



ROADMAP FOR THE GREEN RECOVERY AND TRANSFORMATION OF THE UKRAINIAN FOOD INDUSTRIES

TECHNICAL REPORT
OUTPUT 7-REVITALIZATION OF
THE AGRIBUSINESS AND FOOD PROCESSING

MARCH 2024

THIS DOCUMENT WAS PRODUCED WITH THE FINANCIAL
SUPPORT OF THE FEDERAL REPUBLIC OF GERMANY

Disclaimer

© **UNIDO 2024**. All rights reserved.

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” or “developing” are intended for statistical convenience and do not necessarily express a judgement about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	4
1. EXECUTIVE SUMMARY	5
2. INTRODUCTION	8
3. ROADMAP PHASES	10
3.1 OVERVIEW OF THE GOALS OF THE ROADMAP	11
3.2 OBJECTIVES OF THE ROADMAP.....	11
4. PRIORITISATION OF FOOD PROCESSING INDUSTRIES	12
4.1. PRIORITIZATION CRITERIA	12
4.2. SELECTED FOOD PROCESSING SECTORS & SUB-SECTORS.....	13
5. ASSESSMENT OF UKRAINE’S FOOD INDUSTRY SECTOR	14
5.1. CURRENT STATE	14
5.2. IMPACT OF WAR ON THE AGRICULTURE SECTOR	14
5.3. ASSESSMENT AND ANALYSIS CONCLUSIONS.....	17
6. SUB-SECTOR ANALYSIS SNAPSHOT	19
6.1. VEGETABLE OIL SECTOR	19
6.2. HONEY PROCESSING SECTOR.....	21
6.3. PROCESSED FRUIT AND BERRY SECTOR	23
6.4. DAIRY SECTOR.....	24
6.5. POULTRY SECTOR.....	26
6.6. SUGAR SECTOR	27
6.7. GRAIN PROCESSING SECTOR.....	31
7. VISION AND GOALS	35
8. POLICY FRAMEWORK	37
8.1. EXISTING POLICIES, PROGRAMMES AND INITIATIVES	37
8.2. STRENGTHENING AND SUPPORTING EXISTING POLICIES	41
9. GREEN RECOVERY PROPOSITIONS AND INVESTMENT NEEDS	42
9.1. SECTOR WIDE PROPOSITIONS.....	42
9.2. SECTOR SPECIFIC PROPOSITIONS	50
9.3. AGGREGATED GREEN RECOVERY AND RECONSTRUCTION INVESTMENT NEEDS	59
10. RESOURCE MOBILISATION	60
ANNEX 1 – UNIDO ENTERPRISE SURVEY	61

ACKNOWLEDGEMENTS

This report was prepared by Kjell Sundin, Aleksa Mirkovic from the United Nation Industrial Development Organization (UNIDO), Jelle Tas, Petro Bogachevych, Yurii Oglashennyi and Olena Kovalova – all with UNIDO Project “Industrial capacity-building, policy advice and diagnostics for the green recovery of Ukraine”, Output 7 “Revitalization of the agribusiness and food processing industry”. The work was conducted under the overall supervision and guidance of Mr. Kjell Sundin, Agribusiness Department, UNIDO HQ.

Substantial support in defining the Governmental priorities of Food Industry Development was provided by: Mr. Markiyan Dmytrasevych, Deputy Minister of Agrarian Policy and Food of Ukraine, Mr. Oleksii Pinchuk, Director of the Department for International Cooperation and European Integration, Ms. Polina Ivashchenko, Head of the Division for Coordination of the International Technical Assistance, Ministry of Agrarian Policy and Food of Ukraine; and Ms. Nadia Bigun, Deputy Minister of Economy of Ukraine.

The valuable support and information provided by the NGO sector and processing enterprises enabled the formation of an understanding regarding the current situation, challenges, and requirements of selected food industries. Consultations were held with Mr Rodion Rybchynskyi, Head of “Union of Food Manufacturers”, Head of Union “Millers of Ukraine”; Mr Stephan Kapshuk, Head of “UkrOilProm” Association; Mr Vadym Chagarovskyi (Head), Mr Arsen Didur (CEO), Mr Dmytro Strikhovskyi (Head of Analytical Centre), Union of Dairy Processing Enterprises of Uk-

raine; Mr Oleksandr Taranenko (Head), Mr Dmytro Romanov (CEO), All-Ukrainian Association of Bakers; Mr Oleksandr Baldyniuk, Head of Confectionary Association of Ukraine; Mr Sergii Karpenko, Head of Union of Poultry Breeders of Ukraine; Ms Iryna Kukhtina, Head of Ukrainian Berry Association; Mr Nazar Mykhaylovin, Head of Ukrainian Sugar Association; Mr Eduard Krichfalushyi, Deputy Head of Association of Honey Exporters and Processors; Ms Tamara Nagaitseva, Head of National association of manufacturers of baby food, canned milk and juice products; Mr Volodymyr Pechko, Head of Public Union “Association of Gardeners, Grape Growers and Winemakers of Ukraine”; Mr Volodymyr Pugachov, Head of Association “Donaj Soya”; Ms Veronika Khalaydzhi, Head of Ukrainian Club of Packagers; Mr Volodymyr Cvetov, CEO of Association “Glass of Ukraine”; Mr Georgii Getukha, Head of “Bioenergy Association of Ukraine”; Mr Oleksandr Dombrovskyi, Head of “100RE Ukraine”; Ms Olena Deyneko, Head of the Organic Initiative Public Association; Sergiy Galashenskyi, Director of the Ukrainian certification body for organic products Organic Standard; Kateryna Shor, coordinator of information portal OrganicInfo; and Natalia Prokopchuk, Organic Component Coordinator, Swiss-Ukrainian Program: “Quality FOOD Trade Program”.

Practical clarification of developed proposals was made during the consultations and visiting the enterprises of identified industries.

APK-Inform provided the Food Industry Survey; Ukrainian Club of Packagers provided the Packaging Industry Survey.

1. EXECUTIVE SUMMARY

Project background. The United Nations Industrial Development Organization (UNIDO) is partnering with the Government of Ukraine to develop a green industrial reconstruction and development strategy. The project aims to support Ukraine in creating a green recovery program for sustainable industrial development, focusing on productivity improvement, enhancing industrial policy-making capacity, and fostering green recovery through cooperation with Germany at the municipal level.

Under Output 7, "Revitalization of the agribusiness and food processing industry", UNIDO collaborated closely with local stakeholders. Together, they identified key food processing sectors, conducted detailed assessments, and identified necessary support and investments for recovery and upgrading. The roadmap aims to provide a structured plan for the green recovery of the food processing sector, steering it toward economic sustainability and EU integration, resilience, and environmental responsibility. It serves as a guiding framework for development partners, policymakers, and industry leaders. The roadmap consists of the following phases: prioritization, analysis and assessment, setting vision and goals, policy framework development, sector wide and sector specific development proposals and investments, and resource mobilization.

Introduction. The war in Ukraine has severely affected the country's economy and food industry, causing losses of human capital, infrastructure, trade, and market stability. The agricultural and food processing sectors have suffered direct damages of over \$9 billion, as well as indirect impacts of higher production costs, lower profitability, and reduced consumer power. Despite these challenges, the food industry has shown resilience and adaptability, by shifting to alternative energy sources, trade routes, and markets, as well as implementing resource efficiency measures and skill development programs. The report identifies the common challenges and opportunities for the food industry sub-sectors and

proposes a methodological approach to assess and analyse their development options. The report aims to provide: a pre-selection of most promising food processing sectors; recommendations for enhancing the competitiveness and sustainability of the food industry in Ukraine.

Selected food processing industries. To focus on the most promising and resilient food sectors and sub-sectors, the following prioritisation criteria were applied: export growth, trade surplus, global ranking, EU market importance, war impact, and opportunities for deep processing. Six sectors and 14 sub-sectors, such as livestock products, milk and milk products, vegetable oils, berry and fruits, sugar, and grain processing, are selected based on these criteria.

Prioritised food processing industries. Upon consultation with the Ministry of Agrarian Policy and Food of Ukraine, a prioritized list was jointly developed and mutually agreed upon. This prioritization underscores the emphasis on the development of Small and Medium-sized Enterprises (SMEs), with **a specific focus on the dairy, fruit and berry processing, honey, and grain processing industries.** This strategic prioritization is aligned with the prevalence of SMEs in these specified sectors, in contrast to poultry, sugar, and vegetable oil industries.

A brief overview of each selected sector, offering a snapshot that includes key challenges and main development opportunities and investments is included in this report under section 6.

The assessment of Ukraine's diverse food industry reveals both well-established, export-oriented sectors and smaller less advanced enterprises, all demonstrating entrepreneurial resilience. The assessment methodology used in this assignment includes pre-selection of industries, stakeholder interviews, field trips, and secondary research. The following key challenges are identified:

1. Low adoption of modern technology: Limited uptake of sustainable processing technology, especially in non-advanced sectors, due to complexity and high costs.
2. Limited comprehension of EU market requirements: Lack of clarity at enterprise and Industry association levels regarding Ukraine's single-market accession and limited understanding of Green Deal regulations.
3. Reluctance to invest: Ongoing war and uncertainty hinder investments, pushing businesses into survival mode. Enterprises express a willingness to explore green recovery investment if financing is supported.
4. Misalignment of food safety standards: Efforts underway to enhance standards, but there is still misalignment with EU requirements, leading to mistrust. Laboratories need better equipment and expand accreditation including improvements at the competent authority level.

Vision and goals. Under the "Build Back Better" principle, the Green recovery goals for Ukraine's food industries (2024-2029) align with national priorities. The goal is to revitalize and enhance the sector using sustainable technologies, ensuring food safety, and minimizing environmental impact. Strategies include enhancing resilience, aligning with EU standards, and promoting green investments. The vision aligns with EU accession principles, emphasizing political stability, economic reforms, legal alignment, human rights, regional cooperation, institutional capacity building, corruption prevention, public support, socioeconomic development, environmental sustainability, security, and effective multilateral engagement.

The policy framework was assessed with existing policies impacted by martial law outlined in section 6, including changes in agricultural policies. Integration into the EU single market is highlighted, offering opportunities for funding in transportation, energy, and digital sectors. Public health, state programs, and climate initiatives are discussed. Recommendations to strengthen and support existing policies include strengthening food safety and control policies, offering technical support for EU funding applicati-

ons (including green deal), and addressing challenges identified in the assessment.

The report outlines sector-wide and sector specific propositions in Chapter 9. followed by an aggregate green modernization and reconstruction investment need (see section 9.3. for details).

Based on the prioritised food industries similarities, the sector wide propositions are focusing on:

1. **Sustainable investment capital for private sector** is essential for advancing the green recovery agenda for the prioritised food industries, as private sector plays a crucial role in the green recovery, modernization, employment and economic growth. Specialized financial instruments are needed to support enterprises in their investments. Detailed financing options and propositions are included in this roadmap report under section.
2. **A skill, capacity and knowledge development program** aims to increase the level of awareness and institutional capacity to introduce green recovery technologies, strengthen the competitiveness and prepare for the EU market, including the Green Deal, and to be aware of technologies and legislation, certification processes as part of the EU accession.
3. **Aligning the food packaging industry to EU standards**, aims to create conditions of adapting the industry to EU market framework and regulations, ensure the supply of packaging materials that meet the EU requirements, expanding the use of "green" technologies in the domestic food packaging industry.
4. **Improving food quality and safety standards** in Ukraine aims to enhance and align the existing food safety procedures and standards to the level of EU and other important prospective export markets.

The resource mobilisation section provides a step-by-step approach with the aim of securing financial and non-financial support to transition Ukraine's food processing sector to a low-carbon, resilient, and sustainable model.

The proposed interventions and programs, aligned with EU principles and ongoing development initiatives and programmes, aim to position Ukraine's food

industries for sustainable and resilient growth while advancing integration into the EU and global market.

2. INTRODUCTION

Project background. The project aims to assist the Government of Ukraine in developing a green industrial reconstruction and development strategy. UNIDO will support the government in creating a green recovery program for sustainable industrial development. The project will focus on improving productivity, enhancing industrial policy-making capacity, and equipping Ukraine with tools for green recovery. It will also promote cooperation between Ukraine and Germany, particularly at the municipal level, to foster green recovery and development.

UNIDO is conducting a thematic analysis to understand the baseline situation, challenges, trends, and growth opportunities in Ukraine's industry. Based on this analysis, thematic recommendations and capacity-building activities will be provided. Additionally, UNIDO and the Government of Ukraine are working on concrete project proposals for green recovery and post-war industrial development, which can be implemented with the support of development partners.

Upon project completion, the expected outcomes are as follows:

1. Enhanced industrial policymaking capacity to support the productivity and recovery of Ukraine's industrial sector.
2. Empowerment of the Government of Ukraine, its institutions, and enterprises with tailored tools for short- to medium-term green recovery and long-term sustainable industrial development.
3. Establishment of an evidence-based, result-oriented framework for Ukraine's green recovery program, fostering multi-stakeholder collaboration under the government's leadership.
4. Strengthened local-level cooperation and peer learning between Ukrainian and German municipalities, with a specific focus on priority areas of the future green recovery program.

To achieve these outcomes, UNIDO is conducting a thematic analysis to inform the green recovery program, including assessing the baseline situation, war's impact, sectoral challenges, trends, and growth opportunities. This analysis guides the development of thematic recommendations and capacity-building activities to support national counterparts at both central and local levels in reconstructing the country's industry and building long-term resilience. In order to achieve the envisaged outcomes, the project is implemented through 9 interlinked outputs.

More specifically under Output 7: "Revitalization of the agribusiness and food processing industry" UNIDO in close consultation with local stakeholders, identified a prioritized food sectors and conducted an in-depth assessment to identify the needed support and investment for the upgrading and revitalization of these selected sectors and subsectors, develop upgrading proposals and roadmaps to be used for policy advice and resource mobilization.

In early 2022, as a full-scale war unfolded, Ukraine confronted hard challenges that not only tested its economy but also its very existence as a nation. These difficult challenges included port blockades, ongoing shelling during sowing and harvesting, interrupted power supply and the displacement of many industry workers. Remarkably, despite the wartime conditions, Ukrainian businesses managed to export agricultural and food products worth an impressive \$23.4 billion as of 2022 (\$8.4 billion – food products), and 53% in total exports, \$21.9 billion as of 2023 and 61% in total exports. On the same time, the volumes of agrifood export in 2023 increased on 9,5 mln tons.

These figures underscore the remarkable achievements of everyone involved in producing and processing food, both for the national and the international markets.

The green recovery for the food processing industry in Ukraine refers to a strategic and sustainable approach to rebuilding and revitalizing this sector following economic, environmental and population

challenges caused by the ongoing war. It involves implementing measures that prioritize environmental sustainability, resource efficiency, and resilience in food processing activities. This includes adopting eco-friendly policies and practices, reducing envi-

ronmental impacts, and promoting the use of renewable resources and technologies within the food processing industry to ensure long-term viability and improve sector competitiveness, while safeguarding the environment.

3. ROADMAP PHASES

The strategic roadmap for the green recovery and transition of the prioritised food industries consists of several key stages, as outlined in graph 1 below.

GRAPH 1. ROADMAP PHASES



1. Prioritisation of food processing industries

To bring focus on a number of industries which appear most promising in the near future and resilient amid the current conflict.

2. Assessment and analysis conclusions

A) To identify the current state of the prioritized food industries, including sector commonalities, strengths, weaknesses, opportunities, and threats (SWOT). B) Analyse also the impact of the recent challenges on the sector.

3. Vision and goals

A) To propose a clear vision for a sustainable and resilient food industry. B) Define specific, measurable, and time-bound goals for recovery and modernisation in the short, medium and long term for the food processing sector as whole and for the prioritised sectors in particular that align with the vision.

4. Policy framework

To Outline policies and regulations programmes needed to support the green recovery objectives. To identify policies that support and incentivize “green” investments, that support and improve food safety and control, policies for waste reduction, and environmental transformation and conservation.

5. Green recovery investments and programmes

Identify investments propositions and programs for the food processing sector in the areas of:

- a. Recovery, rebuilding, and modernization of infrastructure
 - i. In conflict scenario (short term)
 - ii. In post-conflict scenario (long term)
- b. Innovation and technology. Investments in sustainable innovative technologies and practices that can enhance sustainability, competitiveness and resilience, including food packaging.
- c. Food safety and quality control
- d. Supply chain resilience: Investment and programmes to minimize disruptions during crises, including transportation, storage, and distribution

6. Resource mobilisation

Prioritize and agree on green recovery policy and investment support programmes. This section outlines the next steps to be taken to Identify development partners and secure resources for detailed design and implementation.

3.1 OVERVIEW OF THE GOALS OF THE ROADMAP

The goal of this roadmap for the green recovery of the food processing sector is to provide a structured and strategic plan that outlines the stages, including steps, priorities, and actions necessary to steer the sector toward sustainability, resilience, and environmental responsibility. This roadmap serves

as a guiding framework for development partners, government policymakers, and industry leaders to collectively work toward several key objectives and to identify investments and programmes to achieve them.

3.2 OBJECTIVES OF THE ROADMAP

1. Rebuild and modernize the food processing infrastructure in an energy efficient and sustainable manner. This will improve food quality and safety, and increase access to domestic and international markets. Some of the actions that can be taken are: repairing roads, bridges and railways damaged by the war; expanding the capacity and efficiency of ports and terminals, waste and water treatment; as well as upgrading food quality and safety infrastructure like laboratories, cold storage facilities and warehouses; and investing in renewable energy sources and smart logistics systems.

2. Adopt emerging and sustainable food processing technologies and skills. This will help enhance the: quality control, value addition, diversification, and innovation of food products, as well as reduce the environmental impact of food processing. Some of the technologies that can be adopted are: traceability systems, food quality and safety assurance and certification programs, waste reduction and recycling programs, food packaging innovation programs and, renewable energy and water conservation programs. But also, human capital

development programmes to assist in improving the skills, knowledge and well-being of the workers in the food processing sector.

3. Strengthen the institutional and policy framework for food processing. This will help create a conducive environment for private sector investment, entrepreneurship, and competitiveness in the food processing sector. Some of the measures that can be taken are: developing a national strategy and action plan for sustainable food processing; harmonizing food safety and quality standards with international (EU) norms; providing investment and technical support to small and medium enterprises and their respective business associations; enhancing public-private partnerships and cooperation; and promoting trade facilitation and market access and export promotion programs.

4. Resource mobilisation. This will direct and focus the necessary resources that are needed for the government and development partners to support the objectives that will benefit the People of Ukraine.

4. PRIORITISATION OF FOOD PROCESSING INDUSTRIES

The food industry in Ukraine is diversified and serves both domestic and foreign markets. Food products are the third-largest export item after metals and grains, and most of them are sold to EU countries. Following the full-scale Russian invasion in 2022, the industry experienced a 23% decline in revenue in US dollar terms. This decline was significantly lower compared to the 49% decline reported in other manufacturing subsectors. The food products exports decreased by 20%, which is lower than the average export decrease of 35%. The food processing industry depends largely on local agriculture. Most of the inputs, such as grains, fruits and vegetables, oilseeds, milk, meat, poultry, and eggs are sourced locally. Local production meets about 90 percent of

the domestic food demand. Before the invasion, about 33 percent of the food products, mainly cooking oil and other oilseed products, were exported; the export rate of other food items was around 20 percent. Many foods are exported as unprocessed product.

Foreign investment has a significant role in the Ukrainian food industry. The food industry makes up about 25 percent of the industrial Foreign Direct Investment (FDI) and 6 percent of the total FDI in Ukraine¹.

In 2021, the food industry was responsible for 2 percent of Ukraine's greenhouse gas (GHG) emissions¹.

4.1. PRIORITIZATION CRITERIA

To focus on the most promising and resilient food sectors and sub-sectors, the following prioritisation criteria were applied:

1. The sector shows **export growth** in 2021-22.
2. **Trade surplus** (more export than import).
3. The Sub-sector is **in top 20** of Worldwide producers.
4. **EU is #1 export market** for sub-sector products.
5. Exports during war (first 10 months of 2022) is **more than 75% of the pre-war export**.
6. The sub-sector **involves or has opportunity for deep-processing and value addition**.

In the current conflict situation, there is also a geographical focus applied, to focus on enterprises which are not in occupied territories or in active combat zones. In practice, this means the Project focus is for now on the western and central provinces and the enterprises already active there or which have moved there since the outbreak of the war. This territorial focus will change if there is a reason to do so.

¹ World Bank. 2023. Private Sector Opportunities for a Green and Resilient Reconstruction in Ukraine: Volume 2 Sector Assessments © World Bank.

4.2. SELECTED FOOD PROCESSING SECTORS & SUB-SECTORS

The pre-prioritisation has led to a first selection of 6 sectors and 14 sub-sectors, and from these a further prioritisation was made.

The Ministry of Agrarian Policy and Food of Ukraine, prioritizes the development of Small and Medium-sized Enterprises (SMEs) as well as prioritize the industries specifically within the: 1. dairy products; 2. fruit and berry processing; 3. honey; and 4. grain processing industries. This sector prioritization aligns with

the prevalence of SMEs in these mentioned sectors compared to poultry, sugar, and vegetable oil. On 21 of March 2024 the trade conditions of Ukrainian access to EU market are under consideration which could have impacts for poultry products, sugar, and potentially for wheat, groats and honey.

The selected sectors and sub-sectors are listed in below table and the prioritised sectors are highlighted in bold.

TABLE 1: THE SELECTED FOOD PROCESSING SECTORS*

№	SECTOR	№	SUB SECTOR
1	Livestock products	1	Poultry meat
		2	Egg product
2	Milk and milk products	3	Butter
		4	Milk powder (full cream)
		5	Milk and cream (not concentrated)
3	Vegetable oils and their cleavage products	6	Soyabean oil
		7	Sunflower oil
		8	Rapeseed oil
4	Fruits and berry products	9	Fruit juice & concentrate
		10	Frozen fruit and berries
		11	Apples, pears processing
5	Sugar and Honey	12	Sugar, raw and refined
		13	Honey
6	Products of the grain processing industry	14	Grain processing products: Malt, Starch, Inulin, flour and flour mixes, bakery (frozen) products

Listed in order of Ukrainian Classification of Goods for Foreign Economic Activity

5. ASSESSMENT OF UKRAINE'S FOOD INDUSTRY SECTOR

5.1. CURRENT STATE

The Ukrainian food industry has historically been a significant contributor to the country's economy. It encompasses a wide range of subsectors, including agriculture, food processing, and food retail. Ukraine is known for its fertile land and is often referred to as the "breadbasket of Europe" due to its substantial grain and oilseed production. Key crops include wheat, corn, sunflower, and barley. The country is also a major producer of poultry and dairy products. Of Ukraine's total land area of 60 million hectares, roughly 41.3 million is classified as agricultural land². Agriculture and Food sectors account for about 20% of GDP in 2021 and roughly 2.7 million people were employed in the agricultural sector in 2021.

The food industry falls under the responsibility of the Ministry of Agrarian Policy and Food of Ukraine, which is the central executive authority of Ukraine in charge of country's agro development; and Ministry of Economy of Ukraine which is the central executive body in formulation and realization of economic and entrepreneurship policies. Ukraine's food processing industry comprises over 14 sectors and sub-divided into 54 sub-sectors. However, the majority of agricultural exports, with the exception of vegetable oils (25% - animal or plant fats and oils, 11% - finished

products), are raw goods such as corn, wheat, rape-seeds, and soybeans.

The Ukrainian food industry sector is structured as follows:

- **Agriculture:** Ukraine has a large agricultural sector, with extensive arable land and a focus on industrial crop cultivation. Farms can range from small family-owned operations, with an average of 200ha in size to large agribusinesses of 300.000 ha in size. About one third of agricultural sector production is provided by households with an average size 4 ha, which are not legal entities. Before the full-scale invasion there were 4.74 million rural households in Ukraine.
- **Food Processing:** Food processing plays a crucial role in adding value to agricultural products. Key processed products include wheat flour and flour products, sugar, vegetable oil, meat, eggs and dairy products, and processed fruits and berries.
- **Export:** The food industry in Ukraine is export driven, mainly in bulk export in raw goods.

5.2. IMPACT OF WAR ON THE AGRICULTURE SECTOR

The entire nation and its economic activities is heavily impacted since the Russian full-scale invasion in February 2022. The food sectors and especially the selected sectors have proven to some extent resilient in the current conflict situation. The sectors continued to operate and adapted to challenges

of electricity shortages, logistic challenges, changes in sales markets, increase in cost of production and shrinking margins. The effects of war are widely spread and can be long-term or short-term, the primary effects and its implications to the food industry are listed in below table 2.

² Based on Ukraine country borders of 1991

TABLE 2: PRIMARY EFFECTS AND ITS IMPLICATIONS TO THE FOOD INDUSTRY

IMMEDIATE EFFECTS OF THE WAR IN UKRAINE ON:	DIRECT IMPACT TO THE FOOD INDUSTRY SECTOR	RESPONSE
LOSS OF HUMAN CAPITAL		
Internal displacement (5,1 million people)	<ul style="list-style-type: none"> Loss of skilled workforce Direct loss of domestic market size, number of consumers 	Skill development for woman and people with disabilities for industrial jobs
People conscripted into the armed forces		Automatization / mechanisation of production processes
Refugees from Ukraine (6.3 million)		Exports development
REDUCED ECONOMIC GROWTH AND TRADE		
Destruction of energy infrastructure	<ul style="list-style-type: none"> Disruption in processing, reduction of output between -10 to -30% 	<ul style="list-style-type: none"> Repair of infrastructure Shift to alternative energy (generator, renewable sources, energy efficiency measures)
Destruction of ports, logistic network	Disruption or complete closure of trade route and markets	Geographically shift in trade routes, Increase capacity and efficiency of border crossings Food processing development (especially in industries where raw materials production is export oriented)
Increasing the production costs	Lowering the profitability; increasing mostly the costs of logistic, energy resources and other components; decreasing the consumer power	Slight increasing the prices, simplifying the recipes, resource efficiency measures, search for new markets/niches
INCREASED RISK AND UNCERTAINTY		
The war creates a lot of uncertainty and volatility in the market.	Difficult for businesses to plan ahead and invest. Damages and losses due to military attacks. There is no affordable/ available war risk insurance.	Most businesses are in “survival” mode, but with support (foreign investments, grants, etc) modernization projects will be under way.
Leading to higher food prices in domestic market	Reduced spending power Idle production capacities	Looking for new markets/products

Logistic challenges: Seaports are crucial as over half of Ukraine's total exports, including 90 per cent of grain exports, rely on maritime routes. Before the war, Ukraine operated 13 ports in the Azov and Black Sea basins and the Danube Delta. Presently, ports of the Azov Sea are temporarily not under Ukrainian control. Black Sea ports like Mykolaiv (capacity is comparable with Odesa ports) are hindered by

Russian blockades; Big Odesa ports (Odesa, Chornomorsk, and Pivdennyi) were ports of Black Sea Grain Initiative and later – export ports since July 2023 for new Ukrainian Corridor. As of March 2024, about 90% of agrifood exports go through Big Odesa and Danube ports. During the two years of the full-scale invasion, more than 20 new transshipment points were opened in the Danube cluster, which ensured a

sixfold increase in cargo turnover compared to 2021. For processed food, an essential option for export before 2022 was sea containers, especially for whey, poultry eggs, starch, wheat flour, groats, sugar, etc, having up to 94% in export structure. In 2022-23, container (sea) shipments were minimized. For now, container logistics through Danube ports have started to develop; for container logistics through Big Odesa ports, it is crucial to issues of insurance and value simultaneously with security issues.

Since the war began, Ukraine has invested in dry ports and streamlined export documentation and certifications for transit goods to facilitate exports to the EU. Train transport faces pre-war challenges such as varying wheel gauges and wagon sizes. Additionally, EU ports like Rotterdam and Rostock lack storage for large grain quantities. Road logistics were until recently seriously hindered at the Poland-Ukraine border, due to road blockages. During this border blockage Ukraine explore alternatives road exports through Romania, Slovakia, and Hungary, and sea exports, utilizing the Constanta port for loading vessels via the Danube, rail, and Baltic Sea. After Russia withdrawal from Black Sea Grain Initiative in July 2023, Ukraine resumed exports from Big Odesa ports. These alternative routes are not ideal and come with a different set of challenges, one of them is costs, that are extremely higher than through traditional sea ports used before the full-scale invasion. It is essential that Ukraine continues to export albeit with higher cost associated to these alternative routes.

Facing challenges in export logistics, SMEs and large businesses like Epicenter Agro, Terra, Kulinichi, and Yuriya are considering investments in domestic processing facilities. Traditionally, 92 percent of

raw agricultural products were exported by sea, a mode of transport now constrained by the invasion³. Investing in processing facilities allows to produce higher-value products per unit of weight/volume, reducing reliance on logistics. Furthermore, with the EU-countries imposing some restrictions on specific grain and oilseed imports from Ukraine, businesses are increasingly motivated to invest in processing. The situation at different border crossings is changing rapidly with blockages ending and new ones starting. For Ukraine it is essential that borders to EU remain open and roads into Europe accessible for Ukraine trucks, ports are accessible for Ukrainian agrifood exports.

Access to finance. Small and medium Enterprises (SMEs) continue to face challenges in accessing finance for their investment needs. In 2020, lending from the banking sector to the private sector amounted to 20.9 percent of GDP, significantly below the average of 55.5 percent observed in lower-middle-income countries in Europe and Central Asia⁴. This lack of credit accessibility diminishes competition, particularly as companies within conglomerates secure financing through intercompany borrowing—an option unavailable to SMEs. Resolving the challenges confronting Ukraine's financial sector it is essential to facilitate a robust flow of finance that can support a green and resilient recovery.

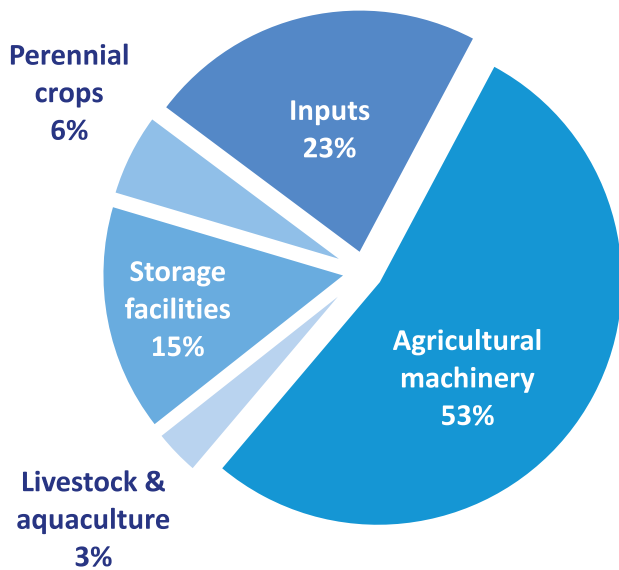
The direct damages to Ukraine's agricultural sector including land resources amounted to 8.7 USD bln.⁵ The damage breakdown indicates that there is \$1.9 billion in losses to grain storage infrastructure and \$4.7 billion in losses to agricultural machinery and equipment. The breakdown of the estimated direct damages is schematically depicted on Graph 2, here below:

3 World Bank. 2023. Private Sector Opportunities for a Green and Resilient Reconstruction in Ukraine: Volume 2 Sector Assessments

4 World Bank. 2023. Private Sector Opportunities for a Green and Resilient Reconstruction in Ukraine: Volume 2 Sector Assessments.

5 Source: FAO survey, January-February 2023, under enterprise with land up to 250 hectares

GRAPH 2: THE DIRECT DAMAGES TO UKRAINE'S AGRICULTURAL SECTOR



The direct damages to Ukraine's food processing sector. Total amount of direct damages to food processing enterprises (according to KSE data, 45 enterprises, without tobacco and alcohol sectors, sample survey) is about \$578 millions. As an example, one of those affected industries is the Zasilnyi Sugar Plant in Mykolayv region, that was destroyed - direct losses in 180 mln UAH, according to Ukrainian Sugar Association. The Union of dairy processors reports that 39 dairy processing plants appeared to have been illegally occupied by the Russian military and are considered lost for Ukraine. The non-profit business association Packagers' Club reports 3 packaging enterprises were fully destroyed with losses amounting to about USD 30 million.

5.3. ASSESSMENT AND ANALYSIS CONCLUSIONS

The pre-defined sectors and sub-sectors are diverse and cover a wide range of products. While some sectors are well-developed, export-oriented, and represented by medium, large to very large enterprises, others are represented by many smaller enterprises with varying degrees of advancement in processing and marketing capabilities. Despite their differences, all sectors are entrepreneurial and have proven to be resilient in the face of the current challenges by responding to them and finding solutions. This section aims to identify the commonalities among the sub-sectors, including their key challenges and opportunities. It also analyses the impact of recent challenges on the sector.

The methodological approach to identifying key challenges, opportunities, and perspectives for industries in terms of development options and investment requirements includes:

1. The preliminary selection and mapping of the most promising and resilient food sectors and sub-sectors;

2. Primary research via stakeholders' interviews surveys, visiting enterprises (including industry associations, etc.);
3. Secondary research, summary and outline of relevant existing sources;
4. Translate research into recommendations for project resource mobilisation and project formulation.

The primary research also includes Field trip aimed to: clarify of upgrading/rehabilitation proposals; clarify the most appropriate green recovery technologies, investments options, legislation gaps, food safety/market access issues, needs in capacity building, skill development and knowledge.

The project team visited companies active in grain milling, pasta production, bread and bakery products, frozen bread products, vegetable oil, dairy, and fruit/jam production in a joint mission to update and validate the preliminary findings.

In order to gain a more comprehensive understanding of the prioritized sectors in the Roadmap, UNIDO commissioned a survey within Ukrainian food industry enterprises, drawing insights from a sam-

ple of 23⁶ effective questionnaires conducted across enterprises of various sizes. The survey summary is included in [annex 1](#).

KEY CHALLENGES. The following key challenges have been identified:

- 1. There is low adoption of modern, resource efficient technology.** With the exception of the more advanced vegetable oil processing sector, and part of enterprises active in dairy, poultry, egg products, grain processing, sugar, and fruit/berry processing sectors, the overall adoption and investment in advanced sustainable processing technology remain at a low level. Venturing into value-added products, poses a challenge due to complexity and the high associated investment costs. Limited awareness and understanding exist regarding green technology and its potential impact on individual companies. The scarcity of available proof of concept examples makes it challenging for entrepreneurs to grasp the benefits, cost savings, and emissions reduction associated with such technologies.
- 2. There is limited comprehension of EU market requirements.** In particular there is a lack of clarity on the implications of Ukraine's accession to the single market at the enterprise and business association level. Additionally, there is a low understanding of Green Deal regulations and their impact on businesses and associated technologies. Currently, Ukrainian food processors and their industry associations (apart from for Packaging, Millers and Bio Energy associations) are not represented in relevant EU business associations .
- 3. There is a strong reluctance to invest.** The ongoing war and uncertainty are hindering enterprises from committing to investments. Many businesses are in survival mode, deferring new initiatives not directly tied to operational continuity. Additionally, the war has pushed up the processing costs and, in some instances, reduced returns have squeezed profit margins, limiting the capacity for self-funded investments. If grants/matching
- grants and support programs are offered, many companies will be ready to look for debt or equity green recovery financing opportunities, as modernization needs are huge.
- 4. The food safety and control standards and procedures are not fully aligned with the EU requirements.** Efforts are underway to enhance current food safety and control standards and procedures. However, the country's official food and feed control system is not fully harmonized with the EU, leading to mistrust among European authorities regarding the results and capabilities of Ukrainian laboratories. Laboratories intended to perform the official control function need to be better equipped and have to expand the scope of accreditation in accordance with the needs of market operators. The small and medium food processors require training on precise EU safety and quality standards, access to EU and national markets. The role of associations as service providers in the field of ensuring food safety and quality, food legislation and compliance with international standards should be strengthened.
5. Ukrainian national statistics system has paper without properly segregating packaging paper, cardboard paper, toilet paper, etc. So, it is not clear how much specific packaging paper is produced in Ukraine each year. Therefore, the national statistics methodology and system needs to be reviewed, analyzed and amended in order to get more specific information about the specific production, market volume, market dynamics to help producers, government in its packaging industry development efforts, consumers, other stakeholders.

6 The Mission was conducted in November 2023 visiting enterprises in Rivne, Volyn and Lviv regions of Ukraine.

6. SUB-SECTOR ANALYSIS SNAPSHOT

In this section a snapshot of each preliminary prioritized sector is presented, giving a short summary and highlighting the key challenges and the main opportunities. This information is based on existing studies and data sources complimented with primary

data gathered through interviews with industry experts and representatives. For detailed project proposal see the corresponding industry Action Plans in the separate action plans report.

6.1. VEGETABLE OIL SECTOR

SECTOR SNAPSHOT:

The vegetable oil processing sector is concentrated, with 45 professional factories responsible for 90% of production, and an estimated 100 manufacturers in total. Of these, 25-30 plants produce retail oil under 30-40 brand names. The industry relies on modern technologies and source raw materials from Ukraine. In 2021, Ukrainian sunflower oil exports accounted for 40% of global exports, making it the top exporter worldwide, while soybean oil made up 1.91% (ranked 10th globally) and rape seed oil comprised 1.03%

(ranked 8th globally), but the vegetable oil exports almost entirely represented by the export of oil as raw product with the value addition taking place outside Ukraine.

EU countries are one of the major importers of Ukrainian soybeans, even in current year. Ukraine is growing GMO free and organic soybeans (producers united in Dunaya Soy Association).

THE IMPACT OF THE WAR:

The war led to the complete shutdown of businesses and the theft or destruction of equipment in the occupied areas. Approximately, 10-15 of the top 45 enterprises stopped completely. In 2022, sunflower oil export reached \$5.47 billion, a decrease of 15 % compared to 2021.

Frequent power outages, intermittent Black Sea routes and ports closures, increased logistics costs led to underutilized production capacity, reducing the

profitability of oil processing, and the oil crops growers. Sunflower oil and sunflower meal exports are the lowest since 6 and 9 seasons, respectively.

As a result, there was a significant increase in the export of raw materials, primarily sunflower seeds, compared to finished value-added products. The export geography shifted, with alternative logistics like rail and road routes to EU.

KEY CHALLENGES

The sector is characterized by large enterprises with advanced processing, producing predominantly sunflower oil (as commodity), leading to the following challenges:

1. **Marketing:** According to Ukroliyprom Association, the primary factors influencing the sunflower seeds and oil markets from 2022 to 2023:

- Reduced harvest of sunflowers in 2022;

- Substantial surplus stocks of sunflower seeds and oil from the 2022/23 season, initially perceived as a challenge.
- These surplus stocks offset the decline in the 2022 sunflower harvest.
- The surplus stocks facilitated industry operations and the augmentation of sunflower oil exports during the 2022/23 season.

Therefore, in 2022/23, Ukraine significantly boosted sunflower oil exports by 25.4% to 5.6 million tons, driven by intensified processing within the country after neighbouring EU countries restricted Ukrainian sunflower imports. The Sunflower meal exports also surged, by a 27.3%.

Soybean oil exports in the 2022/23 financial year rose by 18%, and soybean meal exports increased by 19.4%. The Industry Association – Ukroliyprom, suggests that these figures could have been higher with increased domestic soybean processing.

Furthermore, rapeseed processing in 2023 led to a remarkable over 20-fold increase in the export of rapeseed oil in July-August compared to the corresponding period in 2022.

2023/2024 outlook, Ukroliyprom experts forecast an 18.8% increase in the production of all oil crops in Ukraine for 2023/24. This growth is attributed to a 12.1% expansion in the sowing area and a 5.7% average increase in productivity, primarily driven by a significant 15% rise in sunflower production, fueled by favorable weather conditions.

Even though an increase in production is foreseen the total export of sunflower oil is expected to decrease by 7-8%, refined sunflower oil – by 8.6% in 2023/24 season⁷.

KEY OPPORTUNITIES

1. Diversify oil processing beyond sunflower oil.

While rapeseed is currently exported in its raw state, exporting processed rapeseed oil yields a significantly higher return. The "Law on Export Duties for Certain Oilseed Types" regulates export duties for flax, sunflower, and camelina seeds but presently exempts rapeseed from these duties. Encompassing rapeseed in this tariff structure would provide an additional incentive to process rapeseed before export. This inclusion would also stimulate processing in Ukraine and facilitate ac-

2. Regulatory challenges.

- a. For soybeans – there is a necessity to meet the EU Deforestation Regulation and Deforestation Certification⁸
- b. As electricity/biogas cogeneration project cost is huge, it is substantially burdensome for business to spend significant time and effort on project permits/approvals, electricity plug-in to the grid, apply and obtain state support green feed-in tariff. The general system of electricity plug-in permits/approvals requires deregulation to ease of doing business not only for the vegetable oil industry but also for other businesses.

3. **Challenges related to the war:** A decline of profitability, underutilization of capacity, cost of energy increase, overloaded warehouses, loss of some enterprises, increase in demand for processing capacity, Black Sea and Western border logistics disruptions.

4. **Food Safety & Quality:** The scope of accreditation of Ukrainian laboratories is too limited and manufacturers are forced to use the services of foreign laboratories to cover the entire range of laboratory tests.

cess to foreign markets under Ukrainian brands and packaging.

2. **Enhance product diversity.** Phosphatide concentrate, a by-product of oilseed processing and oil production, serves as a valuable raw material for producing lecithin in the food and confectionery industry, as well as for compound feed and feed additives, like soya protein concentrate.

3. **Promote energy-efficient technologies.** Implement cogeneration of energy, a practice that efficiently utilizes both electricity and thermal energy

⁷ Source: Ukroliyprom Association 2023

⁸ Source: European Parliament legislative resolution of 19 April 2023

sources (for example, sunflower husk boilers). This approach enhances overall energy efficiency, reduces energy waste, and lowers production costs.

GREEN ENERGY IN SUNFLOWER PRODUCTION

About 10 sunflower oil plants in Ukraine have converted boilers to produce both heat (20-50 MW capacity) and electricity (2 MW minimum capacity), replacing natural gas with sunflower husk waste. This is cost-effective, with a payback period of 5-7 years. Excess electricity feed the national grid at feed-in tariff state support. Some vegetable oil producers use surplus sunflower husk to make pellets for export or domestic sales. Many boiler houses in Ukraine can use sunflower pellets, which have a low carbon footprint (10%), resulting in a 90% reduction in CO₂ compared to natural gas.

6.2. HONEY PROCESSING SECTOR

SECTOR SNAPSHOT

Ukraine has significant agro-ecological advantages for producing honey. The favourable climate, distinct seasons and a wide range of flowering plants, allows for honey production throughout the year. These factors make Ukraine one of the largest honey-producing countries in the world and ranked 5th in the world's honey exporters before the war.

Ukraine primarily exports non-branded bulk honey, which undergoes basic processing and packaging in bulk. This export activity is mainly carried out

by 10-12 companies on a consistent basis, while the country is home to approximately 100,000 commercially oriented beekeepers, and 200 000 household beekeepers (producing honey for own consumption and selling in the local market). Honey plays a significant role in Ukraine's confectionery, bakery, and beverage industries. Additionally, beekeeping is vital for the country's agriculture, as it supports pollination.

THE IMPACT OF THE WAR

About 25% of honey production and processing was lost due to the war, important production area's in Khersonska, Kharkivska, Luganska, Donetska, ZapORIZKA oblasts are severely damaged and lost.

In 2022, 88% of Ukrainian honey exports went to the EU for a total of \$120 million. The main buyers of Ukrainian honey were Germany - \$38 million and Poland - \$24 million, Ukraine ranks 2nd in terms of

exports to the EU, following China. In 2021, 48 000 tonnes of honey were exported. In 2022, the export declined by 16.7%, number of the markets decreased from 35 to 32⁹.

The Ukraine's glass jar packaging industry in the beginning of the full-scale invasion was-damaged, and currently in process of restoration of volumes.

⁹ <https://agroportal.ua/news/ukraina/eksport-ukrajinskogo-medu-zris-udvichi>

KEY CHALLENGES

The sector is predominantly characterized by small and medium-sized (family run) enterprises, producing honey with basic processing for the bulk market, leading to the following challenges:

1. **Investment:** The ongoing war and short-term uncertainty are preventing enterprises from making investments, as the bulk honey production reached its limits. Limited financial resources and investment support options further hinder investment efforts.
2. **Food Safety & Quality:** Honey is one of the products, which is easy to counterfeit. It is easy to sell sugar syrup blended with honey. Ukrainian state laboratories lack necessary equipment and competence to verify counterfeit honey and are not equipped enough to check honey for export. Competition with cheap and fake honey makes it

difficult for quality honey to find its way to the final consumer. In addition to laboratory tests, the traceability system should be improved to prevent the avoidance of counterfeit honey. It is also necessary to increase the effectiveness of control measures to verify the traceability system both by the competent authority and by honey producers' associations.

3. **Marketing:** Limited knowledge of retail market requirements and insufficient resources for promoting and establishing market linkages with export markets pose significant challenges.
4. **Technology:** The adoption and investment in advanced honey processing equipment and practices oriented for retail are currently at a low level within the sector.

KEY OPPORTUNITIES

1. **Product quality improvement:** Investing in advanced and sustainable processing methods (filters, pasteurization, packaging and storage) to meet EU standards for both B2B and B2C markets can lead to higher quality products achieving higher prices. Additionally, investments in branding, sustainable packaging for retail consumers, marketing, and promotion have the potential to unlock export sales in the EU.
2. **Packaging, Marketing and Branding:** There is a growing worldwide demand for honey, with a CAGR of 4.9%. When branding is paired with quality improvements and standardisation, market expansion and diversification is achievable. On average about USD 1 million will be needed to install a honey processing line and retail honey packaging/labelling lines for some leading bulk honey producers. For systematic deliveries to the EU, retail market business development, marketing, promotion in the EU, another USD 1 million is estimated

to be needed per enterprise to build the value chain and supplies.

3. **Food safety and control:** Improving State Control and Laboratory Quality: Enhancing state control policies and the quality of laboratory testing capable of identifying the origin of honey. Investing in origin identification (laboratory testing) ensures Ukrainian honey's authenticity, where botanical origin relates to the primary plant source, and geographical origin specifies the collection region. Enhance the food control institutions in line with EU standards and methodologies can foster trust and compliance needed for success in the EU single market. The existing traceability laws and regulations in Ukraine is a good basis to build on which can boost honey's export in EU retail.
4. **Organic:** The growing consumer demand for organic honey presents an opportunity for the sector to achieve premium prices.

6.3. PROCESSED FRUIT AND BERRY SECTOR

SECTOR SNAPSHOT

Ukraine has a well-established fruit and berry industry and markets its products mainly as quick-frozen berries and berry mixes, juice concentrates, pectin, juices, purees and frozen mixed-fruit preparations. The sector is dominated by small and medium-sized enterprises (SMEs) with basic processing. A few larger companies, like Agrana and Dohler, JE Vitmark, TBF Group, and others are involved in more complex processing and exports. Ukraine produces a variety of different berries and has agro-climatic advantages in a number of them. In addition to berries, Ukraine cultivates apples, pears, plums, and cherries.

THE IMPACT OF THE WAR

The primary export category, frozen fruits and berries, which is a crucial export product in the segment, decreased from USD 216 million in 2021 to USD 192 million in 2022. In response to reduced domestic demand, Ukraine managed to increase fruit juice exports from USD 98 million in 2021 to USD 175 million in 2022.

KEY CHALLENGES

The sector is predominantly characterized by SMEs (frozen berries) and medium and large enterprises (juices and pectin), leading to the following challenges:

1. **Investment:** The ongoing war and short-term uncertainty are preventing enterprises from making investments decisions. Limited financial resources and investment support options further hinder investment efforts for SMEs.
2. **Food Safety & Quality:** Enhancements are needed in food safety and quality practices at both the state control and enterprise levels. This involves improving understanding, knowledge, equipment,

KEY OPPORTUNITIES

1. **Marketing:** There is a strong and growing global demand, particularly in the EU, for frozen fruits and berries. Additionally, there is potential for im-

Ukraine maintains a trade surplus in Frozen Fruits and Berries, Pectin (2019 – there were only three apple pectin plants in the World, totally – seven pectin producers), Juice Concentrate (every 10th juice jar in the world is made with Ukrainian concentrate), as well as Fruit Juices, while experiencing a trade deficit in processed fruits and berries, including jams. The EU stands as the top export destination. Frozen fruits and berries exhibit the most significant market demand growth at a 9% Compound Annual Growth Rate (CAGR), with processed fruit and berry sector following at a 4% CAGR.

The processing costs have risen considerably due to: the use of alternative energy sources, such as generators, increased fuel costs, longer and more complex logistics. Profit margins are under pressure because of this. The ongoing conflict presents challenges to Ukraine's potential for developing fruit and berry export value chains.

and technology. Moreover, there is a shortage of reliable, high-quality laboratories accredited by premium market countries for conducting microbiological safety tests. Ukrainian state laboratories lack EU accreditation, resulting in rigorous border checks.

3. **Export Marketing:** Limited knowledge of market requirements and insufficient resources for promoting and establishing market linkages with export markets pose significant challenges.
4. **Technology:** The adoption and investment in advanced processing equipment and practices are currently at a low level within the sector.

port substitution in the processed fruits and berries (jams) category.

2. **Value Addition:** The majority of Ukrainian berries and fruits are currently exported in raw or semi-finished forms to larger processors, primarily in Poland. Opportunities exist for the development of export value chains for high quality processed fruits and berries, including investments in sustainable processing leading to improvements in energy consumption and waste reduction. As also leading to improved sorting and grading practices, cold storage facilities, food quality certification, (aseptic) packaging, labelling, branding, tracing, and distribution.
3. **Wild berries:** Ukraine is a significant exporter of wild berries, including blueberries, cranberries, elderberries, lingonberries, and aronia, to the EU. This offers further potential for improvements in processing, sorting, grading, packaging, cold storage, branding and exports.
4. **Organic:** A fair number of Ukrainian producers of both wild and cultivated berries meet organic standards, presenting an opportunity for expanding organic processing and marketing into EU.

6.4. DAIRY SECTOR

SECTOR SNAPSHOT

Since 1990, there has been a steady trend towards a decrease in the total amount of raw milk produced. About 62% of produced milk comes from households, 38% from commercial farms. As a result, only 20% of raw milk in Ukraine has category “extra” (corresponds to the EU milk quality standard). However, there is a trend of commercial farms increasing the share of “extra” class milk. In Ukraine there are 112 dairy processing enterprises, according to Union of dairy enterprises. Processing facilities remain 40% underutilized (or 60% utilized), due to diminishing dairy herd, and low milk quality of households which

cannot be processed. In 2023, a total of 2.96 million tons of milk were processed. Milk consumption per capita was about 190 litres

With the removal of tariffs and quotas, since 2022 25 processing enterprises have received approval for exporting to the EU. The total number of approved enterprises is 41. Certain enterprises, sanctioned as EU exporters, use this approval as proof of adherence to safety and quality standards for exporting to third countries.

THE IMPACT OF THE WAR

Milk production in Ukraine dropped by about 13% in 2022 and 5% more in 2023 during the war primarily due to losses of territories.

The Black Sea ports blockade stopped the possibility of exporting dairy products (commodities) to Asian countries.

Dairy processing sector lost 38 enterprises located in the areas temporarily occupied by Russian military forces.

KEY CHALLENGES

The sector is characterized by decrease in the total amount of raw milk produced and relatively low proportion of milk of appropriate quality, leading to the following challenges:

1. Production: Ukrainian dairy processors are facing a crisis due to a 4% decrease in the cow population in 2023, leading to a raw milk shortage and increased prices¹⁰.
2. The industry is operating at 60% capacity, impacting production costs and competitiveness.
3. Food Safety & Quality: There is a need to introduce a clear traceability system.
4. Lack of confidence by European competent authorities in the findings of tests conducted by Ukrainian laboratories responsible for official control.
5. Increasing the quality and quantity of raw milk, while dairy herd has been steadily going down.
6. Infrastructure: according to a survey conducted by APK Inform, 63% of milk powder producers and 62% of butter producers have production facilities older than 30 years.
7. There are not enough border inspection posts at the borders with the countries of the European Union.
8. Challenges related to the war: loss of dairy farms, milk producers and loss of processing enterprises, increased cost of production at processing and farm level, export volume dropped to about 80 000 tons in 2023 – lowest level in the last 5 years.
9. Waste utilization/wastewater treatment remains a problem for dairy enterprises, which requires modernization and upgrade of local treatment facilities.

KEY OPPORTUNITIES

There are good opportunities for export expansion of dairy commodities (butter, milk powder, condensed milk, etc) to EU countries due to the reduction of trade barriers, as well as to third countries. Also, local currency devaluation vs hard currencies make it attractive for exporters to increase exports as their products become more competitive.

Green modernization of dairy enterprises is an opportunity. Some 4 dairy enterprises estimated the investment in modernization/upgrade of about USD 27.46 M for replacing boilers, waste treatment impro-

vements, renewable energy installations (solar panels), energy efficiency (ventilation, light systems), water treatment and recycling, cooling system upgrade (from ammonia based to modern CO₂ based). Respectively, for these purposes the investment need of 56 dairy enterprises (half of all enterprises) is estimated at USD 5891.20 million.

The quantity of small processors is increasing. The share of local products in supermarkets is growing. Simplification of legislative requirements for small producers helps to increase sales channels.

¹⁰ according to preliminary calculation by the Ministry of Agriculture and Food of Ukraine.

6.5. POULTRY SECTOR

SECTOR SNAPSHOT

The sector is mainly represented by large and medium size producers. About 30% of poultry meat is produced by households, as well as half of food eggs. Most of these enterprises are also focused on exporting products to EU and third countries. Most companies are vertically integrated, in addition to meat production, they also raise poultry and produce their own feed.

Eggs: Egg production decreased by 40% during 2020-2021 due to high feed prices making some farms unprofitable. But Ukraine remains one of the largest producers of eggs in the world. Three egg processing

THE IMPACT OF THE WAR

General: Disruption of the key production processes caused by blackouts and power outages. Difficulties in preparation of feed and harvest fodder crops due to active warfare, agricultural machinery destruction and mining of fields. Veterinary drug prices increased, shortage of veterinary drugs on the beginning of full-scale invasion.

Eggs: Several farms in Donetsk, Kherson, Sumy and Mykolayiv regions were destroyed including the biggest factory in Ukraine (Chornobayivka) where 3 mil-

KEY CHALLENGES

The sector is characterized by decrease in production and exports volumes, led by the following challenges:

1. **New animal welfare legislation**, which will come in force in 2026, requires about 1 billion of investments in improving of poultry housing.

enterprises and five egg packaging centres have received approval for export to the EU single market. Removal of quotas and tariffs led to an increase of 45% of egg export to EU in 2023, compared to 2022.

Poultry: About 40% of industrial poultry production is exported. Both cooled and frozen products. Removal of quotas and tariffs led to an increase of 50% of poultry export to EU in 2023, compared to 2022. Four out of 10 enterprises have been approved for export poultry to the EU over the past year. Poultry meat producers have modern production equipment.

lion of poultry were lost. An estimated 1 billion eggs are underproduced in 2022 due to destruction of farms, which is 20% of the 2021 production.

Poultry: Poultry meat production decreased by 8%. Turkey meat producers suffered more significantly compared to chicken producers due to a longer growing cycle.

2. **Food Safety & Quality:** Lack of confidence by European competent authorities in the findings of tests conducted by Ukrainian laboratories responsible for official food safety and quality control.

3. **Waste management:** Waste disposal and recycling is still a problem for the poultry and egg industry.

4. **Challenges related to the war:** Power outage, increase in prices for electricity and fuel.

KEY OPPORTUNITIES

Opportunities for export to EU countries due to the reduction trade barriers, as well as to third countries, especially in the sector of poultry meat production, where the infrastructure of enterprises meets European standards. Expand implementation of program "Requirements for poultry farming without the use of antimicrobial agents" for wider range of establishments. Implementation the Carbon Certificates and Carbon trade (for export).

Green recovery opportunities: Waste disposal and recycling is still a problem for the poultry and egg industry, on the other hand it is an opportunity. Chicken manure can be used to extract biogas and use it as heating for poultry and egg production and processing (incl. slaughterhouses), where the big consumption of hot water is needed.

GREEN ENERGY OPPORTUNITY

Biomethane from chicken manure offers a high potential for investment, with an IRR (internal rate of return) ranging from 50-90% and a quick payback period. Given that chicken manure is readily available at no cost, selling biomethane at a premium to the national gas pipeline further enhances the investment appeal. Additionally, the residues from biogas/biomethane production can be used to create organic/natural fertilizers, meeting the significant demand in Ukraine.

6.6. SUGAR SECTOR

SECTOR SNAPSHOT

Ukraine has currently about 30 sugar processing enterprises (down from 45 in 2017), which typically work about 2 months per year (being idle for 10 months), buying sugar beet harvest from local farmers and processing it. Enterprises may have their own sugar beet production (vertically integrated agricultural holdings) or work with farmers on a "given for processing"/tolling scheme. Historically, the reduction of sugar plants was caused by poor competitiveness/operational efficiency, by higher costs of energy component (40-45% share, natural gas, coal, oil fuel use) and sugar beet costs (cost increased from ≈ UAH 55,000 three years ago to ≈ UAH 75,000 per hectare in 2023). Higher natural gas/oil fuel/coal prices may result in a less competitive white sugar.

Overall country sugar beet harvest amounts to about 10 million tons, out of which 1.33 million tons of sugar was produced in 2022/23 MY (120 thousand tons less than in 2021/22 MY), the forecast is 1.8 million tons in 2023/2024 MY. Domestic consumption in 2022/23 MY is rather stable and estimated at ≈1 million tons. So, the remaining share can be exported. 98% of Ukrainian sugar export went to EU countries in 2022. Ukraine's share in EU imports increase from 1% in 2020-21 – 1% to 15% in 2022.

Long term outlook estimations of sugar market will be to reach 219.2 million tons by 2032, exhibiting a growth rate (CAGR) of 1.4% during 2024-2032. However, EU consumption of sugar is expected to drop to ≈ 15.9 million tons in the long term by 2031 (source: Statista).

THE IMPACT OF THE WAR

The impact of the war on sugar production has been moderate, thanks to favourable agroclimatic conditions of the main sugar beet areas which are in

Western Ukraine, not directly affected by the Russian invasion in the East and South. Farmers achieve yield of about 50 t/ha in 2023 and grow sugar beet

profitably despite the inputs cost rise. One sugar plant appeared to have been in the illegally occupied territory in Kharkiv oblast (currently liberated), but Kharkiv oblast sugar plants don't work because there was no sugar beet seeding due to explosives objects and land mines contamination.

Overall, sugar production in Ukraine has grown during the war thanks to favourable agroclimatic conditions helping farmers with better sugar beet yields.

KEY CHALLENGES

The sector is predominantly characterized by sugar plants with various levels of advancement. There are leading, modernized, sustainable sugar makers like Astarta, I&U Group (often financed by international financial institutions) which process sugar beet to extract higher sugar content (20%), often focusing on exports. Less technologically advanced and old sugar plants can get minimal sugar content (15-14%) after processing, having less capacities to export. Ukrainian sugar industry has the following challenges:

1. **Technology and modernization:** The adoption and investment in advanced processing equipment (especially for the demanding EU consumer market) are generally at a low level. Diversifying into value-added sugar products, such as biogas/bioethanol, pellets and fertilizers, can be a challenge due to complexity and high investment cost.
2. **Investment:** A) there is a large investment need for modernization and diversification projects (biogas, electricity, pellets, fertilizers). Limited financial resources and long-term investment support options further hinder investment efforts. B) the ongoing war and uncertainty are preventing enterprises from making investments.
3. **Sugar price fluctuations and cheaper Brazilian, Cuban, India, etc. Cane sugar** can influence competitiveness of Ukrainian sugar in export markets. However, a potential negative situation can be compensated by diversifying into bioethanol/biogas/electricity, pellets and fertilizers production.
4. **Changes in trade policies,** quotas (especially in the EU), tariffs, or market access can affect export flows and opportunities.
5. **Regulatory and Environmental Challenges:** with the accession to the EU and general requirements to improve ease of doing business, the sugar industry in **Ukraine must adhere to environmental regulations and sustainability standards, which** will need investments in modernization of sugar plants, waste management (with potential to produce pellets, fertilizers), pollution control, proper product quality, recycling. It will be a challenge to streamline and harmonize Ukrainian regulations/legislation policies, standards and requirements with the EU ones, including but not limited to: A) Council Directive 2001/111/EC of 20 December 2001 relating to certain sugars intended for human consumption. Generally, Ukraine lacks a comprehensive green strategy and green transition of sugar industry, strategy towards better agricultural waste utilization, more energy efficient and circular sugar production, high sugar quality. B) with regards to large amounts of agricultural waste in sugar production (considered in the EU as animal feed), and high potential to produce renewable energy, granulated pellets and organic fertilizer from sugar pulp, Ukraine is expected to harmonize Ukrainian regulations/legislation with The European Union's Renewable Energy Directive (EU RED), particularly EU RED 2 (Directive 2009/28/EC) and EU RED 3 (Directive (EU) 2018/2001) on the promotion of the use of energy from renewable sources. Additionally, export of biomethane is currently not possible

due to unsettled issue of biomethane customs clearance to transport it abroad, which needs to be resolved.

6. **Marketing and market access knowledge:** Limited knowledge of foreign markets, market requirements, certification, food safety and insufficient resources for promoting and establishing market linkages with export markets pose significant challenges. On the other hand, EU quotas (and duties if quotas are exceeded) for Ukrainian sugar contribute to uncertainty to plan long term. According to APK Inform survey, enterprises exporting more than 30% of their sugar export their sugar to the EU (100%), 17% export to the Middle East countries.
7. **Ease of doing business:** Enterprises note complexity to plug into electricity grid. Compared to the neighbouring countries, it takes the longest time and cost for businesses to prepare, approve the electricity project to get all necessary permits, connect to the electricity grid, and obtain green tariff (if it is a renewable energy project). The same is equally applied to waste treatment, waste water treatment projects which are difficult and time consuming to prepare, approve with authorities, and set into motion, as enabling environment is not business friendly, and requires deregulation to make it faster, cheaper for business to operate. As for the green tariff, according to the past experiences, enterprises note: A) there is a risk that it can be changed, B)

KEY OPPORTUNITIES

1. **Export Market:** there is some potential to export excess Ukrainian sugar to the EU and other markets, when favourable weather helps farmers get 50 t/ha yields or more. If the demand in the EU declines in the long term, Ukraine may potentially get back to its other buyers – Azerbaijan, Georgia, Israel, MENA region, etc.
2. **Product quality improvement and production expansion:** investing in advanced and sustainable sugar production methods to meet EU standards for both B2B and B2C markets can lead to higher

there may be delays or decrease in payments for the green energy.

8. **Standards/certification:** As there are many food production standards – for example, Organic certification, FDA, IFS Food, FSSC 22000, BRC, Halal, Kosher, etc. – often SMEs lack knowledge, skills to implement them, and technology to meet standards of target markets.
9. **Food Safety & Quality:** Ukrainian state laboratories lack necessary equipment and methods to match/align with the EU standards/methods. In addition to laboratory tests and methods, the traceability system should be improved to be aligned with the EU requirements. Knowledge of the practical aspects of implementing traceability along the entire food chain in the sector needs to be improved. For this purpose, it is recommended to train and involve a group of specialists from appropriate associations in the sector. Food safety and Packaging related challenges are addressed in more detail in the sector wide Food quality and control Action Plan and Packaging industry Action Plan
10. Due to low institutional capacity, there are unresolved challenges and constraints mentioned above. Also, there is lack of unified national green transition sugar strategy, export and sugar value chain strategy, fruitful collaboration on green recovery, constructive and ongoing green recovery policy and stakeholder dialogue on a continuous basis.

quality products. Additionally, investments in sustainable packaging (incl. paper bags), marketing and promotion, business development have the potential to unlock export sales in the EU and other countries (provided the EU maintains free trade or large quotas).

3. **International cooperation is a good opportunity for further sugar plant development:** According to APK Inform survey, 75% of respondents' enterprises consider the possibility of cooperation, 25% - do not rule out such a possibility. The desired

types of assistance from international companies (% of those who formed such needs) include: 63% of respondents would like assistance to purchase equipment, 50% welcome assistance to enter/develop export markets, 50% would attract capital injection from international companies.

4. **Water Conservation.** Modernization of the sugar beet washing process to increase sugar content output can also reduce water consumption by 60-70% (the estimated cost is ≈ EUR 5-6 million).
5. **Sugar plant revenue increase potential, diversifying in bioethanol/biogas/electricity production, pellets and fertilizers.** Potential of bioethanol/biogas/electricity production obtained from sugar pulp and residues remains partly untapped in Ukraine due to high investment cost, lack of investment and complex technology, while EU targets to increase biogas consumption up to 35 billion m³ by 2030. There are about 10 operational projects in Ukraine already where biogas is produced from sugar beet pulp (according to Civic union “Bioenergy Association of Ukraine” (UABio)), as biogas is further used to generate electricity (used internally and supplied to the national grid as per the state established feed-in tariff).

In general, the payback period of biogas projects can be about 10 years. The internal rate of return (IRR) can be about 10%. The project cost to produce ther-

mal energy (steam) and electricity from sugar beet pulp (waste) with output of 6MW per hour costs ≈ EUR 23 million, according to I&U Group.

One of the sugar plants estimated that minimum investment in biogas facility would cost ≈ EUR 3-4 million, while thermal power station cost would be ≈ EUR 1.5 million.

- 5.1. **Residues from biogas/bioethanol production** can be further processed into pellets and fertilizers, which is another opportunity.
- 5.2. **CO₂ emissions certificates trade.** Implementation of the Emission Trade System (ETS) and Climate Policy are one of the top priorities for the Ministry of Environment of Ukraine. The Ministry is working on the details of the Climate Law expected to be adopted by the parliament of Ukraine in 2024 with proper ETS concept development in cooperation with the World Bank and GIZ. ETS is anticipated to be fully rolled out in 2026. This remains to be seen how particularly ETS is going to be developed and how it can be used in sugar industry.

If all diversification opportunities are materialized in biogas, electricity, pellets, fertilizer, Ukrainian sugar industry can be more competitive, more technological, value adding and resilient, less dependent on quotas and sugar prices, more diversified and greener.

6.7. GRAIN PROCESSING SECTOR

SECTOR SNAPSHOT

Ukraine's Grain processing sector is presented by the following products: flour with by-products; bakery and flour products, pasta; cereals, groats and flakes; malt, starch and inulin. The sector is supplied by Ukrainian raw materials and share of domestic wheat (winter wheat is prevailing type of in Ukraine, soft; spring wheat - durum) consumption is about 35-40%, corn – about 20% mostly being stable in volumes. Distribution of wheat on milling/feed traditionally was 60/40; there is a trend for reducing the quality, that reinforced by the difficulty of farmers' access to seeds, fertilizers and plant protection products. Consolidation of the production is mixed and varies depending on industry from high concentrated to prevailing SMEs.

The presented technologies differ from outdated to last updated. The sector is well advanced in implementing food safety and quality systems. Geographically flour and bread/bakery production are presented in all regions (oblasts) of Ukraine. Comparing with some other industries presented in the Roadmap, grain processing has less waste and less possibilities to implement green energy systems based on waste processing, but energy-saving and renewable energy systems (solar panels, pellets and other types) are relevant for grain processing enterprises.

According to the State Statistic Service, the flour milling, cereals, flakes production, starches, and starch products industries experienced both profits and losses in 2021/2022. Specifically, the flour/cereals production sector faced losses, while the profitability of the starch and starch products industry improved in 2022.

On the other hand, the production of bread, bakery items, and flour products showed overall profitability in 2021 and 2022. The profits notably increased during the first year of the full-scale invasion, driven by a surge in demand for long-term storage products.

Due to State Statistic Service, in total, flour milling and cereals, flakes production, starches and starch products are profitable with losses in 2021/2022 in flour/cereals production, and profitability of starch and starch products industry in 2022. Production of bread, bakery and flour products in 2021 and 2022 were profitable in total with increasing of profits during the first year of full-scale invasion has increased significantly due to surge in demand for long-term storage products.

The production output of flour and flour-based products shows downward trend last years – due to meaningful statistically uncovered sector (All-Ukrainian Association of Bakers estimates the share of statistically uncovered market before the full-scale Russian invasion as more than 50%) and decreasing the population, changes in diet to be more healthy. Industry meets the demand on organic, gluten-free, whole-grain milling products, specific types of bread like buckwheat, frozen flour products and frozen bakery products (in this case - for retail and cafes).

According to estimations of Union "Millers of Ukraine" the volume of flour production in 2023 is the same as in 2022 (1,1 million tons) and 0,1 million tons less than in 2021. The resilience of the industry taking into account the occupied territories and narrowing the domestic market, decreasing the purchasing power and imports of some products as humanitarian aid on the beginning of the full-scale Russian invasion, was supported by increased on some products domestic demand and exports. The volume of flour export increased in 2023 up to 138,100 tons comparing 74,700 tons in 2022 and 105,700 tons in 2021 and was positively impacted by EU Autonomic Trade Measures (before 2022 flour was an integral part of grain quota). But export prices were lower. As the state Statistic Service data shows, the value of milling-cereals industry, starch and starch products during January-September 2023 was on 11% more than for the same period in 2022.

The main logistics option for domestic and export logistics currently is by roads (trucks), the potential option in terms of complex logistics – is transportation in containers.

In the last five years, about 22-23% of grain mill and starch-molasses product sales were exports. These include, products under private labels and as ingredients. Notably, flour exports increased by 2.21 times in the 2022/23 marketing year compared to 2021/22, despite the challenging wartime conditions.

IMPACT OF THE WAR

The domestic demand for long shelf-life products increased, including flour, biscuits and crackers, noodles, even considering the decreasing of domestic market capacity due to population decline, the

KEY CHALLENGES

Grain processing enterprises continue to operate in the context of the war, adjusting their strategies to the realities of the current situation. Challenges they face are rather common for all food industry, the most significant ones identified by the surveyed grain processing industries enterprises¹¹ are:

- Shortage of qualified personnel because of migration or conscription, affecting 89-100% of respondents.

KEY CHALLENGES

1. **Market:** 1) the domestic consumption and production of wheat flour, bread and pasta is on a downward trend, that caused by population decline, turning to more healthy diet based on tastes differentiation, and constant decreasing the share of statistically covered production of bread and bakery products connected with increasing the of unreported (volumes) production in retail, small cafes, so on (about 50% and more according to different estimations); 2) underdeveloped production of specialized types of flour and blends

Before the war, bread deliveries grew by an average of 18% annually, and export revenue increased by 11% each year. However, in 2022, the share of bakery and flour products sold abroad decreased to 8%, down from the usual 12% over the past five years and 15% in 2021. Although exports of bakery products and bread are statistically small, they include high-quality goods and ready/semi-ready (frozen) products.

Starch exports in 2022 reached a record high, surpassing the 2019 numbers. Key trade partners for these products include the EU and Turkey.

production remained stable, according to the State Statistic Service. Decreasing the number of enterprises and production capacities due to occupation and shellings, increasing the costs.

- Logistic issues, noted by 89-100% of the respondents.
- Energy supply problems are also significant, impacting 56-79% of those surveyed.
- Decrease in demand on products, impacting 50-71% of respondents, depending on industry.
- Complicated supply of raw materials, up to 25-44% of respondents.

(for hotdog, baguette, brown bread croissants, pasta, pizza etc), fortified; 3) logistics disruptions, complicated export through western border and ports, and changes in destination export structure; 4) retail-suppliers relationships, especially important for perishable goods; 5) meeting the of EU market conditions and adaptation to Green Deal requirements; 6) possible changes in EU trade policies; 7) packaging.

¹¹ Source: UNIDO (APK-Inform) 2023 Survey: Characteristics, problems and needs of enterprises in the food industry of Ukraine

2. **Technologies:** 1) The access to input technology is reduced and interrupted, having a negative effect on grain quality; 2) milling technologies are oriented toward traditional flour standards, necessitating equipment upgrades to expand the product range – specialized flour blends. There is a deficiency in research and development, including starch utilization; 3) general lack of energy-saving and resource-effective technologies – especially boilers, water quality, energy-saving; 4) lack of skilled workforce; 5) age of equipment more than 10 years – 43 % of flour enterprises – respondents, 40% - groats producers – respondents, 75% - pasta and 61% - bread producers, confectionery (in total) – 64% with origin of equipment mostly from EU; 6) level of implementation of complex automation in flour production – 57%; groats – 60%, pasta – 75%, 61% - bread production, confectionery – 64%.
3. **Investments:** 1) low access to financing (from 50% up to 75% of respondents with 100% responses concerning high interest rates); 2) among development problems on the first place – shortage of personnel (50-100%), difficulties with attracting the investments (20-33%), decrease in demand for products (18-67); 3) among those respondents planning expansion and development of their enterprises for short-term development, require less significant investments (from \$100,000 to \$500,000) in flour production (25%), bread producers (17%), more than \$1 million – in flour production (50%), groats (25%), bread (17%);¹² 4) reduced access to new technologies due to war risks (100% payments in advance, delivery and chef-montage problems).
4. **Food Safety and Quality:** lack of knowledge about needed certifications and market access, especially for small and medium enterprises. Equipment and methods used by Ukrainian laboratories, including enterprises laboratories do not always meet the needs of manufacturers in to credible certify product quality. The level of implementation of quality control and safety systems is (by self-estimation of surveyed enterprises) fully implemented in all production, except pasta production, where the level is 75%.
5. **Challenges from a regulatory and policy nature** are compliance with EU regulations and lack of knowledge and awareness on EU market and production conditions and regulations, lack of comprehensive grain processing industry development view (strategy) including grain revitalization issues; insufficient institutional capacity for meeting challenges and maintenance the dialogue on NGOs level in EU, with Ukrainian stakeholders.

KEY OPPORTUNITIES

1. **Market and product development:** 1) Developing new products according to consumer trends, including healthy/organic food, special products like gluten-free, sugar-free, plant-based, products with consumption figured the martial law demand like semi-ready eat and with long-term expiration date; development the frozen products segment – for exports, supply to retail and HoReCa, home consumption with development the culture of fresh bakery products easy home cooking; extrusion technologies; for pasta industry, where focus is on inputs an development on products such as noodles production; 2) diversification of traditional (standard) flour to specialized flour and flour blends to meet specific consumer preferences of final bakery products, and consumers preferences, including fortified flour; 3) knowledge exchange with EU business associations and producers, maintenance of communications and strong business relationship with EU and other export markets representatives, B2B, B2C; 4) capacity building of industries associations; 5) container logistics (insurance, affordability); 6) support sustainable packaging (including measured of Packaging Action Plan); 7) foreign market promotion.

¹² Source: UNIDO 2023 Survey: Characteristics, problems and needs of enterprises in the food industry of Ukraine

2. **Technologies:** 1) creating specialized value chains with farmers growing specific wheat varieties for the milling industry and consumer preferred products (for further processing); 2) implementing modern fully automated technologies as response to resource and energy efficiency, reducing pollution, and creation of the inclusive (for disabled people, to meet the lack of personnel challenge) workspace; modernization, especially for smaller enterprises; 3) knowledge and skills development, including technologies, standardization, laboratory processes, marketing, EU requirements; 4) promotion the adoption of energy-efficient technologies and energy systems based on renewable sources (25-44% found existing energy systems sufficient; from 36% to 50% of surveyed enterprises of grain processing industry analysed alternative options, and among priority types of alternative energy supply are diesel generators and solar panels, for bakeries – added waste power plants), energy and recourse audits; 5) survey showed that from 29% up to 50% implemented the measures to increasing the environmental friendless, from 10% to 29%- planning the implementation, that highlighted potential for green revitalization measures implementation in industry¹³.
3. **Investments:** 1) among surveyed enterprises of the grain processing industry plan to extend activities from 29% up to 40%, with directions a) introduction of capacities for new products (33-75%) and b) increase in production volumes (25-67%), modernization (25%); 2) form of investments varies from industry to industry and include capital injection, purchase of equipment, lending, development of export markets.
4. **Food safety and Quality:** accordingly, to the “Food Safety” Action Plan, but at least 1) audit of quality/safety control systems with recommendations and better understanding of the international standards and food legislation, both general and specific; 2) providing the necessary laboratory analysis and increasing the capacity of state control institutions and state laboratory quality in line with EU standards and methodologies.

13 Source: UNIDO 2023 Survey: Characteristics, problems and needs of enterprises in the food industry of Ukraine

7. VISION AND GOALS

Under the “**Build Back Better**” principle, the Green recovery goals and objectives for the selected food industries are established for 2024-2029 and are aligned with the national priorities and the long-term vision in the sector, which will be reflected in the Agriculture and Rural Development Strategy once it is fully developed and finalized.

The goal for the green recovery of Ukraine's food industry is to revive, reconstruct, and enhance the sector using efficient and sustainable processing technologies to create dependable and high-quality food products while ensuring food safety standards and minimize environmental impact.

With respect to this objective the following strategies have been formulated:

THE GUIDING PRINCIPALS

The vision and goals, policies and activities need to be established under the guiding principles that apply for countries in the EU accession process¹⁴. These are as follows:

1. **Political Stability and Governance:** Maintain political stability and strong governance, emphasizing democratic values, rule of law, and effective institutions.
2. **Economic Reforms:** Implement comprehensive economic reforms to ensure a functioning market economy, fiscal responsibility, the improvement of the “ease-of-doing business”; and competitiveness.
3. **Legal Alignment:** Harmonize national legislation with EU laws and standards, ensuring compatibility and adherence to the *acquis communautaire*.
4. **Human Rights and Fundamental Freedoms:** Uphold human rights, democracy, and fundamental freedoms, aligning national policies with EU values.
5. **Improve resilience of the food industries** to sustain current and future shocks caused by the Russian invasion, ensuring food security and availability for the people of Ukraine.
6. **Improve agri-food safety and quality** by further aligning food industries with the EU food and packaging requirements, standards and certifications and advancing institutional reforms, regulatory framework and capacity.
7. **Stimulate and support “green” investment at enterprise level** in sustainable processing technologies and innovations, to increase production and value addition, and to enhance efficiency and minimize environmental impact.
5. **Regional Cooperation:** Foster positive relations and cooperation with neighbouring countries, promoting regional stability and addressing common challenges.
6. **Institutional Capacity Building:** Strengthen administrative and institutional capacities to effectively implement and enforce EU laws and policies.
7. **Corruption Prevention:** Implement robust measures to combat corruption and ensure transparent, accountable, and inclusive governance.
8. **Public Support and Communication:** Cultivate public support for EU integration through effective communication, awareness campaigns, and engagement with civil society.
9. **Socioeconomic Development:** Focus on socioeconomic development, addressing disparities and promoting social inclusion, to enhance overall prosperity.

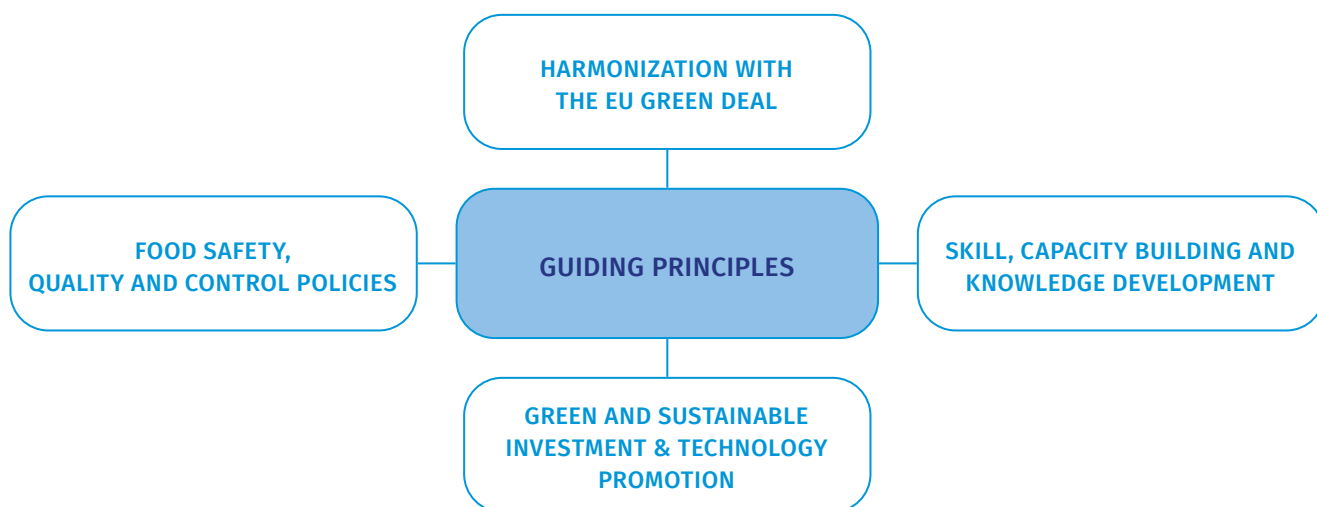
¹⁴ The EU accession process is based on Article 49 of the Treaty on European Union, which establishes the conditions of eligibility and the procedure for becoming a member of the EU. More info can be found [here](#)

10. **Environment and Sustainability:** Prioritize environmental protection, sustainability, and adherence to EU environmental standards.
11. **Security and Defence:** Contribute to regional and international security, aligning foreign and security policies with EU objectives.
12. **Effective Multilateral Engagement:** Actively engage in multilateral forums, demonstrating commitment to international cooperation and EU values.

These principles guide countries through the accession process, fostering alignment with EU norms and values for successful integration. Therefore, they are strongly recommended for the Ukrainian government use during the implementation of the green recovery program and food industry development.

The guiding principles directly related to the Food Industry and Green Recovery Policy framework is schematically depicted on graph 3, below.

GRAPH 3: GUIDING PRINCIPLES ROLE WITHIN FOOD INDUSTRY GREEN RECOVERY POLICY FRAMEWORK.



8. POLICY FRAMEWORK

This chapter highlights existing policies related to decarbonizing the economy of Ukraine, supporting the sector investments and EU integration (section 8.1) and suggests areas for policy support (section 8.2).

8.1. EXISTING POLICIES, PROGRAMMES AND INITIATIVES

This section outlines the existing policies, programmes and initiatives identified which have a direct relation to the UNIDO green recovery project. Following the full scale invasion by Russia, the Ukrainian government has enforced martial law, directing re-

sources towards defence and supporting the people of Ukraine. As a result, budgets have been reallocated, temporarily halting existing (green) policies. Nonetheless, the following existing policies, programmes and initiatives have been identified, till date.

AGRICULTURAL AND LAND POLICES UNDER MARTIAL LAW¹⁵

There are important changes introduced into the agrifood policy of Ukraine as a response to the problems originated from the Russia's invasion. These changes include, but are not limited to:

- special import regime for humanitarian aid;
- introduction of 'Critical Import List' that allow entities to make transfers in foreign currencies;
- introduction of price margins threshold on critical goods and commodities in the national security matter (up to 10% on cereals, etc.);
- agricultural enterprises have the right to apply for temporary release of their employees from military duty, under the conditions of meeting specific criteria;

- Food security programmes implemented for vulnerable population;
- Critical infrastructure enterprises identified;
- Implemented Martial Law legislation norms.

Decree of the President of Ukraine № 681/2023, 09 Oct 2023 "On the decision of the National Security and Defence Council of Ukraine dated October 9, 2023 "On the state of ensuring food security" with instructions to the (extracts) that has a position of **development the Programs for the revival of food and processing industry enterprises through the cluster organization** of production at the levels of the community, district, region and the state as a whole.

INTEGRATION IN EU SINGLE MARKET

The European Union has been working with Ukraine to integrate it into the Single Market and promote business cooperation. The Association Agreement

for Ukraine to join the Single Market Programme (SMP) was signed on February 2, 2023¹⁶. Participation in this SMP will provide support to Ukrainian

¹⁵ Source: The Ministry of Agrarian Policy and Food (MAPF)

¹⁶ Source: [Support actions for Ukraine \(europa.eu\)](https://europa.eu)

small and medium-sized companies (SMEs) to facilitate their access to EU markets, and promote a favourable business environment, sustainable growth and internationalisation. The first support under the SMP is the “ReadyForEU”¹⁷ programme which aims at helping Ukrainian entrepreneurs and businesses to benefit from the Single Market, with a total budget of €7.5 million.

A more extensive support plan to mitigate the consequences of Russia's devastating war, is designed to provide Ukraine with reliable, flexible, and predictable assistance for the 2024-2027 period. This proposal, known as the “Ukraine Facility,”¹⁸ is foreseen up to €50 billion in grants and loans and has the following 3 pillars:

- I. financial support to the State in the form of grants and loans;
- II. a specific Ukraine Investment Framework;
- III. technical assistance and other supporting measures.

European Parliament and the Council to examine the proposal, in the framework of the mid-term review package.

The integration of Ukraine in the EU single market is extremely relevant for the food processing sector. The EU is already a large trading partner for many of the Ukrainian export products, including processed and semi-processed products. But further EU integration, higher value addition and modernization are needed. Improving food safety control systems and approximating legislation and standards with the EU including strengthening associated institutions could build more confidence in the processed food products leading to higher exports into the EU.

Access to EU funding for projects in transportation, energy, and digital sectors. The European Commission is progressing Ukraine's integration into the EU

Single Market by associating Ukraine to the [Connecting Europe Facility \(CEF\)](#) for infrastructure funding. Under this agreement, Ukrainian project initiators can seek EU funding for projects deemed of common interest in transportation, energy, and digital sectors, thereby enhancing Ukraine's connectivity with neighbouring EU countries. This initiative aims to facilitate Ukraine's integration into the EU Single Market.

Opportunities for transport funding, Ukrainian authorities and companies will be able to apply for funding under future CEF transport calls in the current (2021-2027) programming period. The next call will be launched in September 2023

Opportunities for sustainable energy funding. Ukrainian infrastructure projects tied to EU Member States can now be recognized as Projects of Mutual Interest (PMI) under updated EU energy infrastructure rules. PMI, introduced through the revised TEN-E Regulation, streamlines permitting and enhances financial access for projects linking third countries with the EU. This status is crucial for eligibility for [CEF-Energy funding](#).

Public health policy. A 2022 Ukrainian law on public health introduces the “One Health” concept, which should lead to better communication between the health agency, veterinarian service, and food safety authorities. The law on public health is partly aligned with the EU.

State Programme Affordable Loans at 5-7-9%¹⁹. The programme is being implemented by the Entrepreneurship Development Fund (EDF). The Ministry of Finance of Ukraine, is the sole owner of the EDF and coordinates all aspects of the Fund. During the period of martial law in Ukraine, 38,146 loan agreements amounting to UAH 147.9 billion were concluded under the State Programme Affordable Loans at 5-7-9%. Since the beginning of 2024, 3,175 agricultural enterprises received UAH 19.9 billion in bank loans for development. Of these, 1,517 farms were financed for

17 Source: [Calls to support the integration of Ukrainian SMEs \(europa.eu\)](#)

18 Source: [Facility to support Ukraine \(europa.eu\)](#)

19 Source: [The ministry of Finance of Ukraine](#)

UAH 6.3 billion under the state program "Affordable loans 5-7-9".

The National Energy and Climate Plan (NECP) of Ukraine²⁰. This is a strategic document that outlines the country's goals and actions for the transition to a low-carbon and climate-resilient economy by 2030. The NECP covers various sectors, such as energy, industry, transport, agriculture, and waste, and sets targets for reducing greenhouse gas emissions, increasing energy efficiency, and expanding renewable energy sources. The NECP also identifies the financial resources and instruments needed to implement the plan, such as grants, loans, guarantees, and tax incentives. NECPs were initially developed by EU Member States in the framework of the Energy Union. As a party to the Energy Community, Ukraine has also committed to developing its own NECP. The plan should cover the period up to 2030 and include a forecast up to 2050.

The National Waste Management Strategy. The strategy defines the main directions of state regulation in the field of waste management for the coming decades, taking into account the European approaches to the waste management, this is a strategy that defines the vision, objectives, and measures for improving the waste management system in Ukraine until 2030. It is not fully clear which aspects of this strategy have been put into practice and which ones have not been implemented so far. Ukraine has not adopted yet the Law on Packaging and Packaging Waste, which would comprise EU integration and business interests of the Ukrainian packaging industry.

The packaging and packaging waste regulation stipulates that all packaging materials in Ukraine fall under the Technical Regulation for confirming conformity of Packaging (Packaging Materials) and Packaging Waste.

The Regulation regulates any packaging (packaging materials) intended for packaging, protection, transportation, delivery and presentation of goods. According to the Technical Regulations (TR), the manufacturer or an authorized by entity - a resident of Ukraine, makes a declaration of conformity. This declaration is valid only in Ukraine. The Ukrainian TR has not been revised to align with amendments under Directive 94/62/EC. Packaging items must adhere to procedures outlined in Directive 94/62/EC when entering the EU market. Directive 94/62/EC addresses packaging waste and allowable heavy metal content. It mandates member states to achieve recovery and recycling targets for packaging waste, applying to all packaging on the Community market.

The Environmental Policy²¹. The reform is aimed to prevent the adverse impact of climate change, adapt to climate change and preserve the ozone layer by improving public policy for achieving the country's sustainable development, creating legal and institutional prerequisites for the gradual transition to low-carbon development together with economic, energy and environmental security and improving people's welfare. The Ministry of Environment is working on the Climate Law, which is expected to be adopted by the Parliament of Ukraine in 2024.

Current Initiatives. To leverage support for green recovery in Ukraine it is essential to utilize and coordinate and communicate with established development programs, resource mobilization opportunities, and initiatives at the global, regional, or national levels. For that purpose, an initial list has been compiled, listing 20 such programs, see table 3 here below. The listed programs are active programs that directly or indirectly influence the green reconstruction and transformation of the prioritized sectors. There is no information available on the green recovery initiatives which are currently in the pipeline.

20 Source: [Ministry of Economy of Ukraine](#)

21 Source: [Government of Ukraine](#) portal

TABLE 3: ACTIVE PROJECTS AND INITIATIVES RELATED TO GREEN RECOVERY AND AGRI-FOOD INDUSTRY.

№	PROJECT NAME	BUDGET	\$	END DATE	PARTNER
1	Program of leadership, promotion of exports, attraction of investments and development	35.000.000	USD	31.12.23	USA
2	Development of dairy business in Ukraine	21.686.231	CAD	30.09.24	Canada
3	Production of biogas on the basis of treatment facilities of Lvivvodokanal - Project implementation support and engineering supervision	638.550	EUR	31.12.24	EBRD
4	EBRD Deepening and Comprehensive Free Trade Area (CFTA) program: credit lines with investment rewards	1.000.000	EUR	30.11.28	EBRD
5	Development of trade with higher value added in organic sector and in dairy sector	7.899.905	Swiss FR	31.12.27	Swiss
6	Introduction of the common system of sanitary and epidemic control in Ukraine, phase 2	710.000	USD	31.07.24	USA
7	Global program of eco-industrial park in Ukraine: local level implementation (phase 1)	2.260.000	Swiss FR	31.12.23	Swiss
8	Promotion of energy efficiency and implementation of the EU directive on energy efficiency in Ukraine	12.450.000	EUR	30.06.25	Germany
9	Interdisciplinary approach to waste mgmt research: EU practices introduction	28.224	EUR	14.10.23	EU
10	Jean Monet Center of the EU on circular and green economy	122.981	EUR	11.10.23	EU
11	Reconstruction of sewage water cleaning facility and building of residues processing and biogas cogeneration facility in the city of Lviv	7.500.000	EUR	27.09.25	EBRD
12	Introduction of European circular economy via social entrepreneurship as identity of EU4Business	30.000	EUR	31.01.25	EU
13	European green dimensions	49.000	EUR	31.10.25	EU
14	Refinancing of energy efficient investments in SMEs via financial sector (Entrepreneurship development fund III та IV)	400.000	EUR	01.12.24	Germany
15	European inclusive circular economy: post war and post pandemic module for Ukraine	30.000	EUR	30.09.25	EU
16	German-Ukrainian Agro political dialogue	1,949,344	EUR	12/31/2024	Germany
17	Improvement legislation, control and awareness in the field of food safety, animal health and welfare in Ukraine	6,267,110	EUR	5/1/2024	EU
18	Introduction of the common system of sanitary and epidemic control in Ukraine, phase 2	710,000	USD	8/1/2019	7/31/2024
19	USAID Program for Agrarian and Rural Development (AGRO)	120.000.000	USD	11/13/2026	USA
20	The Swiss-Ukrainian DECIDE project - "Decentralization for the development of democratic education"	4,400,000	Swiss FR	1/31/2025	Swiss

8.2. STRENGTHENING AND SUPPORTING EXISTING POLICIES

Some possible policies in Ukraine that support and incentivize “green” investments, that support and improve food safety and control, policies for waste reduction, and environmental conservation which could well benefit from additional support through this project are:

A. Strengthen the current Food Safety and Control policies. Ukraine is moderately prepared to meet EU requirements in the area of food safety, according to the European Commission. The assessment highlights the need to strengthen administrative capacities and enhance coordination among food safety institutions in Ukraine. The State Service of Ukraine on Food Safety and Consumer Protection oversees policy implementation and conducts risk-based inspections at regional and sub-regional levels. While authorized laboratories perform official testing, the-

re is room for increased capacity. The official food and feed control system is not fully aligned with the EU, and there is a risk-based approach to goods import controls. Training is required for operators of mid-size and small food businesses on specific EU safety and quality requirements. Although Ukraine actively participates in the Rapid Alert System for Food and Feed, the report recommends pursuing membership in the EU's Trade Control and Expert System (TRACES). In Section 7.1, a more detailed proposal is presented to strengthen the existing food safety and control systems.

B. Assess and conceptualize technical support to the relevant ministries during the application process for EU funding under the CEF Transport and the CEF Sustainable Energy funding window.

9. GREEN RECOVERY PROPOSITIONS AND INVESTMENT NEEDS

There is scope for sector wide investments and programmes as well as for targeted initiatives that focus on one or multiple specific sectors.

- **Sector wide propositions** (section 7.1) are based on commonalities across the selected food industries - financing options, Skill, Capacity and Knowledge Development Program (section 7.1.2), Food

packaging (section 7.1.3), Improving food quality and safety standards (section 7.1.4).

- **Sector specific investment propositions** (section 7.2) for the green recovery are offered for each sector in the section 7.2. below, followed by an aggregate green modernization and reconstruction investment need (see section 7.3. for details).

9.1. SECTOR WIDE PROPOSITIONS

Proposition 1: Sustainable Investment Support Capital for Private sector is essential for advancing the green recovery agenda for the prioritised food industries, as private sector plays a crucial role in the green recovery, modernization, employment, and economic growth. Specialized financial instruments are needed to support enterprises in their investments in green technology and modern sustainable processing equipment and practices, contributing to the enhancement of the sector for a more resilient future. There are several available financing options for long term environmental and sustainable development to be in line with the strategic direction of the EU integration and EU Green deal.

Some of the suggested below financing options have already proven their functionality and can be used individually or jointly at different points in time covering different aspects, depending on financing partner and the state priorities and capabilities:

1.1.A **Sustainable Food Industry Fund (SFIF)** can be established to incentivize and de-risk investments necessary for green recovery and transformation of the food processing sector. The Fund structure can be a similar legal entity to “Residential Energy Efficiency Fund” created in Ukraine by the law, which is funded by the multi-donor trust fund and Ukraine. SFIF, as a legal entity, can process applications, evaluate, and provide financial products to be determined to food industry and food packaging SMEs and work closely with financial institutions on projects

and disbursements, mitigating and supporting potential long term bank loans to target beneficiaries. Due to proper governance and administration structure and substantial time needed to set up operations, the Fund feasible size is estimated to be over EUR 100 million. The Fund design features, eligibility and selection criteria, investments supported, ceilings and (co-financing) requirements, implementation modalities, interested international donors will need to be further determined.

1.2. A **special Sustainable Food Industry Program** can be established **within current successful state owned and led Affordable 5-7-9% p.a. Loan program**, which could **offer an attractive loan interest rate in UAH for a medium to long term period** to incentivize and support environmental, sustainable modernization and development of the food industry. Entrepreneurship Development Fund (EDF) is a managing agent of the Fund on behalf of the government and can attract and manage international donor funds to subsidize long term loan interest rate for a target beneficiary group to boost green recovery. Since the beginning of the full-scale Russian invasion EDF inter alia booked 317 loan agreements for a total amount of UAH 3.47 billion (or about USD 95 M) for the agricultural processing sector as agricultural processing was defined by the government as one of the priority sectors for Affordable loan 5-7-9% program (Source: EDF). This financing option can use any amount from international donors and state support with annual budget allocations. Some international donors have

funded the EDF and the Affordable 5-7-9 % Loan program, which proved to be an effective and an almost automated loan interest rate compensation instrument with proper governance isolating Fund operations and decision making from political and other influence. Similarly, a specialized food industry program can be housed in and implemented via EDF.

1.3. **Third investment option** is related to individual large size investment projects (greenfield, brown field, joint ventures), which the government is supporting with incentives – 30% of capital expenditures to be covered by the government, 5-year corporate income tax exemption, VAT and import duty exemption for import of new equipment and components, lease of state/communal land plots without auction, land tax exemption/lower land tax rate under conditions that the investment size will be more than EUR 12 million, at least 80 jobs will be created, and eligible industries include, inter alia, processing industry, waste management, transportation, logistics, R&D, warehousing, etc. This investment option will require special approach to bring investors from eligible industries into Ukraine, government engagement and continuous support during the entire project tenor. Additionally, food industry players may bring in several partners/players, financing institutions, guarantors, international funds, and engage the government in these kinds of large projects.

1.4. **The fourth financing option** is related to individual banks/financial institutions, which can design and operate specific and targeted food industry green recovery programs. A good example of a specialized and targeted program is an existing UNIDO program implemented in UkrGasBank directed at energy savings, reduction of CO₂ emissions, certification of the energy management system, supported by technical assistance, trainings and lowered loan interest rate for the borrowers. The drawback of this individual bank financing approach is that each bank will have to build internal capacity and expertise, special products, policies and processes, create and implement a program, which may or may not be a typical bank strategy and priority, therefore, it will require a tailored banking advisory support for the advisory banking program design. It may be ineffective to work

with some individual banks, as opposed to option 1.2 above, which may cover all participating banks with Entrepreneurship Development Fund (EDF) target beneficiaries and other stakeholders at scale.

1.5. In the long-term, **a fifth financing solution option for green recovery** sustainable development of the food industry could be Partial Credit Guarantee (PCG) Fund in Agriculture, which is set to start its first operations in 2024. Even though initially this Fund was designed by Ukraine in cooperation with the World Bank for primary agricultural producers to buy agricultural land, equipment and replenish working capital, the Fund can widen its target beneficiary group defined by the government. Appropriate changes will have to be made in the law of Ukraine and PCG Fund statute and regulations. The advantage of using this Fund is that it has already established a sound governance structure in line with the World Bank recommendations and international best practices, the Fund was specifically designed for the participation and support from international financial organizations, international donor Funds and organizations in a transparent way, isolated from political and other influence.

1.5.1. Special programmes for technology and equipment modernization involving equipment producers, financial institutions, insurance companies.

The key for all 5 options is to provide long term financing at a concessional/low interest rate for the sustainable green recovery development for the food industry, which has not been modernized due to lack of access to long term finance and systemic support.

Each of the mentioned 5 financing options could be a separate project and will require a comprehensive technical assistance and advisory support of the stakeholders on supply side and demand side, bolstered by an actionable green countrywide policy strategy and enabling environment improvements (including but not limited to environmental and construction permits for wastewater and sewage project upgrades, electricity network plug-in, improving electricity power permits and costs, etc), research and adaptations of best available technologies (incl. food safety improvements). Section 2 - Skill, Capacity and

Knowledge Development Program - below uncovers more details on advisory scope.

Proposition 2: Skill, Capacity and Knowledge Development Program aims to increase the level of awareness and institutional capacity to introduce

RATIONALE

Communication with enterprises of selected food industries and public associations showed significant gaps in knowledge regarding ways of more environmentally friendly and economically profitable business; in realities, legislation and contacts on the market of EU countries and the EU as a whole;

Lack of institutional capacity of public associations to provide knowledge and skills, establish permanent relations with similar EU associations, promote products to markets and search for technologies and equipment;

Critical increase in the importance of personnel in production and the need to update knowledge and learn new skills in conditions of shortage of personnel; the need to set up production with an increased

PROPOSAL

Design and implement the Skill, Capacity Building and Knowledge Enhancement Program for stakeholders focusing on:

1. Sustainable food industries, aimed at enhancing the capabilities of the current industrial workforce and enterprises, with a focus on promoting inclusivity by supporting women and veterans into advanced food processing.
2. Industry Associations, aimed to increase their capacity, knowledge and opportunities to provide for industry's enterprises in terms of green recovery the market and green technologies information, representation in the EU associations, promotion on and learning conditions of the EU market, EU Green Deal regulations, new food technology support.

green recovery technologies, strengthen the competitiveness of products and be ready for the requirements of the EU market, including the Green Deal, to be aware of technologies and legislation, certification processes, etc.

level of automation due to this factor, as well as due to the need to create favourable working conditions to expand the application of the principles of inclusiveness (namely, in terms of involving women and people with disabilities);

The combination of the factors of industrial recovery due to the full-scale invasion of the Russian Federation in Ukraine and the simultaneous application of requirements for the use of the best available technologies and regulation of the impact on the environment creates conditions for food producers when it becomes rational to use the latest technologies, access to which is limited - in terms of knowledge and financial capabilities.

3. Sector-wide advisory support, aimed to enhance the awareness about green recovery technologies, EU Green Deal Regulations and market access, and implementation of the green recovery technologies at the government and local authorities' level.
4. Institutional capacity building, policy formulation advice and advisory support to relevant ministries directly responsible for green recovery of food processing industries. Provide advisory support in developing laws/legislative norms and efficient implementation mechanisms of actual compensation payments for destroyed and damaged property of food processing companies.

ACTIVITIES

INDUSTRIES (ENTERPRISES)	INDUSTRY ASSOCIATIONS	SECTOR-WIDE (INCL AUTHORITIES)
Technical support in identifying and implementing the appropriate green technology.	Technical support for the equipment and technologies search, identification and selection in Ukraine (Companies and Authorities)	Advisory and technical assistance support in improving enabling environment and regulations to green technology transfer and implementation, feasibility studies, business plan preparation in terms of green recovery
Workforce skill gap analysis for food processing	Support vocational training, develop technical educational curricula, exchange programs, and support agro-processing knowledge/training and research centres for green technology. Design and implement training adapted for different audiences in terms of scope and depth.	
Support exchange and peer learning programs	Support of membership of the Ukrainian Industry Associations in EU and International Industries Associations, develop and arrange train-the-trainer programs, study tours, video lessons.	Policy advice in food quality & control, cleaner production, waste management, water use and supply, packaging, emissions, energy generation and use, incl. deregulation and improving time and costs for businesses on electric power plug-in to the grid, permits, etc.
Provide technical assistance to enterprises to prepare for technology, skills and financial support and applications	Development Laboratories capacities of Food Quality and Food Safety under Coordination of the Industry's association on the base of Food Universities (two in Ukraine – Kyiv, Odesa) and enterprises	

Every Food processing industry Action Plan consist of the measures in more details on Skills, Capacity Building and Knowledge Enhancement.

Proposition 3: Ukrainian Food packaging in line with EU strategy envisages to create conditions of adapting the industry to EU market framework and re-

RATIONALE

Various laws and regulations related to food packaging come into effect for Ukraine, to name a few:

The Law of Ukraine 19.11.2025 coming in force which regulates materials and objects intended for contact with food products, that aimed to implement:

- Regulation of the European Parliament and of the Council (EC) 1935/2004 of October 27, 2004, on materials and products contacted with food products, which repeals Directives 80/590/EEC and 89/109/EEC;

gulations, ensure the supply of packaging materials that meet the EU requirements, expanding the use and modernization of “green” technologies in the domestic food packaging industry.

- Regulation of the European Parliament and the Council (EC) 282/2008 of March 17, 2008, on recycled plastics and products intended for contact with food products;
- Commission Regulation (EC) 2023/2006 on good manufacturing practice for materials and products intended for contact with food products;
- Commission Regulation (EC) 450/2009 of May 29, 2009, on active and "intelligent" materials and articles intended for contact with food products.

This Law of Ukraine is aimed at ensuring proper protection of the health of citizens and the interests of consumers and applies to objects and materials, including active and intellectual objects, as well as materials intended for contact with food products placed on the market of Ukraine, which are in a finished form:

- intended for contact with food products;
- are already in contact with food products and were intended for this purpose;
- are likely to come into contact with foodstuffs or transfer their constituents to foodstuffs under normal or anticipated conditions of use.

A majority of Food Industries representatives underline the importance of packaging systems adopted to EU and “green” requirements.

HIGHLIGHTS OF PACKAGING SURVEY HELD BY UKRAINIAN CLUB OF PACKAGERS

- Industry consists of production packaging materials, packaging, packaging equipment, and auxiliary packaging materials. Despite the fact that after February 24, 2022, the surveyed packaging companies, especially in the regions where hostilities took place, suffered various levels and types of destruction and damage, most of them continued their production activities.
- The majority of the surveyed companies (78%) plan to implement innovative "green" technologies, but 62% of companies lack the financial resources to acquire such technologies, and 25% of companies have not yet resolved the issue of selling “green” products.
- To implement these business strategies, almost all of the surveyed companies require additional financial resources. Meanwhile, 31% of companies require resources ranging from \$1 to 3 million, 28% require between \$3 to 10 million, and an additional 25% of companies need financial resources within the range of \$0.3 to 1 million.

KEY PROPOSITIONS FOR THE PACKAGING INDUSTRY DEVELOPMENT

The following propositions outline a set of measures for the support and development of the packaging industry (producers of packaging materials, packaging, packaging equipment and auxiliary packaging materials equipment for food labeling, for the packaging of food, beverages and other products) and some main stakeholders with an emphasis on “green” strategy, described in greater detail in the Packaging Action Plan:

- Support the packaging industry state policy, green strategy design and development;
- Strengthen and improve the enabling environment so that the packaging industry becomes greener, reduces fossil fuel/energy and water consumption, improves circularity, and increases renewable energy production;
- Promote and implement innovative and ‘green’ technologies in the industry, emphasizing savings, and the environmental impact;
- Supporting the R&D, Capacity building of science, staff, Train the trainer (ToT)
- Establishing a Center of Excellence on Packaging as a private sector service center with a technical set of services;
- Fostering packaging innovation through a packaging innovation challenge;
- Medium term support on the implementation of the Law on Packaging and Waste utilization and support the system development of packaging utilization and recycling
- Supporting the reestablishment of damaged packaging enterprises;

- Enhancing safety and quality of packaging materials;
- Improving national state statistics methodology on packaging to segregate packaging production statistics for certain categories.

RATIONALE

- Ukraine has signed an Association Agreement with the EU, which requires it to align its food safety and veterinary and phytosanitary policy with the EU acquis.
- Ukraine has made progress in approximating its legislation with the EU, but still faces gaps and challenges in some areas, such as phytosanitary legislation, laboratory capacity, establishment of border inspection posts, and animal welfare.
- Ukraine has reformed its institutional and regulatory framework for food safety, creating a single competent authority, a risk assessment sector, and a national control plan. Administrative capacities need strengthening, and coordination among institutions involved in food safety should be improved.
- Progress has been made, with more than 80 EU legal acts fully adopted by Ukraine, but challenges remain, especially in phytosanitary legislation adoption.
- Ukraine has increased its exports of some food products to the EU by complying with EU rules and requirements and aims to expand its market access for more products.

KEY PROPOSITIONS

PROPOSITIONS	CONTENT
1. Improving food quality and safety standards	<ul style="list-style-type: none"> • Administrative capacities need strengthening, and coordination among institutions involved in food safety should be improved. • Operators of mid-size and small food businesses require training on specific EU safety and quality requirements. • Representatives of the associations should have the necessary knowledge of food safety standards, participate in working groups on the development of food legislation, representing the interests of producers. • Producers' associations capacity building to provide services for the interpretation of food legislation, international standards, the introduction of new technologies, and legal support. • Development of producers' associations as a self-regulatory organization

PROPOSITIONS	CONTENT
<p>2. Support in improving risk-oriented procedures of state control and surveillance of Food Business Operators (FBOs) by the competent authority through development of standard operational procedures and training for state inspectors.</p>	<ul style="list-style-type: none"> • Ukraine has implemented a risk-based approach to official control measures. The system of categorizing enterprises by risk should reflect the latest changes in legislation. It is recommended to develop criteria for assessing enterprises specific to the food industry sectors. • The existing system of food safety risk analysis needs strengthening. • Training for state inspectors: Develop standard operating procedures for official control measures (audit and inspection) and provide training in conducting the audits for state inspectors and representatives of the competent authority. Inspectors should be specialized and trained to perform official food safety controls: <ul style="list-style-type: none"> ▪ by type and capacity of production facilities (industrial, manufactural or catering); ▪ by category of food (for example, dairy, meat products, fruits and vegetables, composite products, natural mineral waters, fats and oils, confectionary, bakery, cereals and grains food supplements, fortified food, food contact materials, food additives, GMO food, feed, animal health and welfare etc.). • Development and implementation of an on-line official control database with dedicated digital tools to manage all official control related activities would be an advantage. • Training for FBOs: develop training curriculum for FBOs Training courses for FBOs should cover specific food legislation requirements, hazards, HACCP principles, raw material standards, risk-based monitoring, traceability, and international standards.
<p>3. Review of activities of ongoing or planned Technical Assistance projects:</p>	<ul style="list-style-type: none"> • A review of various projects related to food legislation, sanitary and phytosanitary measures, and grant support for the food industry is needed. This to avoid overlap with activities of other projects and to combine efforts on technical assistance projects in the areas of harmonization of legislation and support for certain sectors of the food industry.
<p>4. Assess and inventory laboratory infrastructure needs, necessary to comply with EU standards</p>	<ul style="list-style-type: none"> • Laboratories need upgrading to meet EU standards, including scope of accreditation, quality management systems, and addressing challenges such as outdated equipment and low salaries. • Improving access for food business operators to networks of accredited laboratories that provide testing services on a commercial basis
<p>5. Assess the needs for enterprises of various industries to improve infrastructure to ensure compliance with the requirements of food legislation or international standards for the safety and quality of food.</p>	<ul style="list-style-type: none"> • Create awareness of food and animal health & welfare legislation requirements and investment needed (layout and condition of premises, access to communications, waste disposal, etc.). • Provide support in transformation and upgrading of food processor infrastructure and machinery according to, EU requirements have a huge impact
<p>6. Improving traceability systems and certification programs.</p>	<ul style="list-style-type: none"> • Aligning Ukrainian traceability and certification programs with EU standards. • Supporting industry associations in developing guidelines for traceability implementation.

RISK & CONSIDERATION

1. A very minor risk, especially at the initial stages, may be associated with a lack of communication with other stakeholders, although this is less true for government institutions, as there is a clearly defined strategy for activities related to the harmonization of Ukrainian and European food legislation.
2. The lack of sustainability of producer associations, especially at the initial stages of cooperation, may be an obstacle to the significant development of their potential as service providers. This may be due to the lack of understanding of strategic objectives of the industry by association members and management, weak involvement of producers in the work of the association, and lack of specialists. However, the general trend in the development of industry associations in recent years indicates their growing role as representatives of industry interests and as service providers for producers.
3. Lack of a proper assessment of the needs of laboratories involved in official control to improve infrastructure and equipment. This requires a detailed analysis of the existing network of laboratories designated for official control purposes, assessment of the availability of infrastructure, equipment, presence of qualified personnel, and establishment of gaps between the range of tests provided by laboratories and the list of tests required by international standards and European food legislation. It is also important to assess the availability of enterprises that need such tests. Based on this data, prioritize laboratories in regions with greater potential for the development of a particular food industry sector. Regarding economic prerequisites for expanding the network of commercial laboratories, such conditions will be created when Ukrainian food standards are fully harmonized with European ones and the export potential of the industry increases. This will necessitate an increase in the number of laboratory tests for the domestic market and for compliance with international standards.
4. The assessment of the needs for enterprises in various industries to improve infrastructure to ensure compliance with the requirements of food legislation or international standards for the safety and quality of food may be inaccurate due to the lack of a development strategy for enterprises, including product range, production volumes, and markets. Also, inconsistencies in the assessment may be due to inadequate analysis of trends in the development of industry standards. Therefore, before providing support for the development of enterprise infrastructure, the trends in the development of requirements for individual branches of industry should be carefully analyzed.
5. The risk of implementation of traceability systems at enterprises in different industries may be related to the lack of practical skills of producers in implementing the requirements of traceability standards. As a rule, gaps appear between the introduction of documented accounting of food batches and their labeling, as well as when changing the batch of food used. There are also some specific typical inconsistencies related to certain industries. This problem could be easily addressed by developing industry-specific traceability guidelines that focus on practical advice on traceability implementation.

9.2. SECTOR SPECIFIC PROPOSITIONS

The vegetable oil sector. The following propositions are specific for the vegetable oil processing sector. This sector is well developed and large in number and size of enterprises, addressing key challenges requires substantial investments.

PROPOSITIONS	CONTENT
Capacity building of R&D and science	Support of Ukrainian scientific and research Institute of oils and fats, National Academy of Agrarian Sciences of Ukraine
Diversify and increase value addition of vegetable oil.	To meet the growing market demand and its diverse applications of sunflower, soya and rapeseed oil investment in processing techniques, efficiency and value addition is required. Support packaged vegetable oil (for retail) and establish comprehensive export value chains. This includes retail product development, marketing, labelling, retail packaging, obtaining export licensing and certification, ensuring compliance with food safety standards, adhering to DCFTA requirements, and meeting EU accession and regulation criteria.
Production of biodiesel (from vegetable oils)	Biodiesel for export. Due to legislative and economic conditions, the domestic market does not have a high demand. The form of investment is possible in a joint venture with delivery to any EU country. The cost of building a new plant with a capacity of 100,000 tons of biodiesel per year is approx. 27 million euros.
Promote the adoption of energy-efficient technologies. Co-generation of energy (from production waste) and enabling environment improvements/deregulation for green electricity production	<p>Generation of electricity from steam is achieved through sunflower husk combustion, resulting in cost-effective oil production and energy self-sufficiency. 10 MW boiler costs over EUR 20 million with payback period of 5 years. According to one veg. oil producer, a smaller boiler to burn 25 tons/day of husk costs about EUR 4-5 million). Additionally, the remains from sunflower oil production can be used for pellets production.</p> <p>This green (net-zero) technology also involves the expansion of associated businesses, such as boilers manufacturing, bag filters, and flue gas traps.</p> <p>To assist green modernization, deregulation needs to take place so that investments into husk combustion projects are quickly and efficiently approved, electricity is quickly and efficiently plugged-in to the grid.</p>
Development of oil refining	Further increase domestic oil processing and refining. Currently the vast majority of exported vegetable oil is in a crude form, further processing and refining is done in the respective target market. Higher-value products per unit of weight/volume is more optimal to better sustain export disruptions and increase of logistics cost.

RISKS & CONSIDERATIONS

Currently, the regulatory process for green electricity to be successfully plugged in to the national grid is lengthy and complex. Deregulation would benefit investments in this area. Changes in the feed-in tariff could make the investment business case less interesting for this kind of large investments

TABLE 4: GREEN RECOVERY INVESTMENT NEEDS AND POTENTIAL FOR VEGETABLE OIL INDUSTRY, IN USD

Source: UNIDO estimations based on interviews with market players, and assuming some 10 enterprises will be able to implement these projects, as many have already done proper modernizations.

CO ₂ FOOTPRINT REDUCTION	WASTE REDUCTION, RECYCLING	RENEWABLE ENERGY	ENERGY EFFICIENCY	WATER CONSERVATION	PACKAGING UPGRADE	TOTAL
Yes	Yes	200 000 000		20 000 000	Yes	220 000 000

YES, means investment need was identified during discussions with stakeholders, but not yet quantified.

The honey processing sector. The following propositions are specific for the honey processing sector, addressing key challenges like increase cost and resource efficient value addition to honey, improve pa-

ckaging and marketing, improve origin identification (incl. laboratory testing) ensuring Ukrainian honey's authenticity.

PROPOSITIONS	DESCRIPTION
<p>1. Ukraine needs to upgrade from bulk to higher quality retail honey as bulk honey production reached its limits in Ukraine.</p> <p>Enhancement of product quality, sustainable processing and retail packaging is required to access more markets and reach new level of development.</p>	<p>A. Development of and investment in best practices, cost-efficient equipment options/solutions for advanced sustainable honey processing and packaging in Ukraine context (incl. renewable energy solutions).</p> <p>B. Build marketing and promotion capacity needed to expand properly packaged, labelled honey in EU retail.</p>
<p>2. Improving enabling environment and regulations, incl. harmonization with the EU regulations</p>	<p>A. Develop enabling environment, industry development strategy, and regulatory strategies, methodologies/approaches harmonized with the EU ones (incl. Directive 2001/110/EC relating to honey).</p> <p>B. Enhance state control policies and the quality of laboratory testing capable of identifying the origin of honey (incl. operational modern data base for botanical and geographic identification) to ensure Ukrainian honey's authenticity.</p> <p>C. Develop capacity of stakeholders on all the above and raise their awareness.</p>

RISKS & CONSIDERATIONS

Honey processing industry is diverse with many SME actors, and therefore, investment and honey processing and packaging skill needs can vary widely especially on retail packaged honey for the EU. Hence several most applicable, resource- and cost-efficient options (incl. renewable energy solutions) for various enterprise sizes need to be explored, analysed, tested, discussed, publicized, and disseminated, and assisted with implementation.

TABLE 5: GREEN RECOVERY INVESTMENT NEEDS AND POTENTIAL FOR **HONEY PROCESSING** INDUSTRY, IN USD MILLION.

Source: Ukrainian association of honey exporters and producers (UAHEP).

CO ₂ FOOTPRINT REDUCTION	WASTE REDUCTION, RECYCLING	RENEWABLE ENERGY	ENERGY EFFICIENCY	WATER CONSERVATION	PACKAGING UPGRADE	RECONSTRUCTION OF DESTROYED FACILITIES	TOTAL
No	No	Yes	Yes	No	30	25% of honey processing facilities	30

YES means investment need was identified during discussions with stakeholders, but not yet quantified.

The fruit and berry processing sector. The following propositions are specific for the fruit and berry sector processing sector, addressing key challenges including the modernisation of the current

hydrofluorocarbons (HFCs) based cooling and freezing technology into more energy efficient and eco-friendly options.

PROPOSITIONS	DESCRIPTION
Support and promote investments in advanced and sustainable processing equipment and practices.	Ukraine has some primary production capacity but lacks advanced and efficient equipment for processing, which is a foundation for subsequent development of respective export value chains. The development of export value chains for processed fruits and berries with proper food quality certification, (aseptic) packaging, labeling, branding, tracing and distribution.
Enhance cold storage capacity and volume increase and transition to eco-friendly and energy efficient coolants.	HFCs are potent greenhouse gases that contribute to global warming. Therefore, HFC systems are not environmentally friendly, and there is a need to transition to more climate-friendly alternatives, such as hydrofluorolefins (HFOs), carbon dioxide (CO ₂) to name a few. More energy-efficient cold chain systems can yield long-term energy savings and CO ₂ reduction.
Diversify and increase product value addition	To expand export volumes, increase margins and diversify sales markets, Ukraine has to modernize its fruit and berry processing, increase its value addition, storage and transportation in accordance with the EU standards and requirements to improve margins and expand markets. Strategic recommendations to be in line with the EU green deal needs to be formulated.

RISKS & CONSIDERATIONS

The cost of transition / replacement of HFC system into eco-friendly system can vary widely. Hence, cost /benefit analysis is required, for various enterprise sizes, best options need to be tested, analyzed, discussed, publicized, and disseminated. The updated EU regulations on F-gases need to be consulted and adhered to.

TABLE 6: GREEN RECOVERY INVESTMENT POTENTIAL FOR **BERRY AND FRUIT PROCESSING** INDUSTRY.

Source: UNIDO estimations based on interviews with market players.

CO ₂ FOOTPRINT REDUCTION	WASTE REDUCTION, RECYCLING	RENEWABLE ENERGY	ENERGY EFFICIENCY	WATER CONSERVATION	PACKAGING UPGRADE
Yes	No	Yes	Yes	No	Yes

YES, means investment need was identified during discussions with stakeholders, but not yet quantified.

The dairy sector. The following investment propositions for green recovery development have been identified with industry experts and Union of Dairy enterprises of Ukraine.

PROPOSITIONS	CONTENT
CO ₂ reduction.	Obsolete models of gas-fired boilers used for the plant process steam need to be replaced with new ones (pellets and special wood processing residues).
Waste reduction and recycling	Waste reduction and recycling includes recycling of waste packaging materials (cardboard, plastic).
Renewable Energy	Mostly solar panels are best relevant for Southern and Central part of Ukraine where the area has a large number of sunny days. Additionally, due to an ongoing russian targeting and hitting of Ukrainian civil and business infrastructure electricity black outs become a real threat. So solar panels can help strengthen energy independence from electricity grid.
Energy efficiency	Energy efficiency measures include modernization of ventilation, lighting, insulation, air conditioning and cooling systems (currently ammonia-based coolants are used, which need to be replaced with more efficient and eco-friendlier CO ₂ based coolants), fuel efficient transportation with lower emissions, mobile vehicles for milk collection with the possibility of taking samples for laboratory tests.
Water treatment and conservation	Water conservation system upgrade is needed to return water into production cycle, to wash casein, to clean water and store it for the production purposes. Reconstruction, modernization of wastewater treatment facilities.
Upgrade equipment for milk powder and cheese production.	Support search, identification, cost-benefit analysis, business plan, justified selection in procurement of new green, energy and resource efficient equipment and technology is needed.

RISKS & CONSIDERATIONS

A key factor in the effective functioning of the industry is the availability of sufficient milk that meets the safety and quality standards of Ukrainian legislation harmonized with those of the EU.

The absence of such a raw material base may have a negative impact on the volume of dairy products in the domestic market and reduce the export potential of the industry.

The reintroduction of tariffs and quotas on dairy exports to the EU may also reduce the industry's profitability.

Rising feed and fuel prices will increase the cost of raw milk and dairy products, which will not only make exports less profitable but also encourage imports of dairy products to Ukraine

In monetary terms investments to cover the above scope as estimated by the Union of Dairy processors of Ukraine (a leading nonprofit organization for the dairy processing industry) are the following:

TABLE 7: DAIRY PROCESSORS' GREEN RECOVERY INVESTMENT NEEDS (CALCULATED, COMPILED, AND ASSUMED FOR 56 DAIRY ENTERPRISES BY UNIDO, COVERING HALF OF THE TOTAL EXISTING INDUSTRIAL DAIRY PLANTS), USD MILLIONS.

CO ₂ REDUCTION	WASTE REDUCTION, RECYCLE	RENEWABLE ENERGY	ENERGY EFFI-CY	WATER CONSERV-N	PACKAGING UPGRADE	TOTAL, USD
94.6	47.9	65.46	96.48	78.9	1.13	384.47

Aggregate estimated investment need for the Green Recovery amounts to USD 384.47 million, which makes it average USD 6.86 M per 1 dairy enterprise (assuming an overall number of 56 dairy enterprises – an about half of the total number of industrial dairy enterprises in Ukraine). Another half of modernization needs is assumed not to be fully implemented due to a number of bottleneck reasons including but not limited to technological, location and space, financial, infrastructural, capacity, ownership, bank-

ruptcy, ongoing trend of decreasing number of dairy processing enterprises, etc.

It is important to support identified investments with advocacy, enabling environment improvements/deregulation at all regulatory levels, technical assistance to prepare and implement investment projects or project components to speed up and encourage investment decisions and inflow.

The poultry and egg processing sector. The following relevant investment propositions for green recovery and transition have been identified to address challenges in waste disposal, energy consumption and high-water consumption.

PROPOSITIONS	DESCRIPTION
<p>Support renewable and smart energy solutions.</p> <ul style="list-style-type: none"> • biogas production from waste/ manure processing; • solarisation; • recycling energy. • Including related enabling environment improvements/ deregulation on electricity project design and plug-in to the grid, on waste management and treatment, etc. 	<p>Biogas. Due to restrictions on mink farming (industry disposal were used as feed for minks), the problem of waste disposal has arisen for some enterprises. The biggest establishments have launched waste disposal projects (2 biogas plants were built by companies like MHP and Avangard). However, waste disposal is still a problem for the industry. MHP company takes credit from IFC for biogas plant renovation.</p>
	<p>Solar. There is potential for use solar energy. The panels can be placed on poultry house roofs. Most relevant for primary production.</p>
	<p>Recycling energy. Use wasted energy and converting it into useful forms of energy. Expand biogas use as heating energy (water boilers) and for production of electricity.</p>
<p>Promote water efficiency technology. Support implementation of new Ukrainian legislation on animal health and welfare.</p>	<p>The poultry meat industry consumes large amounts of (hot)water. A stunning 1170 liters of water is required for 1 chicken breast (300g) and 200 liters for 1 egg (60g). Investments in water management are required to reduce water consumption and re-use (waste) water.</p> <p>This new legislation, which will come in force in 2026 is essential for maintaining equal access to EU markets and fulfilling the Deep and Comprehensive Free Trade Agreement (DCFTA) commitments. Currently, 95% of poultry cages need to change. It requires approximately 1\$B USD in investments. The awareness of the upcoming legislation implications is low</p>
<p>POULTRY: Support in launching poultry slaughterhouses services.</p>	<p>For those food business operators, which do not have permanent access to slaughterhouses, contractors are hired for slaughter services. They must follow the law. If any issues arise during processing because of the contractor's mistake, the food business operator, who owns the poultry meat, is legally responsible. The enhancement of slaughter services and improvement of food safety compliance will benefit the sector and could increase the process poultry meat.</p>
<p>EGGS: Support in implementation of new rules on the requirements for chicken eggs.</p>	<p>The rules are coming in force in 2028, which will establish requirements for grading, labelling, packaging, traceability of eggs, record keeping and providing the information to consumers or other food business operators</p>
<p>EGGS: Packaging modernization</p>	<p>New legislation for eggs packaging and labelling coming in force in 2028, will demand investment in packaging.</p>

RISKS & CONSIDERATIONS

Until recent the poultry industry of Ukraine has been protracting the implementation of the animal welfare legislation as part of the DCFTA. Most producers are unaware of the urgency and scale of investment required to comply with EU-equivalent animal welfare standards. The investments for the sector to comply to this new legislation are substantial and estimated at 1\$B USD in investments.

TABLE 8: GREEN RECOVERY INVESTMENT NEEDS FOR **POULTRY AND EGG** PROCESSING INDUSTRY, IN USD MILLION.

Source: Ukrainian Poultry association

CO ₂ FOOTPRINT REDUCTION	WASTE REDUCTION, RECYCLING	RENEWABLE ENERGY	ENERGY EFFICIENCY	WATER CONSERVATION	PACKAGING UPGRADE	TOTAL
40.5	108.1	175.7	189.2	74.3	36.5	624

Sugar making sector. The following propositions are specific for the sugar making sector, addressing key challenges like: increasing sugar content, reducing water consumption and high energy (fossil fuel) use.

PROPOSITIONS	DESCRIPTION
At sugar plant level - Increase sugar content, reduce water consumption and promote green energy transition/diversification into biogas/electricity/pellets/fertilizers	<p>Modernize sugar beet washing process to increase sugar content and to reduce water use by 60-70%.</p> <p>Increase renewable energy in processing (electricity from sugar pulp) as electricity cost takes 40-45% share in the cost price of sugar.</p> <p>Diversify into biogas, electricity, pellets, fertilizers for energy independence, resource efficiency, greener, cleaner production.</p>
Develop state sugar industry green strategy, enabling environment and foster deregulation for the modernization of sugar plants	The state green sugar strategy will strive to reduce natural gas/coal/oil fuel consumption (decrease CO ₂ emissions), reduce water consumption and improve circularity, increase renewable energy in the production process, diversify to better use sugar pulp and residues (biogas, electricity, pellets, fertilizers).
Harmonize Ukrainian regulations/legislation with the EU one at the regulatory level and implement them at the sugar plant level.	<p>Harmonize Ukrainian regulations/legislation with Council Directive 2001/111/EC of 20 December 2001 relating to certain sugars intended for human consumption; with The European Union's Renewable Energy Directive (EU RED), particularly EU RED 2 (Directive 2009/28/EC) and EU RED 3 (Directive (EU) 2018/2001).</p> <p>To produce white sugar in accordance with EU requirements the following equipment will be obligatory: centrifuges, vacuum devices; drying machines. (at least 25 sugar plants will need them, according to MAFP)</p>

RISKS & CONSIDERATIONS

If all diversification opportunities are materialized in biogas, electricity, pellets, fertilizer, Ukrainian sugar industry can be more competitive, reducing energy cost, more technological, value adding and resilient, more diversified, less dependent on quotas and on sugar prices.

Competition from other sugar-producing countries such as Brazil, India, and China could reduce world market price, making investments into sugar plan modernization less viable.

Trade policy, quotas, tariffs (especially in the EU) could influence Ukrainian sugar exports.

Green tariff (feed-in tariff) established by the government from the renewable energy sources may change, which is a risk for investment into modernization/diversification into biogas.

Highly capital-intensive and complex projects require knowledge, skills, technology, detailed elaboration and analysis, finding best solutions and access to long term affordable finance.

If cost of natural gas/oil fuel/coal is low, there is little incentive to switch to renewable energy options.

TABLE 9: GREEN RECOVERY INVESTMENT NEEDS FOR **SUGAR** MAKING INDUSTRY, IN USD MILLION.

Source: UNIDO estimations based on the interviews with some sugar plants and sugar association, and assuming 10 sugar plants (out of 30 total) will be able to implement these investment projects (without pellets production or fertilizer production).

CO ₂ FOOTPRINT REDUCTION	WASTE REDUCTION, RECYCLING	RENEWABLE ENERGY	ENERGY EFFICIENCY	WATER CONSERVATION	PACKAGING UPGRADE	TOTAL
YES	YES	60		50	YES	110

YES means investment need was identified during discussions with stakeholders, but not yet quantified.

The grain processing sector. The following propositions are specific for the grain processing sector, addressing key challenges like the modernisation of the outdated technologies into more energy efficient and eco-friendly ones and refocus on more

profitable and growing market segments. The green investments needs are defined in cooperation with industries Associations and based on estimations of number of enterprises will be able to provide the projects.

PROPOSITIONS	DESCRIPTION
Flour, cereals, pasta, bread, bakery and flour products, grain processing products	
<p>Promote energy- and resource efficient technologies in the industry, emphasizing savings and increased product yield.</p>	<p>Reduce grain dust emissions and electricity consumption by adopting 5th generation mills with high automation.</p> <p>Improve/modernize an environmental monitoring system, emissions control, and conduct preliminary audits (incl. energy audits).</p> <p>Support the technology of flour siftings as a component to make pellets for further use as an energy resource for boilers; energy production from residues (starch); solar panels; conversion of boiler to alternative energy sources</p> <p>Implementation of digital technologies (ERP, database management, e-document management)</p> <p>Support the modernization of equipment</p>
<p>Support product development. Support and invest in R&D Personnel trainings</p>	<p>Development of the specified parameter flour, low gluten content flour, composite flour blends, functional, healthy, organic cereal products.</p> <p>Development and implement EU-aligned products and packaging, development standards for such products</p> <p>Support of production of gluten and enzyme ingredients for the flour and bread industries.</p> <p>Facilitation for training network, involving associations, basic enterprises and universities; organization of dual trainings on new technologies, laboratories activities, legislation, EU conditions and other relevant issues.</p> <p>Introduce high-tech starch utilization like bioplastic;</p> <p>Establish university laboratories;</p> <p>Offer grant programs, educational contract payments, and support for young professionals.</p>

PROPOSITIONS	DESCRIPTION
Marketing support	Market research and export promotion support (participation in exhibitions and fairs in new and established markets); Support information exchange between Ukrainian business associations and EU counterparts, arrange study tours, conferences.
Improve statistics methodology and system on groats	Ukrainian statistics has groats as a group of grains processing output without separately segregating oat groats, millet groats, buckwheat groats, wheat groats, sorghum, barley groats, etc. So, it is not clear how much specific groats is produced in Ukraine each year. Therefore, the national statistics methodology and system needs to be reviewed, analyzed and amended in order to get more specific information about the specific groats production, market volume, market dynamics to help grain processors, government in its food security efforts, consumers, other stakeholders.

RISKS & CONSIDERATIONS

The green transformation of the grain processing sector is largely determined by the implementation of alternative, renewable energy sources, as a rule, not directly related to production waste, as well as the use of the latest generation technologies, including automated ones, which will simultaneously mitigate the risks of personnel shortages and reduce the levels use of resources, impact on the environment and increase energy efficiency. The development of the industry is associated with sufficiently high competition for milling wheat between processing enterprises and grain exporters and the need to ensure the proper quality of raw materials. The development of the domestic market is connected with the deepening of the product line and export - with an array of actions related to establishing contacts, ensuring quality and compliance with standards, diversification of logistics, researching new markets and establishing access to them.

TABLE 10: GREEN RECOVERY INVESTMENT NEEDS FOR GRAIN PROCESSING INDUSTRY - FLOUR, CEREALS, PASTA IN USD MILLION

Source: Millers Association of Ukraine

CO ₂ FOOTPRINT REDUCTION	WASTE REDUCTION, RECYCLING	RENEWABLE ENERGY	ENERGY EFFICIENCY	WATER CONSERVATION	PACKAGING UPGRADE	RECONSTRUCTION OF DESTROYED FACILITIES	TOTAL
9.6	4.4	5.3	44.7	2.25	4.36	27.9	98.51

TABLE 11: GREEN RECOVERY INVESTMENT NEEDS FOR BAKERY AND BREAD INDUSTRY, IN USD MILLION.

Source: All-Ukrainian Association of Bakers (UAB)

CO ₂ FOOTPRINT REDUCTION	WASTE REDUCTION, RECYCLING	RENEWABLE ENERGY	ENERGY EFFICIENCY	WATER CONSERVATION	PACKAGING UPGRADE	RECONSTRUCTION OF 4 DESTROYED PLANTS	TOTAL
0.77	10.8	17.6	41.5	31.5	5.4	30.3	138

9.3. AGGREGATED GREEN RECOVERY AND RECONSTRUCTION INVESTMENT NEEDS

Green recovery and reconstruction investment needs of the selected subsectors have been identified within the following main strategic areas relevant for the food industry: 1) Carbon Footprint Reduction 2) Waste Reduction and Recycling, 3) Renewable Energy 4) Energy Efficiency 5) Water Conservation 6) Packaging Innovation/upgrading 7) Reconstruction of the destroyed enterprises.

The green recovery investment needs, as estimated by UNIDO, are presented in the aggregated table below. The data has been collected and compiled from responses to questionnaires provided by business associations, specifically nonprofit organizations representing various sectors within the food industry.

TABLE 12: THE AGGREGATED GREEN RECOVERY AND RECONSTRUCTION INVESTMENT NEEDS, IN USD MILLIONS

FOOD INDUSTRY SUBSECTOR	STRATEGIC AREA OF INVESTMENT							TOTAL
	CO ₂ FOOTPRINT REDUCTION	WASTE REDUCTION RECYCLING	RENEWABLE ENERGY	ENERGY EFFICIENCY	WATER CONSERVATION	PACKAGING UPGRADE	RECONSTRUCTION	
TOTAL	145.5	171.2	524	371.9	257	77.3	58.1	1.605

In line with the green recovery strategic areas, according to estimations, the selected food industries have the overall green recovery investment need of an estimated at least **USD 1.6 billion**. Estimations of

unconfirmed data (on damages, losses, waste reduction, CO₂ reduction, or packaging projects, etc) were not included.

10. RESOURCE MOBILISATION

Resource mobilization for green recovery and transformation involves securing and allocating financial and non-financial support to transition towards a low-carbon, resilient, and sustainable food processing sector. It engages various actors, including of course the Government of Ukraine, uni- and multilateral institutions, the private sector including financial institutions, research and expertise centers and civil society, utilizing sources like public funds and incentives, private investments, grants, (soft)loans, or donations. Strategies such as advocacy, partnership, innovation, and communication are employed to raise awareness, generate demand, and leverage opportunities.

To effectively mobilize resources, it is crucial to:

- Add more detail to the identified propositions in a project concept or action plans including data from the UNIDO Sector Survey and information gathered from the enterprise field visits conducted by the UNIDO team.
- Currently, a total of 9 action plans are developed and combined in the report - Project proposals for selected food industries. There are 7 sector specific actions plans developed (one for each prioritised sector) and two sector wide action plans, namely the packing industry development and the Food safety and Control Action plan.
- Present, discuss and agree with government and industry experts which are the most promising/urgent propositions to focus on.
- Then develop the proposals (action plans) in more detail, including financial analysis and estimation of the various impact indicators. Address challenges and risks while proposing solutions or mitigation measures.
- Develop a compelling value proposition tailored to the specific context, needs, and interests of potential resource providers and users.
- Identify and engage with influential stakeholders and contacts at the Development Partners. Participate or organize in investment fora.
- The Project should work with potential donors to clarify their roles, assess their strengths, and have a division of labour in terms of projects to support so that they are leveraging their strengths and not overlapping
- Raise awareness about the Ukraine's green recovery strategy and developments among the EU organizations, business associations and EU member states (especially from Eastern Europe) to gain their experience, lessons learned to help inform the strategy of resource mobilization and strategy adaptations.
- Design and build on existing efficient mobilization mechanisms, such as government funds, policies, regulations, incentives, contracts, or agreements, to stimulate effective resource flow, targeted for green recovery and transformation.
- Leverage and align with existing development programmes, resource mobilization opportunities and initiatives on global, regional, or national levels to support and complement green recovery propositions.

ANNEX 1 – UNIDO ENTERPRISE SURVEY

INSIGHTS INTO THE UKRAINIAN FOOD INDUSTRY: UNVEILING CHALLENGES AND PROSPECTS

OVERVIEW OF THE SURVEY

In order to gain a more comprehensive understanding of the prioritized sectors in the Roadmap, UNIDO commissioned a survey within Ukrainian food industry enterprises, drawing insights from a sample of 236 effective questionnaires conducted across enterprises of various sizes.

The majority of responding enterprises are actively involved in butter manufacturing (18% of the sample) and the production of whole milk and cream (13%). When including dry milk, the dairy manufacturing sector represents 38% of the total number of surveyed enterprises by industry. It's important to note that this concentration could be perceived as

INDUSTRY SIZE

Medium-sized enterprises dominance: approximately 54% of the surveyed enterprises position themselves as medium-sized businesses.

Large businesses contribute substantially, accounting for about 30% of the surveyed sample. The largest share of enterprises evaluating themselves as big business is among enterprises in the sugar (63% of the total number of surveyed enterprises by in-

QUALITY CONTROL AND CERTIFICATION

Quality control: 91% of the surveyed enterprises showcase a robust implementation of quality control systems, fully or partially embracing the principles of the HACCP system.

Certification: Initial analysis reveals that at least 37% hold certification according to the ISO 22000/DSTU ISO 22000 standard. Additionally, almost 8% boast certification under FSSC 22000.

an overrepresentation of one sector in the overall results, and is flagged as a limitation of the key findings.

While the other industries were more evenly represented, it's crucial to emphasize that the survey findings, although applicable to other food industries or manufacturing sectors, are specific to the surveyed enterprises and should not be generalized as commonalities for the entire food industry. Sector-specific details are included in the separate Industry Action plans where relevant. The main findings of the survey are listed here:

dustry), oilseed (50%-60%) and flour milling (43%) industries.

While small and micro-businesses constituted less than 18%. A large part of the enterprises involved in fruit and berry processing belong to small business. Among the surveyed enterprises there were no small businesses in sugar, oilseed, flour milling and some other industries, where large and medium-sized businesses prevail.

Compliance: Given the extensive implementation of quality control, product safety systems, and certification, these enterprises are subjected to rigorous control measures and inspections. Notably, 80% affirm their regular participation in external audits and inspections.

INFRASTRUCTURE, EQUIPMENT AND AUTOMATION

Infrastructure: Over 80% of respondents report ownership of primary production buildings, warehouses, and office premises. Furthermore, 69% of respondents report ownership of transport vehicles.

Equipment: There's a concerning high level of wear and tear, with 48% of enterprises operating equipment aged over 10 years old. Equipment is sourced

mainly from Europe (57%), followed by domestic equipment supply (40%).

Automation: Nearly 65% of the enterprises indicate a high level of automation, deploying complex systems automation covering various processes, from production to personnel and environmental management.

SALES MARKETS, EXPORT DYNAMICS AND CHALLENGES

Market Focus: The majority (62%) of respondents predominantly focus on supplying their products to the domestic market, ranging from 70% to 100% of their production.

Export dynamics: A mere 6% of the respondents export their entire production, but an encouraging 18% export more than 70%. The EU is the number one export market (92% of respondents), followed by the Middle East (33%) and African countries (24%).

Export aspirations: Interestingly, 46% of enterprises, not currently engaged in substantial exports, express a strong determination to develop and expand into foreign markets.

Export challenges: Analysing the list of problems that prevent both effective export and its start for enterprises that did not export, shows that currently the key problem is complex and expensive logistics. 57% of respondents indicated this particular problem. For 18% of enterprises, the prices offered in export markets are currently not attractive enough, to compensate for the expensive logistics. Other export related challenges include insufficiently qualified personnel (11%), and difficulties in licensing/certification (9%).

WAR RELATED CHALLENGES

The war and security situation (82%) and a shortage of qualified personnel (46%) stand out as major hindrances to development.

War-related challenges include: 89% of the interviewed producers see complicated and expensive logistics as the key problem that hinders export (89%), followed closely by workforce outflow due to migration and mobilization (87%), and unstable energy

supply (71%) emerged as the most impactful challenges during the war.

More than half of the respondents (54%) reported a problem of reduced demand for products, which directly affects profitability. Complicated supply of raw materials currently arises in 44% of companies. Other problems, such as a shortage of spare parts and complicated access to finances, are less significant (22% and 8%, respectively).

ACCESS TO FINANCE

Financing challenges: Despite the fact that only 8% of respondents stated facing difficulties in accessing funding, a more detailed survey on financing revealed that 51% of companies still encounter some challenges with financing and credit. Interestingly is that 50% of surveyed honey producers, 25% of pasta producers, and 16% of milk and cream producers reported

to rely solely on their own funds and not taking any bank loans.

High-interest rates: For 81% of respondents, high-interest rates on loans stand out as a significant financial hurdle.

Banking limitations: Another 25% of respondents in this category highlighted limitations imposed by banks as a key financing problem.

DEVELOPMENT PLANS AND INVESTMENT FOCUS

Short-term development plans: Respondents' short-term development plans show a dual focus. Specifically, 47% expressed intentions to maintain current production volumes. And despite challenges, around 44% of respondents plan to expand and increase production. A rather disappointing 2% of the respondents plans to diversify by introducing new product types.

Investment focus: The majority of respondents (49%) reported being focused on increasing production volumes. A significant share (around 31%) plan to modernize existing facilities or introduce equipment for producing new types of products. In the first case, this often refers to increasing the level of automation and energy efficiency. In the second case, it in-

ENERGY AND ENVIRONMENTAL SUSTAINABILITY

Energy independence: A commendable 43% of respondents claim to have already established an effective system of energy independence, stimulated by interruptions in electricity supply during the start of the war in 2022. The main directions of increasing the level of energy independence of enterprises, are the introduction of solar power plants (41% of respondents) and the installation of diesel or gasoline generators (36%).

Environmental sustainability is a priority for 42% of enterprises, either with an already ecologically clean en-

MICRO AND SMALL ENTERPRISES

Micro and small enterprises exhibit distinct characteristics, including:

- Lower levels of automation of complex production processes (21%).
- Domestic market focus (80%) primarily supplies more than 50% of their products to the domestic market.

volves manufacturing products within the same product category (not diversification by introducing new product types as mentioned above).

Investment analysis: Among enterprises planning expansion, only 55% have analysed and estimated the necessary investment volumes. The vast majority of respondents in this category (74%) assess the necessary investment amount to be in excess of \$1 million, emphasizing the substantial nature of the investment needs.

Global collaboration: A significant portion (more than 61%) of enterprises is actively considering collaboration with international companies for technical re-equipment, financing, and export development.

terprise or a determination to increase environmental sustainability in the short term.

Key directions: Renewable energy systems (50%) and reduction of energy consumption (50%) are identified as the most relevant directions for improving environmental friendliness. Followed by efficient water use, 38% of respondents, the issue of reducing waste volume and disposal reported relevant, by 30% of respondents.

- Energy Independence disparity with the medium and large enterprises: Only 33% of micro and small enterprises indicate to have a self-sufficient energy supply system.
- Legislative challenges: A higher urgency for addressing imperfect legislation is noted, with 50% experiencing such problems already in the pre-war period.
- A similar intention for international collaboration is reported, 63% under the micro and small enterprises.



Vienna International Centre
P.O. Box 300, 1400 Vienna, Austria



Telephone: (+43-1) 26026-0



www.unido.org



unido@unido.org



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION