

EU ETS phase 4 developments - issues

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Content: EU ETS phase 4 developments - issues

- 1. Carbon Leakage Assessment**
- 2. Update of the benchmarks**
- 3. The new allocation rules**

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1. Carbon Leakage Assessment

Carbon Leakage Assessment phase 4: parameters

- Carbon Leakage Assessment 2021-2030 reference years
 - ✓ Reference years for direct emissions, indirect (electricity) emissions, GVA and Trade Intensity: 2013-2015 (Electricity Factor: 2015)
- The assessment is (normally, all chemicals) per 4-digit NACE code
 - ✓ The concept is: the main NACE code of each installation
- Score must be > 0.20
 - ✓ Direct + indirect emission in $\text{kg CO}_2/\text{GVA} \times \text{Trade Intensity}$
 - Qualitative assessment possible if $\text{score} > 0.15 \leq 0.20$
- Issue is also the Electricity Factor: should be from the marginal power plant (instead of as used by the Commission, the average power plant)
 - ✓ EF was $0.423 \text{ ton CO}_2/\text{MWh}$ for CLA 2015-2019 (and 2020)
 - EF (2015) phase 4: $0.376 \text{ ton CO}_2/\text{MWh}$ (-11%)

Carbon Leakage Assessment phase 4: problems

- NACE code: Chemical installations with an incorrect NACE code or with an electricity NACE code
 - Therefore substantial chemical emissions missed in a NACE code
- GVA is taken of the whole sector, while EU ETS installations are in various cases only a part of the sector (rest = non-ETS or “invisible”, part of other ETS installations)
 - This applies to all “smaller” chemical NACE codes: 20.20 (pesticides), 20.30 (paints-coatings), 20.41 (soaps-detergents), 20.42 (perfumes, toilet preparations), 20.51 (explosives), 20.52 (glues), 20.53 (essential oils: 1 ETS installation, in Spain!), 20.59 (other chems), 21.10 (basic pharma) and 21.20 (pharma preparations)
 - Example 20.20: Germany has highest GVA, zero ETS installations
 - Example 20.59: GVA ETS installations << 50% of total GVA (~ 25%)

Carbon Leakage Assessment phase 4: NACE codes

➤ **Member States and Commission realised a NACE code for each installation with an emission in 2013-2015**

✓ This is quite an achievement, but mission is not complete

Chemical NACE codes, wrong or possibly wrong		Total	Wrong chem	Classified as:				Most new	Total	Total	Total
Number of chemical installations		Number	NACE code	35.11	35.30	35.00	35.10			%	E-NACEs
20.11	Industrial gases	49	3	0	0	0	0	3	6%	0	
20.12	Dyes and pigments	32	0	3	2	0	1	6	19%	6	
20.13	Inorganics	157	11	1	12	2	8	34	22%	23	
20.14	Organics	582	24	35	36	8	21	124	21%	100	
20.15	Fertilizers, N-comp.	151	9	4	1	0	8	22	15%	13	
20.16	Polymers	150	14	4	6	4	9	37	24%	23	
20.17	Synthetic rubbers	18	1	3	2	0	1	7	39%	6	
20.20	Pesticides/agrochems	8	0	1	1	0	0	2	25%	2	
20.30	Paints-coatings, etc.	27	0	0	0	0	0	0	0%	0	
20.41	Soaps and detergents	12	0	1	0	0	0	1	8%	1	
20.42	Perfumes and toilet preparations	5	0	0	0	0	0	0	0%	0	
20.51	Explosives	6	2	0	0	0	0	2	33%	0	
20.52	Glues	4	1	0	1	0	0	2	50%	1	
20.53	Manuf. essential oils	1	0	0	0	0	0	0	0%	0	
20.59	Other chems	74	14	3	6	0	2	25	34%	11	
20.60	Man-made fibres	38	0	4	1	2	10	17	45%	17	
21.10	Basic pharmaceuticals	65	11	1	8	0	0	20	31%	9	
21.20	Pharma preparations	69	1	0	2	2	3	8	12%	7	
Totals		1.448	91	60	78	18	63	310	21%	219	
Totals %			6%	4%	5%	1%	4%	21%		15%	

CLA chemical industry 2018 in EU ETS

- **Wrong chemical NACE code (91 installations)**
 - Some debatable, some really wrong (Yara Brunsbüttel NH₃: refinery!)
- **NACE 35.11 = Production of electricity**
 - CHP = also heat (60 chemical installations)
 - Electricity ≠ main code if Heat/Power ratio = 1 or > 1 (which is often)
 - Anyhow, punishment of CHP, emissions off the radar and contrary to concept of carbon leakage assessment
- **NACE 35.30 = Steam and air conditioning supply**
 - Firstly, CHP (55 chemical installations) is more than steam
 - Secondly, if only steam it matters for whom
 - Anyhow, punishment of CHP and stand-alone boilers, emissions off the radar and contrary to concept of carbon leakage assessment

CLA chemical industry 2018 in EU ETS

➤ **NACE 35.00 = Non-existing and undefined**

- 18 chemical CHP or non-CHP installations
- Anyhow, punishment of CHP and non-CHP, emissions off the radar and contrary to concept of carbon leakage assessment

➤ **NACE 35.10 = Non-existing and undefined**

- (35.10 = ISIC Rev.4 code; ISIC = United Nations' International Standard Industrial Classification of All Economic Activities)
- 63 chemical CHP or non-CHP installations
- 58 installations changed from 20.13, 20.14, 20.15, 20.16, 20.17, 20.59, 20.60 and 21.20 to NACE 35.10!
- Anyhow, punishment of CHP and stand-alone boilers, emissions off the radar and contrary to concept of carbon leakage assessment

There are 81 chemical CHP installations with a chemical NACE code

CLA chemical industry 2018 in EU ETS

- **Missed heat volume: ~ 27 Mton CO₂ (2013-2015)**
- **Big CHPs in Italy: Novara, Ferrara (2), Rosignano Marittimo, Brindisi, Ravenna, Mantova**

- **Desired solutions for the future**
 - ✓ Repair incorrect chemical NACE codes
 - ✓ For chemicals, abandon 35.11, 35.30, 35.00 and 35.10
 - ✓ Could be replaced by e.g. NACE 35.10-20.xx (e.g. 35.10-20.12)
 - Deduct electricity emissions (as done in Carbon Leakage Assessment in 2014, not in assessment 2018)
 - ✓ Stop punishment of chemical CHP and non-CHP with electricity NACE codes and follow the concept of carbon leakage assessment
 - Stop more CHP = more heat emissions are gone

Carbon Leakage Assessment phase 4: Scores

Chemical NACE codes, scores Commission 29 May 2018 (score Trade Intensity x kg CO2/GVA)					
		Score			Score
20.11	Industrial gases	1,021	20.41	Soaps and detergents	0,028
20.12	Dyes and pigments	0,519	20.42	Perfumes and toilet preparations	0,035
20.13	Inorganics	1,638	20.51	Explosives	0,048
20.14	Organics	1,049	20.52	Glues	0,067
20.15	Fertilizers, N-comp.	2,418	20.53	Manuf. essential oils	0,046
20.16	Polymers	0,312	20.59	Other chems	0,147
20.17	Synthetic rubbers	0,604	20.60	Man-made fibres	0,412
20.20	Pesticides/agrochems	0,089	21.10	Basic pharmaceuticals	0,192
20.30	Paints-coatings, etc.	0,028	21.20	Pharma preparations	0,049

NACE 21.10 qualitative assessment was positive

CLA chemical industry 2018 in EU ETS

➤ NACE 20.59 (other chems), 3 problems

1. **Incorrect product NACE codes**: Biodiesel classified as NACE 20.14, NACE 20.41 (soaps/detergents, by-product is glycerine), NACE 10.41 (oils and fats = feedstock); missed emission ~ 200 kt

✓ One was OK: Portugal

✓ Biodiesel is NACE 20.59, PRODCOM 20595997: Biofuels (diesel substitute)

NACE 20.59 score is now 0.147, with correct biodiesel classification score would be > 0.15 (eligible for qualitative assessment)

2. **GVA**: With ETS GVA at 50% of total GVA (is likely 25% or less), score would be 0.30, thus truly exposed

3. **Electricity NACE codes**: 2 original 20.59 installations moved to NACE 35.10, one of them (Henkel) ~ 250 kt missed heat emissions

Content: EU ETS phase 4 developments - issues

2. Update of the benchmarks

Update of the EU ETS benchmarks – the Directive

- Period 2021-2025: new BMs based on 2016/2017 compared with BMs 2007/2008 (9 yrs) give the annual reduction rate
 - BMs 2021-2025: annual rate 2008-2023 (15 years)
- Period 2026-2030: new BMs based on 2021/2022 compared with BMs 2007/2008 (14 yrs) give the annual reduction rate
 - BMs 2026-2030: annual rate 2008-2028 (20 years)
- Annual reduction rate min and max
 - Min: 0.2% ($15 \times -0.2\% = -3\%$; $20 \times -0.2\% = -4\%$)
 - Max: 1.6% ($15 \times -1.6\% = -24\%$; $20 \times -1.6\% = -32\%$)

Update of the EU ETS benchmarks – issues

- The data collection for update of the BMs goes via the Member States to the Commission (see Art. 11)
 - Risk that incorrect data inputs are not noticed (by lack of expertise (crackers, etc.), lack of historical BM data)
 - Cefic also determines the product BMs with more extensive questionnaires, this can mitigate this risk

- The fall-back benchmarks, in particular the heat BM

Update EU ETS heat benchmark (1)

- Heat BM phase 3: boiler fired by natural gas, 90% efficiency; thus $56.1/90\% = 62.3$ ton CO₂/TJ heat

- The Commission intends now to determine the “top 10%” of heat generation
 - 100% biomass installations are out (non-ETS), partial biomass is in
 - CHP “proportional” to reference efficiencies heat and electricity:
(heat energy produced / reference heat efficiency) / {(heat energy produced / reference heat efficiency) + (electricity energy produced / reference electricity efficiency)}; ref. heat eff. = 90%; ref. elec. Eff. = 53%
 - Expected CHP outcome: 45-50 ton CO₂/TJ heat
 - Electricity efficiency 60% would be better, but not sufficient

Update EU ETS heat benchmark (2)

➤ Considerations

- ✓ Boiler fired with natural gas with 90% eff. was selected by COM: natural gas is a widely available fuel (coal, oil also, but higher emission; biomass not widely available)

- ✓ The Directive clearly mentions “comparison of those [new] benchmark values with the benchmark values contained in Commission Decision 2011/278/EU” (art. 10a(2); “reflect technological progress” (recital 11)

- ✓ Thus methodology phase 4 = methodology phase 3

But “top 10%” heat generation is a new methodology, thus (legally) not in line with the Directive

➤ Solution option: “top 10%” of gas-fired boilers

- ✓ Then a true comparison is achieved

Update EU ETS heat benchmark (3)

➤ Some figures

- ✓ Annual rate 0.2% would mean 61.2 ton CO₂/TJ measured in 2017/2018, giving 60.4 ton CO₂/TJ (-3.0%) for 2021-2025 and 59.8 ton CO₂/TJ (-4.0%) for 2026-2030
- Annual rate 1.6% would mean 53.3 ton CO₂/TJ measured in 2017/2018, giving 47.3 ton CO₂/TJ (-24%) for 2021-2025 and 42.4 ton CO₂/TJ (-32%) for 2026-2030 (average phase 4: 28% loss of allowances)

➤ Consequence product BMs: CO₂ heat use also much lower

- Relevant for chemical industry: soda ash, styrene, PVC, cumene-phenol (?), EO-EG and aromatics

Update EU ETS process emissions approach

- Phase 3: 97% x Historical emissions ref. period
- Phase 4 COM proposed: 94.1% x Historical emissions ref.
- Request for maintaining 97% (is accepted!)
 - ✓ Linked to raw materials and to the chemical reactions needed to produce a certain product
 - ✓ Process emissions are unavoidable and impossible to reduce without reducing the production level (CCS future)
 - ✓ The EU ETS Directive requests to determine revised benchmark values, not to revise the process emissions approach. This change of methodology is not in line with the EU ETS Directive

Update EU ETS fuel benchmark

- COM seems also to make an update, based on “top 10%”?
- Request for maintaining 56.1 ton CO₂/TJ
 - ✓ Fuel BMs allocation is often used for safety flaring
 - ✓ An efficiency improvement is not meaningful for flaring
 - ✓ The EU ETS Directive requests to determine revised benchmark values, using the same methodology as in phase 3. A change of methodology is not in line with the EU ETS Directive

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3. The new allocation rules

EU ETS new allocation rules (1)

➤ New elements phase 4

Phase 3	Phase 4
8 year trading period	10 year trading period
Cap decreases 1.74%/year	Cap decreases 2.2%/year
Allocation once	Allocation twice, per 5 years
Non-exposed 80% in 2013 to 30% in 2020	Non-exposed 30% 2021-2026 then to 0% in 2030; district heating 30%
Allocation changes with significant capacity changes	Allocation changes with significant activity level changes (> 15%)
New entrants: greenfield installations (new permit) and significant capacity extensions	New entrants: only greenfield installations
Amount auctioning: total minus free allocation	Amount auctioning: 57%, but -3% if needed to avoid CSCF

EU ETS new allocation rules (2)

➤ Non-Electricity Generators

- ✓ Allocation = HAL x BM x CLEF x CSCF
- ✓ Historical activity level 2014-2018 for 2021-2025 (2019-2023 for 2026-2030): COM proposes average, Cefic proposes median (like phase 3), comes closer to reality
- ✓ Carbon leakage exposure factor:
 - 100% for exposed industries,
 - 30% for non-exposed, going linearly down from 30% in 2026 to 0% in 2030
 - 30% for district heating (all years)
- ✓ CSCF (cross sectoral correction factor); end phase 4 or not in phase 4 (esp. if heat BM would be low)

EU ETS new allocation rules (3)

➤ CSCF

- ✓ FAR draft Art. 14(6): Auction volume \times (1-57%) or up to (1-54%) if needed divided by “sum of the preliminary annual amounts of free allowances to installations [of the NIMs] in each year over the relevant allocation period with application of the factors as determined in Annex V [non-exposed 30% to 0%]”.
- ✓ Free allowances = allocation to non-EGs + EGs
- ✓ (Phase 3: non-exposed set at 100% while 80% to 30% was valid!)
- ✓ CSCF (cross sectoral correction factor); end phase 4 or not in phase 4 (esp. if heat BM would be low)
 - CSCF is thus planned to be calculated twice in phase 4.
 - CSCF calculated before each year is better, then lower allocations (> 15% lower activity level) and closures do not cause an unnecessarily stringent CSCF (CSCF might even disappear).

EU ETS new allocation rules (4)

➤ Electricity Generators

- ✓ Allocation = HAL x BM x CLEF x LRF or CSCF if < 1.0
- ✓ HAL as for non-E-Gens
- ✓ CLEF as for non-E-Gens
- ✓ LRF (linear reduction factor): COM has suggested 100% in 2021, then 2.2%/year lower (Guidance 1 draft, chapter 5.3.3: “For installations that are identified as “electricity generator”, as well as new entrants ... reduced each year with 2.2% of the preliminary total annual amount of allocation with 2021 as the reference year”
- ✓ LRF draft Guidance 29 Oct 2018 “first year of each allocation period”, thus 2021 resp. 2026; this is not fully certain.

EU ETS new allocation rules (5)

- Adjustment of allocation due to changes in activity level, threshold 15% (details not yet known)
 - ✓ A deviation of the two-year rolling average activity level (production) of >15% versus HAL (plus or minus) leads to an adjustment of the allocation of >15% (plus or minus).
 - Example: Production level 17% higher means 17% higher allocation.
 - Cefic requests: > 15% or 50,000 allowances (to cope with different permit practices)
 - ✓ Directive Art. 10a(20): “Such adjustments shall be carried out with allowances from, or by adding allowances to, the amount of allowances set aside in accordance with paragraph 7 [NER: new entrants reserve] of this Article.”

EU ETS new allocation rules (6)

➤ New entrants

- ✓ New entrants are new permit installations (not: new sub-installations) after 30 June 2019 resp. after 30 June 2024
- ✓ So 2019-2024 new entrants become incumbents as from 2026
- ✓ LRF 2.2% applies starting 1st year of allocation period (2021 or 2026) (or only starting 2021, not fully clear yet)

- ✓ Allocation basically as for incumbents, HAL x BM
- ✓ Then allocation changes when activity changes > 15%
- ✓ Allocation first 2 years: activity level of the respective year (full ex-post)