



Semi-Finalist GIST Competition GES2019, NL



Desislava Dimitrova

Chief Executive Officer

T: + 359 886 075 636

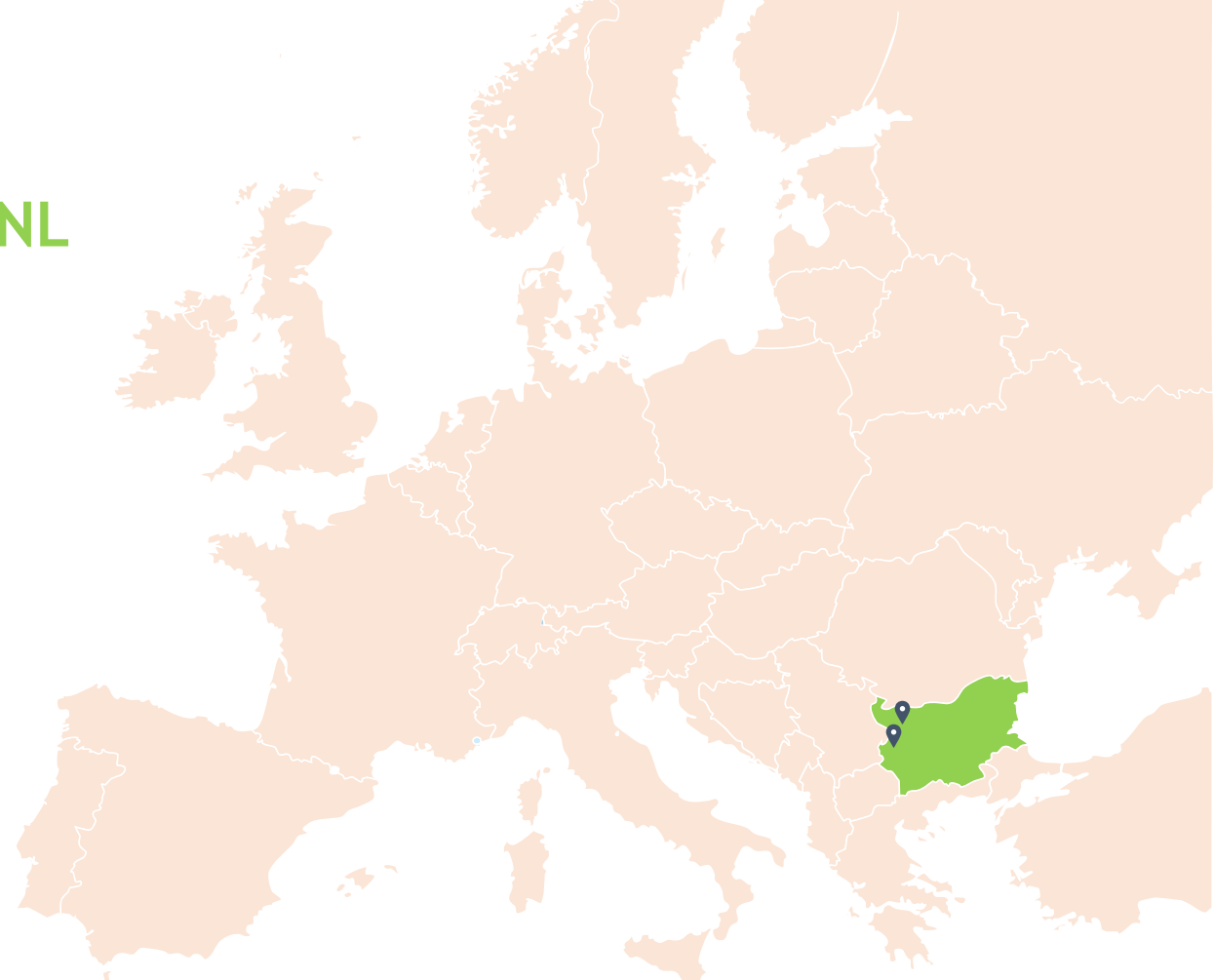
E: desislava.dimitrova@lopyanko.eu

Maria Sirakova

Innovation and Project Manager

T: + 359 894 954 952

E: mariia.sirakova@gmail.com



Bio-Refinery Lopyanko

**Company and Product Presentation,
Investment Opportunities**

Sofia, October 8th, 2019 | Desislava Dimitrova CEO

Bulgaria (Headquarter)

Plachkovitsa Str. 2 | 1407 Sofia

E: office@lopyanko.eu

www.lopyanko.eu



WHAT IS THE PROBLEM ?

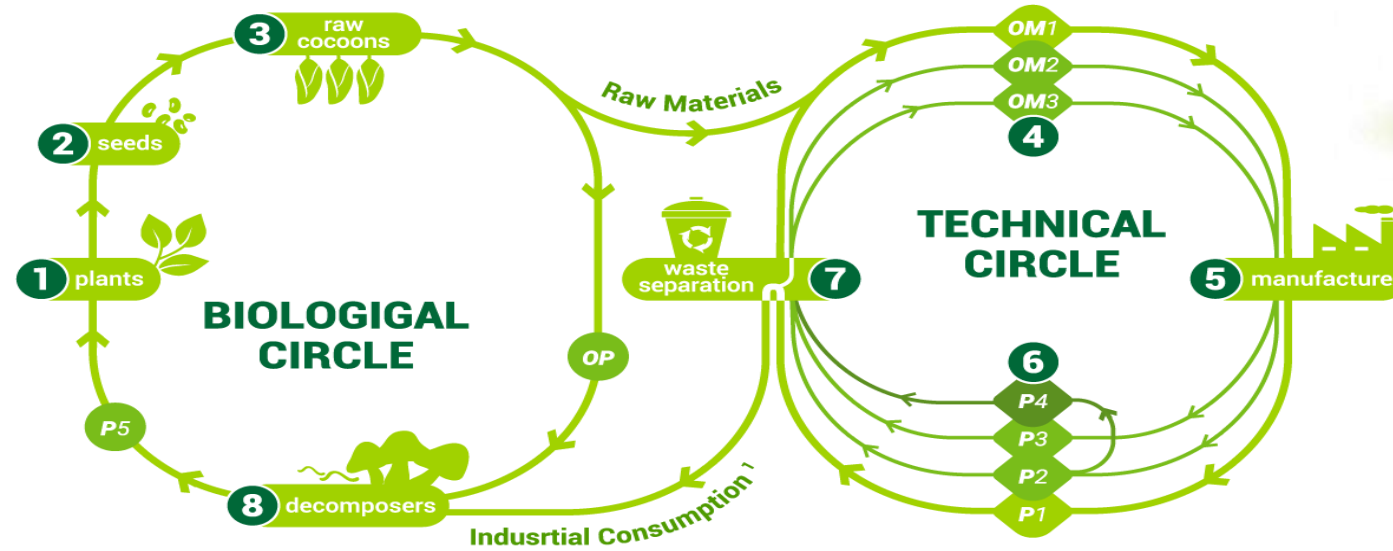
The world population expected to reach 9.6 billion by 2050 → food production needs to increase by 70%

The farming and processing of animal livestock is destroying the nature → thousands of tons of CO2

Wasteful and unsustainable resource use → harmful environmental effects

Continuous expansion of agriculture → huge losses of biodiversity

Circular Economy Approach Renewable Resource



1 Industrial Consumption

- Textile Industry
- Food Industry
- Feed Industry
- Cosmetic Industry
- Pharmacy Industry

2 Manufacture

- Material Reutilitation & Resource Efficiency
- Zero Environment pollution
- Essential Green Growth
- Health impact on human and environment
- Significant Social Impact

Legend

- OM** organic materials
- OP** organic products
- P1** raw silk
- P2** silk protein
- P3** silk sericin
- P4** food supplement
- P5** biomass



TRADITIONS & EXPERIENCE since 1870

SILK BIO REFINERY Goals

1.3 MILLION MULBERRY TREES

I Phase
Bio Refinery for Alternative proteins

ESTABLISH A FIRST OF ITS KIND BIO REFINERY IN EUROPE BASED ON INSECTS

CLEVERSIFARM
Vertical fully automated Silkworm Farm INDUSTRY 4.0

CREATE 120 DIRECT AND 80 INDIRECT JOBS ACROSS THE VALUE CHAIN

SOCIAL IMPACT

RESOURCE EFFICIENCY

CREATE REGIONAL INFRASTRUCTURE AND VALUE CHAIN

CROSS INDUSTRY COLLABORATION BETWEEN AGRO-INDUSTRY, CHEMICAL, COSMETIC, FOOD & FEED INDUSTRIES

INDUSTRIAL SYMBIOSIS

SUSTAINABILITY

II Phase
Paving the way for second stage (R&D) for Biopolymers from biocompatible silk fibres



Lopyanko Silk Bio-Refinery - Target Markets Snapshot

projected average annual growth of the **global silk market** until 2024

7.8%+

growth in **global demand for alternative proteins** in the feed and food industries by 2050

50%+

projected average annual growth of the **technical textiles market** until 2022

5.8%+

projected average annual growth of **biopolymers markets** until 2023, with the packaging industry a major demand driver

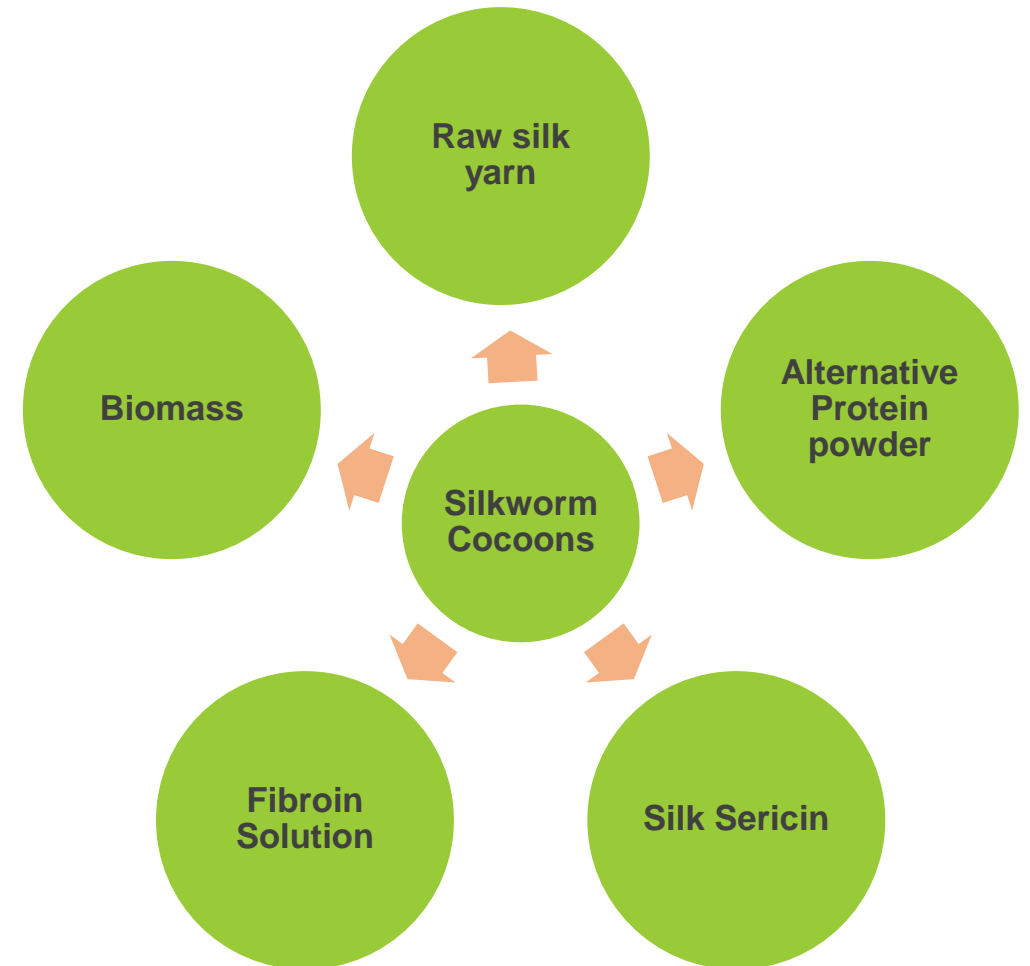
16%+

projected growth in global demand of **feed additives for poultry** until 2024

6%+

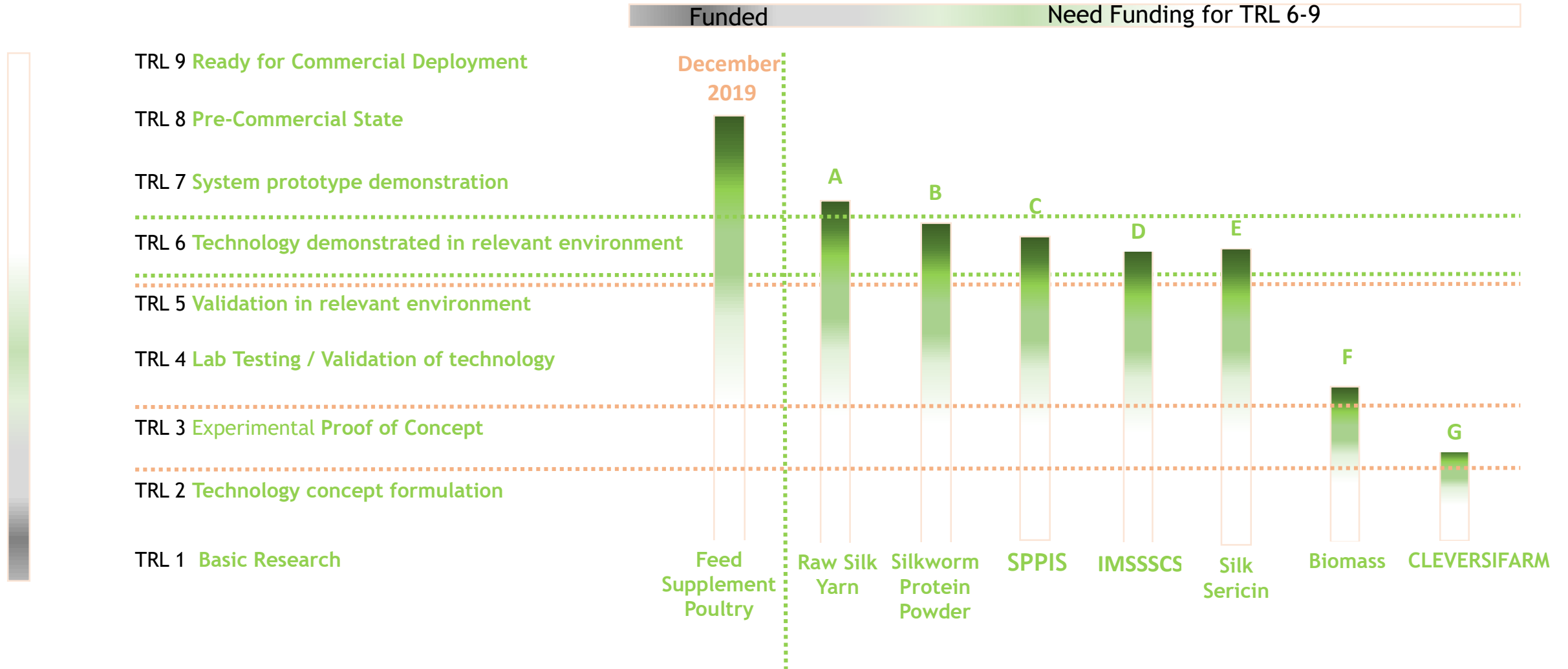
projected growth in global demand of **organic fertilizers** until 2022

12%+





Technology readiness levels (TRL)_October 2019





Current Initiatives - Summary

- In 2018, **Lopyanko** acquired R&D, production and administrative buildings for its plant and the ownership of technological process data, required for raw silk production.
- Beyond individually developing small to middle scale opportunities in this starting phase, the main focus has been placed on building strategic partnerships through joint participation in projects eligible for funding under **Horizon 2020 and BBI_JU** as well as fund raising.
- ➡ **Feed supplement for poultry** - in February 2019, **Lopyanko** won a € 60k grant from **C-Voucher** to implement technologies to shape circularity solutions and create cross-sectoral value chains, in particular for implementing the production of a **feed supplement for poultry** which is a natural source of high quality protein, thus enhancing feed efficiency whilst providing protection against common diseases.
- ➡ **New packaging material based on organic silk yarn production waste conversion** - joint call, September 2019, for development and demonstration at a pilot level, together with Germany's **Fraunhofer IFA, ITA GmbH, NOVA Institute** and **FUTAMURA Group** (Japan) of an **alternative, bio-based, fully biodegradable material for the packaging industry** based on the waste from the raw silk yarn production.
- ➡ **Silkworm Protein Powder Innovative Solution (SPPIS)** - Innovative Silkworm Protein Solution - Lopyanko and its partners develop a disruptive innovation - New fluidized-bed working chamber system for cocoon drying and grinding. The drying process is continuous and takes place inside a fluidized bed of refined, focused on efficient use of resources and support activities such as scaling, piloting and testing the production of an **alternative silkworm protein**.
- ➡ **Innovative Multi-Sensor Selection Silkworm Cocoon System (IMSSSCS)** - A disruptive innovation in the selection process of the silkworm cocoons was created - The multi-sensor system was designed with the aim of performing automatic silkworm cocoons quality classification process, based on **Artificial Intelligence** with main purpose scaling and piloting the production of the raw silk yarn and silkworm protein powder, depending on the cocoons' quality assessment.



Current Initiatives - Partnerships with Special support of the



БЪЛГАРСКА ТЪРГОВСКО-ПРОМИШЛЕНА ПАЛАТА
BULGARIAN CHAMBER OF COMMERCE AND INDUSTRY



Long-term partnership for raw cocoons delivery, participation in the development of **New Packaging Material**

since 2015



Funding for implementing the production of a **Feed Supplement for Poultry**

2018 - 2019



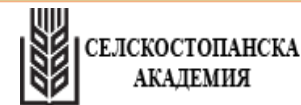
Partner in the production of a **Feed Supplement for Poultry**

since 2018



Joint call participation with ITA GmbH, Nova Institute and FUTAMURA Group for the development of **New Packaging Material**

since 2018



Agricultural Academy and the Scientific & Research Center for Sericulture provide consulting with focus on **innovations in the field of sericulture and horticulture.**

since 2018



Joint call participation with ITA GmbH, VTT and AMSilk for development of **Enhanced industrial application textiles by adding organic silk fibres**

since 2018



Provides consulting with focus on sustainability assessment, economy & markets and political framework aspects of the projects

since 2018



Joint call participation with Fraunhofer IAP, ITA GmbH, Nova Institute and for the development of **New Packaging Material**

since 2019



Agricultural University Plovdiv
Faculty of Animal Science

Partner in the sericulture innovative solutions - silkworm breeding, cocoons growing, **alternative proteins, new methods for silkworm feeding**, hybrids, good hygiene practices.

since 2019



Disruptive Innovations

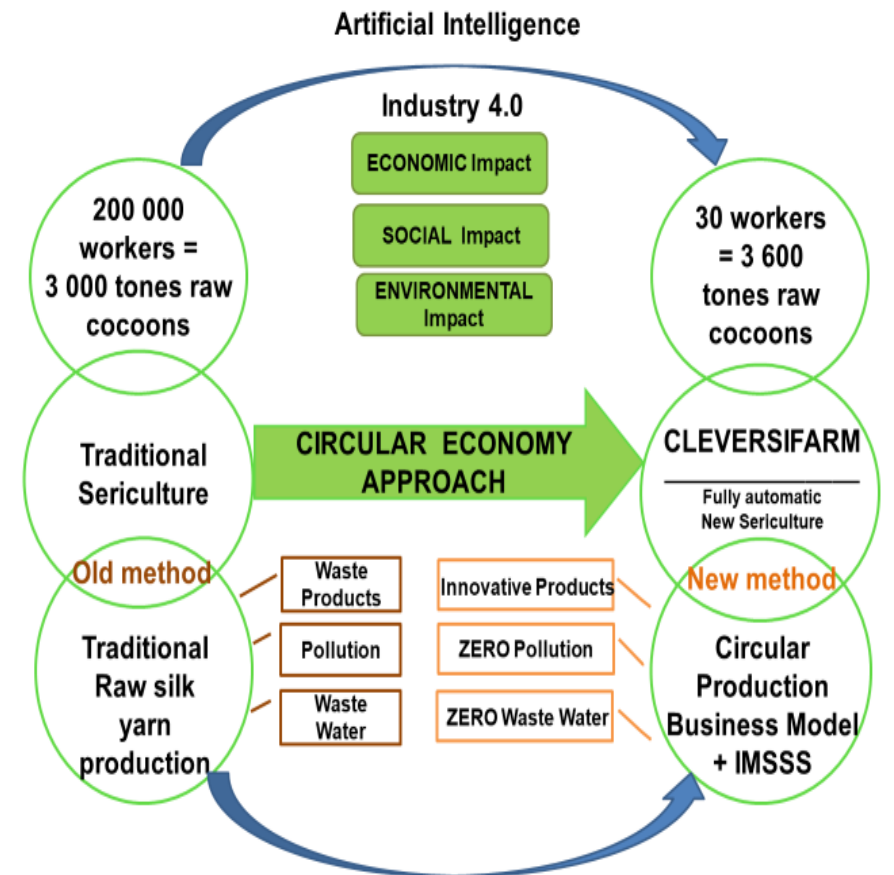
During 2019, two **disruptive innovations** were started to design and develop new systems, that will lead to significant improvement of the current technologies **to shape circularity solutions** and create cross-sectoral value chains, in particular for implementing **high quality system of the silkworm cocoons' selection and silkworm protein powder production.**

Silkworm Protein Powder Innovative System **SPPIS**

- Lead **Lopyanko**
- Goal **New system for silkworm drying**
- Funding **Expected**
- Funding Status **not secured**
- Project Status **July 2019**
- Duration **23 months**
- TRL **6**
- Market launch **Q3 2021 (e)**

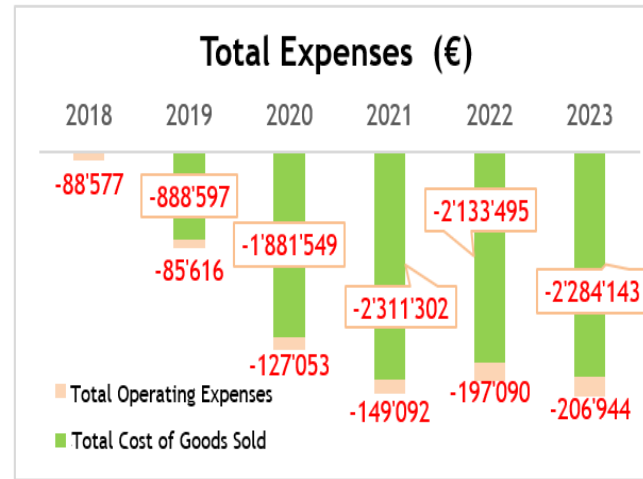
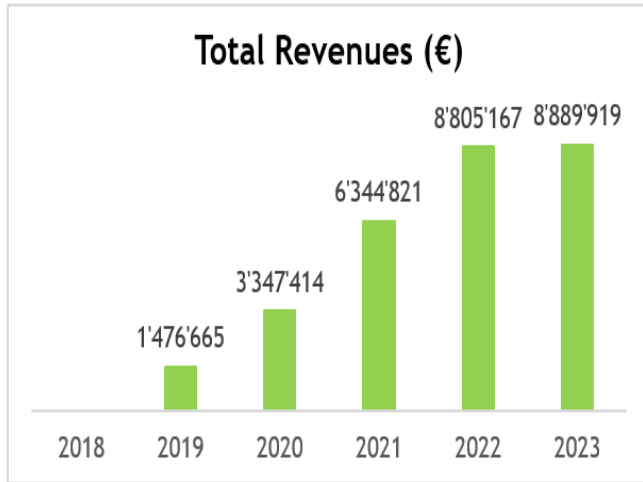
Innovative Multi-Sensor Selection Silkworm Cocoon System **IMSSCS**

- Lead **Lopyanko**
- Goal **AI system for cocoon quality selection & assessment**
- Funding **Expected**
- Funding Status **not secured**
- Project Status **Started in March 2019**
- Duration **24 months**
- TRL **6**
- Market launch **Q1 2021 (e)**





Selected Key Performance Indicators 2019 - 2023 (e) & Investment Proposition

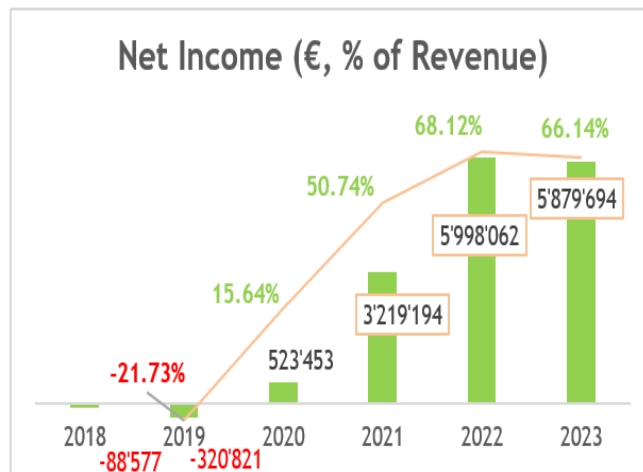
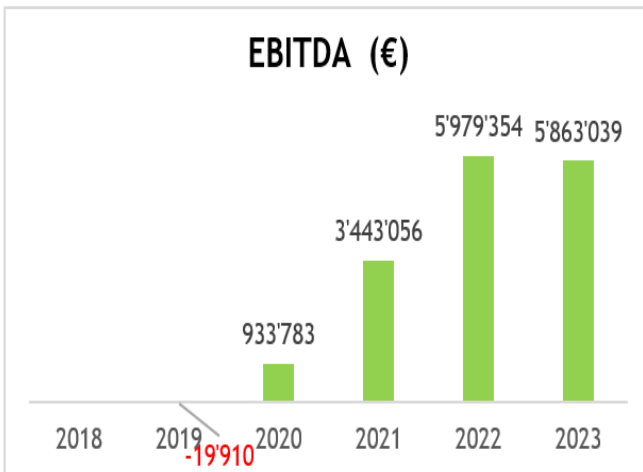


Equity Investment with buy-back after 5 years

€ 2m

Long-term Debt with redemption over 10 years

€ 4m



Return p.a. on Equity from 2021 on

12 %

Interest p.a. from 2019 on

8 %

Projected Total Dividends over 5 Years

€ 1.2m

Projected Total Interest Payment over 10 Years

€ 1.43m



THANK YOU FOR YOUR ATTENTION !