales manager

Vital is in charge of reaching and attracting prospective clients.