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Biomass-related issues and potential windfall profits in the European Union Emissions Trading System

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Abstract Recent European Union Emissions Trading System (EU ETS) legislation amendments elaborate on biomass-related issues, by (1) introducing sustainability and greenhouse gas (GHG) savings criteria (Renewable Energy Directive (EU) 2018/2001; RED II-criteria) applicable in energy production and restricting the scope of the term "biomass" (Commission Implementing Regulations (EU) 2018/2066, (EU) 2020/2085 and (EU) 2022/388) and (2) excluding, during the forthcoming 5-year-long period 2026-2030 and subsequent such ones, stationary installations with GHG emissions mainly (over 95% as a, currently retrospective, preceding 5-year average) from biomass (Directive (EU) 2023/959, relaxing the previously holding 100% provision). Along with broadly planned, on-going decreasing share of free allowances (for GHG emissions) in favor of auctioning, concurrence of the above measures indicates room for windfall profits (contrasting the exclusion rationale) for installations that, being temporarily excluded, would not surrender potentially increased (due to combustion of materials not considered biomass, any more) emission allowances, while being deprived of (potentially curtailed) free ones. Based on the content of an explanatory numerical example in a non-legally binding Guidance Document (provided by the European Commission) on the Interpretation of Annex I (listing regulated activities) in Directive 2003/87/EC (EU ETS Directive), the present work considers issues in the above-mentioned framework, regarding such potential for installations with energy-intensive processes, using biomass-based raw materials and recovering energy from pertinent waste, as in pulp and paper manufacturing. Free allowance and verified emissions data from the (EU ETS-related) European Union Transaction Log combined with Carbon Dioxide emissions data from the European Industrial Emissions Portal (European Environmental Agency) indicate relevance of the above-mentioned, evidently unintended, inconsistency to a small number of pulp manufacturing installations, with potential for manifestation in additional EU ETS installations (especially ones that carry out combustion with rated thermal input exceeding 20 MW, not shielded against Carbon leakage).

Keywords: EU ETS, Free allowances, Biomass, Exclusion, Windfall profits

1. Introduction

Since the original phase (2005-07) of the European Union Emissions Trading System (EU ETS), allocation of free emission allowances to installations has been related to passing on to third parties (customers) the cost of surrendered allowances (Ekins, 2005), while benefitting from such ones received (at least in part) for free (thus generating windfall profits). Concern over elimination of windfall profits is evident in subsequent EU ETS legislation (cf. recitals: (15) in Directive 2009/29/EC; (10) and (11) in Directive (EU) 2018/410; (70), (81) and (89) in Directive (EU) 2023/959), while the "electricity generator" definition (launched in Directive 2009/29/EC Article 1(2.c)), retrospectively involving electricity sale to third parties since 2005 (Tzouvaras, 2023) has deprived aspects of electricity production from free allowances allocation, since 2013. Regarding biomass-based fuels, Commission Implementing Regulations (EU) 2018/2066 (Articles 38 and 39) and EU 2020/2085 (Article 1(6.d)) align the EU ETS with EU renewable energy concepts (Directive (EU) 2018/2001 or RED II), focusing on "zero-rated" biomass and using sustainability and greenhouse gas (GHG) savings criteria applicable since 2022 (deferrable to 2023, through Commission Implementing Regulation (EU) 2022/388, Article 1). Further, Annex I of Directive 2003/87/EC (ETS Directive), listing regulated activities, has been recently amended (Directive (EU) 2023/959, Annex (1a)) so as to exclude from the ETS (over successive 5-year long periods, starting with 2026-30) stationary installations with GHG emissions from zero-rated biomass exceeding 95% of total GHG emissions (relaxing a previous provision for individual units, using biomass exclusively), retrospectively using 2019-23 emissions data. The present work considers effects of such exclusion, relating to potential benefits of installations eligible for exclusion (through 2019-23 emissions data, being actually liberal on biomass quality) during a subsequent time period when their emissions might increase (due to stricter rules on biomass combustion), while free allowances allocation might remain unaffected or even be reduced.

2. Materials and Methods

Elements of a numerical example in a non-legally binding Guidance Document (EC 2023, p. 44) interpreting EU

ETS Directive Annex I, listing regulated activities, provide indications about an installation to be excluded from the EU ETS, as outlined above. These include considerable emissions from zero-rated biomass (compatible with biogenic raw materials), emissions from a biomass stream that ceases being zero-rated beyond 2021 (increasing annual allowances surrender over 70%: from appr. 35.000 to appr. 60.000) and fossil emissions from natural gas and limestone. Figure 1 (left) presents pertinent information (EC 2023; rounded numerical values, up to 3 significant figures). Considering specific EU ETS Directive Annex I activities (beyond the generic provision for installations with total rated thermal input exceeding 20 MW), limestone limits the manufacturing scope (e.g. production of metals, ceramics, cement, lime, paper and soda ash), with biogenic raw materials pointing to the pulp and paper industry (monitored for Carbon Dioxide emissions), typical for high share of biomass-based fuels (Kuparinen etal., 2023). Regarding installations potentially eligible for exclusion from the EU ETS, publicly accessible EU ETS-related Transaction Log (EUTL) data provide annual free allowances and verified emissions, whereas European Environmental Agency (EEA) data (through the European Pollutant Release and Transfer Register, E-PRTR) furnish overall Carbon Dioxide emissions in excess of 100 kt/year (Sweden and Finland reporting biomass-based Carbon Dioxide emissions, as well).

3. Results

Consideration of pulp and paper sector information in EUTL and EEA databases indicates a small number of installations (with relevant data displayed in Figure 1 (right) lists) evidently eligible for (profitable) exclusion from the EU ETS over the period 2026-30 (zero-rated emissions > 95%), contrasting their indicated obligation, should these remain at their current activity level, for annual surrender of more allowances than those granted for free (noting that Carbon leakage counter-measures prevent gradual reduction of free allowances for this sector during 2021-30; Commission Delegated Decision (EU) 2019/708, Annex – point 1).

4. Discussion and Conclusion

Identification of (pulp and paper) installations potentially benefiting from the combined effect of recent amendments in EU ETS legislation (i.e. exclusion conditions and biomass-related effects) appears to defeat a long-standing goal against windfall profits, even creating such ones afresh in isolated cases; such potential beneficiaries might multiply if installations below the E-PRTR 100 kt/year Carbon Dioxide emissions threshold or ones enlisted in the EU ETS through total rated thermal input exceeding 20 MW are taken into consideration.

Example (p. 44 in Guidance on Interpretation of Annex I of the EU ETS Directive, EU ETS Guidance document 0, 19 Dec. 2023); rounded emission entries (up to 3 significant figures)

Source stream	t CO_2	2019	2020	2021	2022	2023	Sum (5yrs)
Biomass No 1							
	Fossil						
	RED II compliant	1.000.000	996.000	998.000	998.000	997.000	4.990.000
	Other biomass						
Natural gas							
	Fossil	29.900	29.900	29.900	30.000	29.900	150.000
	RED II compliant						
	Other biomass						
Limestone							
	Fossil	5.020	4.990	5.020	4.980	5.000	25.000
	RED II compliant						
	Other biomass						
Biomass No 2							
	Fossil						
	RED II compliant	24.900	25.100	25.000			75.000
	Other biomass				24.900	25.100	50.000
Sum							
	Fossil						175.000
	RED II compliant						5.070.000
	Other biomass						50.000
Total emissions							5.300.000
Zero rated emissions							5.070.000
Percentage of zero-rated emissions (%)							95,7

EU Transaction Log (EUTL)						E E A (E-PRTR)		
Country	EUTL Installation ID	City	Annual Free Allowances 2024 - 2025	Total Free Allowances 2019 - 2023	Total Verified Emissions 2019 - 2023	Total CO_2 Reported Emissions 2019 - 2023	Non-biomass CO_2 Reported Emissions 2019 - 2023	Zero-rated emissions (%)
Finland	414	Kemi	13.200 (5-year projection: 66.000)	75.600	310.000	6.600.000	316.000	95,3
Portugal	105	Setúbal	31 (5-year projection: 155)	1.070	262.000	7.050.000		96,3
Sweden	460	Timrå	48.400 (5-year projection: 242.000)	261.000	295.000	9.900.000	295.000	97,0
Sweden	464	Aspabruk	8.460 (5-year projection: 42.300)	42.400	78.200	2.080.000	79.100	96,2

Figure 1. Potential exclusions of installations from the EU ETS: Numerical example (left); Installations data list (right)

References

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Author comments

Although the paper content is considered to be valid, an in depth review would hopefully contribute towards eliminating possibilities of inadvertent misinterpretation of provisions of the legislation involved.