Investment Opportunities in Ukraine

Until 2022 Ukraine was breadbasket of Europe with the most fertile lands and a huge tourist and investment potential. Ukraine have already made a great leap towards a full digitalization. Following the establishment of the Ministry of Digital Transformation of Ukraine, certain tangible results can be seen, in particular the creation of the “Diia portal” for electronic governmental services for citizens. Ukraine has been recognized by international investors as a stable and predictable emerging market, with talented human capital and high-quality undervalued assets.

For more than two years now, Ukraine has faced unprecedented challenges associated with full-scale military conditions in the country. Despite this Ukraine continue to do business. Despite the war and the economic shocks caused by it, inflation slowed down to 5.1% by the end of 2023. Weakening price pressure was largely contributed by high harvests in Ukraine, a sufficient supply of food products, a decrease in world energy prices, a consistent monetary policy of the National Bank of Ukraine and measures to increase the attractiveness of hryvnia assets. Inflation is expected to remain at a moderate level in 2025.

The main achievements of recent years for investment opportunities in Ukraine are:

1.the status of a candidate for accession to the EU

2. 5 "visa-free" regimes with the European Union, including:

- energy (entrance to ENTSO-e)
- customs (joining NCTS)
- transport (elimination of road transport barriers)
- digital (mutual recognition of qualified electronic trust services)
- economic (abolition of all customs duties and EU quotas for Ukrainian goods)

3. abolition of import duties in trade with Great Britain, Canada, Australia and the United States of America (only on steel imports)

4. integration into the Trans-European Transport Network (TEN-T)

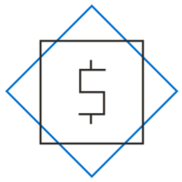
Main advantages of Ukraine are:

1. Investment opportunities are related to reconstruction - currently there are cumulative economic, social and other losses in Ukraine as a result of the war. There is a great potential for investments in such sectors as processing of agricultural products, transport industry, marine infrastructure, production of building materials and furniture, tourism, green technologies. Reconstruction creates a unique opportunity to modernize Ukrainian production facilities and attract foreign capital and modern technologies.
2. Geographical location - International transport corridors running through Ukraine. Ukraine's geographic location makes it an important transit corridor for trade and travel between Europe, Asia, and the Middle East.
3. Digitalization - 50+ of the most popular government services for business are already available on the Diia portal
4. Access to regional consumer markets - Nearly 1 billion consumers are reachable within 2,500 miles
5. Skilled workforce - Ukraine is known for its skilled workforce and high level of education. In 2023, Ukraine ranks 15th in The Global Skills Index 2023, largely due to the level of skills in the fields of computer science, applied mathematics, software engineering, big data and machine learning.
6. A significant raw material base - Ukraine ranks 25th in terms of mineral extraction in the world
7. Investment incentives - tax, customs, IT (Diia City mode), Incentives for agriculture and agro-processing industry etc.
8. World leader - exporter of sunflower oil, producer of sunflower seeds and potatoes, exporter of clays, andalusite, kyanite and sillimanite, semi-finished products from iron and cast iron

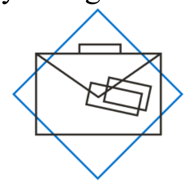
4 pillars WHY to invest in Ukraine?*

Location
A strategic geographical location at the crossroads of Europe, Asia and the Middle East.

Human resources
Talented Human Capital — 70% of Ukrainians have secondary or higher education.



Cost-competitiveness
One of the most cost-competitive locations in Europe to base your business.



Ease of doing business
Simplified legal procedures for business as well as state-guaranteed investment security.

**According to https://ukraine.ua/invest-trade/*

Odesa region is 33.3 thsd.km2 (6% of Ukraine's territory), it has 7 largest ports of Ukraine and access to the main river routes - Danube, Dniester, Dnieper. The sea coast of the Black Sea is extended to 300 km in the region.

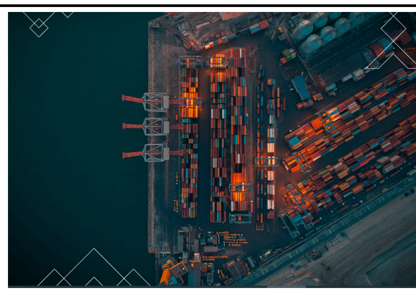
Odesa region is situated in 5 international transport corridors:

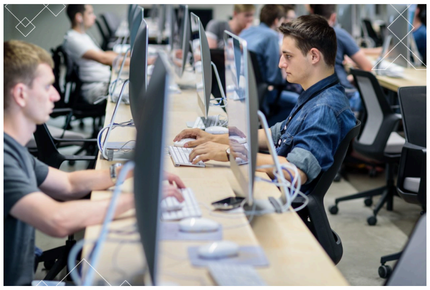
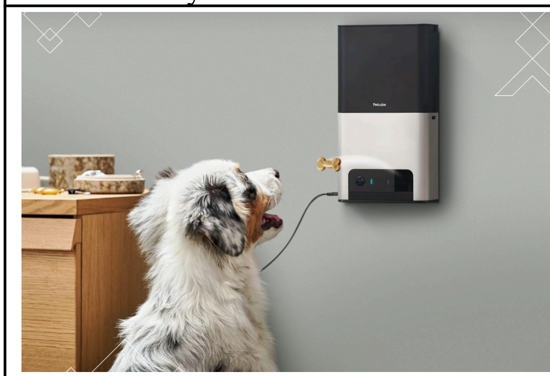
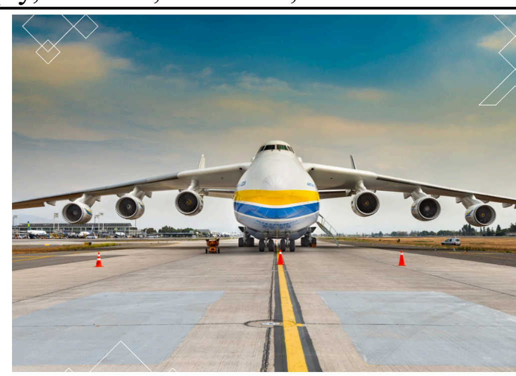
- Cretan 7th and 9th corridors,
- TRACECA transport corridor (Europe-Caucasus-Asia),
- Baltic-Black Sea corridors and Black Sea ring transport corridor - transport corridor around the Black Sea of the Black Sea Economic Cooperation (BSEC).

Investment opportunities of Ukraine are presented in the table 1.

Table 1

Investment opportunities of Ukraine*

	Ukraine is open to trade! It is among the top countries open for trade with 18 free trade agreements for 46 countries (including DCFTA with EU, FTAs with UK, EFTA, Canada, Israel and others). No post-entry quarantine will be needed.
Going digital has become Ukraine's flagship topic and the state priority during the last two years. Here is how Ukraine moves forward with the concept of building a digital state and becoming the world's leading country in terms of providing services for citizens and businesses.	

	Ukraine attracts more and more attention as an IT destination. It is considered a #1 outsourcing destination by Global Sourcing Association and has more than 200 thousand high-skilled IT professionals.
Ukraine has a thriving startup ecosystem and is a country of innovative entrepreneurs who generate creative ideas! Many famous startups were actually born here. How to stay connected with your pet anytime and monitor it all day long? How to turn any (wall, door, fence – whatever!) flat surface into an interactive board? How to tackle the issue of global plastic pollution with the help of a toothbrush? These seemingly crazy ideas have already become success stories. Just like many others.	
	Ukrainian programmers, entrepreneurs, and people with big ideas are already changing the world of technology today. Artificial intelligence training, worldwide job aggregator, and even personal gaming assistant! Ukrainians excite the world with their startups. Here are some of the most prominent Ukrainian startups - Depositphotos, Jooble, Looksery, Macpaw, Mobalytics, Neuromation, People.Ai, Petcube, Preply, Readdle, Restream, Viewdle etc.
Ukrainian startups excite the world with their brilliant ideas and technologies! Here are some of the prominent projects created in Ukraine - Hard disk drives (HDD), Antonov-225 — world's largest aircraft, Antithrombotic prosthetic heart valves, Sikorsky R-4 — the world's first production helicopter, EnableTalk gloves, Liquid fuel missile carrier MBR R-7… Inspired by Ukrainian inventions and inventors? That's only a part of the story. If you have never heard that Ukrainians also were behind WhatsApp, the first passenger aircraft, PayPal, gas lamp, nuclear submarines…	

	Ukraine is deservedly called a nation of inventors and innovators. Getting pure water in desert conditions? Living in a prefabricated 100% sustainable home? Using medical tools that understand needs? Ukrainian engineers and dedicated inventors have already proven that the mission is possible in the right hands (E-bike by Delfast — electric and safe, Effa brush — 100% clean, Esper Hand — a prosthesis that understands the needs, Hushme — the world's first voice mask for smartphones, PassivDom — the Internet of houses, SolarGaps — green energy at a safe home, Smart Oasis — zero-waste water production, UGEARS — more than just toys ETC.).

**Retrieved from https://ukraine.ua/invest-trade/*

Ukraine's Role in the Blue Economy

The prospects of the Blue economy do not bypass Ukraine with its internal sea waters with an area of 27,000 km2, territorial sea with an area of about 30,000 km2, maritime state border with a length of 1,355 km, exclusive economic zone with an area of 82,000 km2. In Ukraine, the center of enterprises of the Blue economy is the part of the Northern Black Sea region within the geographical boundaries of Odesa and Mykolaiv regions. Below is an overview of some of its varieties. The key sectors of the Blue economy in Ukraine are:

1. **Fishing and fish processing.** Odesa and Mykolaiv regions account for 15 and 22 percent of aquatic living resources produced by domestic fishermen, respectively. The basis of sea fish catch is flounder, mullet, trachurus, Bluefish, diplodus, goby, etc. This makes the initiation of mariculture projects, on the one hand, and the implementation of biological diversity conservation programs in natural water bodies of the inland, territorial sea, and exclusive economic zone, on the other, urgent. As a result of introduction of martial law in Ukraine in 2022, the industrial catch of aquatic biological resources in internal fishing waters (parts thereof), internal sea waters and in the exclusive (marine) economic zone of Ukraine decreased by more than 62% and amounted to 20,000 tons. (in 2021 – 53.4 thousand tons). About 80% of users of aquatic bioresources stopped their economic activities. In the Black Sea Basin, the industrial activity of Ukrainian economic entities has actually been suspended. As a result, insurmountable obstacles have arisen for scientific research activities in the field of fisheries. The Fisheries Complex of the Odesa Region consists of the Black Sea Seaports, 6 fish processing factories and plants, 104 fisheries enterprises of various forms of ownership, 7 fish farms, 4 of which have the status of breeding farms.

2. **Aquaculture.** The coastal sea waters of Odesa and Mykolaiv regions are favorable ecosystems for the cultivation of molluscs (mussels, oysters, rapans), the industrial cultivation of which does not require expenses for artificial feed. In the south of Ukraine, it is promising to cultivate species of marine fish that live in conditions of moderate and variable salinity and temperature range of this zone. These include: mullet (flathead mullet, red-lipped mullet, golden mullet) - due to artificial reproduction, grazing in estuaries and lagoons; Pleuronectidae (Platichthys – Black Sea turbot) – possible artificial reproduction, controlled cultivation in pools; Sturgeon fish (sturgeon, sevryuga, bester, beluga, various sturgeon hybrids) – through artificial breeding, controlled industrial breeding in ponds, recirculation systems; Gobiidae – reproduction and cultivation of pastures with the help of artificial reefs.

3. Coastal and marine tourism. The Black Sea coast of Odesa and Mykolaiv regions has great recreational potential. Among its components, the following deserve special attention: Sports and recreation; Sanatorium. The therapeutic profile of the resorts of Odesa and the Odesa region is characterized by the presence of natural healing resources: mineral waters of Odesa, Kuyalnytskyi and Khadzhibey estuaries, oil from estuaries and lakes. Due to the climatic conditions, sea beaches, natural objects and complexes are favorable for treatment, recovery and medical rehabilitation. In 2022, there were 321 sanatoriums in Odesa region that could accomodate more than 40,000 clients. Among the most successful sanatoriums are Bilhorod-Dnistrovskyi (141 facilities), Tatarbunarskyi (80), Kiliyskyi (75), and Ovidiopolskyi (56) districts.

The main recreational areas of the Mykolaiv region are also located on the Black Sea and estuaries. According to the data of the Main Department of Statistics in the Mykolaiv region, health and recreation services are provided by 271 health care and recreation facilities with 29229 beds. The Law of Ukraine "On Tourism" declared it one of the priority areas of economic and cultural development.

4. Marine transport. The economy of Ukraine depends on the efficient functioning of ports. About 39% of its foreign trade (by volume) passes through ports. In particular, 90% of the gross export of agricultural products. Odesa seaport is one of the largest on the Black Sea. Its 55 berths have a total annual throughput capacity of 51 million tons of various cargoes. Five elevators and three covered warehouses are designed to protect and transship 12 million tons of grain per year. The ports of Pivdennyi, Chornomorsk, Izmail, Bilhorod-Dnistrovsk, Reni and Ust-Dunay are also integrated into the logistics scheme of sea freight transportation. There are 34 ports and near-port terminals operating in Mykolaiv and Mykolaiv Oblast. The most effective of them are Mykolaiv Sea Port, Olbia Specialized Sea Port, Ochakiv Port, Mykolaiv River Port, NIBULON, Mykolaiv Specialized Sea Port Nika Tera. Their geographical location, proximity to product-exporting enterprises, and a developed network of connected river, rail, road, and air connections contribute to the organization of cargo transit. Another segment of the sea transportation market is the construction and maintenance of marine energy facilities. Blue energy is a tool for liberating humanity from hydrocarbons, the amount of which is constantly running out on the planet. It also has the potential for sustainable energy production, which is important in the face of growing environmental threats and challenges. During the years of independence, the number of shipbuilding enterprises of the Southern Industrial Region almost doubled. As for civil shipbuilding, individual production prevails here. The “lion's share” of operating companies represents a new generation of investors, managers and engineers with a unique way of thinking and acting. This means, firstly, that thanks to their enthusiasm and capital, an industry of intellectual services was created, which can only be compared with the IT business. They discovered and implemented a new development strategy based on digital economy standards.

In terms of Ukrainian investment potential of **fishery and aquaculture**, the interest in the digitalization of the industry and the promising direction for investment - aquafarming - are impressive. Ukrainian entrepreneurs with an understanding of the basics of digitalization of their own business have prospects of regaining their position in the international aquaculture market.

Even in the conditions of martial law, modern **shipbuilding** is developing and gaining momentum. More than 12 design bureaus operate in Mykolaiv and Odesa, most of which are privately owned and steadily increase the volume of services provided to foreign and domestic consumers. They are innovative investors and engineers who have created an industry of providing innovative and sustainable services based on the fundamentals of digitalization.

Regarding **the recreational potential** of coastal areas, it is worth noting that the medical profile of Ukrainian resorts has a powerful potential. Green ecological, water and active types of tourism (rafting, kiting, jumping) are promising. They are currently focused on the domestic consumer, but the service market is fully ready to return to the international arena after the end of martial law.

Ukrainian Blue Economy Policy

Each of us want positive and fair economic development. But we shouldn't sacrifice marine health – and ultimately our own human health – just for financial gain. Marine sphere provides ecosystem services that are critical to plants, animals and people. To ensure that these services remain available for future generations, the global community must strive for sustainable Blue economic growth.

Together with the green deal, the Blue economy forms the strategic course of the European Union for the coming decades. At the initiative of the European Commission, Ukraine joined the initiative of the "Blue Economy Development Fund in the Black Sea". One of the main goals of the initiative is the fight against pollution in the Black Sea, where the amount of garbage is almost twice as much as in the Mediterranean. The Government Office of European and Euro-Atlantic Integration, the Ministries of Economy and Trade, Foreign Affairs, Ecology and Natural Resources, and other government structures are involved in supporting this initiative.

In order to develop a sustainable economy, the Ukrainian government recommends attracting investments in five areas:

1. Economic and social sustainability of the coast

Recovery of carbon absorbers; projects for monitoring the state of marine ecosystems and mitigating the consequences of anthropogenic impact on them; Coastal resilience and adaptation, especially for ports (including redesign for flooding, waste management, utilities, etc.); and sustainable coastal tourism.

2. Renewable energy

Investing in expanding research and development and increasing production for wave, tidal and wind projects.

3. Marine transport

Propulsion and navigation systems, hull coatings, fuel and silent ship technologies.

4. Fisheries and aquaculture

Reducing emissions from fishing and aquaculture, catching and processing in the wild, regulating the conditions and amount of fishing, reducing the level of poaching

5. Recreation and tourism

Innovative ecologically oriented recreational complexes that will create an ecosystem of recreation and health services

6. Forecasting

Adaptation based on infrastructure to move economic activity; research on carbon capture technologies, storage and geoengineering solutions to reduce undesirable consequences; use of artificial intelligence for the implementation of innovative solutions, digitalization of the industry.

7. For the next generation

Robotics of the industry, use of alternative material to support the vitality of marine ecosystems, research of alternative natural solutions that absorb and store carbon.

In addition to a large list of legislative and other regulatory acts that regulate the relations of separate sectors of the Blue economy in Ukraine, there are regulated strategic documents that comprehensively forecast and determine the conditions for the sustainable development of the Blue economy sectors. Among the above-mentioned acts, the main ones are:

1) Water strategy of Ukraine until 2050, approved by order of Cabinet of ministers of Ukraine, dated December 9, 2022 No. 1134 https://zakon.rada.gov.ua/laws/show/1134-2022-%D1%80#Text. This document defines the main principles of state policy in the field of water use and protection and reproduction of water resources and is aimed at achieving mutual agreement related to their use, increasing the level of water

security and reducing to an acceptable level the risks of managing water resources on the basis sustainable integrated management of water resources.

2) Strategy for the development of the fishing industry of Ukraine for the period up to 2030 and approval of the operational plan of measures for its implementation in 2023-2025, approved by the order of the Cabinet of Ministers of Ukraine dated May 2, 2023 No. 402 https://zakon.rada.gov.ua/laws/show/402-2023-%D1%80?lang=en#Text/ It defines priority goals and tasks aimed at solving economic, ecological and social problems, the implementation of which will make it possible to improve state policy in the field, create favorable conditions for increasing the volume of extraction (fishing) of aquatic biological resources, and increase the bioproductivity of internal fisheries water bodies, internal sea waters and the territorial sea, to increase the production of aquatic biological resources and products made from them in order to guarantee the food security of the state.

3) Strategy for the implementation of the provisions of the directives and regulations of the European Union in the field of international maritime and inland water transport ("road map"), approved by the order of the Cabinet of Ministers of Ukraine dated October 11, 2017 No. 747 https://zakon.rada.gov.ua/laws/show/en/747-2017-%D1%80?lang=en#Text Strategy has the aim to introduce the internal market regime in the relevant sector based on the principle of reciprocity. Such a regime provides for the absence of any restrictions on the freedom to provide services in the relevant field by a legal entity on the territory of the other party in relation to persons of Ukraine and member states of the European Union, who are established in Ukraine or the European Union. The main task of the Strategy is the adaptation of national legislation to the legislation of the European Union, which will contribute to liberalization and mutual access to the markets of Ukraine and the European Union and the full fulfillment by Ukraine of its obligations in the field of commercial shipping and inland water transport, which it has undertaken under international agreements in these areas.

4) Strategy for the development of tourism and resorts until 2026, approved by order of the Cabinet of Ministers of Ukraine dated March 16, 2017 No. 168 https://zakon.rada.gov.ua/laws/show/168-2017-%D1%80#n9 The document defines the development of the entire field of tourism and the Blue sector as well. Its goal is to create favorable conditions for the activation of the development of the field of tourism and resorts in accordance with international quality standards and taking into account European values, transforming it into a highly profitable, competitive field integrated into the world market, which ensures acceleration socio-economic development of the regions and the state as a whole, contributes to the improvement of the quality of life of the population, harmonious development and consolidation of society, popularization of Ukraine in the world.

Last but not least is Development strategy of Odesa region for 2021-2027, approved by the decision of the regional council dated March 3, 2020 No. 1228-VII https://oda.od.gov.ua/en/odeshhyna/soczialno-ekonomichnyj-ta-kulturnyj-rozvytok/strategichni-plany-dij-ta-programy-rozvytku/strategiya-regionalnogo-rozvytku/strategiya-rozvytku-odeskoyi-oblasti-na-2021-2027-roky/ The goal of the state regional policy, which is the basis of the Strategy, is to raise the standard of living of the population, regardless of where a person lives in a united, decentralized, competitive and democratic Ukraine - development and unity, focused on people. The document takes into account the best European experience and approaches to regional development implemented in countries comparable to Ukraine.

The strategy is the main planning document for the spatial implementation of sectoral development strategies, the coordination of state policies in various areas, the achievement of a better effect of the use of state resources in territorial communities and regions in the interests of people, the unity of the state, and the preservation of resources for future generations of Ukrainians.

The Strategy introduces new approaches to the policy of regional development in the new planning period, namely: the transition from a predominantly territorially neutral to a territorially directed policy of development of territories based on stimulating the use of their own potential, providing support to certain territories characterized by special problems of socio-economic development

The document defines the development of all spheres of the Blue economy, in particular the reproduction of the environment of the Azov and Black seas, the development of transport infrastructure, the development of domestic Ukrainian tourism etc.

How to get involved in Blue Economy investments in Ukraine?

Increased attention to the Blue economy in recent years is an undeniable argument "Yes" for investors when determining investment directions. Its development is fostering due to the growing role of components of the Blue economy as one of the largest sources of ecosystem services for humanity. Investors in the process of developing their activities should take into account the specifics of the Blue Economy, as an industry that includes water transport (shipbuilding, sea cargo and passenger transportation), aquaculture&fishing, recreation, tidal and wave energy, and also the extraction of minerals from the sea the bottom

10 TOP TIPS FOR NEW INVESTORS IN THE BLUE ECONOMY SECTOR

1. Correct setting of goals

It is necessary to determine the tolerance for risk and the planned investment horizon. The capital allocated for investment in the Blue Economy should not be critical to sustain life.

2. Always ask questions to the Blue Enterprise

Before searching for "What to buy?" you need to ask: "What is happening?". There is no rush on the stock exchange. The current situation in the market of Blue-chip investments should be carefully studied. The more informed you are, the less likely you are to be caught off guard.

3. Selection of assets

"What to buy?" is an equally important question. There are many different instruments in the Blue Economy market, ranging from simple shares of water companies to complex structured market. Before investing in any instrument, you should understand the nature of its pricing.

4. Knowledge of the market infrastructure

The more theoretical knowledge you have about how the Blue Sector market is organized, the higher are your chances for success.

5. Knowledge and strategy of the Blue Industry

Knowledge should be at the forefront of decisions to buy or sell an asset. Only the experience of the Blue sector development will help to form your own successful strategy. Also, regional strategies will be useful, in each of which promising directions of development of a particular region and state support are determined. Look for and study other people's negative experiences, mistakes can teach more than success stories.

6. Critical thinking

Critical thinking is the key to an objective view of the market. Question and verify all the information pouring out of the information space around the Blue sector. Every day, the information field produces thousands of ideas. The Blue sector includes various industries, so it is necessary to ask yourself the answer to the question "Why not?" and if you do not find the answer - invest

7. Due diligence (homework)

Due diligence before entering a position is a must. It is necessary to determine the trading plan that the deal will follow: entry price, risk, expected return. Strict compliance with risk and money management contributes to the preservation and increase of capital.

8. Prognostic approach

Random, impulsive agreements in a long-distance trades are bound to result in losses. Newbies in the market set themselves the task of making money, but first you should learn not to lose and forecast. The Blue economy is the economy of long-term prospects.

9. Charities – "NO"

Understand what your advantage is and at what expense your profit is formed. Many sides of the Blue sector have been trying to "beat" each other for quite long time - shipbuilding, recreation and aquaculture enterprises within their industries are constantly shaping the investment climate. There are always winners and losers.

10. Hedging and diversification

Hedging and diversification are two risk management tools. Allocate capital to different groups of assets in different sectors of the Blue Economy. For example, in recreation and aquaculture. Smart use of options can significantly limit risk.

11. Invest in your education

The market is changing. Studying other people's stories of mistakes and victories of the Blue sector, reading useful literature and imitating the knowledge of experienced investors and capital managers will bring unconditional benefit. You can learn from mistakes, and you can - at your desk. One does not exclude the other, but works more effectively together.

12. UkraineInvest in help.

https://ukraineinvest.gov.ua/en/ is platform, created to inform the business on important matters related to economic activities under martial law in Ukraine, investment promotion office of the Government of Ukraine. It includes investment attraction, investor support and troubleshooting, promoting ukraine as investment destination.

Ukrainian Ports

The maritime transport complex of Ukraine is a multifunctional structure that meets the needs of the national economy in terms of transport. Sea ports are an integral part of the transport and production infrastructure of the state due to their location on international transport corridors. The competitiveness of the domestic transport complex on the world market depends on the efficiency of the operation of sea ports, the level of their technological and technical equipment, the compliance of the management system and infrastructure development with modern international requirements. The main advantages of the sea port industry of Ukraine are:

- high export potential of cargoes of ferrous metals, coal, iron ore concentrate and grain;
- availability of cargo processing facilities;
- favorable location of sea ports to ensure transit cargo flows;
- availability of a regulatory framework regarding the possibility of attracting private investment for the development of the port industry;
- availability of highly qualified specialists in the port industry.

According to "Register of sea ports of Ukraine" (https://www.uspa.gov.ua/reyestr-po) in Ukraine there are 9 open ports: Bilhorod-Dnistrovsky sea port, Seaport Izmail, Mykolaiv sea port, Sea port Odesa, Olbia specialized seaport, Pivdennyi seaport, Reni seaport, Sea port Ust-Dunaisk, Chornomorsk seaport. Also, there are 9 internal sea ports (including temporarily occupied territories): Seaport Berdyansk, Sea port Mariupol, Skadovsk sea port, Kherson seaport, Sea port Sevastopol, Sea port Kerch, Sea port Feodosia, Yalta Seaport, Yevpatoria sea port.

Currently, due to military operations, the following seaports of Ukraine are functioning in one or another form: the Black Sea ports of Greater Odesa - Odesa, Pivdenny, Chornomorsk, and the Danube ports of Izmail, Reni, and Ust-Dunaisk.

In Ukraine, as in the whole world, the demand for transportation by **inland waterways** is currently growing. Cargo owners, primarily metal producers and grain traders, in the conditions of economic instability, rising fuel prices, increasing cases of interruptions in the operation of railway and road transport due to the state of the country, are trying to reduce transport costs and improve transport logistics.

River shipping is becoming increasingly relevant and in demand in Ukraine. In the near future, inland water transport can regain lost positions and compete seriously with rail and road transport.

Transportation by inland waterways is considered by the Government of Ukraine as a type of transport that must be developed to support the Ukrainian economy by increasing the number of transport and logistics alternatives in order to create a more efficient and sustainable logistics system. The development of river transport, which provides "Blue" transportation, can also have a significant impact on social development and the environment of Ukraine.

It should be noted that river transport has a number of advantages over road and rail transport, which creates prerequisites for changing logistics routes in favor of inland water transport:

1) carrying capacity: 2 barges and a tug replace 250 trucks, or 100 railway cars and 2 locomotives; the possibility of transportation of large cargoes;

2) savings on road repair: 1 million tons of cargo transported by river (redirected from land transport) reduces road repair costs by up to UAH 1 billion. within 4 years;

3) environmental friendliness: modern river transport is the most environmentally friendly along with rail and road transport, which significantly increases its competitiveness in view of the latest trends in EU “Blueing” and the implementation of relevant standards.

Opportunities of Ukraine:

- 3 navigable rivers, two of which are among the TOP-5 largest rivers in Europe.
- 16 river ports and terminals.
- 60 million tons of capacity per year.

The total length of the navigable rivers of Ukraine, which are used as waterways, is 2,241 km, of which the Dnipro is the most important waterway. The Dnipro basin occupies about 65 percent of the river space of Ukraine.

From the point of view of social Blue benefits, the development of river transport in Ukraine and its inclusion in the system of multimodal transportation will allow not only to reduce energy costs and harmful emissions into the atmosphere, but also to transport goods by "river-sea" vessels between the country's large industrial centers and the Black Sea ports without additional overload. In addition, it will allow to reduce the load on highways and "rehabilitate" railways, freeing them from a part of unprofitable transportation, and thus contribute to the reforms taking place in railway and road transport.

How do Ukraine's ports compare to other Black Sea ports?

Before the introduction of martial law in the country in 2022, the port industry had the most powerful potential among the world's leading countries: 38 state-owned enterprises with a turnover of about UAH 10 billions for a year; 5,000 industry entities; 100,000 sailors-citizens of Ukraine; one job in the industry stimulated creation of 4-5 jobs in related industries; 13 continental seaports; 262 million tons of capacity per year; 25 thousand workers. And all this has potential to return of relevant positions in the world.

In the framework of marine ports Ukraine, as before, currently also has a number of advantages after the end of martial law, namely:

- favorable geographical location of seaports;
- availability of cargo handling facilities;
- availability of highly qualified specialists;

- high export potential of cargo;
- real prospects for attracting private investments for the development of the port industry;
- the potential of sea ports (table 2).

Table 2.

Potential of Ukrainian sea ports*

Port	Port depths, m	Berthing line, km	Number of berths	Cargo turnover of the port, million tons
Seaport Pivdennyi	19,0	5,9	30	41,9
Sea port Mykolaiv	11,2	3,8	20	23,5
Seaport Izmail	8,0	2,6	24	5,1
Seaport Mariupol	9,75	3,9	22	6,5
Seaport Bilhorod-Dnistrovsky	3,5	1,1	8	0,4
Seaport Reni	7,5	3,6	30	1,1
Seaport Chornomorsk	14,0	6,0	29	17,2
Seaport Skadovsk	6,0	0,8	5	0,021
Seaport Odesa	14,0	9,0	54	24,1
Seaport Kherson	9,6	1,5	10	3,3
Seaport Berdyansk	8,4	1,6	9	2,4
Seaport Ust-Dunaisk	6,0	0,15	1	0,054

** with the exception of the temporarily occupied territory according to Ukrainian Sea Ports Authority data (https://www.uspa.gov.ua/en/homepage-en)*

Ukrainian port sector can be characterized by availability of more qualified personnel, better motivation, more efficient organization of work, faster response to market needs. Despite the difficult investment climate, infrastructural investment projects are implemented in Ukraine, funds are attracted and they are aimed at developing the activity of ports. Unfortunately, ports located in Odesa and Mykolaiv regions, are losing competitive level in the Black Sea basin. The production potential is used only up to 50 percent due to prolonged hostilities.

The activity of the sea port economy of Ukraine should be provided with a clear and balanced investment strategy for the formation of mutually beneficial conditions for the participation of private foreign and state business in joint investment projects.

The state infrastructure of ports should be modernized at the expense of, first of all, a private investor who will be able to use the investment object (with benefits from the state) for commercial purposes. This will make it possible to allocate additional cash flow, reduce the budget burden and generate additional cash flow for other seaport development projects.

Blue Economy projects in Ukraine

Description of Ukrainian significant initiatives, startups and projects in Blue economy can be started from **Ukrainian Maritime Cluster** (https://maritimeukraine.com/en/about-us/), which grew from the initiative during multiple public events in 2018-2019 and was established as Public Union by proactive Ukrainian companies in 2020. UMC is a platform for the Ukrainian maritime industry companies to share best practices and develop a consolidated position. Primary objective of UMC is consolidation of legal entities of private law to facilitate the development of Ukrainian maritime economy and to protect its rights and interests. Main activities of organization are forming of economic, technological, and political environment for the development of the Ukrainian maritime economy; support for global integration and growth of international competitiveness of cluster members.

Another successful project is **“Precious Plastic Ukraine”** – the creative manufactory, created by Yevhen Khlebnikov in 2016. It is a continuation of the international project of the Dutch engineer Dave Huckins. Dave has developed equipment for crushing plastic and shares his inventions online. “Precious Plastic Ukraine” is oriented on marine litter and seashore plastic. Its main task is to change the attitude towards plastic. To show people that this is not waste, but a valuable raw material that cannot be thrown away. And they also managed to establish the production of plastic paving slabs. The first experimental batch is already ready and now Yevgen, together with European researchers from the EMBLAS (Environmental Monitoring in the Black Sea) project, are looking for a place in Odesa where this tile could be placed to test its strength.

The main advantages of this business are:

- Financial and legal support at the state level, as this production is aimed at improving the environmental situation.
- There is no need to obtain a license.
- The availability of raw material base in large volumes, as PET containers are thrown away in large quantities in every city.
- High profitability when establishing stable production and sales channels.

"Precious Plastic Ukraine" plans to create a plastic bank project - a certain record of the plastic that people hand in will be kept, and according to it they will receive funds, as well as bonuses to their own "accounts" for further orders of plastic products.

Another successful startupproject, which is now restarting after pause due to martial law is **“Seadora”** – first and unique fish-booking in Ukraine. The fish does not “travel” for a long time, because it “reaches the table” directly from the hands of the fisherman. The service adheres to the concept of "No waste" and catches as much fish as it was ordered. The startup has partners all over the world, after the set of orders, they carry out the catch, and then organize air transportation. At the same time, the seafood itself is not frozen, but only cooled and stored at a temperature of +3-5 degrees. The company advocates for preserving the resources of the world's oceans - thanks to Seadora's work format, seafood losses are close to zero. In addition to reducing waste, seafarers also benefit from receiving bonuses directly instead of intermediaries.

“Oysters of Scythia” is another Blue-oriented business project in which Scythian oysters are grown on the shores of the Black Sea in an ecologically clean place on the border of the Mykolaiv and Odesa regions, directly in the natural national park, which once again confirms the environmental friendliness and safety of the water area. The most common edible oyster is grown there from material obtained from a famous farm in the West of France. Experts, who absorbed the experience and skill of French oyster farmers, recognized leaders in the global oyster industry, are also trained there.

LLC "Odesa sturgeon complex" is Ukrainian Blue enterprise. The production facilities of the enterprise are located in two areas:

- Plot #1 - section of recirculation system of aquaculture. Here sturgeon in conditions that meet the highest standards is grown. Pure artesian water, water heating and cooling systems, a unique ozonation system, multi-stage filters, UV water purification is used.
- Plot #2 - full-system fish farming section is located in the ecological zone of the Danube Delta biosphere reserve at a distance of 220 km from Odesa. Here fish is raised in conditions as close to natural as possible, and only purebred lines of wild-type species are used. This allows us to get healthy fry with a strong immune system and a high growth rate. This fish has a unique natural taste. In this area, there is incubation section, where high-class specialists receive fertilized eggs and

fry. The fish processing plant and sturgeon caviar production line are also there. Premium black edible beluga roe, Siberian sturgeon, sterlet and golden albino sterlet roe is produced.

The project **Water Cloud UA** started in 2017. The idea of extracting water from the air was born from experience in the agricultural sector and an understanding of the problems farmers have, in particular, the irrigation process - the availability of water resources, costs and costs. The device consists of a solar panel, a Peletier thermoelement, as well as a set of various systems and modules, depending on the scope of application. It uses the operating principle of an air conditioner. For private use: fans operate on a magnetic cushion, which is driven by an electromagnetic coil; the latter, in turn, is powered by any source of electricity. It undergoes purification, cooling, condensation, mineralization, resulting in structured drinking water with the pH balance necessary for the human body. One installation is enough to produce 15 liters of water per day. Since the device works at a minimum air humidity of 20%, it can be programmed, and the degree of water mineralization can also be adjusted - it can be used by farmers. On average, a field of 1 ha requires 15 to 20 such installations. WaterCloud can also be used at home - the device generates at least 4 liters of water per day. Therefore, the business development potential has a high rate of profitability.

The mobile application **"3UrK Fishing - fishing in Ukraine"** is also successful project, which includes useful information about the fish that live in the waters of Ukraine, fishing rules, responsibility for their violation, the minimum size of aquatic biological resources allowed for fishing. Created by an amateur fisherman who still doesn't not know a programming language, but had a great desire to do something useful for people. Currently the application contains the following sections: fish of Ukraine, minimum fish sizes, "Red Book", prohibited fishing gear, Prohibited fishing areas, Prohibited periods of catching, legislation, fishing gear, bait for fishing, fishing methods. Therefore, the application helps both to provide convenience for the fisherman in finding fishing spots and fish characteristics, and to warn against violating the law

"Fishing Planet" is a project of the Ukrainian studio "The Angler Game". Fishing Planet is a highly realistic first-person online multiplayer fishing simulator. Developed by avid fishing enthusiasts to bring people the full thrill of actual angling. With stunning graphics, ultra-realistic gear damage physics, hydro and aerodynamics, and most importantly, artificial intelligence of fish based on real behavior, players will literally be on the water and able to improve and hone their real-life fishing skills.

Above are listed only a small part of the Blue growth successful projects of Ukraine, which can become an example for successful investment and big developments in the field of the Blue Economy of Ukraine.

Key transboundary Blue Projects, in which Ukraine is involved

Among the transboundary projects, initiatives and international technical support in the field of Blue growth of Ukraine, the **Digital Blue economy and innovation Acceleration Network** (DBAN) project should be noted. DBAN project № 101077599 is funded by the European Union through European Maritime, Fisheries and Aquaculture Fund (2021-2027) of The European Climate, Infrastructure and Environment Executive Agency (CINEA). The project idea is designed around the concept of establishing a regional Blue economy and innovations acceleration network – based ecosystem which supports existing and emerging businesses and business initiatives in the Blue economy sectors. The project aims at creation of regional digital Blue Innovation Acceleration Network for the Black Sea region that will be first implemented between the partnering cities of Burgas, Batumi and Odesa. Consortium of partners – Burgas Municipality (Bulgaria), International Business and Economic Development Center (Georgia), Southeast Digital Innovation Hub (Bulgaria) and Odesa State Agrarian University (hereinafter - OSAU) (Ukraine) jointly are successfully executing actions that are incorporating Blue economy activities from partnering countries' regions to promote and accelerate innovative business ideas for Blue growth and innovations.

In the framework of the project in Ukraine several activities were successfully implemented for promotion the Blue economy and innovations to businesses. Digital educational modules "Digitalization for Entrepreneurship Entities" and training sessions were conducted for 3 groups of stakeholders separately - coastal and maritime tourism, fisheries and aquaculture and maritime transport; competition of entrepreneurial ideas Hackathon UA BGrowth 2023 was conducted; mentoring guide for Blue economy innovators was implemented; large-scale communication and promotional campaign ensured increased awareness of interested parties about the relevant project; information regarding https://Blue-growth.net/ platform was disseminated which arose big interest among stakeholders; sociological survey with a focus group meeting for a thorough assessment of specific needs related to digitalization and use of innovative tools with stakeholders in Blue economy sector was conducted.

OSAU held a competition of entrepreneurial ideas Hackathon UA BGrowth 2023, the purpose of which was to accumulate a significant number of startup project ideas dedicated to the sustainable use of natural resources, preservation and restoration of aquaculture, sustainable maritime tourism and transport. Accordingly, this initiative stimulated local entrepreneurs to develop and present their innovative solutions related to the Blue economy and explored the potential for SME startups in Blue-green innovation as a foundation for accelerating the Blue economy.

OSAU developed digital educational modules "Digitalization for Entrepreneurship Entities", which included theoretical materials (on digitalization of business services, use of applications in various areas of business, social media marketing), syllabus, curriculum, presentation materials for visualization. Detailed content of course was chosen according to requests of stakeholders of coastal and maritime tourism, fisheries and aquaculture and maritime transport. The blended course "Digitalization for entrepreneurship entities" was aimed at the use of digital tools and resources to generate new ideas and solutions and the use of media technologies to solve professional tasks with the help of modern software. Guidelines for the digitalization of business entities in the maritime industry was developed by OSAU. This document revealed the concept of digitalization, understanding why is digitalization of own business important, features of small and medium Blue business, resources and opportunities of digitalization the Blue sector business, basics for digitalization of business activities, recommendations on digitalization of business and general action plan for the digitalization of the Blue sector business activities.

Another effective and efficient international project is **4BIZ** (https://4biz.bsun.org/) – boosting the Blue economy in the Black Sea region by initiating a business collaboration framework in the field of fisheries and aquaculture, coastal and maritime tourism and maritime transport. The aim of the project is to address local capacity building needs to boost innovation, digitalization and investment in the Black Sea Blue economy. The main sectors are fisheries and aquaculture, coastal and maritime tourism, as well as maritime transport. The collaboration framework is bringing together Blue economy stakeholders in the EU and eligible non-EU Black Sea countries. This Project has received funding from the European Union's European Maritime, Fisheries and Aquaculture Fund (EMFAF) under Grant Agreement 101077576. Consortium consists of partners: Black Sea Universities Network, International Center for Black Sea Studies, Galati Chamber of Commerce, Industry and Agriculture, Igor Sikorsky Kyiv Polytechnic Institute, Public Union "Ukrainian Maritime Cluster", Batumi State Maritime Academy, Doğu Karadeniz Kalkınma Ajansı, Marine Cluster Bulgaria, Bucharest Academy of Economic Studies. Partners successfully assessed and identified best practices of other regions and seabasins that could match with the identified gaps, designed the collaboration and support services for SMEs on Fisheries and Aquaculture, Coastal and Maritime Tourism and Maritime Transport for the Black Sea Region, developed Pathways for Boosting Blue Businesses in the Black Sea Region Consolidated regional.

Another successful non-Ukrainian project with involving Ukrainian scientists and testing the vessel in Ukraine is Bulgarian-based startup **13 Mari**, which develops innovative drag reduction solutions for improved fuel efficiency and cleaner waters. The company received coaching through the EU BlueInvest Readiness Assistance Programme and was able to secure more than USD 500,000 in funding (https://oceans-and-fisheries.ec.europa.eu/news/Blueinvest-supports-13-mari-innovation-fuel-efficiency-2023-08-18_en). 13 Mari (https://13mari.com/) developed a simple, yet effective approach to improve fuel efficiency. They introduced a composite element that reduces "drag," the resistance faced by ships in water. By reducing drag, ships need less energy to move through water, resulting in lower fuel consumption and fewer CO2 emissions. 13 Mari's solution involves attaching 15-30 composite elements to the ship's hull, each providing a 10% faster water flow and 20% less drag locally. On average, major vessels, such as tankers and container carries, can reduce their drag by 3.7% by introducing the retrofits at the present stage. This can lead to fuel savings of at least 3.7%.

Also, important Blue initiative project was made in 2023. **WWF-Ukraine** carried out stocking of sturgeon species by releasing 2,500 young sterlets and sturgeon into the Solomon arm of the Danube River on the territory of the Danube Biosphere Reserve (https://wwf.ua/?12036966/2500-sturgeon-released-into-the-Danube-by-WWF-Ukraine). Stocking has a strategic goal — to contribute to the restoration of the sturgeon population in the Danube and to ensure the monitoring and protection of their habitats.

Stocking during the war was carried out for the first time. The event was supported by the Ministry of Environmental Protection and Natural Resources of Ukraine, the Ministry of Agrarian Policy and Food of Ukraine, the State Agency for the Development of Land Reclamation, Fisheries and Food Programs of Ukraine, specialists of Odesa Sturgeon Complex LLC and the Danube Biosphere Reserve. Danube sturgeon stocking was carried out thanks to the support and funding of WWF-Netherlands together with Rewilding Europe.

Ukrainian organizations participate in another ongoing international project "**Development of Aquaculture and Fisheries Education for Green Deal in Armenia and Ukraine: from education to ecology** " (AFISHE) (project number 101082557, duration - 2022-2025) within the framework of the Erasmus+ Program of the European Union. It is aimed on reducing the negative impact of aquaculture and fishing on the environment in Armenia and Ukraine by developing the latest approaches to the training of master's degree candidates. Consortium of partners: National university of water and environmental engineering (Ukraine), Armenian National Agrarian University (Republic of Armenia), National Academy of Sciences of the Republic of Armenia (Republic of Armenia), Slovak Agricultural University in Nitra (Slovak Republic), Sumy National Agrarian University (Ukraine), University of Dubrovnik (Republic of Croatia), University Porto (Portuguese Republic).

The main directions of the project are the development and organization of training programs with all supporting materials, the creation of laboratories, training of teaching and support staff of universities. The AFISHE is aimed on creation the network between Armenia, Ukraine and EU partner countries in the fields of aquaculture and fisheries.

Links:
https://ukraine.ua/invest-trade/
https://zakon.rada.gov.ua/laws/show/1134-2022-%D1%80#Text
https://zakon.rada.gov.ua/laws/show/402-2023-%D1%80?lang=en#Text/It
https://zakon.rada.gov.ua/laws/show/en/747-2017-%D1%80?lang=en#Text
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https://ukraineinvest.gov.ua/en/
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https://oceans-and-fisheries.ec.europa.eu/news/Blueinvest-supports-13-mari-innovation-fuel-efficiency-2023-08-18_en
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