



# **BUSINESS PLAN OF THE INVESTMENT PROJECT**

«Organization of waste-free production of protein-lipid concentrate, zoohumus, feed and food additives from insects, bee products, cultivation of aquaculture in closed water supply installations based on feed from the Black Soldier Fly larva (*Hermetia illucens*) in the Dyatlovsky district of the Grodno region»

Project initiators:  
ULA GROUP OF COMPANIES

MINSK 2021



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<b>Name:</b>	<b>ULA GROUP OF COMPANIES</b>
<b>Market:</b>	Agriculture, biotechnology, foodtech
<b>Product:</b>	<ul style="list-style-type: none"> <li>» Protein-Lipid concentrate (PLK)</li> <li>» Zoohumus</li> <li>» Chitin, chitazan, melanin</li> <li>» Honey and bee products</li> <li>» Aquaculture</li> </ul>
<b>Financial investments:</b>	<p>12,4 million US dollars</p> <ul style="list-style-type: none"> <li>» Credit - 12,4 million US dollars</li> <li>» Share capital – 10 thousand US dollars</li> </ul>
<b>NPV:</b>	18.7 million US dollars
<b>Internal rate of return:</b>	106,1 %
<b>The calculation horizon:</b>	36 months
<b>Payback period:</b>	14 months



### WE ARE A COMPANY THAT:



solves environmental problems of environmental pollution by recycling food industry waste and food losses;



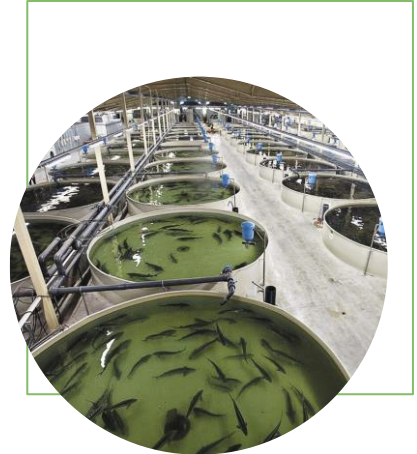
supports the delicate balance of ecosystems in the environment and preserves biodiversity;



creates a sustainable development ecosystem, using local secondary resources and applying innovative technologies to obtain valuable and healthy food, high-quality feed and feed additives



BECOME a LEADER  
in industrial beekeeping and  
breeding



ENTER the TOP FIVE largest players in  
the global market for the production of  
protein, feed additives and  
other products from BSF larvae





- » Already, food production causes air, water, and soil pollution, accelerates climate change and biodiversity loss, and consumes excessive amounts of natural resources, while a significant portion (about 40%) of the food produced goes to waste



- » According to the UN, waste accounts for 8% of greenhouse gas emissions
- » According to UN estimates, by 2050, the world's population will increase by a third, and reach almost 9 billion people
- » To meet the need for food, it is necessary to increase its production by 70%!
- » Animal feeds that are not based on soy, corn, fish and meat and bone meal are a key solution to sustainably meet the world's growing protein needs. Feed production today generates 45% of global greenhouse gas emissions associated with livestock production and contributes to water scarcity, among other resource problems



- » It is known that farming insects is sustainable a closed system in which agricultural products power supply (for example, products from grain processing or Breweries, unsold food from supermarkets and local food producers or bakeries) are food insects
- » Insects are rich in protein and other useful substances, and the cost of their production is much less



COST REDUCTION FOR THE PRODUCTION OF 1 KG OF INSECT PROTEIN COMPARED TO THE PRODUCTION OF 1 KG OF BEEF PROTEIN:

water



**500** times less

feed



**12** times less

land



**10** times less



- » In this regard, the search for the possibility of using insects in the feeding of farm animals is logical
- » In 2017, research was conducted by R. V. Nekrasov (G. N. S., head of the Department of feeding of agricultural animals, Doctor of Federal Research Center for Animal Husbandry - VIZ named after Academician L. K. Ernst), who established the positive effect of feeding the larvae of the fly *Hermetia Illucens* on the growth and development of animals, the immunity of experimental animals, and especially on the composition of the intestinal microbiocenosis. The biological effect of the studied component is confirmed by higher indicators of growth, animal safety, and feed conversion
- » **Thus, the breeding of *Hermetia Illucens* fly larvae and the organization of feed production on its basis is relevant not only for the agriculture of the Republic Belarus, but also for the whole world**







**The Black Soldier Fly** (*Hermetia illucens*) belongs to the Larvae family (Stratiomyidae), numbering in the world over 1,500 species in 400 genera

Short development cycle



Food waste disposal



Obtaining protein feed, fat, BAS



Getting zoohumus





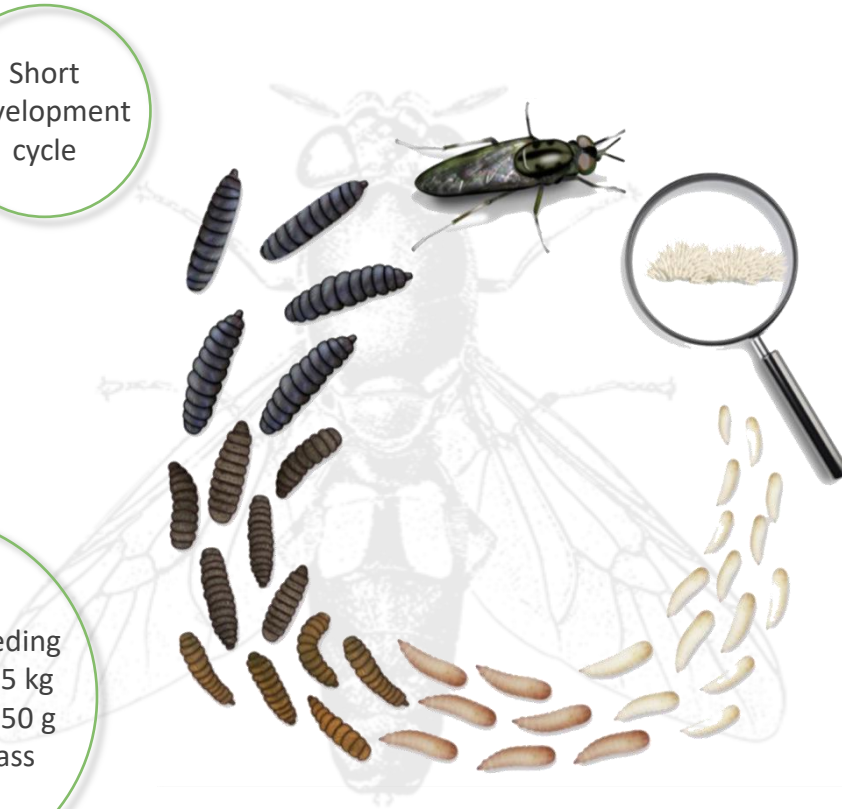
Short  
development  
cycle

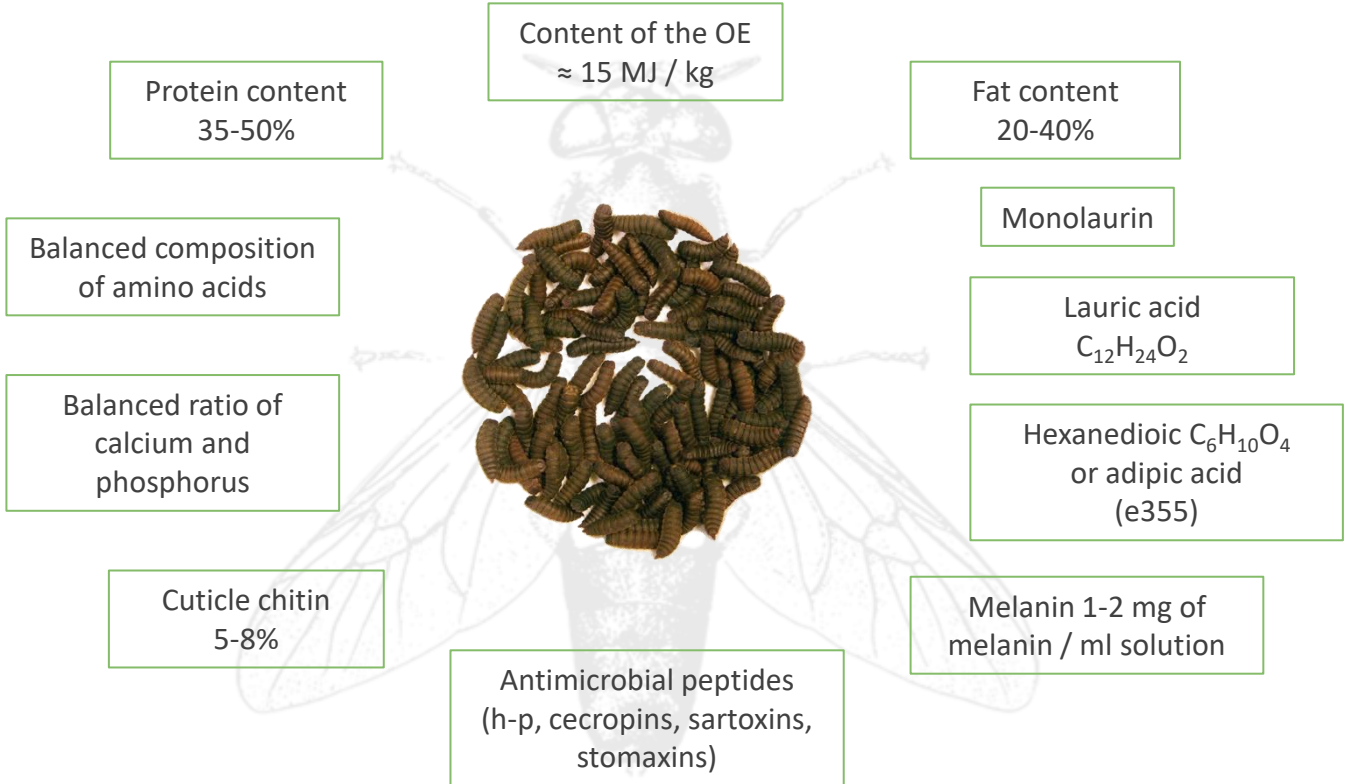
Intensive growth  
by 18 days: live  
weight up to 235 mg,  
raw material  
consumption  
500 – 2000 mg

With 1 m<sup>2</sup> of breeding  
area - yield of 2.25 kg  
of raw larvae or 750 g  
of air-dry biomass

Optimal  
nutritional  
composition

Full-fledged  
protein





## PROMISING AREAS OF USE LARVAL BIOMASS OF THE HERMETIA ILLUCENS



BIOMASS

Dietary supplements  
with probiotics and  
biologically active  
substances of larvae  
*Hermetia illucens*

Drying,  
flour for  
animal feed

Fat extraction

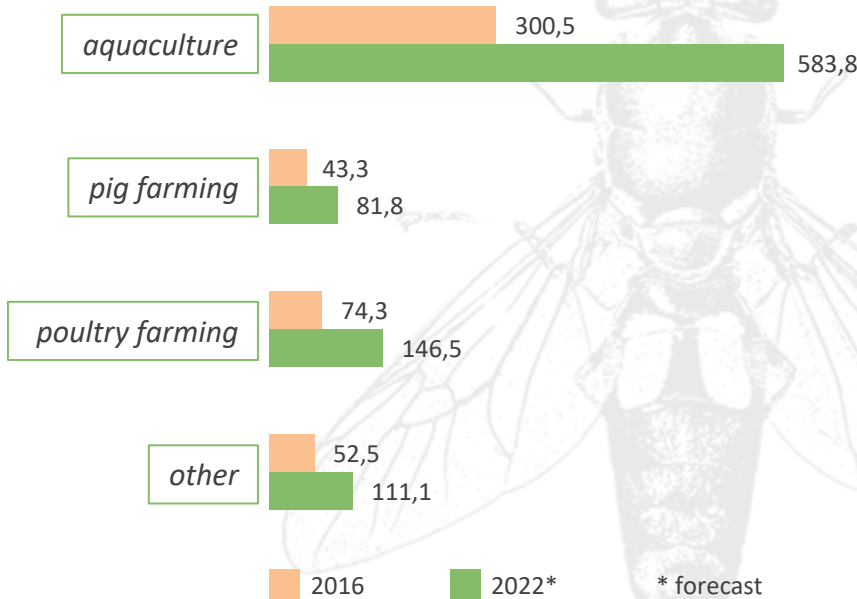
Drying, flour  
protein concentrate  
for animal feed

Fat for  
pharmacology and  
cosmetology



## MAIN CONSUMERS OF INSECT-BASED FEED

Sales volume (thousand tons)



In 2017, the global feed industry was estimated at \$ 430 billion. According to Entoprotek research, among feed consumers, the largest increase in the replacement of traditional protein with insect-derived protein is expected in such areas as aquaculture production, pig farming, and poultry farming

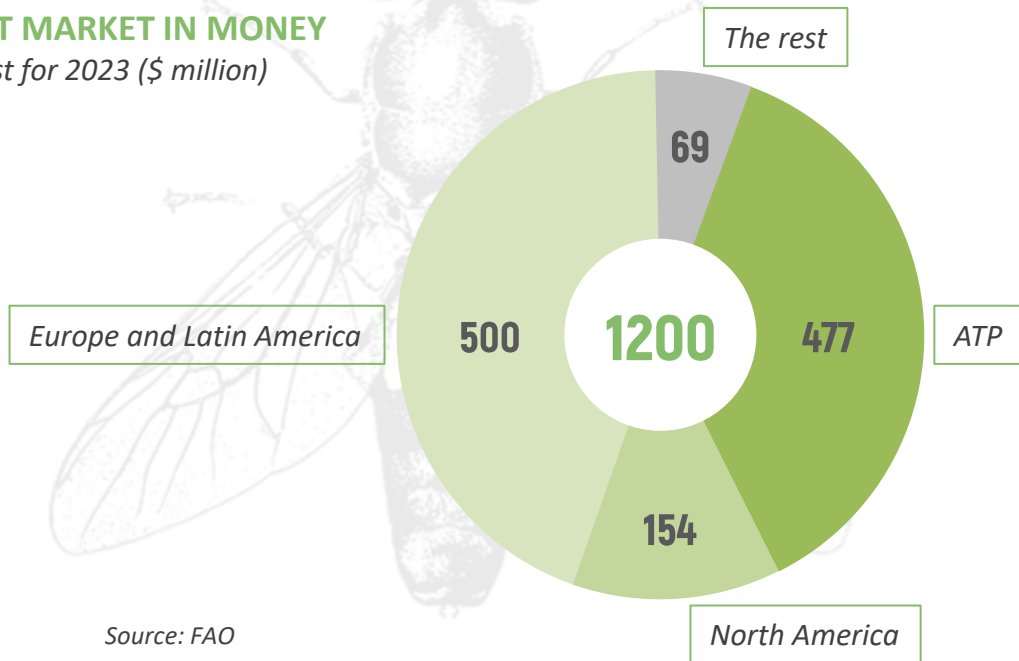
Source: ENTOPROTEK»



- » Last year, the FAO estimated the market capacity of edible insects at \$400 million
- » FAO predicts the market for edible insects to grow to \$1.2 billion by 2023

### INSECT MARKET IN MONEY

Forecast for 2023 (\$ million)



Source: FAO



### In Russia:

- » NordTehSad LLC - 5 tons / day. live larval biomass
- » Entoprotek LLC – 7 tons / day
- » GC "Zooprotein" – 3 t / day

### Major market players:

- » Entomotech (Spain) is developing a pilot project to produce an alternative protein feed product and fat from insects
- » Meertens (Netherlands) receives up to 800 kg of larval biomass per day and processes it
- » Agriprotein (Great Britain-South Africa) in 2014-2015 built a large plant, where on an area of 8.5 thousand m<sup>2</sup> daily 8.5 billion rubles. flies process 250 tons of bio-waste into 50 tons of live larvae. In the next ten years, the company is going to build 25 similar enterprises
- » Big Cricket Farms (USA) - a company that processes crickets, works with insect biomass as part of the Boston-based startup SixFoods

**No manufacturers were identified on the Belarusian market!!!**



**Conclusion:** currently, the niche is free, which will allow the company to take a strong position in the market





The ULA Group of Companies consists of two private production unitary enterprises:



**PPUE "ULA-FARMS"** - production of protein-lipid concentrate (PLK), fats, animal humus, feed and food additives, biopolymers from insects: cultivation of aquaculture (closed water supply system)



Private unitary enterprise **"API-STANDARD"** - industrial beekeeping

*Founders: Vladimir Zaenchik , Valery Kozarez*





- I. Utilization of food waste and food losses through their biological processing by Black Soldier fly larvae (BSF) into pure organic fertilizer "zoohumus";
- II. Organization of environmentally friendly and waste-free production of alternative protein, protein-lipid concentrate, fats, biopolymers (polysaccharides of chitin/chitazane and melanin), zoohumus from insect biomass BSF;
- III. Organization of industrial beekeeping with a capacity of 1000 bee colonies for the production of eco-products of beekeeping;
- IV. Organization of responsible innovative industrial fish farming in conditions of closed water supply for the production of environmentally friendly 1100 tons of commercial trout and sturgeon per year on 99% organic feed from live insects BSF (swimming pools with closed water supply)



The production complex will combine  
3 main directions, in which  
waste-free production will be organized:



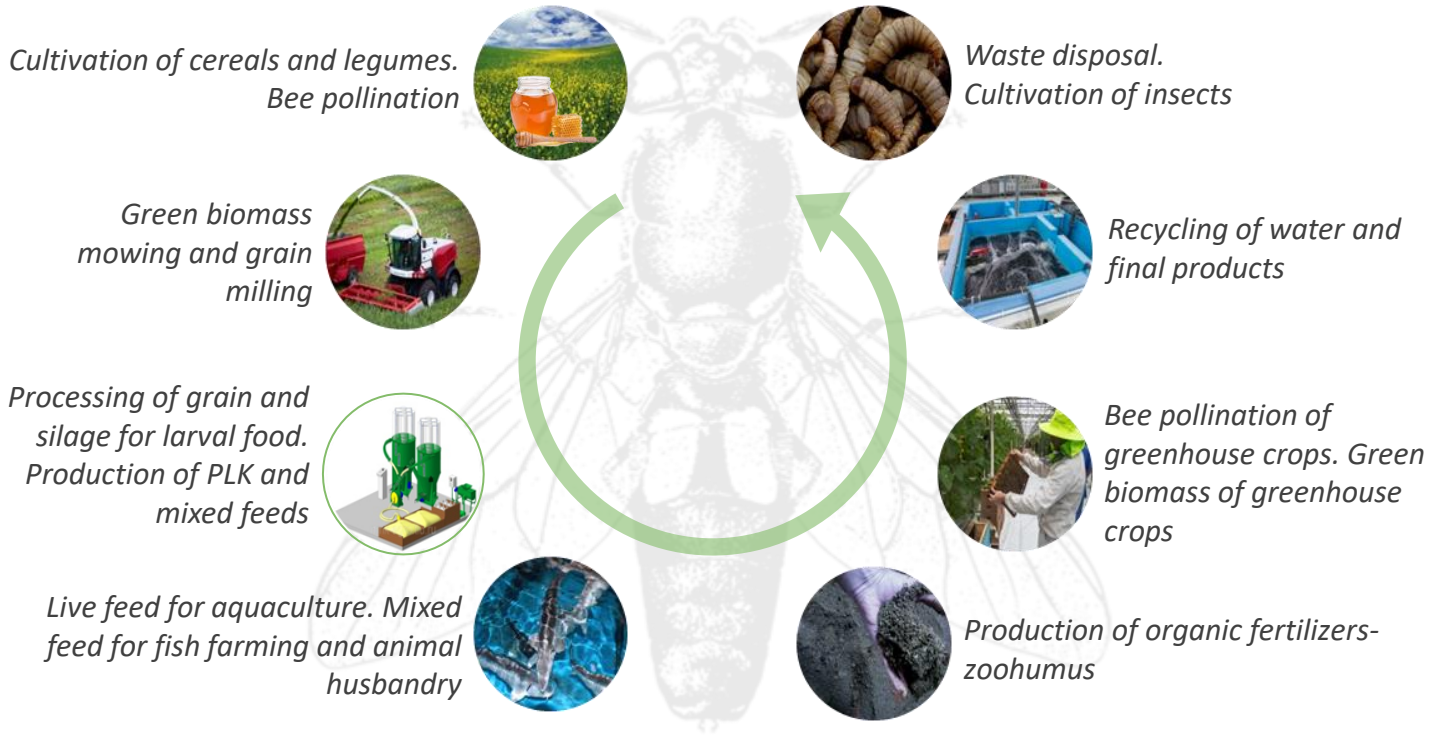
***Larval breeding  
Black Soldier Fly***



***Beekeeping***



***Fish farming***





***Cultivation of cereals and legumes. Bee pollination.***

On the sown areas, we grow cheap grain crops - forage rye, tretienium, etc., as well as various herbs-honey plants – rapeseed, sweet clover, phacelia and other legumes



***Green biomass mowing and grain milling.***

After removing the honey collection from them, we get honey, pollen and perga, and after the ovary is formed until it is fully ripe, all the green biomass of grasses (legumes) is mowed down on the silo and enters the burts for storage. After processing the silage into a homogeneous mass and enriching it, this biomass becomes an excellent food for the Black Soldier Fly (BSF) larva



***Processing of grain and silage for larval food. Production of PLK and mixed feeds.***

The feed grain processed into flour is also food for the BSF larva, which in turn is used for processing and obtaining pure protein flour for food products – sports nutrition. PLK, a valuable feed additive, is produced from larvae grown on food and plant waste



***Live feed for aquaculture. Mixed feed for fish farming and animal husbandry.***

Part of the native biomass of the larvae in live form is used for growing aquacultures. PLK is added to the feed produced from its feed grain. The resulting granular feed, in accordance with the recipe for valuable breeds of fish, poultry and other animals, is ready for use and sale



## THE TECHNOLOGICAL CHAIN OF THE CIRCULAR ECONOMY



### ***Production of organic fertilizers-zoohumus.***

Food waste processed by the larva (including green biomass) it turns into a valuable biological fertilizer-zoohumus, which is sold for greenhouses, fruit and vegetable farms and households, and will also be used in its own production of vegetables and fruits



### ***Bee pollination of greenhouse crops. Green biomass of greenhouse crops.***

In the conditions of greenhouse farming, crops are again pollinated by bees to increase the yield and quality of fruit and vegetable products. After harvesting, the green biomass of the plants goes to feed the larvae and turns into zoohumus



### ***Recycling of water and final products.***

The water from the pools is filtered and reused in the aquaculture pools. With a small water exchange, a small part of the water with fish feces is discharged into the tank, from where it is later used for watering plants. Fish feces are turned into valuable biological fertilizer mixed with zoohumus of larvae



### ***Waste disposal. Cultivation of insects.***

Fish waste is processed into fish meal, which is used to enrich the nutrient substrate for BSF larvae to obtain a higher quality product with a high protein content

***The result - environmental safety and sustainable development of the agricultural sector!***



**STRENGTHS**

*the Initiator has the necessary competencies and management experience to create and effectively run a business, an optimal organizational structure, a sufficient raw material base, and strong company management*

**WEAKNESSES**

*no stable client pool, no reputation in the market*

**OPPORTUNITIES**

*growing market, government support for this sector*

**THREATS**

*possible tightening of competition in the field, high entry barriers to entry to the market*

**CONCLUSION**

*the company has a significant potential for development and in the long term will be able to take a strong position in the market*



Name of works and events	1st year of project implementation			
	1st quarter	2nd quarter	3rd quarter	4th quarter
Conclusion of an agreement with an investor and organization of financing				
Land plot selection and purchase via auction				
Cadastral and land management, and other works				
Approval of design and estimate documentation				
Working design				
Work with the administration to coordinate the project and provide technical specifications				
Comprehensive sanitary and epidemiological survey of the territory				
Engineering and geological surveys				
Obtaining technical specifications for water, electricity and Sanitation				
Laying of water supply and drainage networks				



Name of works and events	1st year of project implementation			
	1st quarter	2nd quarter	3rd quarter	4th quarter
Laying of external power supply networks				
Conclusion of contracts with contractors				
Construction of industrial buildings				
Purchase of specialized vehicles				
Purchase of equipment and materials. Delivery				
Laying of internal power grids				
Manufacturing, installation of production equipment				
Installation of the ventilation system				
Installation of the heating system				
Purchase of consumables				
Start-up and adjustment works				
Landscaping				
Staff training				
Debugging of the technological process				
Full power start-up				





PROJECT INVESTMENT COSTS	AMOUNT, ths. USD without VAT
Design and survey work	200,55
Construction and installation works	6 354,41
Equipment	3 366,00
Purchase of raw materials to start work	11,62
Other expenses	417,63
<b>TOTAL</b>	<b>10 350,20</b>



Name of works and events	1st year of project implementation			TOTAL
	2nd quarter	3rd quarter	4th quarter	
Design, examination of project documentation, obtaining a construction permit	110,27	90,27	-	200,55
Construction and installation works	1 934,77	3 215,99	1 203,65	6 354,41
Payment for equipment	207,71	1 644,05	1 514,24	3 366,00
Purchase of raw materials to start production	-	-	11,62	11,62
Other capital investments	56,87	221,74	139,02	417,63
<b>TOTAL</b>	<b>2 309,62</b>	<b>5 172,06</b>	<b>2 868,52</b>	<b>10 350,20</b>



No	Name of indicators	2021	2022	2023
1	Revenue from sales of products	0,00	14 958,05	25 620,52
2	Taxes and fees calculated from the proceeds from the sale of products	0,00	582,03	1 446,42
3	Revenue from sales of products, net of taxes and fees calculated from revenue	0,00	14 376,02	24 174,10
4	Production and sales costs	0,00	2 582,93	3 294,59
5	Profit (loss) from sales	0,00	11 793,09	20 879,51
6	Financial expenses	375,56	504,57	0,00
6.1	including interest on the loan	375,56	504,57	0,00
7	Profit before tax	-375,56	11 288,52	20 879,51
8	Income tax	0,00	0,00	0,00
9	Net profit (loss)	-375,56	11 288,52	20 879,51
10	<b>Net project income</b>	<b>-375,56</b>	<b>11 751,63</b>	<b>21 342,62</b>



No	Indicator name	Value
1	Accepted discount rate	7,50 %
2	Dynamic payback period of the project	14 months
3	Net discounted income (NPV)	ths. USD 18 674,5
4	Internal Rate of Return (IRR)	106,1%



## The ANALYSIS

of the project performance indicators allows us to conclude that with the projected sales volumes, capital investments, product prices and sales costs, the project is cost-effective and recoupable



## The ANALYSIS

of the amount of net profit and cash flows during the forecast period indicates the stable financial and economic position of the company during the project implementation period and its ability to pay its obligations in a timely manner





THANKS!