

## **Recycling of Carbon Revenues in Bulgaria**

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### **Abstract**

*The current paper deals with the recycling of CO<sub>2</sub> allowances revenue, which Bulgaria receives at the regular auctions held within the EU Emission Trading System (EU ETS). Based on the normative and comparative approaches, the author concludes that the country has opted for a smart trajectory of carbon revenue recycling. The proceeds from national CO<sub>2</sub> allowances are returned back to the Bulgarian economy fostering thereby clean electricity generation. EU ETS financial resources have been earmarked to the extrabudgetary fund "Security of the energy system". In turn, the latter channels the income from CO<sub>2</sub> allowances towards reduction of the green component in the price "Obligations to the public". This recycling decision helps relieve the electricity cost burden of businesses and households in Bulgaria.*

*Keywords: EU Emission Trading System, Bulgarian CO<sub>2</sub> allowances, recycling, carbon revenue, clean electricity generation, price "Obligations to the public".*

*JEL Code: H27, Q48, Q54, Q58*

### **Introduction**

Attaching a price tag to the greenhouse gas emissions, and carbon dioxide in particular, dates back to the beginning of the 1980s. The pricing of air pollution evolves and its scope widens. It encompasses both market-based and command-and-control tools. The latter include technological and emissions standards (benchmarks), while the former consist of environmental taxes, charges, and emission trading schemes (Hahn, 2006; Metcalf, 2001; Twomey, 2010). The deployment of the above mentioned tools leads to price increase that erodes the competitiveness of industries and the welfare of households. Therefore, the economic actors tend to disapprove of pollution pricing instruments.

A variety of economic studies show that an important parameter for the further deployment of environmental pricing tools depends on whether a recycling scheme of the collected revenue is designed and applied or not. Most scholars refer particularly to the revenue recycling within the framework of carbon taxation (Carratini et al., 2018; Klenert et al. 2018; Jagers et al., 2018; Beiser-Mcgrath et al., 2019). The same approach for earmarking of revenue and returning it back to society can be deployed with regard to the income generated from auctioning of the national CO<sub>2</sub> allowances issued and auctioned within the European Union's Emission Trading Scheme (EU ETS).

### **1. Budgetary arrangements for carbon revenues recycling**

In order to achieve better social acceptability and credibility while reducing the CO<sub>2</sub> emissions, the budgetary arrangement seems to be a feature of the revenue recycling worth paying attention to. Several budgetary arrangements for reusing the income from carbon dioxide allowances are suggested (Trim et al., 2018).

The revenues from auctions of CO<sub>2</sub> allowances can be transferred to the government budget. The former constitute an asset for the society, while the government (its institution) is charged with issuance of allowances and their subsequent sales to the polluting installations. Such "division of labour" is consistent with the "principal-agent" doctrine. In this case, the society is the principal, and the government – its agent. The incoming revenues can be assigned to the category of non-tax such and subsequently integrated into the government budget (Le Den et al., 2017).

In this budgetary setting, the accumulated non-tax proceeds provide financial resources for the public expenditure in general according to their priority, which is assessed and determined

within the political process of decision-making. Provided that the public perceives environmental protection and climate change mitigation as priorities, there will be a political earmarking of the carbon revenue to funding the aforementioned community causes. This budgetary setting is supposed to be less acceptable for the society as its efficiency in terms of carbon emissions' reduction remains unclear (Trim et al., 2018).

Another arrangement for recycling the revenue from auctioning the national CO<sub>2</sub> allowances is their earmarking to an extrabudgetary public fund separated and autonomous (in financial terms) from the government budget. The accumulated financial resources are further provided as compensation, which is targeted towards industries and households. The latter need evidence that they are affected to different extent by carbon pricing and their ability to pay declines. The extrabudgetary arrangement may improve the acceptability and credibility of carbon revenue recycling as its benefits become more transparent for the public (Trim et al., 2018). The design of the compensatory schemes can vary across addressees. The schemes can be provided *across the board* or to *pre-selected groups* of businesses, households/individuals, which are considered “the victims” of deploying the carbon pricing instruments.

Within this compensatory setting, an important parameter of carbon revenue recycling is its *conditionality*. The latter concerns whether the possible beneficiaries of compensation are required or not to apply certain measures and bring evidence for carbon footprint reduction. In case of a *missing conditionality*, the provision of any compensation would be inefficient in terms of changing the polluting behavior of actors. The public resources spent via compensatory schemes without conditionality would probably miss the energy and CO<sub>2</sub>-saving targets.

The third budgetary arrangement facilitates carbon revenues' recycling towards funding of measures that immediately and directly aim at mitigating climate change. The latter can be initiated, designed and deployed within economic activities that are covered or uncovered by the carbon pricing. In a setting where the covered businesses receive compensation via recycling of national carbon revenue, the former would perceive themselves as positive stakeholders of emission trading, which increases the acceptability and credibility of recycling.

The carbon revenue may also be recycled in favor of measures that diminish rising energy prices and costs for industries *uncovered* by emission trading, respectively carbon pricing. In this case, a redistribution issue arises, which is often controversial. On the one hand, the former might be perceived as a sign of solidarity among industries: from those inside towards those outside of the emissions trading scheme. In terms of the polluters-pay principle, the industries with large carbon footprint provide funds compensating those that are climate neutral or clean, which would boost acceptability and credibility of any recycling scheme. On the other hand, some industries may become vulnerable to freeriding behavior, relying on others' financial support and neglecting energy and carbon savings in their activities. Under such circumstances, the acceptability and credibility of the recycling scheme would deteriorate.

## **2. Carbon Revenues from the EU ETS: Patterns of Recycling**

EU member states recycle the proceeds from the auctioning their national CO<sub>2</sub> allowances. They allocate their carbon revenue mainly to improving energy efficiency of residential and industrial properties (41%), generation of green electricity (27%) and sustainable public transport (10%) (Wiese et al., 2020). Energy efficiency seems to be the leading direction for recycling, although its share varies across different countries. France is earmarking all its revenue to energy efficiency followed by Latvia (97%) and Croatia (88%). While Slovakia, Latvia and Estonia reuse their national carbon revenues for the renovation of mainly public sector buildings (cultural, educational, kindergartens), the Czech Republic, France and Germany recycle financial resources from CO<sub>2</sub> pollution to renovate residential properties that belong to the energy poor and low income individuals/households (Wiese, 2020).

The recycling in favor of energy efficiency is considered as a strategic investment of the

collected ETS EU revenue (Wiese et al., 2020; Le Den et al., 2017). Firstly, long-term cost savings are secured through the improvement of energy efficiency. Secondly, carbon emissions from residential and non-residential buildings also tend to decrease in the long run. Thirdly, carbon revenue recycling benefits companies with less ability to pay and households most vulnerable to energy poverty, who usually rely on public financial support for higher energy savings. Fourthly, due to revenue recycling, energy efficiency improves both in EU ETS covered and in uncovered industries, which refers to *financial solidarity* flows from former to the latter.

The revenue accumulated from the auctioning of CO<sub>2</sub> allowances on the European Energy Exchange (EEX) is “committed” to compensating the cost burden of different industries throughout the EU-27. The rising prices of the EUAs since 2019 have been affecting the energy costs of any businesses, in particular the energy intensive and exporting ones. Their production technology depends on high share of electricity costs that they usually cannot shift to the output price (since most of the enterprises are price-takers on the international markets). Hence, these industries have to cope with deteriorating market share and competitiveness, which all stem from rising electricity costs as a consequence of the peaking prices of CO<sub>2</sub> allowances.

Energy-intensive and exporting industries have to choose between two options. The first one is to incur financial loss and accumulate corporate debt, which is unsustainable in the long term. The second option is to shift their production outside the EU, where third state jurisdictions do not adhere to ambitious climate and energy goals. The relocation possibly leads to *carbon leakage* (Monjon et.al.2011; Zaklan et al., 2019). The empirical evidence does not give credence to possible carbon leakage within the first two phases of the EU ETS (Joltreau et al., 2019). Joltreau and Sommerfeld (2019) argue that carbon leakage was negligible at the start of the emission trading scheme due to the surplus of allowances allocated and their costs being passed onto end consumers. In the steel and cement industries, there was also no evidence of carbon leakage throughout the first and second phases of the EU ETS (Branger et al., 2016).

In fact, the risk of carbon leakage during the 2005-2012 period is negligible for several reasons. Firstly, in the considered period at least 90% of CO<sub>2</sub> allowances were allocated gratis (*grandfathering*) to polluting enterprises and installations Europe-wide. Secondly, during most of the time the EU economy was not able to recover from the financial crisis. Thirdly, a compensation scheme had applied in terms of state aid notified to and approved by the European Commission.

The state aid scheme is still provided to energy intensive industries with rising CO<sub>2</sub> emissions - and electricity costs under stringent conditions (Directive 2003/87/EC, Art. 10a(6)). The latter require that the financial resources for the state aid are funded through recycling of carbon revenues that the particular governments collect by auctioning national CO<sub>2</sub> allowances. In order to contain possible mismanagement and abusive practices, the funding is limited to no more than 25% of the country’s proceeds from EUAs sold on the European Energy Exchange (EEX).

The state aid has been provided in several EU member states with already liberalized and interconnected energy markets. According to the rules, the financial support is transferred until the end of the year following the year when rising cost occurred as a consequence of peak CO<sub>2</sub> allowance’s prices (European Commission, 2019a). The Netherlands has already notified the Commission of €70 mln. of state aid, whose beneficiary for the 2019-23 period is the railway transport in this country. Italy also allocates until the end of 2022 the amount of €151 mln. out of its recycled carbon revenues as state aid. For 2020-21, Poland recycles €417,5 mln. from its auctioned national EUAs for state aid. It benefits all the industries affected by the rising costs of electricity. The businesses hit by the peaking energy/CO<sub>2</sub> allowances costs in Flanders (a region in Belgium) also benefited from state aid for €5 285 mln. from 31 March 2019 to 31 March 2020. Slovakia allocated €4 mln. of state aid to ten companies from its environmental extrabudgetary fund, which relies on the national carbon proceeds (European Commission, 2019; Hudec, 2021).

In order to mitigate the consequences of rising CO<sub>2</sub> emission prices, €633 mln. in total of the carbon revenues are recycled for state aid that is provided to different businesses in 2019 (€433

mln. in 2018) (Carbon Market Reports, 2020). The state aid scheme for compensating different industries indirectly hit by the rising prices of the CO<sub>2</sub> allowances will also be implemented in the next decade within the revised EU ETS Directive. The carbon revenue recycling will be supplemented by the feature of conditionality. Businesses would further benefit from state aid in case they are capable of proving that the government provides funds for measures facilitating further savings of energy and GHG emissions (European Commission, 2021).

Making the recycling of carbon revenues for state aid *conditional* requires its beneficiaries to perform mandatory energy checks, followed by investment projects for improving the energy efficiency within a reasonable timeframe. With reference to the time dimension, the European Commission considers economically profitable investments in energy efficiency with a payback period of up to three years (European Commission, 2021). Undoubtedly, the feature of conditionality for approving and receiving a state aid lets the administrative burden rise as the proposed measures from the energy audit are mandatory and need to be implemented. The latter has to be verified through follow-up checks – on site or financial ones. In case of abuses, the state aid discontinues or is restricted (European Commission, 2021).

### **3. Recycling the income from Bulgarian CO<sub>2</sub> emissions – financial reward for clean energy deployment**

Since its accession to the EU, Bulgaria has been taking part in the Community's Emission Trading Scheme. In its third phase (2013-2020), the country auctions its national CO<sub>2</sub> allowances on the platform of the European Energy Exchange (EEX). The revenue collected there depends on the quantity of emissions allowances<sup>1</sup> sold and their market price.

The number of allowances allocated to Bulgaria from 2013 to 2020 depends upon the following factors: 1) the annual level of GHG emissions averaged over the 2005-07 period (the pilot phase of the EU ETS); 2) the average income, which is an argument for allocating additional allowances due to EU solidarity. The latter requires low income member states to be supported through extra allowances in order to achieve a higher economic growth; 3) the performance of this country in terms of at least 20% reduction of CO<sub>2</sub> emissions by 2005 compared to their level in 1990 (Directive 2003/87/EU, Art. 10, p.2).

With regard to the first factor for EUA allocation, Bulgaria is an insignificant GHG emitter. Nevertheless, the country receives additional allowances thanks to its own efforts to reduce air pollution by 2005 and the principle of solidarity, to which EU institutions adhere. Thus, it can be concluded that Bulgaria has been assigned sufficient EUAs, hence their price becomes the most important determinant of the amount of carbon revenues the country collects and recycles.

At the beginning of the third phase of the EU ETS, the market price of an EUA is low due to the sluggish recovery of the EU economy from the financial crisis and the accumulated *surplus* of allowances. In order to absorb *it*, a reserve for market stabilization was established and became operational in 2019 (Decision EU 2015/1814). The bulk of issued but unused EUAs was transferred to the stabilization reserve. Its operation and the ambition of the EU to reduce CO<sub>2</sub> emissions by 2030 by 55% instead of by 40% contributed to EUAs' price rise in 2019-20. The latter is more impressive in 2021 – at the beginning of the year the CO<sub>2</sub> allowance's price was €20/t, in May - €50/t, while in August it reached €61/t peaking further in the autumn of 2021 (Financial Times, 2021).

The dynamics of the Bulgarian carbon revenue collected from the EEX auctions can be observed in fig.1. At the beginning of the EU ETS third phase Bulgaria receives almost BGN 144 mln. (2013) that rose to more than BGN 860 mln. (2019). The latter coincides with the adoption of measures significantly changing the EU ETS design (the reserve for market stabilization and the Green Deal trajectory of decarbonization). In terms of carbon revenue collected, Bulgaria benefits

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<sup>1</sup> EUA – European Union Allowance. 1 EUA = 1t CO<sub>2</sub>e.

from rising CO<sub>2</sub> allowance's prices and the EU's ambitions for global leadership against climate change.

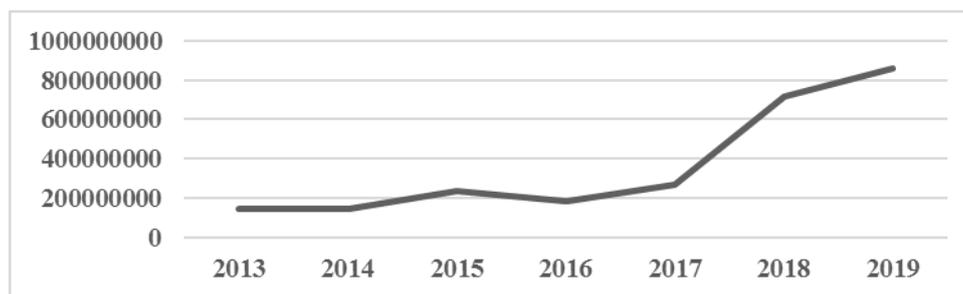


Figure 1. Total revenue from national CO<sub>2</sub> allowances in Bulgaria, third phase EU ETS (in BGN)

The rising proceeds from auctioning CO<sub>2</sub> emission allowances is not a target per se for Bulgaria. The country chose to earmark the amounts it receives from auctioning of its national carbon allowances in an extrabudgetary fund “Security of the energy system” (Naredba za fond “SES”, Art. 5, t.6)<sup>2</sup>. Such a budgetary solution allows it technically to recycle the proceeds in a transparent and accountable manner outside the government budget. The legal basis for the earmarking and recycling is the EU Directive on ETS and its transposition into the Bulgarian Act on limiting climate change (Art.57(1)). It proposes at least ten options for the recycling of collected carbon revenue in Bulgaria, i.e. for funding the development of clean energy, energy efficiency improvement of immovable properties, R&D, sustainable transport, carbon capture and storage, etc.

Against the background of EU schemes where member states' revenue from carbon recycling is geared towards state aid for affected businesses, the energy-intensive industries in Bulgaria are disadvantaged in terms of the compensation provided. Consequently, the competitiveness of those industries may suffer. Meanwhile, business entities/companies also have to manage the peaking electricity prices on the Bulgarian Independent Energy Exchange since the new regulatory period starting on July 1, 2021.

On Figure 2, the rising average price/MWh of electricity on the free segment of the energy market (the Independent Bulgarian Energy Exchange) can be observed. The horizontal line depicts the average annual market price predicted by the Water and Energy Regulating Commission (KEVR) for the period 01.07.21 – 30.06.2022<sup>3</sup>. The rising discrepancies between the actual and predicted prices throughout the new regulatory period in Bulgaria immediately affect the business sector, and with some short-term delay - the households. Therefore, industrial and employers' associations require from the government to be compensated for at least 50% of the *extra* energy costs to be incurred from October 2021 to March 2022. The amount of compensation pleaded by the business sector from the government initially was circa BGN 840 mln. with subsequent reestimation of the former (AIKB, 2021).

On its part, the government does not dispute the necessity of compensation. The debate between businesses and the government concerns mainly *the source(s)* for the provision of the public financial support. The affected businesses and their associations argue that the funds shall be funded from the excess profits accumulated by the state-owned nuclear power station “Kozloduy”, National Electricity Company and other state-owned energy producing companies (AIKB, 2021). Their excessive financial profits are due to the increasingly widening difference between market and predicted price per MWh of electricity (see fig.2). An alternative source for providing funds to businesses in Bulgaria is the extrabudgetary fund “Security of the electricity system” where the

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<sup>2</sup> Initially (2013-15) the revenue was transferred to the government budget.

<sup>3</sup> The latter is known as the regulatory period for the public supervisor authority.

revenue from selling national CO2 allowances is transferred.

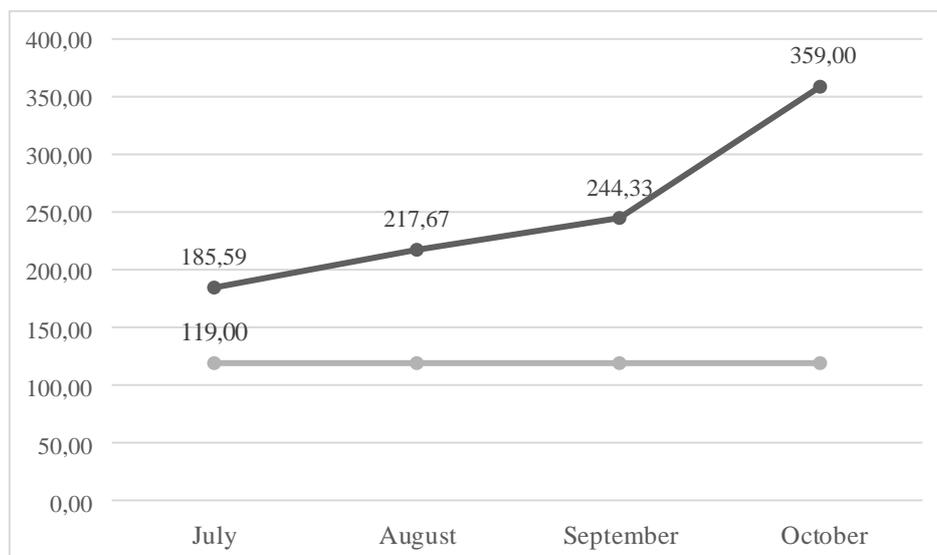


Figure 2: Average monthly price/MWh on the Bulgarian Independent Energy Exchange (July-September 2021), in BGN/MWh

Source: Based on price data from Independent Bulgarian Energy Exchange at: <https://ibex.bg>

With reference to the extrabudgetary fund’s legislation, it is not allowed to provide compensations for the affected businesses since the proceeds from CO2 allowances are earmarked to and reserved for green energy deployment in Bulgaria. Therefore, despite the looming energy crisis, this country will not seek the EU Commission’s approval for recycling its national carbon revenue as compensation for different industries. Bulgaria tends to spend all of the income gathered from CO2 allowances for climate change mitigation. The exact amounts and trajectories of national carbon revenue recycling can be observed below (Figure 3).

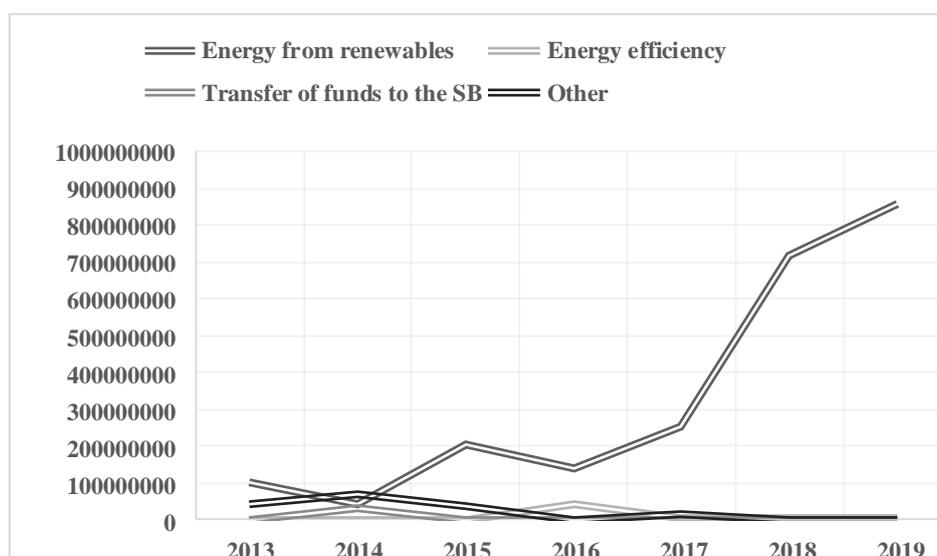


Figure 3: Recycling of national carbon revenue in Bulgaria: different trajectories, 2013-2019 (in BGN)

As depicted in Figure 3, only an insignificant amount of the national carbon revenues is recycled for energy efficiency improving projects in Bulgaria. In the considered period, they provided investments for renovation of buildings, which belong to municipalities and other (central) government entities. The bulk of financial resources for energy efficiency investments Bulgaria receives and absorbs from the EU Structural and Investment Funds (Le Den et al., 2017).

Unlike other EU member states, which reuse their national carbon proceeds mainly for energy efficiency, Bulgarian authorities decided to earmark them to increase the share of clean electricity. Initially, income from the auctioning of national carbon dioxide allowances is still moderate and flows directly into the state budget. Since 2016 the collected amount of BGN 202,4 million from carbon revenues has been earmarked to the extrabudgetary fund devoted to the security of the energy system. The latter recycles the steadily rising amounts of carbon revenues for clean energy promotion. By the end of the considered period, the monetary transfer reached almost BGN 1 billion.

This recycling trajectory of the national carbon proceeds is consistent with the financial incentives provided domestically to clean energy projects since the 2010s. In order to secure a high long-term return on investment, green power producers in Bulgaria are paid for the whole quantity of electricity generated at preferential prices (feed-in tariffs). The latter are set higher than their market counterparts according to long-term contracts concluded for 12 to 20 years with no option for a price adjustment included (KEVR; Staykov, 2016).

In an attempt to contain the growth of the cost burden imposed by clean energy, the green electricity generation has been fostered with premium payments since 2016 - the difference between preferential and market prices. Both the feed-in tariffs and the premiums contribute to a large quantity of green power produced. The latter has been fully purchased by the National Electricity Company (NEK-EAD) that plays the role of the public supplier in Bulgaria.

In order to compensate the NEK-EAD for its purchasing costs, policymakers have set up the so-called *price "Obligations to the public"* (Energy Sector Act, Art.35). The latter is part of and inflates the electricity price for all end consumers in Bulgaria. The price for public obligations contains several "color" components. One of them - the green one, is earmarked to fund clean energy generation, while the brown one compensates the costs for high effective co-generation in Bulgaria. In terms of the latter technology, heat and electricity have been produced from the same primary energy source, which contributes to better energy efficiency.

Being part of the whole price for the electrical power consumed, the green component imposes an additional burden on industries and households. In order to reduce their rising bills on sight of clean electricity development, the fiscal and energy authorities decided to compensate industries and households with 100% of the amounts from carbon revenues that Bulgaria receives at the regular auctions on the EEX. In technical terms, the carbon revenues collected at the EEX are recycled (spent) for reducing the burden of the green electricity's rising share in the domestic energy mix.

The recycling design Bulgaria applies to its carbon revenues has its benefits. Firstly, the collected and reused carbon income reduces the cost burden that households/individuals pay for clean electricity. It is a "smart" recycling decision as energy poverty is a widespread phenomenon in Bulgaria. The country ranks on top in the EU-27 throughout the 2014-20 period. According to a regular survey, between 40,5% (2014) and 27,5% (2020) of the Bulgarian population are not able to heat their homes adequately. In the EU-27, only 10,4% (2014) and 6,9% (2019) of the respondents complain about poor heating in their homes (Eurostat, 2014-20)<sup>4</sup>. Secondly, revenues from the auctioning carbon dioxide allowances are collected from polluting installations most of which belong to large corporations with high profits/ability to pay. Thus, the burden of the recycled carbon

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<sup>4</sup> In light of the current energy crisis, it is expected that the share of people who cannot afford heating their homes adequately will rise again both in Bulgaria and in the EU.

revenue is supposed to be distributed in a progressive manner. Thirdly, an environmental justice in terms of “polluter pays principle” is embedded in this recycling pattern since installations with large verified emissions pay proportionally for CO<sub>2</sub> allowances, compensating in the end those that generate power from renewables.

Despite the benefits mentioned above, the recycling of carbon revenues towards incentives for green electricity in Bulgaria has its shortcomings. Firstly, since the compensation is proportional to the units of consumed energy, the former practically rewards electricity-intensive households and industries. Thus, no change in their behavior in terms of energy savings and carbon footprint reduction may be expected. Secondly, the recycling of the revenues from auctioning of CO<sub>2</sub> allowances is not targeted at a special stakeholder – it occurs “across the board” addressing even firms and households with a high ability to pay. Thirdly, the compensation that industry and households receive monthly, does not depend on the timing and efforts to reduce their energy bills and CO<sub>2</sub> emissions.

### **Conclusion**

The recycling of revenue from national CO<sub>2</sub> allowances constitutes an important feature of the carbon pricing design. Most EU member states reuse their proceeds from EEX in the economy in order to achieve domestically long-term energy and climate goals. Against the backdrop of peaking CO<sub>2</sub> allowance and electricity prices, the national carbon revenues provide reliable compensation for the rising energy costs to businesses and households throughout many member states. Bulgaria opts to recycle its national carbon revenue for the sake of the green electricity, while reducing the burden, which the green component imposes through the electricity bills on households and firms.

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