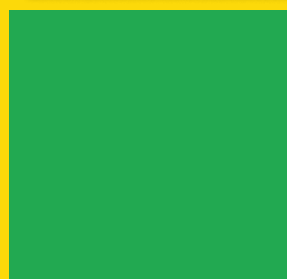
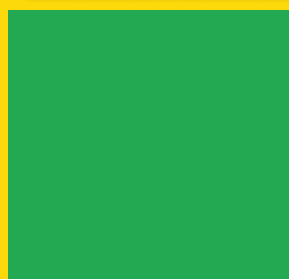
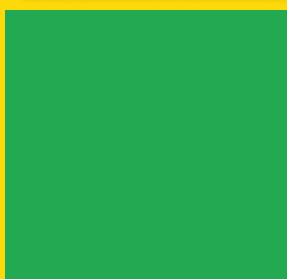
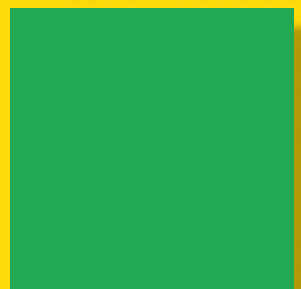
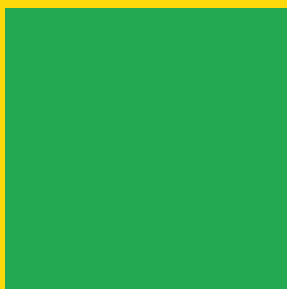
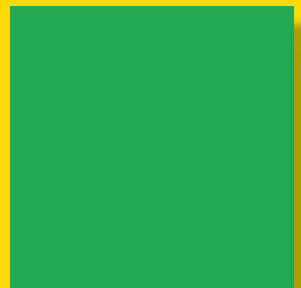


HOW TO REBUILD A “GREEN” COUNTRY: RECOMMENDATIONS FOR UKRAINE’S RECOVERY

MAIN IDEAS AND THESES





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CHAPTER 1

RECOMMENDATIONS FOR UKRAINE'S RECOVERY: HORIZONTAL DIMENSION



HOW TO REBUILD A “GREEN” COUNTRY: RECOMMENDATIONS
FOR UKRAINE’S RECOVERY. MAIN IDEAS AND THESES

WAR DAMAGE AND MACROECONOMIC STABILITY

On February 24, 2022, Russia launched a full-scale invasion of Ukraine, which resulted in a war that has lasted for over 200 days. In addition to military losses and casualties among Ukrainian civilians, Ukraine is also suffering economic and environmental losses that are difficult to calculate in the context of ongoing hostilities.

Economic losses:

- The Government does not provide official estimates, the calculation is ongoing. The Government has [approved](#) and improved the Procedure for determining the damage and losses caused to Ukraine as a result of the armed aggression of the Russian Federation (CMU Resolution No. 326 of 20.03.2022 as [amended](#) on 30.08.2022) and developed the [Methodology](#) for determining the damage and amount of losses caused to enterprises, institutions and organizations of all forms of ownership as a result of destruction and damage to their property in connection with the armed aggression of the Russian Federation, as well as lost profits from the inability or obstacles to conduct business activities. Assessment of losses, according to the methodology, will be carried out through an independent assessment of losses or will be the result of a forensic examination (expert study). The U.S. dollar will be taken as a conventional monetary unit, and the result will be converted into the (UAH) hryvnia equivalent at the National Bank of Ukraine (NBU) exchange rate on the date of assessment. Some preliminary estimates of losses, [announced](#) by Prime Minister D. Shmyhal as of August 23, 2022, are approximately [UAH 1 trillion](#);

- According to KSE Institute [estimates](#) as of September 5, 2022, the total amount of direct infrastructure losses reaches **USD 114.5 billion**. Compared to previous estimates (August 22, 2022), the damage caused by the destruction and damage to civil and military infrastructure has increased by USD 1 billion;

- Business also counts losses. According to the European Business Association (EBA) [survey](#), losses incurred by small and medium-sized businesses as a result of the war have increased in recent months. Thus, 27% of surveyed entrepreneurs estimate losses in the amount of up to USD 10 ths, 28% - in the range of USD 10-50 ths, another 13% - in the

range of USD 50-100 ths, and 20% - more than USD 100 ths. Only 5% of entrepreneurs report no losses.

- According to the Mastercard SME Index, since the beginning of the full-scale invasion, 79% of small and medium-sized businesses have reduced their activities, and for most of them such a reduction was significant by 50-99%. According to the same study, one third of Ukrainian businesses need funds for development.

Main needs of Ukrainian business



Source: Mastercard SME Index

- The credit risk of Ukrainian companies as of June 2022 increased significantly (+5) due to a sharp increase in expected losses and deterioration in loan portfolio quality assessments. This happened because the war also affected the financial and banking sectors, which were unprepared for such changes in the environment. The NBU survey showed that already during the first quarter of 2022, most financial institutions significantly tightened credit standards for all types of loans due to the deterioration in economic activity. Only about a quarter of respondents said they had not changed credit standards for businesses. At the same time, the survey showed changes in the demand for corporate loans, in particular a reduction in borrowers' interest in all types of loans, so the need for working capital, debt restructuring and internal financing is significant.

- A survey of representatives of Ukrainian energy companies conducted by DiXi Group also illustrates the need for lending, at least on pre-war terms. At the same time, lending to businesses is beginning to recover: the state business support program "Affordable Loans 5-7-9%" on simplified terms did not stop operating during the war, and a number of support programs for SMEs were continued or launched by Ukrainian banks and foreign donors.

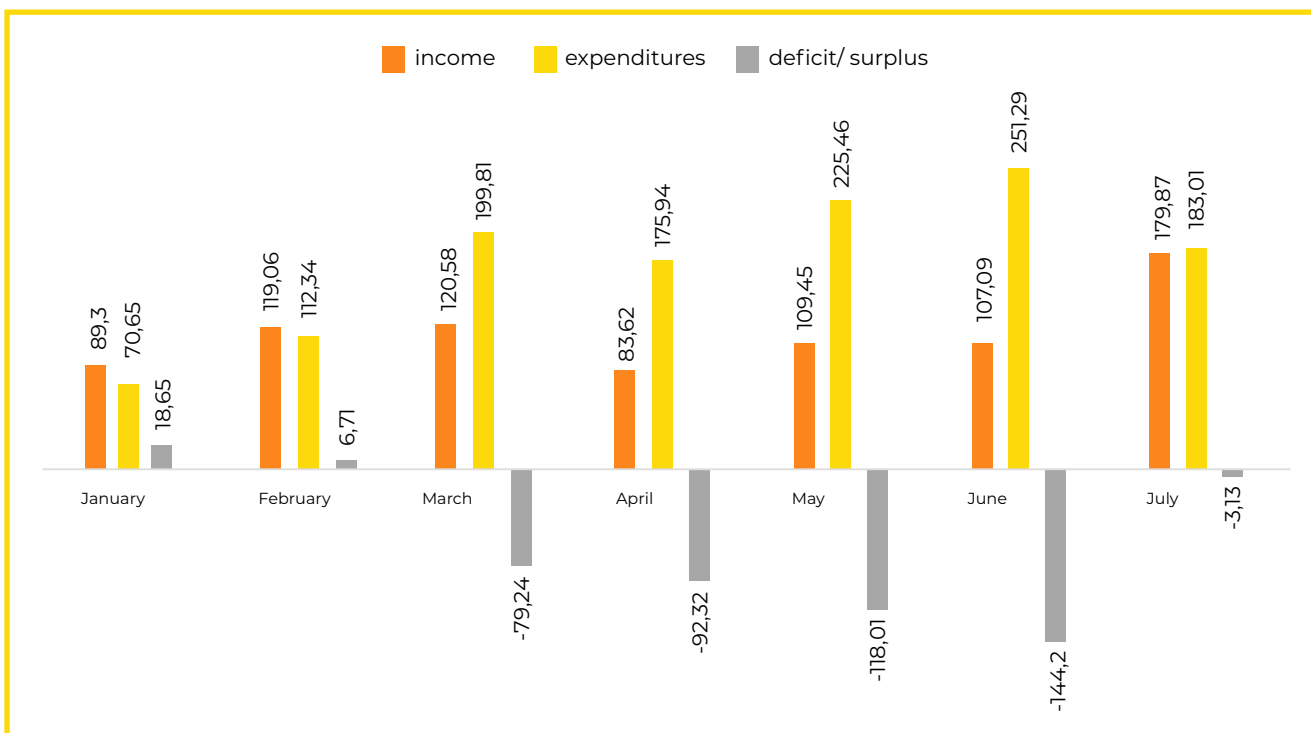
Environmental damages:

- According to DiXi Group [estimates](#), as of 100 days of Russian aggression, the war has [caused](#) the greatest environmental damage to Donetsk, Luhansk, Zaporizhzhia, Kherson, Kyiv, Chernihiv and Sumy regions. In particular, it is air, soil and water pollution, flooding of territories, violation of wildlife habitats, destruction of protected areas, forest fires, etc.
- During the six months of the full-scale war, the Ministry of Environment [recorded](#) more than two thousand cases of wildlife destruction and destruction of ecosystems. Materials on 304 cases were handed over to law enforcement agencies, investigative actions are underway. The total amount of damage caused by the Russian Federation is preliminarily estimated at [more than UAH 962 billion](#). However, the Ministry plans to [develop](#) a separate methodology for certain types of pollution, such as atmospheric air. According to preliminary estimates by the Minister of Environmental Protection and Natural Resources Ruslan Strilets, the unconfirmed but potential volume of pollutant emissions during the war from all sources [reached](#) 46 million tons (for comparison: in 2021, total emissions in Ukraine amounted to about 2.25 million tons).

War also has an indirect impact. It affects the country's investment climate, reduces its foreign exchange reserves, requires the lion's share of the budget to be spent on defense, creates unpredictable losses for the restoration of destroyed infrastructure and affects the state's ability to service its external debt.

As of July 2022, the budget [execution](#) by revenues amounted to **54.4%**, by expenditures - **40.2%**. According to the NBU [forecasts](#), Ukraine's GDP may fall by more than a third by the end of the year. As of July 2022, the budget [deficit](#) amounted to **UAH 411.5 billion**, which is partially [financed](#) by the NBU through the redemption of bonds. However, there are signs of improvement. Back in early August, the Minister of Finance Serhii Marchenko [confirmed](#) a monthly budget deficit of approximately USD 5 billion. Due to the increase in international aid, for the first time since the beginning of the war, the monthly budget deficit in July approached the pre-war level and amounted to UAH 3.13 billion (compared to the same indicator in June - UAH 144.19 billion). On the one hand, the assistance of partners helps to reduce the budget deficit, on the other hand, expenditures become dependent on external factors.

State budget performance in 2022, UAH billion



Source: [State budget web portal for citizens](#) as of 12.09.2022

INTERNATIONAL ASSISTANCE

After February 24, 2022, Ukraine faces two most important tasks – to return and protect its territories and to ensure effective recovery of the country from the consequences of the war. There are many discussions around the issue of reconstruction regarding the effective organization of international assistance and its use.

In early July 2022, the Government of Ukraine [presented](#) a draft large-scale recovery plan for international partners. The documents include more than 2 thousand pages and contain a list of projects in various fields, and the need for funds for such projects is estimated at USD 750 billion. Among the sources of funds for recovery, the Government of Ukraine sees the following:

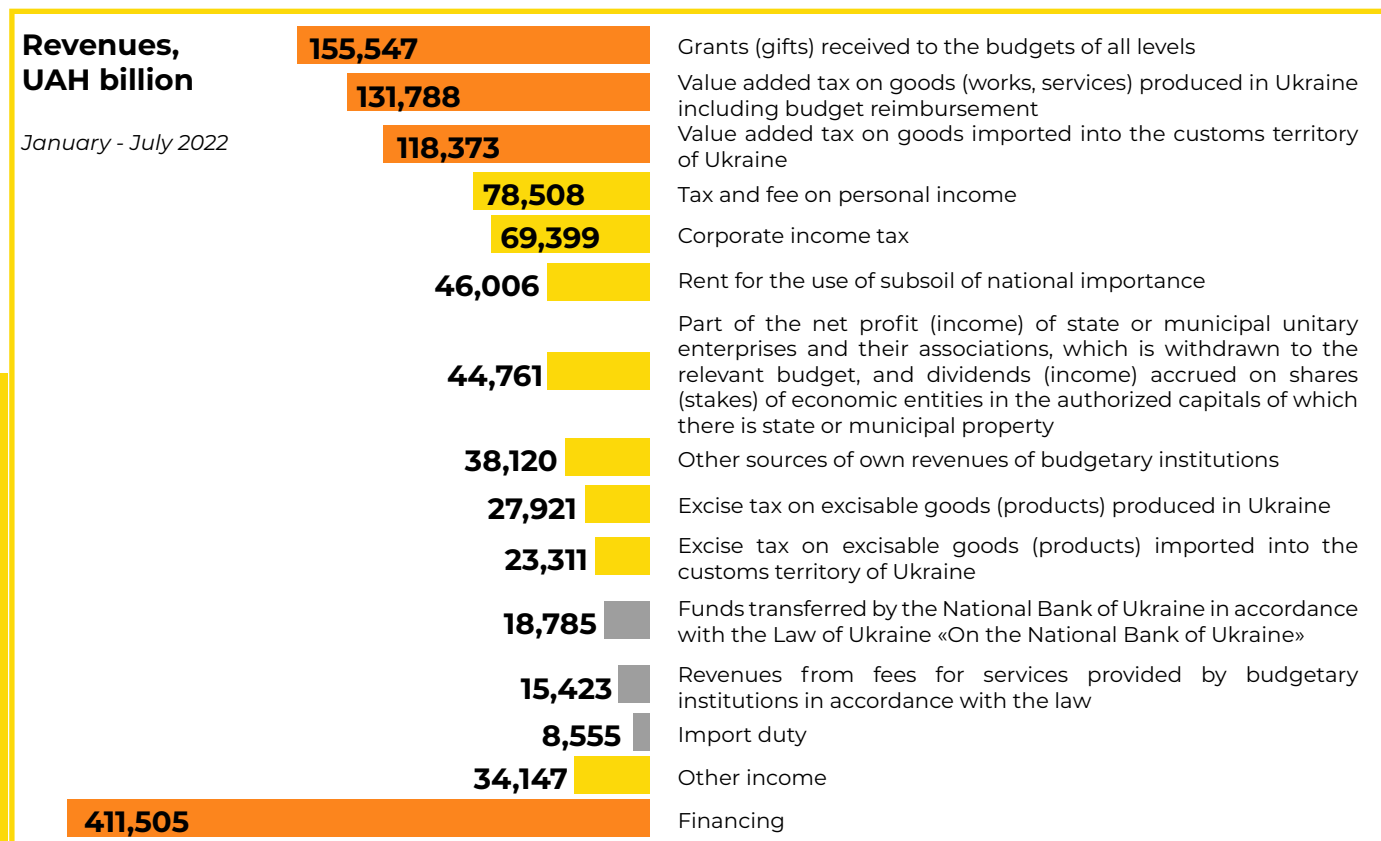
- assistance from partner states, international financial organizations and large international corporations;
- targeted assistance from partner countries to the affected regions (patronage);
- frozen and confiscated assets of the Russian Federation in Ukraine and other countries;
- contributions from private individuals;
- assistance from international humanitarian organizations and charitable foundations.

As of July 2022, the budget [received](#) about **UAH 160,616 billion** of assistance from the EU, foreign governments, donors (or 19.8% of revenues). At the same time, more than 40% of the total state budget expenditures are [directed](#) to security and defense needs. In fact, defense needs can be covered by revenues from international aid and VAT.

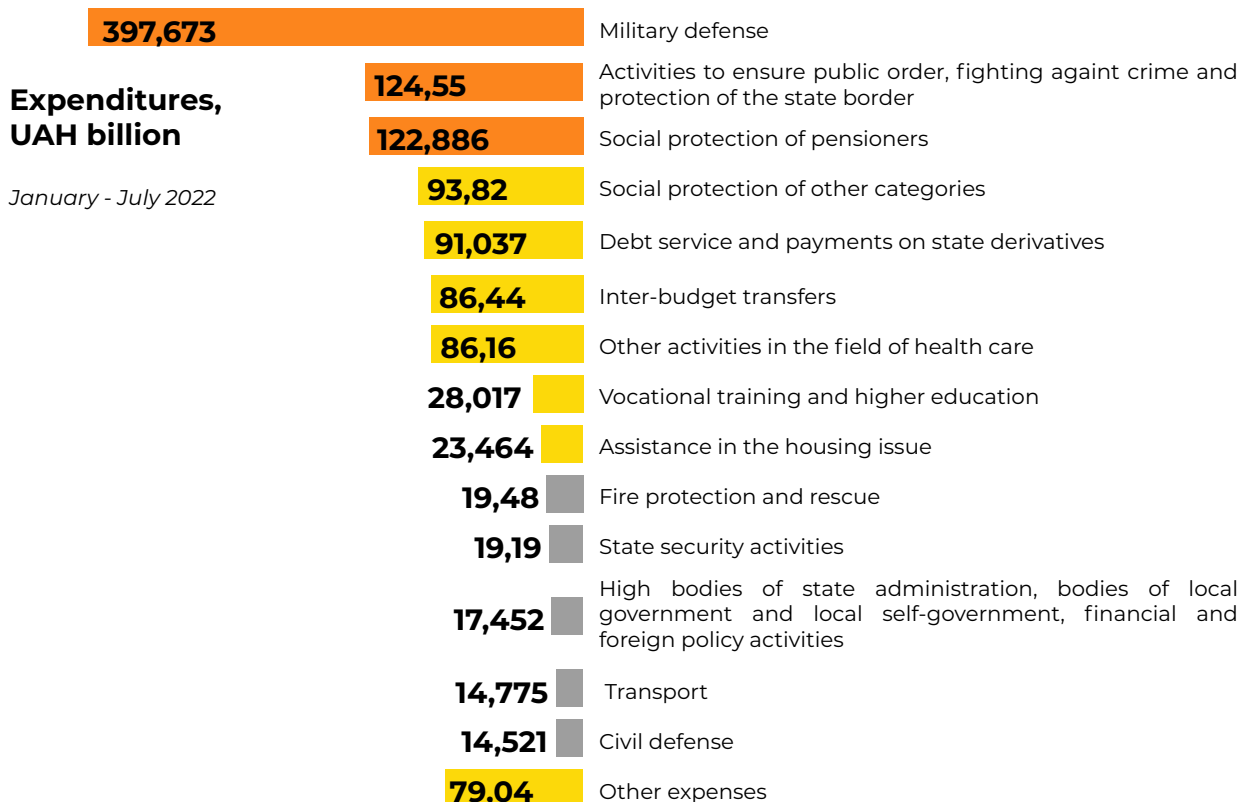
The state and state-guaranteed debt of Ukraine [amounted](#) to **UAH 3,539.29 billion**. During July 2022, the amount of public and publicly guaranteed debt of Ukraine [increased](#) by UAH 456.14 billion (while [decreasing](#) in dollar terms by USD 8.6 billion). According to the NBU [forecasts](#), the debt-to-GDP ratio will also increase significantly in 2022.

About two-thirds of the expected international assistance are loans from partner countries and international financial institutions (IFIs), which are provided on preferential terms – at low interest rates and for long periods, but carry currency risks in the future. At the same time, Ukraine continues to service its public debt on time. The Government also raises funds on the domestic market, but the amount of borrowings does not exceed the repayments for the corresponding period.

State of budget execution



State of budget execution



Source: [State Budget Web Portal for Citizens](#) as of 12.09.2022

In May, the European Commission (EC) [announced](#) the launch of an international coordination “Platform for the Reconstruction of Ukraine”, which will be co-chaired by the EC itself and the Government of Ukraine, and will work as a strategic management body responsible for endorsing the reconstruction plan developed and implemented by Ukraine. The Verkhovna Rada of Ukraine and the European Parliament will participate in the platform as observers. The RebuildUkraine reconstruction plan approved by the platform [will serve](#) as a basis for the EU and other partners to identify funding priorities and specific projects. The platform will coordinate funding sources and targets to optimize the use of funds, as well as monitor progress in the implementation of the plan.

Also, in early March, the World Bank [established](#) the Multi-Donor Trust Fund (MDTF) to facilitate the fast and secure transfer of targeted financial grants provided to the Government of Ukraine by international partners. And in early April, the IMF [created](#) an administrative account (Multi-Donor

Administered Account for Ukraine) to receive funds from donor countries. As [noted](#), funds to the administrative account will be able to come both in the form of loans and grants, and they can be provided not only by the governments of the IMF member countries, but also by international organizations.

In its turn, the European Investment Bank (EIB) [proposed](#) the establishment of the EU-Ukraine Gateway Trust Fund to stimulate private and public investment and support Ukraine’s recovery. According to the EIB, the Trust Fund should accept contributions from EU Member States and other countries and partners, and facilitate further cooperation between donors. The Fund could accumulate and provide guarantees, investment grants (which will be partially deployed by mixing with loans), as well as technical assistance and advisory services to improve the quality of projects and their further implementation. It is also noted that this instrument will be adapted to the requirements of the platform provided by the EC.

In Ukraine, the government has established [six recovery](#) funds through which money are collected in certain areas, in particular:

- for the restoration of destroyed infrastructure ([Property and Destroyed Infrastructure Restoration Fund](#));
- for economic recovery and transformation ([Economic Recovery and Transformation Fund](#));
- to support the work of small and medium-sized businesses ([Small and Medium Business Support Fund](#));
- to service Ukraine's international financial obligations ([Public Debt Service and Repayment Fund](#));
- for humanitarian needs ([Humanitarian Fund](#));
- to support the army ([Army Support Fund](#)).

Thus, the money accumulated through these funds should be spent on the needs depending on the specialization of the fund. As you can see, the specialization of the

existing funds covers a group of the most acute problems caused by the war. [UNITED24](#) fundraising platform was also created to collect donations to support Ukraine. The funds are transferred to the accounts of the National Bank of Ukraine and directed by the relevant ministries for the needs in three areas: 1) defense, demining; 2) medical aid; 3) reconstruction of Ukraine.

In addition, in mid-September 2022, the Office of the President of Ukraine [discussed](#) the draft of the Ukraine Recovery Fund as a financial instrument for post-war reconstruction. As noted, the Fund's activities will be based on the principles of full openness to donors and citizens of Ukraine, clear and effective control over the use of funds with the involvement of international partners. It was [reported](#) that the draft law on the Recovery Fund will be submitted to the Verkhovna Rada of Ukraine, however, as of mid-October, there is no such document.

RECOMMENDATIONS FOR HORIZONTAL REFORMS

The state of macrofinancial stability is a kind of real-time snapshot of the consequences of the war. Its temporary improvement is facilitated by increasing international assistance from partner countries, but it can be fully stabilized only by solving systemic problems, including those that were manifested in Ukraine before the war. Thus, an important element of post-war recovery of Ukraine is:

● **Judicial and anti-corruption reforms.**

Foreign investments are needed to reboot the economy, and a reliable business climate is extremely important for this. If now some investors have “frozen” their business in Ukraine for security reasons, before the war there were questions about the possibility to protect their interests in courts. One of the key needs of business is the protection of property rights. Therefore, the implementation of judicial and anti-corruption reforms remains a fundamental aspect of attracting investment, as well as a [prerequisite](#) for Ukraine's accession to the EU;

● **Public finance reform** to create conditions for economic growth and investment attraction. The World Bank [determines](#) that it is necessary to move away from the practice of supporting the public sector through tax privileges, reduce the influence of state-owned banks, accelerate the sale of

unproductive public sector assets, strengthen public procurement instruments, continue to ensure their transparency and efficiency, and the development of the insurance market is of high relevance. It is also important **to fully implement medium-term and switch to long-term budget planning.** Despite the fact that the medium-term budget planning is introduced at the level of the Forecast of Economic and Social Development and the Budget Declaration, not all budget entities have plans for 3 years. As a result, budget allocations are still allocated on an annual basis, and each year the decision to include budget requests is made anew by the Ministry of Finance as part of the budgeting process for the next year. This often results in projects and programs that should be implemented over several years not receiving funding for more than one year;

● It is important to **support small and medium-sized businesses**, which are the “backbone” of the Ukrainian economy (before the war, their contribution to GDP [was estimated](#) at 55%), to help them enter foreign markets (including through the Export Credit Agency, international projects, etc.), to look for ways to insure risks, and to create favorable conditions for the return of small and medium-sized businesses that relocated production outside the country

due to the war. It is necessary to work on **export diversification** in a new dimension: Ukrainian exporters should focus their efforts on exploring and occupying new markets and covering the share of the Russian market that has been released due to sanctions. Instead, the state should help businesses in the new conditions, and this should be reflected in the updated Export Strategy. The full [functioning](#) of the Export Credit Agency PrJSC and effective risk insurance mechanisms (including with the support of partner countries) are also important;

● **Privatization of state-owned banks**, [according to](#) experts of the Centre for Economic Policy Research, can facilitate Ukraine's access to international capital markets and increase investor confidence in Ukraine. The goal of reducing the state's share in the banking system of Ukraine to 25%, which is enshrined in the [Principles of Strategic Reform of the State Banking Sector \(Strategic Principles\)](#), should be achieved by 2025. Despite the risks of finding a buyer in the current security and macroeconomic situation, the idea of bank privatization has potential in the future, at later stages of recovery.

RECOMMENDATIONS FOR DONORS TO PROVIDE INTERNATIONAL ASSISTANCE

— **Close coordination and “interoperability” of donors are needed.** The international community's attention to the issue of Ukraine's recovery is unprecedentedly high. Various institutions are developing mechanisms to receive, use and control such assistance, but there is no leadership in this process, although there have been some [signals](#) of such leadership from the EU. A good example of the necessary coordination of assistance is the so-called “[Ramstein format](#)”, which allows to ensure the effectiveness and timeliness of military assistance to Ukraine from different countries.

— For the internal administration of aid in Ukraine, a possible solution may be to **identify an authorized state bank with an extensive regional network that could become a partner bank in the distribution of funds, in particular for financing “green” projects.** Taking into account similar experience in the implementation of energy efficiency initiatives, Ukraine could choose one of the state-owned banks and/or among those that have been [involved](#) in the mechanisms of the [Energy Efficiency Fund](#) and, accordingly, already have relevant experience and a regional network.

— However, we should not forget that the **“ownership” of donor assistance should remain in Ukraine**, which means that Ukraine retains the right to prioritize the use of funds, as well as responsibility for the final result. It is necessary to provide a mechanism for managing donor funds, where abuse would be prevented to the maximum extent possible, but which, at the same time, would

not deprive Ukraine of the right to decide how to use the assistance and prioritize where to direct it.

— **Aid should be prompt, but accountable and transparent.** Since the beginning of the war, foreign partners have responded promptly to Ukrainian needs and requests for assistance. Thus, [according to](#) the BRDO, as of the end of June 2022, financial assistance to Ukraine came from 21 countries and 16 international organizations, and humanitarian assistance – from 103 countries, 22 international organizations and numerous foreign companies. To ensure that such support continues, **Ukraine must show where it spends its recovery funds**, including through existing transparency tools: ProZorro, E-data, Open Data Portal, Prozorro. Sale. Medium-term budget planning, regular reports on the implementation of budget programs, as well as effective work of control and audit bodies are also important for Ukraine in terms of transparency: Accounting Chamber of Ukraine, Bureau of Economic Security, State Financial Monitoring, State Audit Service, etc. Since transparency builds trust, which is the key to the confidence of donors and investors in the proper use of the resources provided, and this will increase the volume and effectiveness of assistance in the future. In addition, **it is recommended to increase the transparency of state recovery funds:** despite the significant number of state recovery funds established (6), information on their use and the number of recovery measures financed remains closed. Understanding and taking into account the security risks, such information could still

be made public in a summarized form, for example, along the lines of the [UNITED24](#) fundraising platform, which shows the balance and distribution of funds by sector.

— **The resources provided for Ukraine's recovery should not increase its debt burden, if possible.** [As of](#) August 2022, the largest financial donors to Ukraine remain the EU and the US, which together promised over USD 10 billion in financial support to Ukraine. The US assistance is mostly in the form of grants, while the EU funds will mostly be [loans](#), albeit on preferential terms. In addition, negotiations on the restructuring of the external debt [are ongoing](#) and partially [successful](#). Thus, on July 20, a group of Ukraine's creditors from the G7 countries and members of the Paris Club of creditors (the "Group of Creditors") [announced](#) their intention to defer the payment of principal and interest until the end of 2023 with the possibility of extending the deferral for an additional year (until 2024). On September 14, Ukraine [signed](#) a Memorandum of understanding on the suspension of external debt payments with international partners in the G7 and the Paris Club. At the same time, in order to channel more resources to reconstruction rather than servicing new debt, it is important that most of the financial assistance be non-repayable - at least until Ukraine's macro-financial situation allows it to fully meet its debt obligations.

— One of the good [international practices](#) is the **mechanism of debt swaps**, which consists in an agreement with the creditor to partially or fully restructure the obligations of the debtor country, and the released funds are redirected to certain development-oriented goals (usually environmental and/or climate projects). The advantage of this instrument is the possibility to reserve funds for "green" recovery in the future. The weakness is that the debt restructuring process does not create a new resource, but only cancels the debt obligation and replaces it with an "environmental" one, which does not allow all funds to be released for priority recovery projects. Therefore, this instrument has the potential to be used rather in the long term and has an auxiliary nature in the overall debt management strategy. Another way to implement a swap - the creditor's entry into the debtor's capital (debt-to-equity swap) may look more attractive, but it concerns the debts of business entities, not the state, and may carry the risk of losing control over assets.

— Instead, **business can receive support for the development of activities from international financial institutions in the form of preferential lending.** Funds from international donors, in particular grants, are more attractive because they do not need to be repaid and interest is not paid. However, grants are usually smaller than possible loans and may take longer to process.

International financial institutions could develop and implement sector-specific recovery programs and finance business lending through Ukrainian partner banks.

On the one hand, IFIs have more opportunities to provide more favorable lending conditions. On the other hand, Ukrainian banks will have access to capital and will be able to improve their performance, which will have a positive impact on the banking sector. In addition, such a mechanism would allow financing business recovery directly, not through the mechanisms of the government's Recovery Plan, which are not yet fully defined.

— **The criteria for selecting recovery projects** are of particular importance, as the number of funded projects will be limited and they should be mutually consistent in terms of their objectives and activities, so that the implementation of one project does not contradict another and vice versa. Given Ukraine's status as an EU candidate country, the system of criteria should include performance indicators in the implementation of the Association Agreement, which is 65% implemented as of September 2022. Projects that do not meet the requirements of a particular EU directive or the goals of European integration cannot be selected for support. Equally important is the compliance with the [EU Taxonomy of Sustainable Economic Activities](#). Among other things, to ensure "green" recovery, donors should also set "sustainability criteria", e.g. take into account energy efficiency (in the case of housing) and emission reductions (rehabilitation of already modernized industrial plants).

— **Public control over the policy aimed at the country's recovery should be envisaged.** According to the results of a survey conducted by DiXi Group among representatives of energy companies in Ukraine, transparency is among the most important criteria for effective recovery of the country and trust in the government. In this context, civil society can be the link that can ensure monitoring and public oversight of the

post-war recovery processes. Also, to prevent abuses and corruption risks, it is important to have a permanent dialogue between civil society and the government, business representatives and foreign stakeholders. An example of such an effective dialogue with the involvement of the professional public can be the activities of the Multilateral Group for the Implementation of the Extractive

Industries Transparency Initiative, which operates in accordance with the [Law of Ukraine “On Ensuring Transparency in Extractive Industries”](#). The mentioned group consists of representatives of the state, business and the public on a parity basis and makes decisions by voting by a complex majority.

KEY THESES ON “GREEN” RECOVERY

The impact of the war on the Ukrainian environment should be interpreted in two dimensions. *On the one hand*, the war has damaged and continues to damage the Ukrainian environment, and Ukraine's natural system is in need of restoration measures. *On the other hand*, before the war, Ukraine implemented a number of environmental reforms (e.g. Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA)) and should have taken, but did not have time, further steps: coal phase-out, industrial pollution prevention, improvement of environmental tax, emissions trading system, etc.

Some of these reforms will be difficult to implement during the war and the reconstruction process. At the same time, Ukraine's [ambitious intentions](#) to achieve EU accession readiness by the end of 2024 require adherence to the environmental vector in reforms, and hence in recovery. In addition, before the war, Ukraine declared its [support](#) for policies under the European Green Deal, the implementation of which aims to achieve climate neutrality in Europe.

Therefore, within the framework of “green” recovery should be covered:

- **Actual recovery (reproduction) of natural resources** polluted or lost as a result of military actions. This should include the expansion of protected areas in order to ensure natural recovery processes, which partially takes place in the areas most affected by military operations. Thus, on September 22, the Kyiv Regional Council [supported](#) the submission of the Kyiv Military Administration and decided to establish 22 protected areas of Ukraine in Bila Tserkva, Brovary, Vyshhorod and Fastiv districts on the area of almost 600 thousand hectares and to expand the territory of the park-monument “Green Gate” in Sofiivska Borshchahivka village of Buchanskyi district by 9 hectares. Other initiatives include the

implementation of afforestation programs; implementation of mine clearance programs; compliance with EU horizontal environmental directives ([EIA](#), [SEA](#), [Environmental liability](#)) in the framework of project implementation as a prerequisite for “green” growth and an element of environmentally friendly planning;

- **“Green” element in post-war reconstruction.** As mentioned above, it is important to ensure the differentiation of [projects](#) within the draft [Post-War Recovery Plan of Ukraine](#): they must comply with the [principles](#) of “green” reconstruction and the requirements of the [EU taxonomy](#). At the same time, an individual approach should be applied during differentiation. For example, if there is a reconstruction of an object that is important for the physical existence of the community (a dam, a bridge), it should be restored as quickly as possible, assuming that all the necessary procedures for such an object have been carried out earlier. If it is a question of building a new plant on the site of the destroyed one, it is obvious that the process should take into account environmental and energy-efficient technologies and comply with all required environmental procedures, including EIA and SEA, if they are required;

- **Access to environmental information.** Transparency of environmental policy and awareness of the state of the environment is the key not only to successful recovery, but also to a full life. The right of free access to information on the state of the environment, as well as the right to disseminate it is guaranteed to citizens of Ukraine by Article 50 of the [Constitution of Ukraine](#). Such information cannot be classified by anyone. The [Aarhus Convention](#), to which Ukraine is a party, also stipulates that information on pollution cannot be classified. Although the legal regime of martial law allows certain restrictions of rights, environmental information should remain available and/or be

provided upon public requests. Currently, this is not always the case: for example, [according to](#) SaveDnipro, out of 34 data sources used by the SaveEcoBot system, 22 are closed. This situation, as well as the state of affairs with data openness in general, requires [changes, which DiXi Group emphasizes in particular](#):

- The **environmental tax** also needs to be reformed. This tax instrument, especially in combination with a debt swap for environmental needs, has the potential to become one of the sources of financing for “green” recovery measures. But for this, the approach to it should be radically changed: from the tax base to the [targeted use](#). In the EU, environmental tax [includes](#) taxes on resources, energy, transport and pollution. Instead, the Ukrainian environmental tax is [tied](#) only to the amount of pollutants and CO2 emitted into the atmosphere by stationary sources (Article 242 of the Tax Code). Thus, EU countries can use much more resources for “green” growth than Ukraine. For example, in 2020, EU governments [collected](#) an eco-tax of EUR 300.5 billion, or 2.2% of EU GDP and 5.4% of total EU revenues from taxes and social contributions. The largest part of EU environmental tax revenues in 2020 (77%) came from energy taxes. Transport taxes accounted for 19.3 %, while the share of pollution and resource taxes is still very small (3.7 %);

- **“Green” financing instruments** can be a good tool for raising funds. For this purpose, Ukraine has already created a legislative framework - the Concept for the introduction and development of the green bond market in Ukraine [approved](#) by the Government on February 23, 2022, as well as the practice of issuing green bonds by private and state-owned companies. In particular, in 2019, such securities were successfully placed by [DTEK Renewables](#), which was the first in the Ukrainian market, and in 2021 - by [Ukrenergo](#). In addition, there are many sustainable financing instruments that may be of interest to Ukraine in the context of post-war reconstruction, including green bonds, sustainability bonds, green loans and others. Moreover, IFIs offer their own green financing instruments. For example, as of 2020, the EBRD has provided over EUR 36 billion in green investments and financed over 2,000 projects that are expected to reduce greenhouse gas emissions by 104 million tonnes annually. In 2021, the Bank financed the installation of more than 1.9 GW of new renewable energy capacity and plans to further increase investments in renewable energy.



RECOMMENDATIONS FOR UKRAINE'S RECOVERY: SECTORAL DIMENSION



Every day the war causes large damages to the energy sector of Ukraine. As of September 5, 2022, direct and indirect energy damages are [estimated](#) by KSE Institute experts at USD 13.4 billion. Moreover, Russian troops continue to terrorize the civilian population of Ukraine and carry out missile and bomb attacks on critical infrastructure, depriving civilians of basic needs in electricity, gas and water supply. Since [February 24, 2022](#), more than 2.6 thousand settlements and 20.2 thousand transformer substations have been completely or partially disconnected due to the hostilities. [As of October 6](#), 1,299 settlements (about 725,800 consumers) in Ukraine were disconnected from electricity supply due to damage caused by hostilities. About 622,000 consumers were without gas supply. As of October 4, 976 de-occupied settlements - almost 64% of the total number of liberated cities and towns - were supplied with electricity. In total, over 200 days of war, [oil refineries and oil depots, power generating facilities \(nuclear power plants, thermal power plants, solar power plants and wind power plants\), coal mining, gas and electricity networks \(trunk and \[distribution\]\(#\)\) and \[equipment\]\(#\)](#), as well as numerous municipal infrastructure facilities have already been damaged.

As of September 22, 349 critical infrastructure facilities in the field of heat supply were [damaged](#) as a result of hostilities, including 335 boiler houses (332 damaged and 13 destroyed), 11 thermal power plants (7 damaged and 4 destroyed) and 3 thermal power plants. The [mines](#) "Zolote" and "Toshkivska" in the Luhansk region, "Pivdennodonbaska No. 1" and named after M.S. Surgai in the Donetsk region are not subject to restoration. In addition, as a result of large-scale missile attacks on Ukraine's critical infrastructure, which began on October 10 and hit thermal generation and electrical substations, Ukraine has [stopped](#) exporting electricity and is taking emergency measures to stabilize the energy system, including schedules of emergency disconnections of consumers. Given the fact that Ukraine's energy system continues to be threatened by terrorist attacks and missile strikes on the energy infrastructure by the Russians, and many critical infrastructure facilities have already been damaged, seized or destroyed by the occupation forces, Ukrainians are likely to face the most difficult winter since independence.

In addition, [since March 4, 2022](#), Zaporizhzhia NPP, the largest in Europe and the third

largest nuclear power plant in the world, which before the war [provided](#) almost half of all nuclear generation in Ukraine, has been under occupation. As of October 2022, the plant has been shut down and is not under the full control of SE «NNEGC «Energoatom», with interference in the work of the staff by the occupiers and representatives of Rosatom. There are constant provocations and shelling on its territory, which result in periodic external power outages.

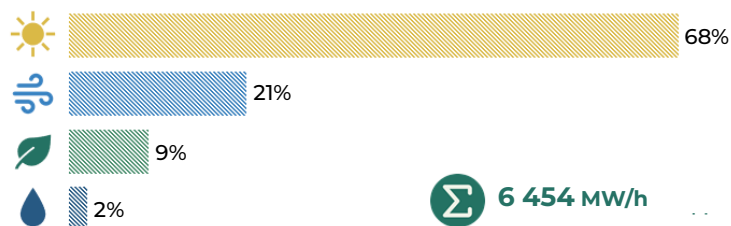
To support the restoration of the destroyed energy infrastructure, the [Ukraine Energy Support Fund](#) was established, which is managed by the Energy Community Secretariat. The donors of this Fund are EU Member States, international companies and corporations, and the funds are used to restore energy infrastructure that was damaged or destroyed as a result of hostilities in Ukraine. In addition, immediately after Russia's invasion of Ukraine, the Energy Community Secretariat established the [Ukraine Support Task Force](#), which manages and coordinates the door-to-door delivery of specialized energy equipment, fuel and materials needed to repair infrastructure damaged during the war. The coordination of requests from Ukrainian companies within the group and the fund is [entrusted](#) to the Ministry of Energy, and the selection of suppliers (if goods or services are purchased through the Fund) is carried out through international procurement agencies with experience in the energy sector.

A separate difficult situation is observed in the RES sector. The Kakhovka Hydroelectric Power Plant and about 40% of all renewable energy facilities [are under](#) temporary occupation. At the same time, [according to](#) the analytical center REN21, Ukrainian owners have lost control over 90% of wind energy capacities, as well as 30% of solar energy capacities.

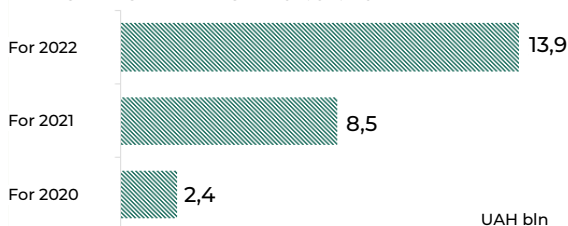
According to the results of a DiXi Group survey of representatives of Ukrainian energy companies, RES companies expressed concern about the crisis, which, in their opinion, is associated not only with the war, but also with the limitations of the state-guaranteed mechanism for supporting RES producers. Thus, as of the end of September, the average level of settlements with RES producers at feed-in tariff [was](#) only 46.9% in 2022.

Information on the level of settlements with producers at the feed-in tariff

ELECTRICITY PURCHASED FROM 01.01.2022



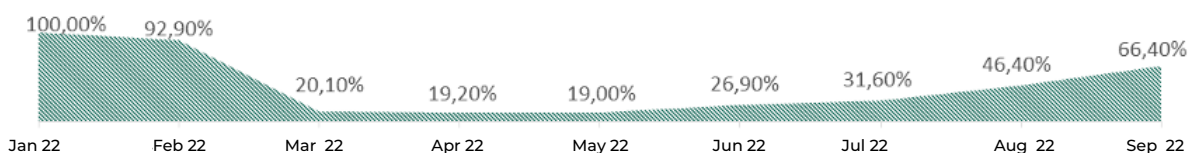
PAID WITH FUNDS FOR PURCHASED ELECTRICITY FROM 01.01.2022



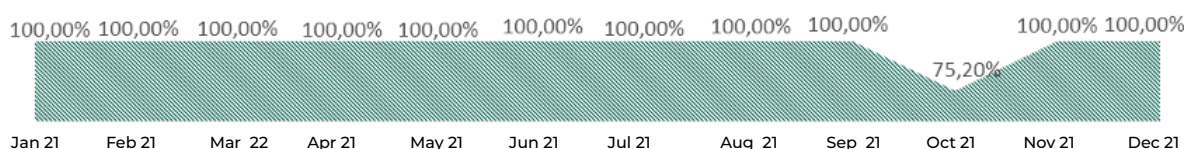
DEBT OF UKRENERGO



PAID FOR ELECTRICITY FROM 01.01.2022 FOR 2022 (IN TERMS OF MONTHS)



PAID FOR ELECTRICITY FROM 01.01.2022 FOR 2021 (IN TERMS OF MONTHS)



Source: "[Guaranteed Buyer](#)" (as of 28.09.2022)

Also, the results of the interviews showed that the surveyed companies in the sector were not involved in the formation of the Recovery Plan of Ukraine or had no opportunity to propose their projects to it (except for those who are members of business associations, as they were involved in the development of the Recovery Plan), while all companies in the sector stressed the need for "green" recovery.

RECOMMENDATIONS

Despite existing estimates, the actual losses of the energy sector are still difficult to assess. Given the importance of the continuity of electricity supply and, during the heating season, of heat supply in centralized systems, the restoration of infrastructure in many cases is virtually non-stop and begins immediately after the shelling and elimination of the

consequences by the State Emergency Service of Ukraine.

In this regard, it is important to better understand the effectiveness of coordination of assistance in the energy sector and therefore to ensure greater transparency of the Energy Support Fund for Ukraine and the Operational Support Group, which were established under the Energy Community Secretariat. The effectiveness of this support mechanism and the possibility of replicating approaches for other sectors is open, due to the lack of information about the achievements of the Fund and the Task Force. Currently, such information is limited to press releases of the Energy Community Secretariat, one of which [notes](#) that North Macedonia was the first Energy Community country to donate emergency power

equipment to Ukraine. Of course, the scope of transparency should be limited by security considerations, however, **the publication by the Ministry of Energy of generalized information on the amount of donations and/or equipment provided, as well as the number of restored energy infrastructure facilities** could be a compromise option to ensure transparency of the use of the Fund's resources.

The issue of data openness in the energy sector during the war deserves special attention. As in the case of environmental information, many datasets are closed for security reasons. The Ministry of Digital Transformation of Ukraine announced a [public discussion](#) of draft amendments to the relevant resolutions of the Cabinet of Ministers, which, if adopted during martial law, will allow information managers to partially or completely close access to published datasets in “manual mode” using an application programming interface. In DiXi Group's [opinion](#), if at the beginning of the invasion the decision to close access to data was justified as a response, now the determination of data for publication requires more comprehensive work. Initially, it is advisable **to develop a universal approach to identify information that may pose a threat to national security, and after this step - to identify those data sets whose publication should either be stopped completely or published with changes (in aggregated form or with a delay)**. Leaving such differentiation to the discretion of information managers will lead to abuse, distortion or complete closure of information, which in turn will set the open data reform back a step.

It is also important to take care of the protection of energy infrastructure facilities not only in case of their damage during hostilities, but also in the strategic perspective. In November 2021, the [Law of Ukraine “On Critical Infrastructure”](#) was adopted, but measures aimed at substantive implementation have not been taken. For example, only in October, the authorized body in the field of critical infrastructure protection (State Special Communications Service) and information exchange between the subjects of the national critical infrastructure protection system was [determined](#) (there is a corresponding [list](#) of sectors and bodies). However, **in order for the National Critical Infrastructure Protection and Resilience System to work, it is necessary to create a register of objects, organize processes for**

their certification and security monitoring, develop and start implementing resilience plans at the local level, etc.

RECOMMENDATIONS FOR “GREEN” RECOVERY

● **Ukraine's energy policy should focus on 4 pillars: decarbonization, energy efficiency, diversification of energy supply sources and further deeper integration with the EU energy system.** These four components are important not only in achieving climate neutrality, but also in ensuring energy security and sustainability. Moreover, on the way to full integration with the EU, reducing dependence on fossil fuels, launching full-fledged electricity trade, diversifying sources of energy supply, and reducing “unnecessary” energy losses are not just important, but necessary.

● **A more flexible, decentralized system, an increase in distributed energy generation from renewable energy sources,** in particular through the creation of a class of prosumers (consumers-producers of energy) can help to achieve a higher level of energy security. Thus, households and businesses can produce electricity from RES and supply the surplus to the grid, with the possibility of its further use at a convenient time. As of the end of 2021, there [were](#) about 45 thousand households in the country using solar panels with a total capacity of more than 1.2 GW, their number has been growing rapidly since 2019. In this context, the legislative [initiative](#) of the Ministry of Energy to introduce a net billing mechanism is important and timely. With the development of distributed RES generation and energy storage systems, we can talk about virtual power plants and other ways of managing the power system.

● **The Ukrainian gas storage and transmission network should be optimized and integrated into the European gas infrastructure.** Ukraine's gas transmission system is [considered](#) one of the largest in the world, but significant unused capacities require its optimization and modernization for new gas flow directions (e.g. North-South instead of East-West). In addition, in a climate-neutral future, it is important to adapt the grid to the prospects of renewable and synthetic gases (biomethane and hydrogen). For biomethane projects, there is already a legislative basis (the [Law of Ukraine “On Amendments to Certain Laws of Ukraine on the Development of Biomethane Production”](#)

adopted in October 2021), the first [projects](#) of connection to distribution networks and the [launch](#) of biomethane plants are planned, but hydrogen projects are still for a longer perspective.

● **It is necessary to continue implementing the policy of abandoning the use of coal with the simultaneous transformation of coal regions, diversification of the economy of such regions and creation of conditions for their reorientation.** On September 22, 2021, the Cabinet of Ministers [approved](#) the concept of the State Target Program for the Fair Transformation of Coal Regions of Ukraine for the period up to 2030. And in 2022, it was planned to launch pilot projects for the transformation of coal regions in Chervonohrad (Lviv region) and Myrnohrad (Donetsk region) with the support of international partners. However, given the military actions, partial loss of coal industry assets, flooding of mines, it is obvious that there are no noticeable steps in this direction. However, the matter does not lose its relevance, so the transformation of coal regions along with the abandonment of coal should be based on fair, inclusive and socially acceptable approaches, take into account economic feasibility and existing infrastructure, as well as relevant experience of EU countries in creating support and financing instruments.

For example, [Polish Silesia](#) implemented a gradual transformation - along with the restructuring of the mining sector, there was a reorientation to the service sector. There was an inflow of investments into the region, the automotive sector and high technology were developing. There was a decrease in pollution, museums and cultural objects dedicated to mining were opened, housing in mining areas was redeveloped. In [Germany](#),

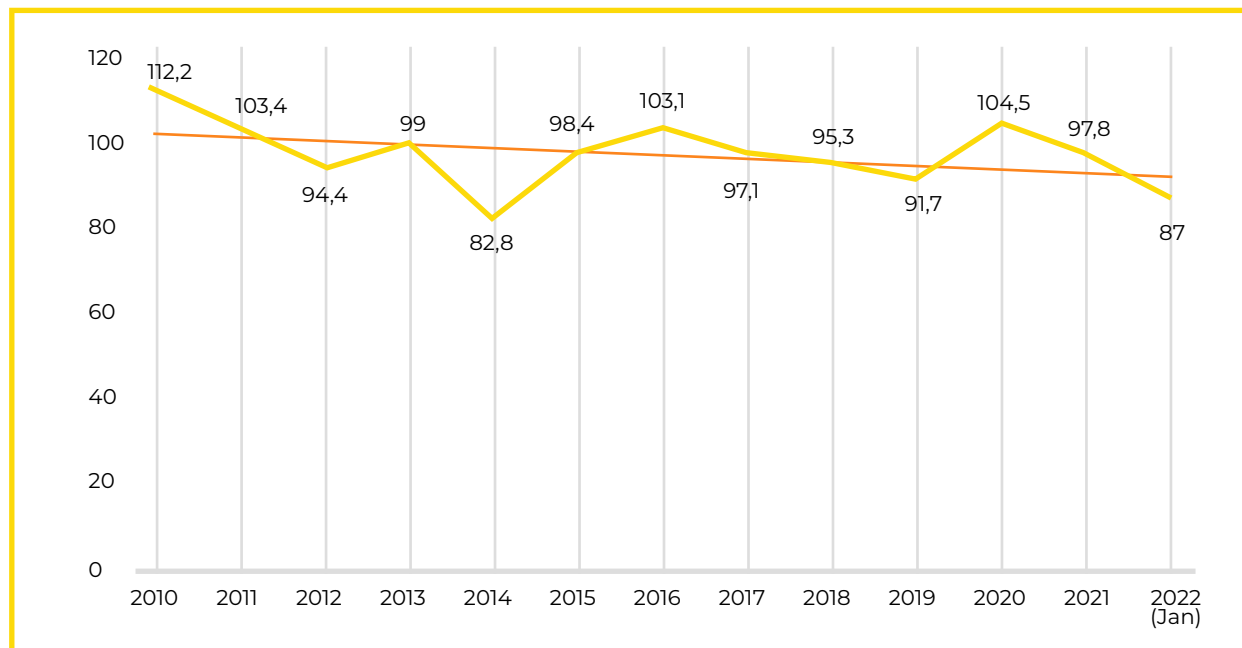
during the crisis in the coal industry, a dual approach was applied: subsidies to support existing mines and diversification of the economy of the Ruhr region (stimulation of innovations in other industries besides coal). A number of measures were also developed to restructure and retrain the workforce, promote technological innovation and redevelop residential areas. As a result of the restructuring of the economy of the coal region of [Los en Goel in the north of France](#), a business center and research center for sustainable development resources was built and about 350 jobs were created.

● **Also, Ukraine should return to the formulation of specific deadlines for the phase-out of coal in electricity generation and heat supply,** while Ukraine's capacity to ensure such a phase-out should be assessed, taking into account the impact of the war on the Ukrainian energy sector. This political decision should also take into account the fact that a significant part of the financial resources that in peacetime would have been directed to the diversification of the economy of coal regions and social programs for dismissed workers, will be primarily spent on the maintenance of the dismissed facilities in a safe condition for the environment and people (necessary measures to pump water out of flooded mines, degassing, rehabilitation of territories, monitoring of the environmental situation, etc.) Therefore, the need to attract international technical assistance will increase.

INDUSTRY

The situation with the development of industry in Ukraine was difficult even before the war, and has only worsened since it began. The industrial production index has fluctuated over the last 10 years, tending to decline.

Index of industrial production, %



Source: [Ukrstat](#)

Since the beginning of the war, some industrial enterprises were forced to stop production, and some suffered significant damage as a result of hostilities, which is difficult to assess. Overall, about 30-40% of metallurgical capacities of Ukraine were [lost](#). The blockade of ports, partially lifted for grain exports, has nevertheless [affected](#) export supply chains: railway capacity in Ukraine and the EU cannot compensate for sea and river logistics. Ukrainian industry has also faced reduced demand, and some companies have problems with raw material supply. For example, the logistics chain of Arcelor Mittal Kryvyi Rih [provided for](#) the supply of 30% of coal from Arcelor Mittal Temirtau (Kazakhstan), which was shipped through Russia. The loss of personnel due to relocation to other regions and abroad was also a challenge.

The problem of modernization of capacities becomes a separate step, because in 2019 the industry [generated](#) 23% of greenhouse gas emissions in Ukraine. This is the second place after electricity production (27.8%). Modernizing the industrial sector is a difficult and expensive task. "Green" technologies that currently [exist](#) are quite expensive and not applicable to all industries and productions, some are even experimental. On the other hand, there are best available technologies and practices ([BAT](#)) in energy and industry

that are used in Europe, but Ukraine has not yet defined their application at the legislative level. At the end of 2021, a number of draft laws were developed (No. [6004](#), [6004-1](#), [6004-2](#)), each of which defined a different scenario for industrial pollution prevention reform. None of these draft laws has yet been considered by MPs at the plenary session of the Verkhovna Rada of Ukraine. The reform of the industrial sector requires a political decision, as the implementation of the requirements of Directive 2010/75/EU in any configuration causes resistance from business, and in the conditions of war this problem will only worsen, as it will be even more difficult to make the necessary investments in modernization against the background of losses.

However, restoration of industrial capacities using previous technologies and fossil fuels is likely to [be an unviable option](#), given the future extension of the Carbon Based Import Adjustment Mechanism (CBAM) and other policies under the EGD to Ukraine in connection with future EU membership. DiXi Group experts conducted a separate extensive [study](#) on the reform of industrial pollution prevention, where they proposed optimal scenarios for the implementation of state policy.

RECOMMENDATIONS

Ukrainian industry must become powerful and competitive after the war. Large-scale losses require the government to respond to the needs of industry and implement a set of measures aimed at:

- **Searching for new sales markets** for Ukrainian industrial exports, which should be reflected in the updated Export Strategy, and developing **risk insurance** mechanisms (including with the support of partner countries)
- Long-term reduction of duties, abolition of quotas and **elimination of other trade barriers** for Ukrainian industrial products (based on the temporary regime of abolition of import duties on Ukrainian exports [introduced](#) by a number of allied countries);
- **Building new logistics routes** for the sale of products, which consist in expanding the capacity of the railway (renewal of the fleet of wagons and locomotives, construction of new tracks, warehouses and transshipment terminals). This will partially help to solve the logistical problem of passenger traffic: when air travel within the country is not available, the expansion of the railway network will relieve passenger traffic, which in turn has also changed its structure during the war.
- **the possibility of postponement or transition period for Ukraine in the implementation of the CBAM.** Ukrainian industry will not have equal opportunities to adapt compared to other countries directly or indirectly affected by the CBAM. The timing of this postponement may depend on when Russia's war against Ukraine ends and the degree of destruction of the industrial sector. [According to](#) DiXi Group estimates, the end of the war in early 2023 and the current level of destruction gives the Ukrainian industry a prospect to carry out eco-modernization measures, apply BAT, and the state - to adopt the relevant legislation. This will reduce the pressure of the CBAM on the Ukrainian industry, as it will be more in line with EU standards. In case the war continues, the scenarios of industrial pollution prevention reform become more uncertain, and Ukraine will need some deviations from the CBAM.

RECOMMENDATIONS FOR A "GREEN" RECOVERY

An effective way to stimulate the modernization of Ukrainian industry would be to combine a number of actions that require difficult but necessary political and industrial decisions:

- **The Verkhovna Rada of Ukraine should adopt framework legislation** and launch industrial pollution prevention reform (draft law No. [6004-2](#));
- Business voluntarily starts to **implement BAT, and "dirty" modes of transportation (road transport) are replaced, where possible, by more environmentally friendly modes of transport** (electric railway and inland waterways);
- For better coordination, the Government should better **synchronize the goals, objectives and timelines** of the updated NDC, NPER, Concept for Implementation of the State Policy in the Field of Industrial Pollution, etc. Such synchronization should also be done for the Recovery Plan of Ukraine, which is currently being actively prepared by the Government.
- It is also necessary to develop **effective financial instruments** to support "green" transformations. These instruments should be synchronized with the development and further implementation of the Post-War Recovery Plan of Ukraine. And the Plan itself should provide funding not only for the restoration of damaged energy facilities, but also for the installation of modern equipment to meet the requirements of Directive 2010/75/EU.
- The government is recommended to **update the Concept of Development of the Gas and Oil Refining Industry of Ukraine**, taking into account the challenges caused by the war, as well as to take into account the requirements for the application of environmental standards that comply with BAT during the restoration of industrial capacities.
- It is necessary to develop programs for **retraining and vocational training of personnel**, in particular in the coal and coke-chemical industries, where jobs will be cut as a result of the "green" transformation of the economy.

URBAN AND COMMUNITY DEVELOPMENT

According to the United Nations High Commissioner for Refugees (UNHCR), as of 13.09.2022, 12,660,508 people [left](#) Ukraine, of whom 5,755,970 have already [returned](#) to Ukraine. Although this is an optimistic trend, according to a UNHCR survey, about two-thirds of refugees from Ukraine [plan](#) to stay in host countries until the situation with hostilities and security changes, as they are concerned about their future because of the war and cannot make safe long-term plans.

As of June 2022, as a result of the full-scale invasion of Russia, more than 350 thousand objects of residential, educational, medical, sports infrastructure were [destroyed](#), thousands of kilometers of roads and railways, airports, ports, etc. were damaged. As of September 5, the losses of housing stock and infrastructure of Ukraine during the full-scale invasion of Russia in Ukraine are [estimated](#) by experts of KSE Institute at USD 82.9 billion. According to the Ministry of Regional Development, as of September 22, 349 critical infrastructure facilities in the field of heat supply were [damaged](#) as a result of hostilities, including 335 boiler houses (332 damaged and 13 destroyed), 11 TEL (7 damaged and 4 destroyed) and 3 thermal power plants. Moreover, due to the massive missile strikes on the territory of Ukraine, which began on October 10, thermal generation facilities and electrical substations were damaged, which led to the application of emergency shutdown schedules for electricity consumers in many regions of Ukraine. Thus, a significant part of the centralized heat supply infrastructure of Ukraine in the war-affected settlements is damaged and cannot be restored. Targeted missile attacks on critical infrastructure on the eve of the heating season ([Kharkiv CHPP-5](#), [dam in Kryvyi Rih](#)), if systematic, will also weaken the energy resilience of communities.

As we have already mentioned, Ukraine is likely to face a difficult heating season. As of October 3, 2022, 13.9 bcm of gas was [accumulated](#) in Ukraine's gas storage facilities out of the 19 bcm target set by the government. In August, the Chairman of the Board of Naftogaz Yuriy Vitrenko [doubted](#) the reality of achieving this figure without additional imports. However, at the government level, at the end of September, it was [noted](#) that at the beginning of the heating season it is planned to accumulate 14.5-15 billion cubic meters of gas. At the level of cities and communities, measures are being taken to form stocks of reserve fuels

(fuel oil, firewood) for heating systems and other emergency preparations (e.g., purchase of generators and mobile boilers).

In addition, communities and cities had and still have a number of pre-war problems that hindered their development and "green" growth, among them:

- Outdated, therefore inefficient and environmentally unfriendly public transport (the share of electric transport [is](#) only about 60%, 92% of trams, 78% of subway cars, 63% of trolleybuses have been in [operation](#) for more than 15 years), public transport enterprises are heavily subsidized;
- Low energy efficiency of residential and non-residential buildings (85% of the housing stock of Ukraine was [built](#) before independence, due to the age and deterioration of structures, these buildings consume 40-70% more energy compared to new buildings);
- Unsatisfactory condition of the municipal infrastructure, in particular heat, water supply and sewerage systems (the total length of heating networks [is](#) 20,326 km, of which 8,519 km, or 41.9%, are [recognized](#) as dilapidated and emergency. Actual losses in the heating networks of NEURC licensees as a percentage of the total heat supply to the network in 2019-2020 [amounted to](#) 19.6% and 22.8%, respectively.
- Unsatisfactory condition of drinking water supplied to consumers and the condition of treatment facilities (drinking water supply in Ukraine is [provided by](#) 80% from surface sources and by 20% from underground sources). The quality of wastewater treatment is also low, and monitoring of the water quality of surface water bodies shows that their ecological condition is practically not improving);
- Insufficient capacity of the garbage and other waste disposal system, insufficient number of disposal enterprises (in 2020, about 12,634.6 thousand tons of solid waste was [generated](#), and 7,521.5 thousand tons were removed). This complex problem has been partially addressed at the national level: the [National Waste Management Strategy until 2030](#) has been adopted. According to the strategy, the level of municipal waste disposal should be reduced from 94% to 35% by 2030. That is, in 8 years, Ukraine needs to

go the way that other countries [took](#) almost twice as long. In June 2022, the Parliament adopted the framework [Law of Ukraine “On Waste Management”](#), which will enter into force in July next year.

- Ineffective state policy on energy prices and utility tariffs, and the related system of subsidies for vulnerable groups (e.g., as of May 2020, the weighted average price of electricity for the population was [half](#) as low as for small non-household consumers of the 2nd class; to regulate the situation in the gas market and in the field of heat supply, a [special law](#) was adopted requiring the allocation of UAH 76 billion from the state budget to compensate for the difference in tariffs). Also, the population receives subsidies that are not properly verified, and therefore are not always provided to those who really need it (there is no definition and procedure for protecting vulnerable consumers).

RECOMMENDATIONS

Given the large number of temporarily displaced persons who have not returned from abroad, Ukraine may face the loss of a large number of working-age people, which in turn will have a negative multiplier effect: it will affect the labor market, the development of small and medium-sized businesses, tax payments, etc. Accordingly, it is important to implement measures aimed at **stimulating the return of displaced persons to Ukraine, taking into account their basic needs - security and integration** (for those who temporarily cannot return to their place of residence and/or lost their jobs and/or housing during the war). This requires:

- **Protection of critical infrastructure with reliable air and missile defense systems and provision of settlements with sufficient number of shelters**, including for already constructed buildings that do not have such shelters. At the same time, according to the [amendments to the construction legislation](#), all new buildings should be built with appropriate shelters.
- **Incentive programs, such as free education (retraining), provision of temporary housing, one-time assistance “for returning to Ukraine” for certain categories of persons.** Effective cooperation with countries where displaced persons have moved to, primarily Poland, is also needed to promote the development of Ukrainian communities and create incentives for

their return to Ukraine. It is also necessary to develop measures that would provide returnees with jobs, such as special incentive programs for employers, grants for setting up their own small businesses.

It is also necessary to make the public utilities system cost-effective and resistant to security and other risks:

- To continue the **reform of housing and communal services** in terms of managing apartment buildings through condominiums, to develop a plan for **gradual alignment of utility tariffs** to the break-even level and to direct the available state support instruments to really **vulnerable consumers** (see a separate [study](#) by DiXi Group);
- At the same time, the population should receive **additional support tools for energy efficiency measures** that will help them to offset the cost of utility bills. Such tools could include loans for condominiums for partial and comprehensive modernization of buildings, programs for modernization/replacement of gas boilers, heating points and other equipment, compensation of part of the costs of energy efficiency measures (city programs, revolving funds, etc.), provided that they are developed and scaled up.
- As we mentioned in the previous sections, the first steps have already been taken at the national level to implement a critical infrastructure resilience system. Meanwhile, the current situation with the shelling of critical infrastructure reveals the need to **strengthen the energy resilience of communities**. For example, this can be achieved through the development and implementation of regional energy resilience plans (Energy Assurance Plans) following the example of the United States, where such plans are developed for each state, and in some cases - for the federal district (e.g. [Arizona Energy Assurance Plan](#), [DC Energy Assurance Plan](#), [Washington State Energy Assurance and Emergency Preparedness Plan](#)). Implementation of such plans will give communities a well-developed mechanism for coordination and response to threats and will regulate the issue of creating reserves in case of crisis situations.

RECOMMENDATIONS FOR “GREEN” RECOVERY

- The international assistance that is coming to Ukraine and is planned to be provided in the future can be used to restore the municipal infrastructure. Following the approach already applied by leading institutional donors and investors, **the criteria for allocating funding should be the transition to new energy efficient technologies and sustainable development of the community as a whole.** Such approaches should be applied to the construction of new water treatment plants, sewage facilities (collectors), repair and laying of new heat and water supply networks.

- **Energy efficiency should be a priority** and become a cross-cutting component in the rehabilitation of not only housing stock, but also public buildings. The first steps in this direction have been made. In early July 2022, the Verkhovna Rada adopted the [Law “On Amendments to Certain Laws of Ukraine on Creating Conditions for the Implementation of Comprehensive Thermal Modernization of Buildings”](#) aimed at strengthening energy efficiency measures and thermal modernization of buildings, and the Energy Efficiency Fund [plans](#) to launch a new program to provide financial support to co-owners of apartment buildings to restore housing damaged as a result of hostilities. It is important in this process to launch the program quickly and to have enough financial resources to cover the requests of the population for housing reconstruction. It is also important to **continue the installation of heat meters and the implementation of heat supply systems modernization programs;**

- **Cities and communities should, where possible, make the transition to renewable energy sources in heat supply.** For example, a DiXi Group survey of representatives of energy companies in Ukraine showed that some companies already have successful cases of switching from gas to biomass in heat supply. According to their experience, the use of biomass can fully cover the needs for energy supply in winter for certain communities, reduce the cost of heat production and contribute to the development of the economy of these regions.

- **It is necessary to accelerate the development of secondary legislation necessary for the implementation of the Law of Ukraine “On Waste Management”,**

so that in July next year it could not only formally enter into force, but also work fully. This is necessary, in particular, for the full sorting of household waste, the introduction of new modern means of waste disposal, the construction of waste processing plants, solid waste landfills with the ability to generate electricity and heat from methane, and the establishment of responsibility of industrial waste producers;

- **Traffic flows in cities and intercity connections should be reoriented from less environmentally friendly automobile to more environmentally friendly electric and river transport** (where possible). For this purpose, cities should create the appropriate infrastructure and develop the latest technologies (for example, the use of compressed and liquefied natural gas, hydrogen as a fuel for urban transport). Of particular importance is the formation of an appropriate culture of the population to the use of bicycles and micro-mobility, which are also important elements of decarbonization of the transport sector. For Ukraine, following the best European experience, it is important to accelerate the development of the National Cycling Strategy, which was launched in 2020, which sets out requirements for local authorities and local self-government bodies to develop local cycling strategies and targeted development programs for cities, regions and communities for the systematic development of the cycling system, as well as to ensure the development of a draft law that will stimulate the development of micromobility.

- Cities most affected by the Russian aggression could make **greater use of green financing instruments offered by donors.** For example, the EBRD provides support to build a better and more sustainable future for cities and their citizens through its Green Cities programme. As of June 2022, the programme includes 7 Ukrainian cities, including Kyiv, Lviv, Kharkiv, Khmelnytskyi, Kryvyi Rih, Dnipro and Mariupol. Given the EBRD's active involvement in supporting projects in Ukraine (investments in 2021 amounted to more than EUR 1 billion), this program may become a tool in the future for the restoration of Ukraine and the “green” reconstruction of cities. However, such re-profiling should be the subject of separate negotiations.

AGRICULTURE

The share of agriculture in Ukraine's GDP was [one of the highest](#) among the sectors of the economy and amounted to [10.6%](#) in 2021. Agri-food products also accounted for the largest share of Ukraine's total exports - about 41% for the year.

However, the war has made its own adjustments to the development of the sector. [According to](#) experts of the Kyiv School of Economics and the Ministry of Agrarian Policy of Ukraine, direct losses from the war in agriculture of Ukraine reached USD 4.3 billion, indirect losses (reduction of production, blockade of ports and rise in prices of production factors) are [estimated](#) at USD 23.3 billion. And despite the fact that the development of the agricultural sector under martial law is trying to [support](#) both at the state level (under the program of preferential loans "5-7-9" to support agricultural producers, Ukrainian banks as of June 8, 2022 [issued](#) UAH 38.5 billion) and in the framework of cooperation with the EU and international donors (e.g. USAID Rural Development Program), the sector still faces many challenges. Among the biggest [problems](#), in addition to security, are disrupted logistics and loss of supply chains, lack of working capital, fuel shortages and rising prices, lack of human resources and loss of production resources.

It is worth mentioning the loss of natural resources, which in particular meet the needs of agriculture (water, soil and forests), the impact on which is analyzed in detail in the [DiXi Group analytical document "100 days of war: consequences for the Ukrainian environment"](#):

- **Contamination of fertile soil layer** due to: shell explosions; leakage of pollutants and hazardous substances from damaged tanks, oil products and fuels and lubricants; waste leakage on the terrain due to the destruction of filtration field dams, destruction of treatment or hydraulic structures; corpse poison due to mass deaths of animals and people; degradation of vegetation cover, increased wind and water erosion from the movement of heavy machinery, construction of fortifications and hostilities, etc;
- **Water resources are polluted** as a result of: pollutant emissions due to damage to treatment facilities, equipment of industrial facilities, violation of the integrity of chemical warehouses; leakage of oil products and fuels

and lubricants, including from broken military equipment; mining of water bodies and their coasts, explosions of ammunition in water bodies; unauthorized burials, unauthorized dumps, waste, broken equipment in the regions of active hostilities near water bodies; malfunctioning of pumping stations that pump water from non-operational coal mines;

- **Forests suffer from:** fires as a result of shell explosions, explosions of military equipment, which lead to the destruction of vegetation cover of valuable plant species; movement of armored vehicles; burning of wood to meet the vital needs of people in cities where communications are destroyed, as well as its use outside the city for military purposes, including the construction of fortifications; harmful effects of acid precipitation resulting from numerous explosions and large-scale fires, etc. Almost 20% of the territory of Ukrainian forests was [damaged](#) during the hostilities and due to the intense fighting within the forest plantations, most of the territory remains mined.

RECOMMENDATIONS

To restore the agricultural sector and ensure its sustainable operation, it is necessary to solve 3 main problems that were [identified](#) at the level of the Prime Minister after the completion of the sowing campaign.

- The first of these problems is the **export of the harvest**. Due to the blockade of Ukrainian ports by Russia, 23.5 million tons of grain and oilseeds remain. [According to](#) the Ministry of Infrastructure, 4.27 million tons of agricultural products have been exported under the "grain initiative" since the first ship with Ukrainian food left the port. So the problem is being solved, albeit slowly. At the same time, the Ministry of Infrastructure and the Ministry of Agrarian Policy should continue to **look for ways to increase the throughput capacity on the western border of Ukraine for the export of agricultural products by rail and to create capacities for storage and transshipment of agricultural products (warehouses, logistics hubs, etc.)**.
- The second problem is the **preservation of the new harvest**. A possible solution, which is being [considered](#) by the government, is the organization of **mobile grain storage facilities**, which will allow Ukraine to increase the storage capacity by 10-15 million tons. This

solution is recommended for elaboration, but taking into account its technical features. For the implementation of such a project, it is necessary to [ensure](#) good quality of the site (preferably asphalt), the availability of a source of electricity, to eliminate the risk of moisture, manual labor when covering the oval grain storage with heavy tents.

- The third challenge is **providing farmers with fuel**. To overcome it, the Ministry of Agrarian Policy has [launched](#) a platform to help farmers in the sowing season, based on the collection of data of which international partners sent assistance if necessary. One of the key needs was fuel. And although the crisis was provoked by Russian aggression and attacks on Ukrainian oil depots, the situation with fuel, in particular in the agricultural sector, brings Ukraine back to the **need to create minimum stocks of oil and petroleum products, the requirements for which are set by Directive 2009/119/EU**, as a reserve for the functioning of critical infrastructure, as well as the agricultural sector.

Of course, the solution of these problems and cash gaps caused by the difficult sales of products due to the war will require preserving the access of farmers to capital, so the continuation of preferential lending programs for producers will be a necessary condition for such recovery.

RECOMMENDATIONS FOR “GREEN RECOVERY”

To ensure “green” recovery in agriculture, it is important, first of all, to create conditions for the reproduction of natural resources. A separate challenge is mine contamination, which does not allow the full use of agricultural land and leads to injuries to workers.

In addition, we consider the following steps necessary:

- It is necessary to **develop and implement programs for the restoration of forest, water and soil resources**. For example, for the restoration of forest resources, it is advisable to resume the launched [initiative](#) of afforestation of Ukraine – “Green Country”, which provides for the planting of 1 billion trees in 3 years, for water resources - to provide for appropriate health and protection measures in the draft [Water](#) Strategy and the current [Marine](#) Environmental Strategy, for soil

restoration such documents only need to be developed, they are currently [absent](#). It is also possible to take as an example the approach of programs and initiatives abroad, such as the Great Green Wall - for the re-greening of territories after clearing from mines and ammunition, increasing resilience to climate change and restoring biodiversity; and the Peace Forest Initiative - for transboundary management of shared natural resources in the restoration, rehabilitation of degraded lands and forests in vulnerable and post-conflict regions.

- Agricultural enterprises need support to resume their work. Despite the already available instruments of state and international support, agriculture, according to the World Bank, still [needs](#) crediting. This is especially true for small and medium-sized farms, which currently cannot afford the latest equipment that reduces greenhouse gas emissions. Therefore, it is important to **develop special programs to help farmers implement climate-friendly projects, for example, preferential lending for asset restoration and modernization, the introduction of no-till farming, strip-till, and other technologies for soil restoration;**

- **More “green” technologies should be given preference in financing agricultural sector rehabilitation projects.** “Green” rehabilitation of the agricultural sector [should](#) focus on organic production based on the circular economy model and best available technologies and practices aimed at reducing pressure on water sources, reducing greenhouse gas emissions and soil degradation and reducing dependence on fossil fuels, etc. Examples of such technologies can be those approved in BAT (best available techniques and practices) for the implementation of Directive 2010/75/EU, in particular in the following sectors: [food industry, beverage and milk production, industrial refrigeration systems, intensive poultry or pig rearing, large volumes of inorganic chemicals - ammonia, acids and fertilizers, waste management](#) and [other BAT](#).