

**MACROECONOMIC IMPACTS OF THE CIRCULAR TRANSITION: THE GREEN SWANS OF DECARBONIZATION ON THE PATH TO SUSTAINABILITY  
МАКРОЕКОНОМІЧНІ НАСЛІДКИ ЦИРКУЛЯРНОГО ПЕРЕХОДУ: ЗЕЛЕНІ ЛЕБЕДІ ДЕКАРБОНІЗАЦІЇ НА ШЛЯХУ ДО СТАЛОСТІ**

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***Abstract.** The purpose of the article is to determine the prerequisites for a theoretical rethinking of the problem of price instability and inflation processes as such in the context of a managed green and circular transition as a consequence of the institutional legitimation of climate neutrality on the path to achieving sustainable development. The circular economy, as an important component of the ambitious concept of sustainable development, involves a change in the approach to natural resources, which entails the abandonment of traditional business models and the search for new investment solutions that cannot be fully achieved by attracting private capital. This places great responsibility on governments, which, on the one hand, set ambitious goals (green transition, energy transition, circular transition, sustainable development), and, on the other hand, are not able to respond in a timely manner to the consequences of climate change and to respond to the impacts created by these two factors (institutional pressure and market failures) negative spillover effects. Control of hydrocarbon emissions should be offset by the use of a wide range of green incentives (green quantitative easing policy, green guarantee policy, green subsidy policy) and by providing access to long-term loans as part of responsible government planning. Fiscal, monetary, exchange rate and industrial policies must ensure the sustainability of the green transition. Only in this case can the stability and efficiency of the financial system be guaranteed, as well as the technical re-equipment of the production sector, focused on new technologies, while maintaining its productivity indicators. It has been established that green inflation can occur: as a reaction to irresponsible management (where economic agents actively created such a reality in which environmental*

*degradation and climate problems lead to food, raw material, energy and other crises, which reduces supply, and therefore provokes an increase in prices ); as a reaction to an attempt to implement large-scale projects aimed at decarbonization within a limited time frame (where economic agents and consumers become "victims" of monetary and fiscal policies of governments); as a reaction to the tightening of business standards, for which the end consumer will have to pay (the price of minerals needed for green technologies - from wind turbines and solar panels to electric cars - will require a "green premium" (or "greenium") as due to relatively higher demand on them with limited supply, as well as due to the fact that the extraction of minerals is usually associated with higher environmental costs, which will be "punished" by taxes).*

**Key words:** *decarbonization, sustainability, circular economy, circular transition, green incentives, green investments, loans, regulation, climate financing, monetary policy, fiscal policy, Central Bank, inflation, Green Deal, EU, ESG*

**Анотація.** *Мета статті полягає у визначенні передумов для теоретичного переосмислення проблеми цінової нестабільності та інфляційних процесів як таких в умовах керованого зеленого та циркулярного переходу як наслідку інституційної легітимації кліматичної нейтральності на шляху до сталого розвитку. Циркулярна економіка, як важлива складова амбітної концепції сталого розвитку, передбачає зміну підходу до природних ресурсів, що тягне за собою відмову від традиційних моделей бізнесу та пошук нових інвестиційних рішень, які неможливо повністю забезпечити за рахунок залучення приватного капіталу. Це покладає велику відповідальність на уряди, які, з одного боку, ставлять амбітні цілі (зелений перехід, енергетичний перехід, циркулярний перехід, сталий розвиток), а, з іншого боку, не здатні своєчасно реагувати на наслідки кліматичних змін та реагувати на ті, що створюються цими двома факторами (інституційний тиск та ринкові провали) негативні спилвери-ефекти. Контроль за вуглеводневими викидами має компенсуватися застосуванням широкого інструментарію зелених стимулів (політика зеленого кількісного пом'якшення, політика зелених гарантій, політика зелених субсидій) та надання доступу до довгих кредитів у рамках відповідального державного планування. Бюджетно-податкова, грошово-кредитна, валютна та промислова політики мають забезпечувати стійкість "зеленого" переходу. Тільки в цьому випадку можна гарантувати стабільність та ефективність фінансової системи, а також технічне переоснащення виробничого сектора, орієнтованого на нові технології за збереження показників його продуктивності.*

**Ключові слова:** *декарбонізація, сталий розвиток, зелена економіка, циркулярна економіка, циркулярний перехід, енергетичний перехід, зелені стимули, зелені інвестиції, позики, регулювання, кліматичне фінансування, монетарна політика, фіскальна політика, економічний інтерес, ЦБ, інфляція, криза, ЄС, ESG*

**Introduction.** After 300 years of industrial development, when each successive level of technological development was accompanied by a transition to new energy sources, the policies of world leaders turned in the opposite direction. For the first time in its history, humanity is moving from more efficient fuel sources to less efficient ones that produce less CO<sub>2</sub> emissions, setting quite ambitious deadlines for completing this monumental task. For example, The European Green Deal alone envisages at least €1 trillion of investment over the next 10 years. Investment required in the water, agriculture, telecommunications, energy, transport, construction, industrial and forestry sectors is currently estimated at approximately \$5 trillion per year, according to current OECD forecasts (Reznikova, N., & Grod, M., 2023). This raises the question of whether Europe's decarbonization agenda will lead to greenflation. After all, financial analysts, not seen in moralizing on the topic of circular and green transition, have long considered the latter not only as a tool for market stimulation, but also for speculative price growth.

The circular economy is an integral part of the ambitious concept of sustainable development, and the goal of the circular economy is to decouple economic growth from extensive consumption of natural resources. Despite the fact that one of the differences between the concept of a circular

economy and the concept of sustainable development is that the social aspects of sustainable development in the concept of a circular economy are largely underestimated in terms of exploring ways to improve the level and quality of life of the population, our proposed approach to highlighting the goal setting of a circular economy from the perspective of R-strategies of business activities allows us to demonstrate the potential for solidarity of these concepts by highlighting the latest social patterns of society.

If the concept of "transition" from the point of view of the circular economy is interpreted as the process of realizing a set of intentions to change the essence, principles and forms of economic activity and the establishment of alternative mechanisms for the implementation of economic relations in the process of production, distribution, exchange and consumption of goods in order to change the qualitative and quantitative characteristics of models growth and development, then the "transition to sustainable development" appears as the process of implementing the energy transition (symbolizing the transition to renewable energy sources and reducing the share of fossil energy in the energy balance), circular transition and bio-economic transition (observing the principle of the integrity of human and natural systems, which are united in the concept of green transition), digital transition. At the same time: (1) the functional basis of the development of the circular economy and bioeconomy is the energy transition; (2) the development of the circular economy depends on the development of the digital economy and the bioeconomy; (3) the dynamics of the circular transition depends on the dynamics of the transition to sustainable development.

In order to accelerate the circular transition, it is necessary to encourage green public and private investments, as well as fair climate investments by households, which, without a doubt, will become an additional trigger for economic growth against the background of the development of large-scale stimulus packages to overcome the consequences of the pandemic. Some experts will rightly note that the current "commodity supercycle", in which a wide range of commodities are trading at prices higher than long-term trends, much of which is critical to the green and digital transition, has already contributed to price destabilization and therefore further stimulus green and circular transitions will exert inflationary pressure on the macroeconomic environment.

**The purpose of the article** is to determine the prerequisites for a theoretical rethinking of the problem of price instability and inflation processes as such in the context of a managed green and circular transition as a consequence of the institutional legitimation of climate neutrality on the path to achieving sustainable development.

**Literature review.** Among the inflation triggers, D. Prokopovich (*Prokopowicz, D., 2022*) considers the breakdown of logistics supply chains and purchases during the pandemic, international trade wars in the context of increasing international rivalry, challenges to energy security, the consequences of diversifying energy sources and accelerating the process of forced transition to renewable energy sources in accordance with the directions of the environmental policy of the European Union, rising prices for raw materials and various categories of production factors. Researchers note the impact on the level of inflation of monetary policy rates (*Anari, A. and Kolari, J.W., 2017*), the unconventional monetary policy of helicopter money (*Coupey-Soubeyran, J., 2020; Reznikova, N., Ivashchenko, O., Hrynychak, N., Dvornyk, I., 2022; Reznikova, N., Bulatova, O., Yatsenko, O., Ivashchenko, O., 2022; Coppola, F., 2022; Rosa, B., 2022*), features of the implementation of stabilization policy (*Reznikova, N., Panchenko, V., Ivashchenko, O., 2021 a; Reznikova, N.V, Panchenko, V.H, Ivashchenko, O.A., 2021 b*), features of the synchronization of debt, financial and business cycles (*Shlapak, A., 2023*). The problem of inflationary costs in the implementation of green and circular transitions, as well as the energy transition, has become the focus of research by scientists who particularly note the role of greening the mandates of central banks (*Diluiso, F., B. Annicchiarico, M. Kalkuhl, and Minx J. C., 2021; Abdelli, M., & Batsaikhan, U., 2022; Schoenmaker, D. & Tilburg, R.V., 2016; Van Lerven, F. & Ryan-Collins, J., 2017*). The scientific literature does not reach a consensus on the inflationary consequences of the green transition, but it notes the responsibility of monetary and fiscal authorities for the macroeconomic consequences of implementing climate change policies towards sustainability and climate neutrality (*Del Negro, M., Di Giovanni, J., Dogra, K., 2023; Ferrari, A. and Nispi Landi V., 2022; Konradt, M.*

and Weder di Mauro B., 2021). The circular economy is considered both a tool for achieving the green transition (Cheba, K., Bąk, I., & Pietrzak, M. B., 2023) and sustainability (Fromberg, E.H.E., Bakker, C.A. & Peck, D., 2023; Kandpal, V., Jaswal, A., Santibanez Gonzalez, E.D.R., Agarwal, N., 2024; Dovgal, O., Borko, T., Miroshkina, N., Surina, H., & Konoplianyk, D., 2024), and a special environment for the implementation of anti-crisis policies (Krysovaty, A., Zvarych, R., Zvarych, I., Reznikova, N., & Homotiuk, V., 2021; Mercy, T., 2023). Understanding the links between the green economy, circular economy, sustainability and competitiveness (Petkov, P., Slaveva, K., Kasabova, S., Shopova, M., Varbanov, T., & Ovchinnikov, E., 2024) are important for prioritizing pro-environmental economic transformation while taking into account challenges to macroeconomic stability (Prokopowicz, D., 2020).

**Main results of the research.** The term "greenflation" serves to explain the "price vicissitudes" that may occur on the way to the green transition (as a result of increased demand for selected resources), as well as the costs associated with reducing sources of carbon emissions (as part of "green" investment packages and financing of relevant projects that increase the money supply) or as a result of limiting the supply of goods due to climate disasters or environmental degradation. In other words, green inflation can occur:

1) as a reaction to irresponsible management (*where economic agents actively created such a reality in which environmental degradation and climate problems lead to food, raw material, energy and other crises, which reduces the supply, and therefore provokes an increase in prices*);

2) as a reaction to an attempt to implement large-scale projects aimed at decarbonization within a limited time frame (*where economic agents and consumers become "victims" of monetary and fiscal policies of governments*);

3) as a reaction to the tightening of business standards, for which the end consumer will have to pay (the price of minerals required for green technologies - from wind turbines and solar panels to electric cars - will require a "green premium" (or "greenium") due to a relatively higher demand for them with limited supply, as well as due to the fact that the extraction of minerals is usually associated with higher environmental costs, which will be "punished" by taxes).

But is it worth manipulating the greening of inflation and are we not exposed to false conclusions by allowing ourselves to be lured by a new-fangled term?

There is no unanimity in the interpretation of what can actually be considered "green" (Szopik-Depczyńska, K., Cheba, K., Bąk, I., Stajniak, M., Simboli, A., & Ioppolo, G., 2018; Melnyk, T., Reznikova, N., & Ivashchenko, O., 2020; Khoshnava, S. M., Rostami, R., Zin, R. M., Štreimikiene, D., Yousefpour, A., Strielkowski, W., et al., 2019). Most often, the term "green incentives" can hide "incentives for the development of clean energy sources", "incentives for the development of sustainable infrastructure" and "low-carbon" incentives. Clean energy incentives typically include investments in renewable energy and energy efficiency, but sometimes other investments that affect energy use, such as rail and electric vehicles. Green incentives may also include conservation measures such as forest protection and restoration and other environmentally beneficial measures that reduce air pollution, improve water quality and water supply, or contribute to climate change mitigation, adaptation or resilience. A "low-carbon" incentive is usually entirely focused on curbing emissions. However, different countries may choose different decarbonization strategies, such as the same investment in power lines can be "eco-friendly" if they connect renewable energy sources to the grid, or "eco-unfriendly" if they connect fossil fuel power plants. Therefore, in many cases governments have their own definitions of whether a project is "green" or not. For some of them, "green" is large hydropower, natural gas, nuclear energy, carbon storage, for others this interpretation is unacceptable.

The International Energy Agency (IEA) has called for the development, implementation and integration of clean energy technologies to be a cornerstone of economic recovery plans. The IEA and other experts say that increasing the share of "green stimulus" in the recovery package will help create new jobs. From these positions, the current crisis is a test for governments in terms of commitment to the problem of climate change and the transition to clean energy, which is declared on various international platforms as a priority for the world community. According to the

calculations of IEA experts, investing \$1 million in improving the efficiency of buildings, environmentally friendly urban transport or solar photovoltaic systems will create more than twice as many jobs as investing \$1 million in coal or gas energy. Sustainable forest management, EV charging infrastructure, pedestrian and cycling infrastructure, biofuels and recycling were also identified as employment drivers. Those who question the optimism of the conclusion that overall clean energy can create more jobs than other infrastructure investments in the near future are usually told in discussions that, say, environmental projects such as installing solar panels or planting trees, more labor-intensive than highly automated capital-intensive projects from the extraction of oil, gas, coal and other natural minerals. However, they forget to clarify that "green projects" may require less qualified labor or those who belong to the representatives of the so-called gig economy (a set of independent contractors, workers of online platforms, employees of contract firms, on-call workers and temporary workers employees).

The analytical platform Rhodium Group tracked the costs of stimulating the green transition of the four largest regions in the world in terms of greenhouse gas emissions - the USA, the EU, China and India. It turned out that the EU is the leader in terms of this indicator: the total amount of "green expenses" at the beginning of 2021 amounted to 249 billion dollars (almost 20% of the total amount of measures to restore the economy of the union) (*Rhodium Group, 2020*). The implementation of "green" initiatives was facilitated by the active use of the potential of discretionary fiscal policy, which refers to what happens as a result of government decisions, purposeful manipulation of public procurement, taxes and transfers with the aim of stabilizing the economy. Under discretionary fiscal policy, in order to support economic activity during a crisis, a state budget deficit is purposefully created, and a surplus is deliberately formed during an economic boom. However, there is a time lag between the implementation of fiscal policy measures and the manifestation of their economic effect, and according to experts, it is 1-2 years. Therefore, the implementation of an effective discretionary fiscal policy requires a fairly accurate forecast of economic processes, based on which the government would be able to adjust the tools - public procurement, taxes and transfers - to the future economic situation. In the case of the "green transition", the global conjuncture is actually created in manual mode.

The United States of America ranks second with \$26 billion, which is only 1.1% of total US stimulus funds today. At the beginning of March 2021, US President Joseph Biden signed a document on directing \$1.9 trillion to restore the economy. Immediately after the launch of the stimulus package, consideration of the volume of infrastructure financing was updated, and already on March 31, an infrastructure plan for \$2.3 trillion was submitted, calculated for the next eight years, within which green energy costs take second place (24%). In India, the share of environmentally friendly investments is more than twice as high as in the USA (2.4%), but the total scale of spending is only 830 million dollars. And China's "green costs" are estimated at 1.43 billion dollars, which is only 0.3% of the total costs for stimulating the economy (*Rhodium Group, 2020*).

As the idea of sustainable development advances, changes in the role of central banks (CBs) cannot be avoided. Many of them are already officially talking about the negative consequences of uncontrolled climate change for financial stability. Obviously, the Central Bank will have to become "climate rescuers of last resort." And this is the real intrigue. The nature of the "green transition" and its consequences, which influence business and consumption models, will be felt by absolutely everyone, but with varying degrees of drama. Therefore, many experts are already calling the movement towards climate neutrality a "green swan".

The term is analogous to the "black swan," made popular by Nassim Taleb, who argues that it is "black swans"—events with unpredictable consequences and large-scale impacts—that drive history and change the way we think about risk. The climate crisis is very similar to a "black swan" event, because the results of climate change will undoubtedly be severe and extreme, as will the consequences of containing it.

In June 2021, leading central bankers, representatives from the Bank for International Settlements (BIS), the International Monetary Fund (IMF), the Network for Greening the Financial System (NGFS), policymakers and academics held the Global Virtual Conference on Greening swan

2021" (Green Swan 2021). According to the approved communiqué, participants committed to “appropriately integrate considerations of climate change and biodiversity loss into economic and financial decision-making, including addressing macroeconomic impacts and making optimal use of a range of policy levers to set carbon prices.”

Events caused by “green swans” significantly affect the state of the financial system, forcing the Central Bank to introduce instruments of a “green” quantitative transition. Indeed, in order to ensure that the green transition does not negatively impact the financial system, banks will have to align their monetary and regulatory policies with environmental policies. In this situation, central banks could play a key role by helping the financial system by purchasing depreciated assets resulting from rapid climate change, as long as these measures are aimed at financing environmental sustainability projects or “green” industries.

The green quantitative transition is comparable to the quantitative easing policy initially implemented by the Bank of Japan back in the early 2000s and later by the Federal Reserve and the European Central Bank (ECB) in response to the financial crisis that began in 2007/2008 and subsequent crises euro and the coronavirus pandemic. Quantitative easing is the injection of liquidity into the economy by purchasing assets from financial institutions. And “green” quantitative easing will be implemented on the same principles, but aimed at curbing climate change. Central banks will also issue securities to benefit from Development Banks to ensure that institutions can finance the projects needed for the transition without encountering obstacles arising from the private credit market.

Referring to the ECB's mandate, which defines price stability as a primary objective, but stipulates that the ECB “shall support the general economic policy in the Union, promoting the achievement of the objectives of the Union, provided that such actions do not prejudice price stability (Article 127.1 of the Treaty on the Functioning of the EU (TFEU), the researchers confirm that the ECB is already institutionally prepared to play an active role in mitigating the effects of climate change. After all, the Union's goals imply that the EU internal market should “work for the sustainable development of Europe based on balanced economic growth and price stability aimed at full employment. and social progress, as well as a high level of environmental protection and improvement” (Article 3.3 TFEU) Therefore, these TFEU articles provide the ECB with considerable space to support the EU's “green” goals (*EUR-Lex*).

Most likely, central banks will have to use the Brazilian experience of creating companies (like the Emgea Asset Management Company) to manage the exchange of financial assets associated with old technologies (so-called “brown” assets) for “green” assets. After all, investors, squeezed into the corset of ESG criteria for selecting projects that comply with the principles of responsible financing, actually cut off power to “dirty” industries, which will not be able to modernize without financial injections.

The creation of such companies will allow central banks to rescue financial institutions that have fallen into difficulty during the transition period, and at the same time set conditions for their further activities as part of financial market reregulation. In other words, central banks could protect financial institutions from problems with stranded assets by directing their activities to “green” projects, determining the conditions for the exchange of assets, and even nationalizing private financial institutions if their financial and credit activities have reached a dead end. But the government, through a green quantitative transition, could finance green industrial policy and innovation for the purpose of industrial retooling, introducing fiscal policy as a tool to stimulate technological and innovative changes. But such a commitment to facilitating a successful transition to a green economy will require a review of macroeconomic policies.

The primary responsibility for responding to market failures caused by the climate challenge actually lies with governments. They have the power to make decisions that can fundamentally change the economic and social landscape and have a wide range of policy levers, including setting a price on carbon emissions, setting regulations for reducing emissions, making the necessary investments and providing guarantees. And therefore, state planning, its institutions and the policies used - fiscal, monetary, monetary and industrial together with credit - must ensure the sustainability

of the “green” transition. Only in this case can the stability and efficiency of the financial system be guaranteed, as well as the technical re-equipment of the production sector, oriented towards new technologies while maintaining its productivity indicators.

At the same time, the revision of the tax-budget base, which makes it possible to obtain additional state loans for investing in "green" projects, may take the form of exempting investments in green projects from the basic criteria of 3% of the budget deficit or 60% of the debt level. This can happen, for example, by allowing another 1% of GDP to be allocated to investments in relevant green projects and allocating an additional amount - almost 5% of GDP - to the accumulation of "green debts". Here it is worth noting that the supranational influence on the fiscal sphere within the EU resembles the practice of economic regulation applied by national governments. Moreover, it is not about direct regulation (state procurement, sale of state property), but about indirect influence (regulation of the deficit, state debt, and as a result, budget expenditures and revenues). When considering the option of "borrowing for investment", it is worth noting that with historically low borrowing costs, some see it as more appropriate to support public investment, rather than increase current spending. For example, the UK has increased the allowable level of net public investment from 2% to 3% of GDP, while debt servicing costs are less than 6% of public spending. Since most Eurozone bonds have negative yields, governments can borrow effectively for free, increasing the return on any government investment.

Denmark and Canada have made the most serious joint effort to reorient their economies through stimulus spending. Canada has announced a "Healthy Environment and Healthy Economy Plan" that covers energy efficiency, low- and zero-emission transportation, a clean energy transition, low-carbon agriculture and environmental initiatives. The plan contains 64 measures for the development of "green infrastructure" and the direction of "green" investments in infrastructure, etc. Along with financing the health care system and households in Canada, significant support is also provided to business through a number of specific measures related to the environment: subsidies that stimulate employment (wage subsidies); direct payments; postponement of tax payment or reduction of tax amount. Most of the "green incentives" are directed to the energy sector. Given that the policy of energy deregulation has a greater negative impact than a number of positive "green" measures, the implementation of this plan does not provoke the development of green inflation.

The European Commission's "green spending" and stimulus packages introduced in Great Britain, the Netherlands, Austria, France, Germany, Finland, Spain and Sweden are also large-scale. The Netherlands and Austria are the first EU countries to join the regional recovery initiative REACT-EU (Recovery Assistance for Cohesion and the Territories of Europe). Participation in the financing program will make it possible to increase the volume of investments in green and digital transitions in certain regions of the country. In particular, in the north of the Netherlands, the program will support long-term investments in sustainable innovation projects in the areas of closed-loop production, renewable energy, digitalization and healthcare. In the east of the country, the program will support the further development and market entry of innovative technologies and processes, as well as investments that strengthen the innovation ecosystem. Areas of investment for the green transition will also include sustainable energy and materials use. In the south, projects aimed at the implementation of sustainable innovations will be supported within five spheres: energy, raw materials, climate, agriculture and food.

It is worth emphasizing that measures for the green recovery of the economy are carried out in the Netherlands not only by the state, but also at the business level. For example, in 2020, the Dutch Coalition for Sustainable Growth initiated the Green Recovery Statement, which was joined by more than 250 of the country's largest companies. The business community is striving to rebuild the economy after the pandemic, which is in line with the UN Sustainable Development Goals. The Netherlands is also an active participant in multilateral initiatives for cooperation in the field of green recovery and the provision of appropriate assistance to the least developed countries. At the meeting of the Development Committee of the World Bank Group in April 2020, the representative of the country emphasized the importance of financing by international organizations of plans for the recovery of the economies of developing countries, which contain provisions for financing renewable

energy, sustainable water resources and food systems while simultaneously reducing fossil fuel costs. The Netherlands' global recovery efforts are focused on low-income countries and the most vulnerable countries, fragile states in conflict zones. In 2020-2021, the Netherlands supported green post-crisis recovery projects in Africa, the Middle East, South America and Asia. In addition, it was announced that it will continue to encourage countries with long-term national environmental strategies despite the consequences of the pandemic.

The Benelux Union Annual Plan 2021 states that the Benelux Green Deal should become an EU-wide model. And the agreement provides that the countries will cooperate in the implementation of national energy and climate plans until 2030 in accordance with the provisions of the Regulation of the European Union on the management of the Energy Union (EU Governance of the Energy Union Regulation). More specifically, the Benelux countries committed to include relevant green provisions in their national post-crisis recovery plans. The transformation of the energy market (transition to hydrogen fuel) and sustainable mobility have been defined as the main areas of cooperation. For example, by the end of this year, the Benelux countries will introduce a procedure for registering operators of electric car charging points, which is in line with the EU's green ambitions to deploy infrastructure for alternative fuels. In addition, it is planned to develop cross-border infrastructure for zero-emission trucks, as well as for cross-border hydrogen-fueled ships. But Japan, South Korea, Italy and Australia, although they have made efforts to green their own stimulus measures, have not been able to achieve transformational shifts towards a green transition.

But the integration of climate and clean energy into large-scale investments to stimulate the economy is only one indicator of commitment to the fight against environmental change. For countries that do not have a strong policy framework for curbing greenhouse gas emissions, incentives may be one of the most promising tools for advancing green priorities. On the other hand, where climate policy already limits the main sources of emissions (in the EU and many of its member states), stimulus spending can be an accelerator of progress, but not the main means of reducing emissions. And, for example, in India, a number of projects to accelerate the implementation of clean energy are outside the scope of the stimulus plans for post-pandemic economic recovery.

According to the latest Greenness of Stimulus Index (GSI) report from think tanks Vivid Economics and Finance for Biodiversity (F4B), almost a third (\$4.6 trillion) of stimulus provided by the governments of the G20 and other countries (Scandinavian, Columbia, Switzerland, Spain, Singapore and the Philippines) to their own corporations at the beginning of 2021 (\$14.9 trillion) was in sectors that could play an important role in ensuring more sustainable development, including agriculture, energy, transport, waste disposal and heavy industry (*Vivid Economics, 2021*). But only 1.8 trillion dollars from this funding were either directed directly to low-carbon development and environmental improvement projects, or included an environmental criterion to determine potential recipients of such incentives. Fewer than ten of the analyzed economies invested in so-called conservation projects, such as tree planting, forest protection and regenerative agriculture (*Vivid Economics, 2021*).

China has committed to becoming carbon neutral by 2060 and has set an interim goal of reducing carbon intensity by 65% by 2030 compared to the 2005 baseline. But the GSI shows that China has continued to focus stimulus support on big coal and industrial production without regard to environmental conditions, even as it has announced plans to develop solar and wind power. While other Asian countries, along with Japan and India, have directed a significant share of stimulus funding to specific low-carbon sectors such as climate change adaptation, renewable energy generation and energy storage, they also continue to actively support the coal industry.

**Conclusions.** In the early stages of the pandemic and the global recovery, most governments reasonably focused the first wave of stimulus measures on the most urgent priorities: supporting the health sector and providing direct assistance to households, businesses and ordinary workers. But then, when the crisis began to turn into a long-term economic recession, governments tried to use the "green agenda" as a way to stimulate national development and announced increased funding for the green transition. In fact, the "green transition" destroys the usual business models ("business as



usual"), revises the "portrait" of countries regarding their comparative advantages, and reformats the international division of labor.

Climate change and measures to combat it may have unintended consequences for inflation, even to the extent that they may undermine monetary policy's efforts to maintain price stability. While most analysts are convinced that the spike in gas prices has nothing to do with climate policy and much more to do with oil production curbs imposed by OPEC+ in an attempt to keep prices high and recoup losses after the pandemic hit on the oil markets, there are also those who place the responsibility for the price peak on poor planning of decarbonization processes.

A possible trigger of "green inflation" is considered to be the following options of "green incentives" that potentially affect the "greening" of inflation and the probability of their impact is increasing today, namely: first, the adjustment of the tax and budget base, which makes it possible to obtain additional borrowings for investing in "green" projects; secondly, actions of the ECB to stimulate green activity; thirdly, the "green transition" in German politics, which can open opportunities for the growth of "green" investments by 1% of GDP; fourth, the introduction of state guarantees – a key financing mechanism of the EU Green Deal – for the expansion of green projects now that new renewable energy sources are approaching the criterion of competitiveness with fossil fuels in conditions of strict market regulation of the latter.

Decarbonisation hides at least two risks in regulation and taxation: first, it could hold back investment and harm growth by exacerbating stagnation; second, it objectively creates more barriers to trade, which is a problem for the export-dependent European economy, if increasing production costs in Europe due to more expensive energy will require constant adjustments to import taxes and export subsidies to protect industry. At the sectoral level, energy-intensive industries (steel, chemicals and cement) may suffer from high EU environmental taxation, carbon taxes and environmental regulation, and may then be at risk of moving to jurisdictions with lower energy costs. From these positions, inflation is unlikely to turn green.

The peculiarity of the EU's National Resilience and Recovery Plans illustrates the importance of separately assessing the impact of "green stimulus" on climate and nature. Although 37% of the €672.5 billion Recovery and Sustainability Fund is earmarked to invest in environmental initiatives, an analysis of ten EU member states' €500 billion plans by GSI experts found that more harm than good has been done to nature (Todd, M. C., Taylor, R. G., Osborn, T. J., Kingston, D. G., Arnell, N. W., and Gosling, S. N., 2011). The experts extended the GSI methodology to distinguish between climate impacts and nature impacts, and found that 98% of climate-related costs, while capable of reducing emissions, more than half of nature-related costs are actually for it is harmful. Moreover, the severe imbalance between the size of costs affecting nature and the climate has largely put nature at a disadvantage and failed to fully meet the environmental ambitions of the recovery package introduced by the European Commission. The analyzed countries invested only 1% in solutions focused on nature conservation, while, according to various estimates, they neglected the triple possibility of obtaining significant benefits for the labor market (without ensuring the creation of jobs) and the economy, reducing emissions and improving nature and biodiversity.

We assume that the impact of "green inflation" will be unclear, because there are restrictions on increasing the pace of deployment of new projects. Additional costs related to additional infrastructure, such as power lines, backup power, energy storage or fuel storage, may be unaffordable from a budgetary "maneuver" point of view. In addition, the emergence of cost-competitive renewable energy technologies provides governments with an unusual opportunity to stimulate private sector investment and growth by offering conditional guarantees rather than direct subsidies.

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