INSTRUMENTS FOR FINANCING ENVIRONMENTAL PROJECTS DURING THE GLOBAL ENERGY TRANSITION

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Abstract

This article examines the financing tools for environmental projects that ensure an effective flow and transfer of capital between global investors. All this is aimed at expanding the use of "green" technologies, strengthening "green" culture and environmental sustainability, as well as solving the problem of climate change during the global energy transition. The study noted that improving the energy efficiency of countries and economies will be crucial in order to meet climate ambitions, ensure growth and improve well-being, especially to achieve the goal in terms of carbon emissions in the long term. Energy efficiency in the financial industry is considered an attractive investment, as it generates new dynamics to accelerate and expand private financing of investments and make these investments more effective for investors. The publication lists various instruments for financing environmental projects. The distribution of funds distributed among various programs within the framework of the EU's next-generation economic recovery program for the period from 2020 to 2027 and the Use of green bond programs in Europe in 2014-2021 by industry are also presented in the form of graphs. Financing instruments for environmental projects play a key role in promoting sustainable development and reducing negative environmental impacts. In recent years, there has been a growing interest in "green" financing, which includes various financial instruments aimed at supporting environmentally friendly technologies and projects. Crowdfunding as an alternative source of financing: Crowdfunding allows you to attract an unlimited number of investors with different levels of financial literacy and accessibility, which makes it attractive for environmental projects. Green bonds and loans are important tools for financing the transition to a green economy by providing extra-budgetary sources of financing.

Keywords: capital movement, the "green" transition, energy efficiency, safe and reliable economic justification, Innovative tools, financing of environmental projects, global energy

I. Introduction

Investments in energy efficiency often lead to high transaction costs because projects are small and not aggregated enough to attract investors. These types of investments, such as building overhauls, have a long payback period, and investors fear that the savings achieved will not justify the cost of energy upgrades. However, it is becoming increasingly clear that the risks associated with them are lower than the level perceived by the market.

To convince investors that energy efficiency projects in general have a safe and reliable economic justification, and to help banks and other financial institutions easily understand and assess all the risks and opportunities associated with a particular project. There is an urgent need for technical and legal standardization at all stages of the investment value chain in order to simplify transactions and increase the trust of financial institutions.

The lack of standardization of projects hinders the securitization of energy-efficient assets in the capital markets. It is usually expected that the cost of energy efficiency investments will be offset solely by reducing energy bills, but it is becoming increasingly clear that the benefits are non-energy in nature, including improving comfort and health parameters in buildings, increasing the cost of the building itself, increasing the cost. A lower probability of default on mortgages and lower rates for attracting tenants or vacant property play a key role in deciding whether to invest in this area. Therefore, there are tangible financial and economic incentives to encourage financial institutions to invest more in energy efficiency. In Italy, innovative tools proven by industry are aimed at encouraging additional investments in energy efficiency initiatives, especially those conducted by small and medium-sized businesses.

II. Methods and materials

The research uses information data, as well as methods of theoretical research, namely: monographic.

Financing environmental projects in the energy sector is an important aspect for achieving sustainable development and reducing negative environmental impacts. In recent years, there has been an increase in interest in various financial instruments that can support the implementation of such projects.

III. Results and discussion

Green bonds and other debt instruments. The use of green bonds and other debt instruments such as corporate bonds, project bonds and financial green bonds to mobilize private capital. The use of project financing for large investment projects in the field of renewable energy allows for better risk management and reduction of agency conflicts. Guarantee schemes and tax benefits. Development of green loan guarantee schemes to reduce credit risks and the use of tax incentives to increase the profitability of green projects.

Funds and subsidies. Creation of funds, such as the Environmental Protection and Energy Efficiency Fund (EPEEF) in Croatia, to finance environmental and energy projects through soft loans, subsidies and grants. Legal mechanisms and digital green industrial mortgages. Development of legal mechanisms, such as digital green industrial mortgages, to attract investments in environmental projects in the fuel and energy sector.

Risk and profitability management. An effective policy should simultaneously take into account the risks and returns on investment in order to attract private capital to renewable energy projects. Financing environmental projects in the energy sector requires an integrated approach, including the use of various financial instruments such as green bonds, project financing, tax incentives and guarantee schemes. Both state and non-state financial institutions play an important role. Effective legal and policy mechanisms aimed at managing risks and profitability are also key to successfully attracting investments in this area.

Green bonds: the energy sector benefits the most. Use of procceds from green bonds in Europe 2014-2021, by industry (in billion U.S. dollars) (Fig. 1).

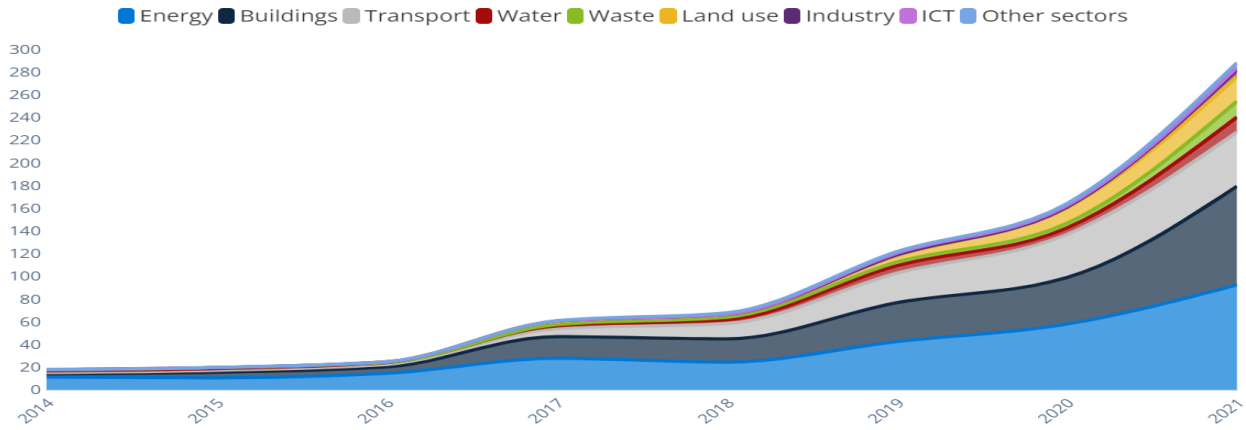

Figure 1: *Green bonds: the energy sector benefits the most. Use of procceds from green bonds in Europe 2014-2021, by industry (in billion U.S. dollars)*
Source: https://www.statista.com/topics/6233/green-bonds-in-europe/#topicOverview [103]

Green bonds, also called climate bonds, indicate that investors are interested in sustainable development. Environmental degradation and climate change pose serious physical and transitional risks to financial stability, such as business disruptions, asset destruction, reduced value of unused assets and increased insurance costs. Investors recognize the potential of sustainable financing and launch new and restructure old financial products to identify opportunities, mitigate risks, or align values. In Europe, the most common type of green bond issuers were financial corporations, which accounted for a third of all green bonds issued in Europe in 2022 [1-11].

The role of financing is extremely important to fill the deficit in order to develop Indonesia's green economy. The government has released an innovative financial instrument for financing the state budget (APBN) with the help of "green" sukuk. In 2019, the government also established the Environmental Fund Management Agency (BPDLH) to improve the quality of green financing.

Singapore has allocated 2.1 billion Singapore dollars from proceeds from the sale of bonds maturing in 50 years to cover the cost of building two subway lines. This bon was presented as part of the Singapore Green Bon program and is part of a larger government strategy to finance environmental projects. The construction costs of MRT Jurong and MRT Pulau include 1.7 billion Singapore dollars due to green bonds issued in 2022 and 0.4 billion Singapore dollars due to green bonds issued in September 2023, where trade turnover increased 1.4 times to 2.8 billion Singapore dollars.

Since 2027, the construction of the MRT in the Jurong area and on Penang Island has been carried out in stages. The opening of two metro lines will help reduce carbon dioxide emissions by more than 100,000 tons per year, which is equivalent to eliminating the use of 22,000 trains on motorways. He notes an 81 percent reduction in CO2 emissions. A $2.1 billion green bond fund has been allocated for the construction of a highway across Jurong Island [12].

A total of $ 2.1 billion raised through green bonds issued by the Government has been allocated for the construction of the Jurong Area Line (JRL) and the Inter-Island Line (CRL), which are currently under construction. Both routes support the basic principles of the “sustainable lifestyle" of the Singapore Green Plan 2030. According to the September 25 report of the Ministry of Finance (MOF), the funds were distributed in 2023. As part of this phase, it is planned that by 2030, 75 % of passengers will use public transport during peak hours compared to private transport. According to the latest data, this figure is about 64 %.

This is a serious effort to achieve the ambitious goal of significantly reducing carbon dioxide emissions by land transport in absolute terms, in line with Singapore's goal of zero carbon dioxide emissions by 2050. Experts estimate that routes in the Jurong area and between the islands will

provide total carbon dioxide emissions savings equivalent to the use of at least 22,000 vehicles. It is expected that the remaining funds from the newly opened part of the program will be fully allocated by the end of the 2025 fiscal year. Today, Singapore's green bond system remains a key element of Singapore's efforts to channel investments into projects that will contribute to sustainable development efforts.

By 2030, the Singapore government will issue green bonds worth up to $35 billion to finance public sector green infrastructure projects. The relevant categories included renewable energy sources, energy efficiency, green construction, environmentally friendly transport and sustainable management of water supply and wastewater. These projects are expected to help Singapore transition to a low-carbon economy, contributing to the achievement of the climate and environmental goals set by the Government. As a leading energy transition company, Pertamina is committed to achieving zero emissions by 2060 by continuing to support programs that directly impact the achievement of the Sustainable Development Goals (SDGs). All these efforts are consistent with the principles of environmental, social and managerial responsibility (ESG) in all business lines and operations of Pertamina.

The Government has put into effect the tools of the Federal Communications Commission to finance environmental protection measures in forests. A non—market financial instrument, the Forest Conservation Certificate (FCC), is used to finance forest conservation and environmental protection activities. The FCC is one of the mechanisms developed by the Malaysian Forest Fund (MFF) since 2022 as part of the Financial REDD Plus (RFF) program.

The Forest Conservation Certificate (FCC) issued by the Malaysian Forest Fund (MFF) is a financial instrument that is not used in the market to finance environmental protection measures and initiatives for sustainable forest management, as well as to protect the environment.

Since 2022, Malaysia has begun work on the creation of innovative financial instruments based on RFF. Thus, the RFF mechanism is a one—step transformation that provides a new paradigm in financing environmental activities and nature-based solutions, recognizing the important role of the public-private partnership structure.

Breakdown of funds allocated among different programs in the NextGenerationEU economic recovery package from 2020 to 2027(in billion Euros) (Fig. 2).

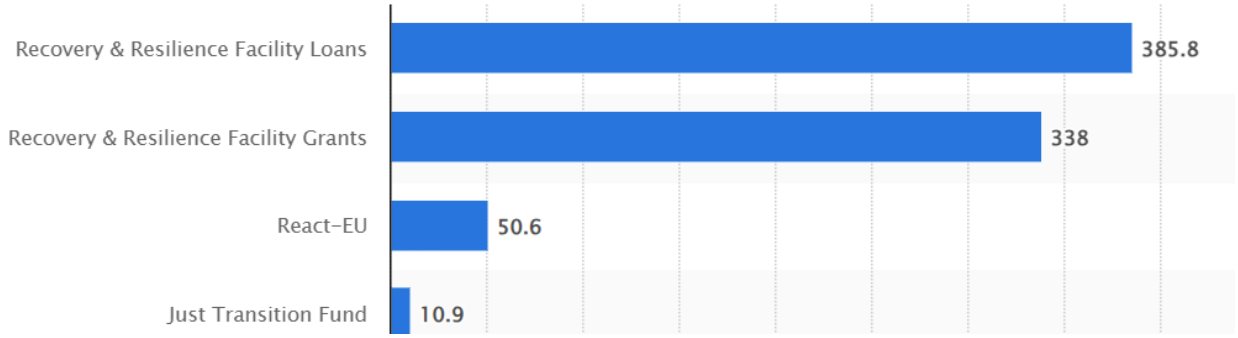

Figure 2: *Breakdown of funds allocated among different programs in the NextGenerationEU economic recovery package from 2020 to 2027(in billion Euros)*
Source: https://www.statista.com/statistics/1366824/next-generation-eu-funds-allocation/

From Fig. 2 it can be seen, the largest share in the package is occupied by the Recovery and Sustainability Fund, which provides loans and grants to participating countries to invest in projects that promote the growth of "green" industries, stimulate the digitalization of the economies of participating countries, as well as to invest in social, economic and institutional development. Other programs included in the NextGenEU package range from the Fair Transition

Fund, which aims to support regions most affected by the transition to a green economy, to rescEU, which invests in supplies to respond to humanitarian crises.

About 45 percent of the total funds of the Recovery and Sustainability Fund (RRF) were allocated to green transition projects (not including projects in which the element of green transition is combined with one of the other categories). Member States such as Denmark, Poland, Belgium and Ireland have allocated most of their funds to this category. On the other hand, Greece, Slovakia, Latvia and Cyprus have allocated more funds to projects focused on social, economic and institutional development. Germany has allocated the largest share of RRF funds to digital transformation — about 37 percent of the total.

IV. Conclusion

Financing instruments for environmental projects play a key role in promoting sustainable development and reducing negative environmental impacts. In recent years, there has been a growing interest in "green" financing, which includes various financial instruments aimed at supporting environmentally friendly technologies and projects.

Crowdfunding as an alternative source of financing: Crowdfunding allows you to attract an unlimited number of investors with different levels of financial literacy and accessibility, which makes it attractive for environmental projects.

Green bonds and loans are important tools for financing the transition to a green economy by providing extra-budgetary sources of financing.

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