The Arhitecture of EU Emission Trading System and Its Specific Funding Mechanisms up to 2030

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Abstract

The European Union Emissions Trading Scheme (EU ETS) is the core mechanism for addressing climate change through the reduction of greenhouse gase emission in a cost-efficient manner While the theoretical foundation of EU ETS has been widely acknowledged, the research on its future arhitecture has only been published recently or is forthcoming.

In order to describe and summarize the main features of EU ETS in the period 2021-2030, this paper reflect the operating mechanism and economic effect of the EU ETS. to summarize, Moreover,considering the dynamic of international negotiations under the United Nation Framework Convention on Climate Change and the Paris Agreement, the future arhitecture of EU ETS in the post 2020 period also considers the connection of EU trading system with other trading system arround the world in the light of international carbon markets.

Based on the current research on the future legislation on the revised EU ETS, this overview may be helpful to recognize and implement the features of the EU ETS in post 2020 period , including in our country.

Key words: climate change, EU emission trading scheme
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1. Introduction

On 12th December 2015, in Paris was adopted the Paris Agreement (PA). It imposes legal obligations on all Parties and how to achieve the long-term global objective of maintaining global warming below 2 ° Celsius by 2030 compared to the pre-industrial, depending on their capabilities and responsibilities and capabilities. The long-term goal of PA is limiting global average temperature increase below 2 degrees Celsius . As a unique element, Parties will strive to limit the temperature increase to 1.5 degrees Celsius .

This is the first legally binding multilateral agreement with universal participation in the field of climate change and to be applied starting 2020.The Paris Agreement entered into force on 4 November 2016. The ratification of PA by the EU triggered its entry into force worldwide.

On June 1, 2017, the US Presidential Administration announced its withdrawal. At EU level, the European Council has consistently delivered a message from European leaders on the EU's firm commitment to implement the Paris agreement. the Heads of State and Government decided on the EU`s contribution to the Paris Agreement by adopting the 2030 Framework, namely "mandatory reduction target of at least 40% of greenhouse gas emissions by 2030 compared to 1990". On 6th of March 2015, the EU submitted its Intended Nationally Determined Contribution (INDC) formally putting forward a its binding, economy-wide 40% reduction GHG target by 2030.

The 40% greenhouse gas emissions reduction target compared to 1990 is divided as follows: by 2030, the reduction of GHG from EU ETS sectors by 43% and by 30% by the the non-ETS sectors..

In July 2015, a legislative proposal was presented by the European Commission which supported the revision of the EU Emissions Trading System for the period after 2020. The revised EU ETS Directive Directive EU 2018/410 amending Directive 2003/87/EC to enhance cost-effective emission reductions and low-carbon investments entered into force on 8 April 2018.

In the context of each global stocktake under the Paris Agreement, the provisions of the revised EU ETS Directive will be kept under review. The PA shall be reviewed every five years beginning in 2023.

Table no. 1. EU ETS verified emissions and allocation in RO and EU

YEAR	RO total allocated EUA (millions tonne CO2)	EU total allocated EUA (millions tonne CO2)	RO verified emissions (millions tonne CO2)	EU verified emissions (millions tonne CO2)
2013	73,85	2 096, 54	42, 41	1 881.84
2014	46,859	1 551,26	42, 57	1 787.15
2015	55,08	1 479,54	42, 39	1 775.53
2016	66,29	1 548, 05	39, 77	1 723.70
2017	72,40	1 696, 82	40, 61	1 726.61
2018	16,48	672 655		

Source: Author data adapted from https://www.eea.europa.eu/data-and-maps/dashboards/emissions-trading-viewer-1 , 2019

2. Theoretical background

The Directive 2018/410 includes, inter alia, provisions on free allocation of EU allowance (1 EUA = 1 tonne of CO2 equivalent) to sectors under the EU emission trading scheme , measures to protect the industry at the risk of carbon leakage based on free allocation, auctions, the reserve for new entrants and specific financial mechanisms. These ETS specific mechanisms are the Innovation Fund, the Modernization Fund and the derogation for power sector represented by the transitional allocation for the energy sector based on the provisions of article10c.

The Market Stability Reserve (MSR), is a specific EU ETS mechanism aiming at reducing the surplus of EUA in the carbon market.. In this respect, between 2019 and 2023, the amount of EUA put in the reserve will be doubled to 24% of the allowances existing in the market. The regular feeding rate of 12% will be restored as of 2024.

"At the start of phase III, the formation of a significant surplus of allowances, initially started in phase II as a consequence of the lower demand for allowances in the aftermath of the 2008 economic crisis, became a serious problem. The EU ETS's fixed supply of allowances offered the advantage of simplicity when determining the cap – but it did not provide for any possibility of adjustment to unexpected economic conditions".

a. Free allocation to industry and carbon leakage rules

The revised EU ETS Directive provides predictable, robust and fair rules to address the risk of carbon leakage In this respect energy-intensive industries will receive free 100% allocations. For the other sectors and sub-sectors that are able to transfer a higher share of the cost of EUA into product prices, the level of free allocation is 30% (binary system). Unless otherwise decided in the review, free allocations for these latter sectors and subsectors, except for district heating plants, the allocation after 2026 will gradually decrease so that in 2030 it reaches a level of 0, without any free allocation.

The system of free allocation will be prolonged for another decade and has been revised to support those sectors at the highest risk of relocating their production outside of the EU. The district heating installations will receive part of their allocation for free, considering that their activity has a social component.

More than 6 billion allowances are expected to be allocated to industry for free over the period 2021-2030.

b. Auctioning

Member States can make revenues from auctions EUA that will be used, under certain conditions, to fund emission reduction measures. At each Member State, the volume of the EUA for auctioning are distributed as follows:

- according to the emission criterion, i.e. the share held by the Member State concerned in total verified emissions under the EU ETS, 90% of the total number of allowances will be allocated to all MSs while the rest of 10% will be distributed
- to certain MS for the application of the principle of solidarity , but also for growth and interconnections. For this purpose and for those countries with GDP / capita under 90% will be used the 2013 data.

c. ETS specific funding mechanisms

will be set up to help of the transition to a: The Innovation Fund, the Modernisation Fund and derogation for modernization of power sector under Article 10c are the ETS funding mechanisms helping the energy-intensive industrial and the power sector meet green energy .

They are presented at lenght and in details in the below section.

The main features of the **Innovation Fund** are:

- all Member States are eligibile;
- the fund comprises 450 million EUA which will be monetized and managed by the European Investment Bank (EIB);
- projects are selected on the basis of transparent and objective criteria, taking into account, where appropriate, the extent to which these projects contribute to the reduction of greenhouse gase emissions below the reference values;
- projects must have the potential to be widespread or significantly reduce the cost of transition to a low-carbon economy;
- projects involving the CCU (Carbon Capture and Utilisation) must ensure a net reduction in emissions and the avoidance or permanent storage of CO2;
- supported technologies must not be available on large scale on the market but must be revolutionary solutions or mature enough to be ready for a pre-commercial demonstration;
- can cover up to 60% of the relevant costs.

The key characteristics of **the Modernization Fund** are:

- eligibile Member States are: Bulgaria, Czech, Estonia, Croatia, Hungary, Latvia, Lithuania, Poland, Romania and Slovakia (same beneficiaries as for derogation under the provisions of article10c);
- its volume is around 310 million EUA for the period 2021-2030; these will be auctioned by the Euroepean Investment Bank (monetization of allowances);
- the Fund will be distributed among eligible Member States according to a pre-defined formula based on 2 criteria, each weighting of 50% namely the ETS verified emissions and GDP;
- Romania will receive 11.98% of the 310 million EUA; the level of the revenues will depend on the carbon price at the time of the auction;
- at least 70% of the financial resources resulted from the Modernization Fund are used to support investments (projects) provided that the remaining costs are financed by private legal entities: production and use of electricity from renewable sources; improving energy efficiency, without production of energy using solid fossil fuels; energy storage and

upgrading of energy networks, including pipelines for district heating plants; electricity transmission networks and increasing interconnections between Member States; support for the transition to a low carbon economy in the regions addicted to fossil fuels in the beneficiary Member States so as to sustain the relocation, vocational reconversion and improvement of workers' skills, education, initiatives for job search and start-ups in dialogue with social partners. Investments in energy efficiency in transport, construction, agriculture and waste are also eligible;

- before deciding to finance an investment from the fund, the Member States shall submit the investment project to the Investment Committee and the EIB. If the EIB confirms that the investment falls within the areas mentioned above, the authorites may proceed to finance the project on the basis of Member State share from the fund;
- where a project in the modernization of energy systems proposed to be financed by the fund does not fall within the areas mentioned above, the Investment Committee shall assess the investment concerned from technical and financial point of view, including emission reduction and give a recommendation, including appropiate financing instruments. The Investment Committee shall ensure that any investment in district heating achieves a a major increase in energy efficiency and emission reductions.

The key characteristics of the **derogation for modernizing the power sector** are:

- the general rule for energy producers is that they buy from the market all the necessary EUA. For Member State with a GDP/capita below 60% of the EU average in 2013;
- under certain conditions and meeting the criterion GDP/capita below 60% of the EU average in 2013, 10 member states can apply for for this derogation; alongside Romania there are Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, and Poland (same beneficiaries as for the Modernization Fund);
- these Member State can decide to allocate a transitional free allocation to power production which ensures modernization of the energy sector and diversification of energy mix;
- the supported investments must be consistent with the transition towards a secure and sustainable low-carbon economy and with the objectives of climate policy reflected by the EU legislation and Paris Agreement;
- the selection of investment projects to be funded and involving a total investment amount below 12.5 million EUR is based on a competitive bidding procedure to be developed by the beneficiary Member State;
- where investments of less than EUR 12,5 million EUR are not selected through the competitive bidding procedure, the Member State selects the projects on the basis of objective and transparent criteria. The results of the selection process are subject to public consultation.

Table no. 2. Treatment of unused 10c allowances 2013-2017

Member State	Number of 10c allowances which have been auctioned	Number of remaining unused allowances
BG	7 800 000	1 100 000
CY	0	0
CZ	0200 000	0200 000
EE	300 000	400 000
HU	0	0900 000
LT	700 000	0400 000
PL	0,0	113 300 000
RO	12 400 000	4 400 000
Total	21 400 000	119 600 000

Source: Report on the functioning of the European carbon market - COM(2018) 842 final, 2018

The EUA which were initially intended to be used for the the purpose of power sector derogation but left unused, may either be auctioned under the pre 2020 period , or may be allocated in 2021-2030 to Article 10c investments selected through competitive bidding. *Table 2. Treatment of unused 10c allowances 2013-2017* shows the number of 10c allowances for the years until 2017 which have been auctioned in the period 2013 -2017, although initially proposed for the use of derogation. Investments for the purpose of 10c derogation are reflected by the last column of the table, namely the equivalent allowances which may be transferred and allocated in 2021-2030. .

For the period 2013-2017, Romania used 46, 96 millions EUA for the implementation of the 10c derogation for the power sector. The equivalent value of this volume represents up to 305,25 millions EUR for the modernization of power sector. National authorithies used the mechanism with an effciency of 96,71% compared to european average.

d. International carbon markets

The Paris Agreement provides for a robust and ambitious basis for the use of international carbon markets which can play a key role in reducing global greenhouse gas emissions cost-effectively. Similar to EU emissions trading system there are systems already operating or under development all around the world (Europe – Switzerland; North America - United States andCanada; Asia - China, Japan, South Korea; New Zealand) .

In 2014-2017, the European Commission in close cooperation with China carried out a 3-year project to support the design and the implementation of emissions trading in China.

The emission trading programme in China can, on the micro-economic level, help minimize the costs of GHG emission reduction, develop new business opportunities, promote business engagement, and establish links with international carbon markets. At a macro-economic level, a successful national ETS will contribute to the transformation to a low-carbon economy and strengthen China's role in international climate change negotiations.

3. Research methodology

Based on the current research on the future legislation on the revised EU ETS, this overview may be helpful to recognize the of features EU ETS for 2030 and guide its efficient implementation, including in our country.

At the same time I analyzed and assessed relevant data and documents of the European Commission and European Environment Agency. I used the "EU ETS data viewer" (available on the European Environment Agency website) to determine different indicators. The EU ETS data viewer provides an easy access to emission trading data contained in the European Union Transaction Log (EUTL). The EUTL is a central transaction log, run by the European Commission, which checks and records all transactions taking place within the trading system. The EU ETS data viewer provides aggregated data.

4. Findings

The historic Paris Agreement to combat climate change was signed by 195 nations in 2015 (COP 21, Paris) and will come into effect in 2020. The Paris Agreement represents the decisive point for the development of present generations so as not to jeopardize the inheritance of future generations. The main objective is to keep under control the increase in the global temperature below 2 degrees Celsius. .

In the forthcomings of COP 21, the revision of EU ETS for the post 2020 period was initiated. The main featurs of the revision focus are: further development of EU ETS as an investment driver in low-carbon technologies and innovation, increasing the increasing the linear reduction factor from 1.74% in the current trading phase to 2.2% as of 2021; consolidating the MSR considering a higher level of its feeding rate and validity rules; under certain conditions on technological progress, further use of the free allocation for those industrial sectors at risk of carbon leakage ; the transition of EU's industry and power sector to low carbon economy will be supported by several low-carbon ETS funding mechanisms .

The principle that pollutershould pay is enshrined in the provisions of article 191(2) of the Treaty on the Functioning of the European Union (TFEU). Considering this the auctioning of allowances remains the general rule with free allocation as the exception.

The main effect of the auction is to transfer the windfall profits of (high) emitters into government revenue.

To address the oversupply of EUAs under the current trading phase and create a more stable carbon price, EU policy makers established the MSR. It starts in 2019 by temporarily withholding part of the surplus from the market and bring it back when available allowances go below a certain level. A robust carbon price also promotes investment in clean, low-carbon technologies. From the perspective of an efficient CO2 cost management, the current low EUA prices seems to be no longer attractive for the private sector to support investments in low-carbon technologies in the energy sector.

The ETS specific funding mechanisms include one new fund, namely the Modernisation Fund. It will support investments in modernising the power sector and diversify the energy mix, improving energy efficiency and facilitating the transition to low –carbon economy in 10 lower-income Member States. For all these mechansims alongside Romania, there are 9 other eligibile Member States with a Gross Domestic Product per capita below the 60 % Union average in 2013: Bulgaria, Czech, Estonia, Croatia, Hungary, Latvia, Lithuania, Poland and Slovakia.

The support under Article 10c of the EU ETS Directive will continue to be available for the abovementiond 10 Member States also eligible for the Modernisation Fund. Unallocated allowances for the purpose of power sector derogation may either be auctioned or allocated in 2021-2030 under the Article 10c investments. The implementation of the 10 c mechansism is at the decision of each MS eligibile . At national level, having in mind the efficiency of its implementation in the current trading period and the need of decarbonisation of our energy system, the mechanism should be further used in the period post 2020.

The Innovation Fund will support innovative technologies and peak of innovation in industry. The amount of funding available will correspond to the market value of at least 450 million emission allowances.

5. Conclusions

The European Commission launched the revision process for phase IV of the EU ETS in 2015, in the forthcoming of COP 21 (Paris, december 2015) and at a moment when the carbon price generated was relative low compared to previous expectations.

A reformed EU ETS is the path for the European Union to reach its agreed greenhouse gas emission reducion target for 2030 and the commitments under the Paris Agreement. The EU ETS stand as an EU specific legal construction, permanently adapting itsdelf to the fight against global warming and at best support achieving the necessary long-term decarbonisation. The achievement of a 43% GHG emissions reduction generated by EU ETS sectors by 2030 will be delivered by the revised EU ETS Directive for phase 4 for . Many of the elements included in the phase IV reform aim at addressing the shortcomings previous experienced.

In order to meet the Paris Agreement goal, the reformed ETS decrease the total volume of EUA available on the carbon market while increasing the linear reduction factor of 2.2% from 2021 onwards compared to 1.74% (). It corresponds to the EU target of an overall 40% reduction in greenhouse gas emissions by 2030.

The measures to strengthen the ETS post 2020 based on the MSR are likely to be justified considering the current surplus of EUAs on the EU carbon market. Establishing a meaningful ETS price signal alongside a broad set of policy measures and instruments will be needed in order to guide the transition to a renewable energy future.

The modernization of the energy system and the improvment of energy efficiency is

According to market analysis forecasts, the average price of the EUA could be 20 euro/EUA in the period post 2021-2030. Regarding the Modernisation Fund, the amount that Romania could benefit from is 742,76 millions EUR, calculated with a volume of 37,138 millions EUA. The Investment Board and a Management Committee will govern this fund. .

The international carbon markets can play a key role in the future arhitecture in the field of climate change at global level. The EU ETS is the first emissions trading market on global level, accounting for over threequarters of international carbon trading. It continues to be starting point for other national or regional emissions trading systems. Europe wants to link the EU ETS with compatible tradingsystems in other countries.

6. References

- David P. Keller, Andrew Lenton, Emma W. Littleton, Andreas Oschlies, Vivian Scott, Naomi E. Vaughan , 2018. The Effects of Carbon Dioxide Removal on the Carbon Cycle. *Current Climate Change Reports,* Volume 4, Issue 3, p. 250–265;
- Jacob K. Goeree, Karen Palmer, Charles A. Holt, William Shobe, Dallas Burtraw , 2010. An experimental study of auctions versus grandfathering to assign pollution permits. *Journal of the European Economic Association*, volume April–May 2010, p. 514–525;
- Kenig-Witkowska, M., Krämer, L., Ubysz, K., Stoczkiewicz, M. , 2015. *Derogations from a transition Free EU ETS allowances for the electricity sector in Poland*. Warszawa: ClientEarth Poland. p. 44-48;
- D.Rob et al. , 2014. Towards global carbon pricing: Direct and indirect linking of carbon markets. *OECD Journal: Economic Studies,* Vol. 2013/1;
- Bogojevic, S. , 2013. Emissions Trading Schemes: Markets, States and Law. 1st edition. Oxford: Hart Publishing. p. 66;
- https://www.eea.europa.eu/data-and-maps/dashboards/emissions-trading-viewer-1
- https://ec.europa.eu/clima/policies/ets/revision_en
- https://ec.europa.eu/clima/sites/clima/files/ets/docs/com_2018_842_final_en.pdf
- https://ec.europa.eu/clima/sites/clima/files/factsheet_ets_en.pdf
- http://www.caneurope.org/docman/emissions-trading-scheme/2832-can-europe-ets-reform-position-april-2016/file
- https://www.oxfordenergy.org/wpcms/wp-content/uploads/2018/09/The-EU-ETS-phase-IV-reform-implications-for-system-functioning-and-for-the-carbon-price-signal-Insight-38.pdf