PERFECT STORM OR RAPID DECARBONIZATION

Taxation of CO_2 emissions from BiH Electricity Sector

mr. Damir Miljević

prof. dr. Mirza Kušljugić

This document was prepared within the project "Energy Transition in BiH - Opportunities and Challenges", which is being implemented in the period from July 1, 2021 to June 30, 2022.

Supported by the Open Society Fund Bosnia and Herzegovina

The project is implemented by the Center for sustainable energy transition ReSET

October 04, 2021

TABLE OF CONTENTS

I. INTRODUCTION

By signing the Sofia Declaration in November 2020[1], Bosnia and Herzegovina (BiH) committed itself, among other things, to work on the introduction of carbon dioxide (CO_2) taxation mechanisms and on harmonization with the European Emissions Trading System (EU ETS) in order to support de-carbonization in the Western Balkans region. In July 2021, as part of the proposal of the legislative framework for achieving the de-carbonization targets of the European Union (EU) of 55% by 2030[2], the European Commission proposed the introduction of a safeguard mechanism for imports of energy-intensive products from countries without CO_2 taxation (Carbon Border Adjustment Mechanism - CBAM). CBAM also applies to electricity imports.

For the Energy Community member states, under certain conditions, for the export of electricity to the EU, it is possible to postpone the application of the CBAM mechanism until 2030. During the preparations for the meeting of the Ministerial Council of the Energy Community, which will be held at the end of 2021, a plan for the de-carbonization of the members of this organization until 2030 is being discussed, which would meet the specified conditions. The basis for the preparation of this plan is the study "Carbon Pricing Design for the Energy Community"[3], which was completed in early 2021.

CO_2 taxation is the most important mechanism to encourage the de-carbonization of the electricity sector. Despite the great importance of this sector in BiH (BiH exports 1/3 of produced electricity, mainly to EU countries, while producing 2/3 of energy from domestic coal-fired power plants), and certain consequences of the introduction of CO_2 taxation, there is no public debate on the consequences of application of CBAM and/or ETS schemes.

The choice between the application of CBAM and the introduction of the emissions trading system, which is compatible with the EU ETS, is not easy. In this document[4] (policy brief), the mechanisms of the EU ETS and CBAM are first described. Then, the possible implications of the application of CBAM or the introduction of ETS on the electricity sector in BiH were derived. Two scenarios have been developed, which are called: "perfect storm"[5] and "rapid de-carbonization". In the end, conclusions and recommendations were given. The aim of the document is to initiate an argument-based discussion on this extremely important topic for the future of the power industry in BiH.

[1] https://www.rcc.int/docs/546/sofia-declaration-on-the-green-agenda-for-the-western-balkans-rn
[2] https://ec.europa.eu/commission/presscorner/detail/en/IP_21_3541
[3] https://energy-community.org/news/Energy-Community-News/2021/01/20.html
[4] Remark: the views expressed in this document represent the views of the authors and do not necessarily reflect the views of ReSet and OSF BiH.
[5] The term “perfect storm” is used to describe a situation in which, due to a combination of bad events that occur as a result, processes cannot be managed, and optimal decisions can’t be made. The state of a perfect storm is mainly the result of insufficient consideration of the risks of structural changes.

II. WHY TAX CO_2 EMISSIONS FROM THE ELECTRICITY SECTOR?

The energy transition is an important aspect of the sustainable development paradigm, also known as the Third Industrial Revolution[6] or the Green Industrial Revolution[7]. The energy transition from the existing to the future concept of development, which should be completed within the next 30 years, is the most radical technical, economic, social and political change that humanity has ever encountered. It is also a process we must implement if we are to limit global warming and mitigate the negative effects of the climate change. Decisive activities should be realized within the next ten years. In developed countries, the socio-economic recovery after the Covid-19 virus pandemic is based on the concept of "green recovery" (e.g. in the EU "European Green Deal"[8] and in the US "New Green Deal"[9]).

Energy sector is relatively the largest emitter of CO_2. De-carbonization, as a fundamental component of the energy transition, is a completely different concept of energy development from the existing one, which is based on fossil fuels. De-carbonization is based on increasing energy efficiency, the use of renewable energy sources, and the electrification of transport and heating. Although BIH has sufficient potential to increase energy efficiency and use renewable sources, it is only at the beginning of this complex transformation.

Technically, the simplest and economically most justified way to de-carbonize energy is to reduce CO_2 emissions in the electricity sector, which can be primarily achieved by reducing the use of coal and by increasing the share of renewable sources in electricity production. The most commonly used mechanism for energy de-carbonization is the taxation of CO_2 emissions. There are several ways to tax CO_2 emissions: explicit, implicit, internal. It is possible to use the model when taxing emitters, which must obtain certificates for each ton of CO_2 emitted (the price of the certificate is expressed, for example, in euros per ton of CO_2 equivalent) (€/tCO_2]), or taxes, when physical quantities are taxed during the energy purchasing.

The most cost-effective way to reduce CO_2 emissions is to use a cap-and-trade system, known as the Emissions Trading Scheme (ETS). The ETS is an implicit taxation of CO_2 emissions that requires complex legislation to ensure the integrity, transparency and liquidity of the CO_2 emission market. Funds raised at auctions are mainly used to finance the energy transition. Each scheme also has a mechanism for protecting socially vulnerable categories of the population from the consequences of the introduction of CO_2 taxation.

[6] Rifkin, „The Third Industrial Revolution“, book 2011., https://www.foet.org/
[7] W. Clark, G. Cook,“The Green Industrial Revolution“, book 2014. https://www.elsevier.com/books/the-green-industrial-revolution/clark/978-0-12-802314-3
[8] https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en
[9] TIR Consulting Group, „America 3.0 The Resilient Society“, report 2021. https://www.foet.org/FOET-data/uploads/2021/07/Jeremy-Rifkin-America-3.0-The-Resilient-Society-20210728.pdf

III. WHAT ARE THE EU CARBON TAX PRACTICES?

The scheme for greenhouse gas emissions trading in the EU[10], which was introduced in 2005, covers more than 15,000 factories and power plants (installation operators) from 31 European countries and is the largest emissions trading program in the world. The fourth phase of the EU ETS for the period 2021-2030 is currently being implemented. The concept is that the total allowed emissions are reduced every year (from 2021 by 2.2 % annually) and that after allocations at auctions they can be traded on the stock exchange[11]. Installation operators are obliged to monitor and report on emissions and to purchase the necessary certificates at auctions or on the market.

Certificate allocation revenue in 2019, with an average cost of 24 [€/tCO_2], was over € 14 billion, and in the first half of 2020 it was € 7.9 billion. In 2019, 77% of the funds raised at auctions were used to implement climate policies in member states.

Since the beginning of this year, the price of CO_2 emission certificates has risen from 34 to 60 [€/tCO_2]. For comparison, the average price of electricity on the reference regional stock exchange in Budapest in 2020 was 50 [€/MWh]. Since thermal power plants in BiH emit an average of 1 ton of CO_2 per 1 MWh of electricity produced, if they had the obligation to pay for CO_2 emissions, they would not be competitive in the export of electricity to the EU.

The consequence of this EU policy is an increase in the share of renewable energy from 15% in 2005 to 38% in 2020, with a simultaneous decline in the share of fossil fuels from 53% to 37%[12]. The largest decline was registered in the use of coal, whose share in 2020 is below 15%. Coal still has more significant share in electricity production in Poland, Bulgaria, Romania, Czechia, Slovenia and Germany.

IV. WHAT IS, WHY AND HOW IS CBAM INTRODUCED?

The implementation of the EU ETS scheme has created a danger of the so-called "Carbon leakage", i.e. a situation in which energy-intensive industries can potentially be relocated from the EU to countries where there are less emission restrictions and where CO_2 is not adequately taxed. Carbon leakage has two potentially negative effects. One is to increase greenhouse gas (GHG) emissions in countries where industries are relocated, and the other one is to reduce the competitiveness of EU industries and businesses covered by the ETS, compared to non-EU competitors who place their products on the EU single market[13].

Therefore, in the current period of implementation of the EU ETS, to prevent the negative effects of implementation, a large part of energy-intensive industries in the EU were entitled

[10] https://ec.europa.eu/clima/sites/clima/files/news/docs/com_2020_740_en.pdf
[11] https://www.eex.com/en/market-data/environmental-markets/eua-primary-auction-spot-download
[12] https://ember-climate.org/european-electricity-transition/
[13] https://ec.europa.eu/clima/policies/ets/allowances/leakage_en

to partial or completely free allocation of CO_2 emissions certificates, as well as some financial measures to reduce indirect costs increase in the price of electricity due to the payment of the CO_2 costs. Given that the total permitted emissions are planned to be reduced in the coming period, and that the free allocation of certificates will be reduced, the EU has introduced a Carbon Border Adjustment Mechanism (CBAM)[14] as a new protection mechanism against carbon leakage, and to preserve the competitiveness of its economy.

CBAM basically represents an import tax on certain products from countries that do not have a CO_2 emission taxation system in place, which is compatible with the EU ETS. In this way, the EU protects its economy from unfair competition from products imported into the EU and coming from countries where CO_2 emissions are not adequately taxed.

The CBAM should ensure that the price of imported goods into the EU reflects the price of carbon paid by domestic producers through the ETS mechanism and should prevent the EU's efforts to reduce CO_2 emissions from being reversed by increasing CO_2 emissions outside the EU. It is important to note that, in essence, the CBAM is primarily a climate measure and not the fiscal one designed to fill European budgets, which stems from the fact that CBAM will not apply to imports from those countries that have an EU ETS compliant taxation system.

Regulations related to CBAM should enter into force on January 01, 2023, and will be applicable from January 01, 2026. A transitional period of 3 years will be used to establish procedures, register importers, obtain permits, and establish a CO_2 calculation mechanism, as well as a monitoring and reporting system. In addition to importers, third country producers can also register and verify their GHG emissions. Emission verification will be performed by certified authorities.

In the first phase, CBAM is expected to cover the import of the following products:

a) iron,
b) steel,
c) cement,
d) pipes and other iron and steel products,
e) aluminum,
f) fertilizers,
g) electricity.

This means that the CBAM will apply to those goods that are currently subject to the EU ETS. This implies that as the ETS system improves (abolishes free emissions) and extends to other goods and services, the coverage of the CBAM scheme will also expand. CBAM certificates will be issued for the import of goods subject to CBAM, and their price will be determined and published weekly based on the average weekly price of the EU ETS. CBAM certificates will be valid for two years from the date of their issuance, i.e. procurement, while there will be the

[14] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0564

possibility that they can be returned if they are not used. A slightly different mechanism will be established for the import of electricity into the EU, which will be based on pre-determined values of GHG emissions in the electricity sector. It will also be possible, with a strictly defined procedure, to prove that the imported electricity comes from renewable sources or from sources that have lower emissions than predetermined.

The calculation of emissions for the goods which are subject to CBAM can be done in two ways:

a) by taking the initial (reference) values,

b) by calculating the actual "embedded" emissions.

The importer is free to use the method he deems more cost-effective. When the actual emission values cannot be adequately determined by the importer, the initial (reference) values will be used. The initial values will be determined as the average value of the emission intensity for each exporting country and for each goods subject to CBAM, except for electricity, increased by the margin to be subsequently determined in the bylaws.

If it is not possible to obtain reliable data on average emissions for exporting countries and goods from those countries, the average emission intensity calculated for 10% of EU producers of the same goods, which have the worst emission performance, will be applied. In the first phase of implementation, only direct emissions will be taken into account when calculating actual “built-in” emissions.

Initial values for electricity imports will be determined based on specific initial values of exporting countries, groups of exporting countries or regions within the exporting country. If it is not possible to determine the initial values in this way, the initial values from the EU will be used for similar electricity generation. Specific initial values will be calculated on the basis of the best data available to the European Commission, which determines the factor of average CO_2 emissions in tons of CO_2 per MWh of electricity produced for sale (electricity on the grid without own consumption). Specific initial values will not be used for exports of electricity to the EU, which resulted from imports of electricity from third countries for the purpose of "re-export" to the EU.

Where specific initial values for the exporting country, group of countries or region within the exporting country cannot be determined or where re-export will not be used, alternative initial values will be used. An alternative starting value for electricity imports, in this case, will be the EU CO_2 emission factor expressed in tons of CO_2 per MWh, which is a weighted average of the CO_2 intensities of electricity produced from fossil fuels in the EU.

The CBAM regulations offer the possibility to extend the CBAM mechanism to other goods, and to calculate and charge indirect emissions in addition to direct emissions incorporated into goods, such as e.g., emissions from the production of electricity from fossil fuels, which is used in the production of goods subject to the CBAM tax on import into the EU.

V. IMPLICATIONS OF THE INTRODUCTION OF CBAM ON BIH POWER SECTOR

In CBAM regulations, there is a possibility that a third country (non-EU), which is based on a market related to the internal energy market in the EU, be conditionally exempted from the application of CBAM, when it comes to export electricity, no later than 2030, if there are no technical possibilities to apply CBAM. This is important for BiH, which exports a significant part of its electricity to EU countries.

For a third country exporting electricity to the EU to be exempted from the application of CBAM to exports of electricity to the EU, it is necessary to cumulatively meet the following conditions:

a) to have a signed agreement with the EU in which it has accepted the obligation to apply EU laws in the field of electricity, including regulations related to renewable energy sources and rules in the field of energy, environmental protection and competition;

b) that the main provisions of EU regulations related to the electricity market have been implemented in national legislation, including the development of renewable energy sources and the integration of the electricity market;

c) that the country has submitted to the European Commission a Roadmap for implementation in which the country is committed to climate neutrality by 2050 and accordingly developed and communicated a long-term low-carbon development strategy and implemented the resulting obligations in national legislation, and that i n implementing its Roadmap, the country has made significant progress in aligning its legislation with that of the EU in the field of climate protection, including CO_2 taxation in the field of electricity generation. In doing so, the implementation of the emissions trading system in electricity generation, with the price of emissions equal to the price of the EU ETS, must be established by 01, January 2030;

d) to have an effective system in place to prevent indirect exports of electricity to the EU from third countries, which do not meet the above conditions for exemption.

The above listed conditions are in line with the Sofia Declaration, and the dynamics of their implementation should be contained in the Energy Community De-carbonization Plan until 2030. In order to assess whether a third country meets all the conditions of the exemption, it is obliged to submit to the European Commission two reports on the fulfillment of the above conditions, the first report by July 1, 2025, and the second report by July 1, 2029. By the end of the reporting year, the European Commission will assess whether the country meets the commitments and conditions set out above.

A third country will be removed from the list of exemptions from the application of CBAM for electricity exports if the European Commission considers that the country has not made sufficient progress in meeting any of the above conditions of exemption or if the country

undertakes activities incompatible with EU climate and environmental objectives and legislation.

In addition, the country will be removed from the exemption list if it acts contrary to its de-carbonization targets, such as providing public support for the construction of new fossil fuel power generation capacity where CO_2 emissions per kWh of electricity produced exceed 550 g[15].

All of the above implicates that the implementation of CBAM from 2023 in the EU will have very serious implications for the electricity sector in exporting countries. The biggest social and economic challenge of de-carbonization in the BiH electricity sector is to abandon the use of coal for electricity production, which is likely to happen by 2050 at the latest.

The impact analysis of the introduction of the CBAM mechanism indicates that BiH will face two key challenges. The first and most serious challenge is the fact that BiH needs to meet the cumulative conditions for exemption from the CBAM for electricity in the next 16 months, which is almost impossible task bearing in mind the current political situation and relations in BiH, slow implementation of obligations in transposition of the EU acquis communautaire through the Energy Community[16] and limited professional and technical capacities.

Another, no less serious and significant challenge is that by the beginning of 2030, BiH must fully implement the emissions trading system in the electricity sector, which will be compatible with the EU ETS at the price of emissions, if BiH wants to be exempted from the application of CBAM. Given that the current price of CO_2 emissions in the ETS system is over 60 EUR/tCO_2, this means that by 2030 the export price of electricity from thermal power plants in BiH will most likely be unattractive for EU buyers, i.e. for export.

The introduction of the EU ETS compatible emissions trading system will lead to a significant increase in the cost of electricity from thermal power plants, which may result in rapid closure of thermal power plants, significant increase in electricity costs for businesses and households or orienting customers towards renewable electricity.

There are two scenarios according to which BiH can react to the introduction of CBAM. The first scenario is that BiH does not accept the possibility of exemption or does not meet the conditions for exemption from CBAM. In this scenario, the export of electricity from BiH falls under CBAM from 2026.

The second scenario implies that BiH accepts and meets the conditions for exemption from the CBAM, where the most important is the urgent accession to the introduction of the ETS system for emissions from the electricity sector. In this scenario, in 2025 and 2029, the EU will assess the extent to which BiH consistently meets the set conditions and, based on that, will make a decision on the application or exemption from the CBAM.

[15] This essentially refers to the construction of new thermal power plants and coal-fired units (author's note).
[16] https://www.energy-community.org/regionalinitiatives/WB6/Tracker.html

In both scenarios, by the beginning of 2026, the export of electricity from BiH would proceed as smoothly as so far. Given the extremely high prices of electricity on regional stock exchanges in 2021, with a tendency to further growth in the coming years, this would in the short-term lead to very significant profits for electricity exporters. The question is how will the realized profit from exports be used?

In the first scenario with the application of CBAM from 2026, exports from thermal power plants would probably become uncompetitive. In case of possible export from thermal power plants, the funds collected through the CBAM tax would go to the EU budget. The consequences of the application of CBAM for individual producers in BiH would depend on their product portfolio. There are two options in this scenario.

The first option is to reduce the export of electricity from thermal power plants due to the application of CBAM from 2026. This implies that consequently there is a surplus of production capacity within BiH, which would result in rapid closure of at least one or two thermal power plants, with all the consequences that unplanned and market-influenced rapid closure of mines and thermal power plants implies. This option can be characterized as a "perfect storm for thermal power plants and mines", which occurs after 2026.

Another option is to continue exporting electricity exclusively from renewable sources that BiH has at its disposal, primarily from hydro and wind power plants, if it is technically possible to monitor and prove that the exported electricity comes from renewable sources. In the option of exporting electricity from renewable sources, the profits of the power companies EP BiH and EP RS would be far higher than they are today, when electricity is exported mostly from thermal power plants, primarily due to significantly lower production prices of electricity from these sources compared to the electricity price from coal[17]. In this option, domestic consumption would be covered almost exclusively from the most expensive source, which is electricity from thermal power plants[18]. This would immediately lead to a very significant increase in electricity prices for all categories of domestic customers, with all the consequences it has on the economic and social situation in the country and on the competitiveness of the exporting companies. This option could be characterized as a "perfect storm for consumers".

If the regulators would not allow an increase in the price in domestic consumption, which would fully cover the real costs of electricity produced in thermal power plants, the power companies would have to cover the difference from the profit realized through exports of electricity from renewable sources. However, problems with exports would arise when the EU (e.g. in 2030) decides to introduce CBAM taxes on indirect emissions of industrial products as

[17] *For example, the production price of electricity from TPP "Ugljevik" in 2019 was 44.84 EUR/MWh, while the production price of MWh from Hydroelectric Power Plants on the Drina was only 15 EUR/MWh, or almost three times less.*

[18] *The production price from existing coal-fired power plants will also increase significantly due to the costs of meeting the requirements of the EU Environmental Directives (LCPD and IED).*

well. Then the demand for renewable energy within BiH grows. Therefore, this option could be characterized as a "delayed perfect storm for consumers - exporters".

In this scenario, private (mostly foreign) investors would implement large renewable energy projects, focusing on energy for exports. Thus, the best locations and capacities of the transmission network would be used for the de-carbonization of other countries, and the de-carbonization of consumption in BiH would be delayed. This would mean a significant delay in implementing the reforms needed to realize a sustainable energy transition. It is especially dangerous to delay the implementation of the restructuring of mining regions, as the implementation of this process requires significant time. The consequences of the delay are already described the scenarios of a perfect storm (from 2026 or 2030), with incalculable economic, social and political problems.

The second scenario implies that BiH resolutely opts for the energy transition and meets the conditions for the exemption of electricity exports from the CBAM, and to immediately start implementing the ETS system for emissions from the electricity sector. Funds raised from the ETS would remain in BiH. Such a scenario would enable the process of systematic adjustment, implementation of de-carbonization and transition from coal to take place in an organized, cost-effective, rational and just manner.

This means that by 2030, BiH could continue to export electricity without paying the CO_2 tax (according to the CBAM), while at the same time the country would have an rapid process of introducing ETS, which would be compatible with the EU ETS from 2030.

In this scenario, new capacities from renewable sources should start to be built rapidly, primarily from solar and wind energy, as the sources with the shortest construction period, the lowest price of energy produced and the lowest impact on the environment. Also, the planned and organized closure of thermal power plants and coal mines would be initiated, which in the conditions of full application of the EU ETS compatible system and full prices of CO_2 emissions do not have an economic basis for further work. The costs of new investments in renewable sources the public utilities could largely cover by increased profits, which would be realized in the export markets in the period until 2030, while part of the costs of energy transition could be systematically and gradually transferred to final consumers, without major economic and social shocks.

Funds raised from the ETS could be used for energy poverty reduction programs and a just transition of mining regions. Together with the already started international programs for the coal regions in BiH, with the funds available from the EU Green Agenda for the Western Balkans and from the programs of international financial organizations, it would be possible to finance rapid de-carbonization and sustainable energy transition in BiH. In this scenario, by organizing auctions for renewable sources, the state could attract foreign investors to deliver all or part of the energy from the production capacities they are building within BiH and thus participate in the de-carbonization of consumption in BiH. This scenario could be characterized as "rapid de-carbonization".

VI. CONCLUSIONS AND RECOMMENDATIONS

The previous chapter describes two possible scenarios of the impact of the introduction of CBAM and ETS on the electricity sector in BiH. The analysis covered the entire country. The impact that CO_2 taxation will have on individual producers will depend on their current portfolio, their strategy of adapting to the new EU regulations and especially on the prices of CO_2 certificates and electricity prices on the regional market. So, other scenarios are possible as well.

Based on everything presented in this document, it is possible to conclude the following:

- The introduction of the Carbon Border Adjustment Mechanism (CBAM) in the EU will pose a major challenge for energy policies and the electricity sector in BiH, given the structure of production, the importance and role of energy in the economy and society and the economy and citizens of BiH;
- In the case of the introduction of CBAM, regardless of whether the exemption from this mechanism will apply to BiH by 2030 or not, any policy of building new capacities for electricity production from coal becomes irrational and socially harmful in the short term, and especially in the long term and certainly leaves behind the so-called "stranded assets". At the same time, investing in the revitalization of existing blocks in order to extend their lifespan also becomes economically questionable;
- Although the text presents two possible scenarios for BiH, it is obvious that the first scenario, which implies that BiH will not be exempted from the CBAM mechanism, would be almost disastrous for citizens and the economy and some public utilities in the BiH electricity sector and will have all the characteristics of the “perfect storm”.

In order to avoid the scenario of a perfect storm, it is necessary:

- That the competent authorities and other participants urgently begin activities to create all conditions and fulfill all the obligations necessary for BiH to be on the list of countries exempted from the application of CBAM by 2030;
- Urgently and without further delay, turn to the de-carbonization of the electricity sector, which primarily means determining the exact date, i.e. year, when the production of electricity from coal will stop. In that way, conditions will be created for the development of realistic, effective, and efficient de-carbonization programs and measures, conditions for economic restructuring of the coal region and local communities that depend on coal, and conditions for the beginning of a just transition.
- Accelerate the development of new capacities for the production of electricity from renewable sources, primarily from solar and wind energy. It should be taken into account that the new commercial capacities of wind and solar power plants must primarily be in the function of de-carbonization of domestic consumption, and not in

the function of clean energy exports. Therefore, legal regulations for organizing auctions for the construction of renewable energy sources need to be adopted urgently.

- It is especially important to legally enable and support investments in community energy and production for self consumption (prosumers), which is a precondition for successful de-carbonization and sustainable transition.