Carbon-removal liabilities are physical, not political

Emissions are measured per installation under the EU ETS — the removal cost they create is recorded nowhere.

Evidence dossier accompanying feedback on the revision of the EU Emissions Trading System · Jan Kechel, Ostrach, Germany · August 2026 · Full register and original documents: co2-entnahme.info

1. Summary

Every tonne of fossil CO_2 emitted today creates a future, quantifiable cost: the cost of removing that tonne from the atmosphere again (carbon dioxide removal, CDR). Section 2 derives this claim in six verifiable steps. Over the past year I have asked, in writing and under freedom-of-information law, every authority in Germany that could plausibly be responsible for assessing or recording these costs. The result, documented in Section 4 with file numbers: **twelve written statements from authorities in six German Länder and at the federal level confirm that these costs are examined nowhere** — not in permitting, not in environmental impact assessment, not in any budget, not in any balance sheet. In every instance, the authorities point to the EU ETS as the exhaustive instrument. Yet the ETS prices the right to emit — it neither funds nor mandates the removal of the emitted tonne (Section 6). The instrument cited as exhaustive omits the largest cost. The revision tabled on 17 July 2026 (COM(2026) 616) does not close it (Section 7) — which is what this feedback asks the co-legislators to correct.

2. The chain: why every tonne creates a removal liability — six steps

1. **The tonne stays, and it keeps warming.** Fossil CO_2 remains climate-effective in the atmosphere for centuries to millennia. Halting emissions stops the *further increase* of warming, but does not lower temperature again; the only mechanism that brings temperature back down is net removal of CO_2 from the atmosphere. [IPCC AR6 WG1]

2. **The 1.5 °C threshold is already being exceeded — and must be re-undercut.** 2024 was the first calendar year above 1.5 °C; the 2023–2025 mean stands at roughly 1.5 °C [Copernicus/WMO]. Several Earth-system tipping elements

become likely already between 1.5 and 2 °C [Armstrong McKay et al., Science 2022]; once crossed, they are effectively irreversible on human timescales and self-amplifying, which is why the science calls for *declining*, not merely stabilised, temperatures [Schleussner et al., Nature 2024; PIK]. Because the 1.5 °C budget is exhausted, every additional tonne emitted enlarges the overshoot that must be removed again — approximately one to one, since warming scales with cumulative net emissions [TCRE, IPCC AR6].

3. **Removal costs real money.** Separating CO_2 back out of 0.04 % ambient concentration has a physical minimum energy cost; in practice, permanent removal costs €388–500 per tonne according to the figures the Potsdam Institute submitted to the Federal Constitutional Court, with current market prices higher still. The magnitude is uncertain; the existence of the cost is not. [PIK; market data]

4. **Every tonne is attributable.** The emissions of step 2 are already measured, reported and verified *per installation* under the EU ETS monitoring rules. Attribution is not a construct — it is existing administrative practice. [EU ETS MRV]

5. **The liability therefore arises at the moment of emission.** What remains open is only when, by whom and at what exact price it is settled — the classic profile of a provision or contingent liability, not an argument against one.

6. **Delay compounds the bill.** Until removal has happened, damages keep accruing — and they scale with the *duration* of the overshoot, not merely with the quantity emitted. The longer the overshoot lasts, the more likely tipping elements (permafrost, forest dieback) are crossed that release additional CO_2 without any further human emissions, potentially multiplying the quantity that must eventually be removed [Armstrong McKay 2022; Schleussner 2024] — and, with it, the cost. Nor is that added cost diffuse: responsibility for the overshoot tracks each party's share of the emissions beyond the exhausted 1.5 °C carbon budget [IPCC AR6, 2021] — a share quantified per country [Fanning & Hickel, Nature Sustainability 2023] — so the same tipping dynamics that raise the total removal need raise the cost attributable to each major emitter and country in the same proportion. Today's per-installation figure is therefore not an upper bound but the most conservative figure available: the price of acting now.

Returning below 1.5 °C is a legal duty, not a policy preference — and an

urgent one: it must be achieved as fast as possible, before further tipping points are crossed. This is settled in law and quantified in science, not rhetoric. Germany's Federal Constitutional Court derived an intergenerational duty to protect life, health and the natural foundations of life directly from the constitution [BVerfG, 24.03.2021 – 1 BvR 2656/18]; the European Court of Human Rights held that inadequate climate protection violates the Convention [ECtHR, *KlimaSeniorinnen v. Switzerland*, 9 April 2024, Art. 8 ECHR]; and both EU and German law expressly envisage *net-negative* emissions after 2050 — removing more than is emitted [Art. 2(1) Regulation (EU) 2021/1119; § 3(2) KSG]. The harms attached to inaction are documented, not speculative: loss of life and irreversible ecosystem damage [IPCC AR6 WGII], and — in the EU's own assessment — forced displacement and heightened conflict, as climate change acts as a "threat multiplier" [EU Joint Communication JOIN(2023) 19; World Bank, *Groundswell* 2021]. The duty to remove is therefore not contingent on anyone's willingness to act — it follows from rights and from physics alike. What remains genuinely open is the subject of this dossier: who records and bears the resulting cost.

3. The register: 26 gas-fired power plants, €305 billion

The public register at co2-entnahme.info/register applies this chain to all 26 gas-fired power plants currently planned, permitted or under construction in Germany: roughly 30.6 million tonnes of CO_2 per year, or about €305 billion in removal costs over twenty operating years (at 500 €/t), calculated per installation, with sources and the authorities' original answers linked per plant. Germany's first two capacity auctions (2 × 4.5 GW) are scheduled for September and December 2026; none of the tender documents state these costs.

4. What the authorities answered — the record

> *„Die Folgekosten gehören nicht zum Prüfrahmen … liegen daher nicht vor."*
>
> "The follow-on costs are not part of the examination framework … therefore they are not on file."
>
> District Government Arnsberg, formal UIG decision, 30 June 2026, ref. 900-0364506-0005 (Gersteinwerk plant — the same decision states the plant's projected emissions: 2,667,946 t CO_2/a).
>
> *„Folgekosten aus den CO_2-Emissionen, insbesondere Kosten für eine spätere*

Entnahme des emittierten CO_2 aus der Atmosphäre, wurden nicht ermittelt, bewertet oder in Unterlagen ausgewiesen.“

"Follow-on costs of the CO_2 emissions, in particular costs of a later removal of the emitted CO_2 from the atmosphere, were not determined, assessed or disclosed in any documents."

Saxony State Directorate, operative part (tenor) of a formal decision, 6 July 2026, ref. 44-8315/25/38 (Lippendorf plant). The same decision confirms that the plant's CO_2 quantities appear neither in the partial permit of 22 August 2024 nor in the EIA report of 4 August 2023. An identically worded formal decision followed on 31 July 2026 for the Schwarze Pumpe plant (ref. 44-8315/25/39).

„Eine Ermittlung von Carbon-Removal-Kosten hat in diesem Vorbescheidsverfahren nicht stattgefunden. Es wird darauf hingewiesen, dass eine Ermittlung in dem Verfahren nicht erforderlich war.“

"An assessment of carbon-removal costs did not take place in these proceedings. We note that such an assessment was not required."

Trade Supervisory Office Braunschweig (Lower Saxony), 9 July 2026 (Mehrum plant, ref. BS 23-066 — the largest plant in the register, ≈€23bn over 20 years).

„Ich kann Ihnen lediglich bestätigen, dass die Folgekosten im Genehmigungsverfahren nicht Gegenstand der Prüfung sind. Ob diese Kosten in keinem behördlichen Verfahren betrachtet werden, entzieht sich meiner Kenntnis.“

"I can only confirm that the follow-on costs are not subject to examination in the permitting procedure. Whether these costs are considered in no administrative procedure at all is beyond my knowledge."

Regional Council Darmstadt (Hesse), 1 July 2026 (Staudinger plant). The same authority expressly cited § 5(2) of the Federal Immission Control Act: for ETS installations, no CO_2 requirements may be imposed beyond the ETS.

„In den ergangenen Bescheiden sind keine CO_2-Jahresemissionen prognostiziert, ausgewiesen bzw. als Grenzwerte festgelegt.“

"The permits issued neither project nor disclose annual CO_2 emissions, nor set them as limit values."

Brandenburg State Office for the Environment, 12 June 2026, ref. UIG 003/26-T24 (Jänschwalde plant). Similarly the State Administrative Office of Saxony-Anhalt, 18 June 2026 (Schkopau): removal costs are "as a rule not quantified" in permitting procedures.

> *„Bei den CO2-Entnahmekosten fehlt es an den für den Ansatz notwendigen Gläubigern. … Der Staat (hier der Bund) kann keine Rückstellungen gegen sich selbst bilden.“*
>
> "For the CO_2 removal costs there is no creditor as required for recognition. … The State (here: the Federation) cannot form provisions against itself."
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> Federal Ministry of Finance, 30 June and 8 July 2026 — declining to record the liability in the federal asset accounts, either as a provision or as a contingent liability. Germany simultaneously contributes USD 100 million to the international Loss and Damage Fund — a payment to precisely the third parties said not to exist.

Earlier statements to the same effect: Regional Council Stuttgart, District Governments Cologne and Düsseldorf (2025/26, each in writing: cost and budget questions are "not part of the immission-control permitting procedure"); the Federal Court of Auditors and the Court of Auditors of Baden-Württemberg (no obligation to respond; audit topics chosen independently). All documents are linked per plant in the register. Notably, in more than a year of correspondence, **no authority has disputed that these costs arise** — only that it is theirs to record them.

> *„Eine gesonderte Bafin-Verwaltungspraxis, Leitlinie oder dokumentierte Fachauffassung speziell zu diesen Fragen existiert nicht. … Fälle, in denen diese konkreten Einzelaspekte in einer Prüfung erörtert wurden, sind der Bafin nicht bekannt.“*
>
> "A separate BaFin administrative practice, guideline or documented position specifically on these questions does not exist. … Cases in which these specific aspects were discussed in an examination are not known to BaFin."
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> Federal Financial Supervisory Authority (BaFin), freedom-of-information answer, 3 August 2026 — completing the chain on the corporate side: balance-sheet enforcement has never examined the question, and BaFin knows of no company that has recognised such a provision or contingent liability. BaFin adds that the applicable accounting standards are the framework to assess it, citing i.a. the IFRS IC agenda decision “Climate-related Commitments (IAS 37)” (April 2024).

5. What follows from the record

– **The gap is built into law — with the ETS as its justification.** German permitting authorities are barred from CO_2 requirements beyond the ETS (§ 5(2) BImSchG); federal EIA rules (UVP-VwV No. 16.4.1, in force since April 2025) exclude greenhouse gases of ETS installations from environmental impact assessment. Every rejection cites the ETS as exhaustive — which makes the ETS revision the natural, and arguably the only, place to close the gap.

– **A permit is not a discharge.** A permit's legalising effect extends only to what was examined (established case law). Since removal costs are expressly outside the examination framework, permits cannot discharge operators from them. The Higher Regional Court of Hamm confirmed in *Lliuya v RWE* (28 May 2025, 5 U 15/17) that major emitters can be proportionally liable for climate damages *irrespective of permit compliance*. Concrete claims now exist: 39 plaintiffs from Pakistan are suing RWE and Heidelberg Materials at the Regional Court of Heidelberg for damages from the 2022 floods. The International Court of Justice (advisory opinion, 23 July 2025) confirmed that breaches of climate obligations trigger a duty of full reparation between states — obligations that exist under customary international law, independently of treaty membership.

– **The liability is homeless.** There are two sets of books in which a €305bn obligation could appear — public accounts and operators' balance sheets. Both currently say no, each pointing elsewhere. Where liabilities attach to nobody, they do not disappear; they accrue, unrecorded, to the public and to future generations — precisely the burden-shifting the German Constitutional Court declared unconstitutional [1 BvR 2656/18].

6. The ETS today does not cover removal

The allowance prices the right to emit; no removal obligation attaches to it, and auction revenues are not reserved for removal. Permanent removals certified under the CRCF (Regulation (EU) 2024/3012) exist as a category — but certification is voluntary and creates no removal obligation for emitters. Under the Directive in force, the cap declines to approximately zero around 2039, leaving no mechanism for the removal of the stock emitted until then; the revision tabled on 17 July 2026 (COM(2026) 616) would slow that path (linear reduction factor 3.7 % for 2031–2035, 1.7 % from 2036), extend auctioning beyond 2039 and admit up to 260 million international credits in 2036–2040 — more gross emission space, for longer. In short: the instrument that German authorities cite as the exhaustive answer to the removal question does not, today, contain one — and the tabled revision, as the next section shows, still does not.

7. What the proposal of 17 July 2026 does with removals

COM(2026) 616 integrates permanent carbon removals through a *central purchase financed by a cap increase*: the Union-wide quantity of allowances is raised by 250 million allowances, which the Commission auctions between 2031 and 2040 to buy an "equivalent amount" of CRCF-certified BioCCS and DACCS removal units (new Article 9c) — in the Commission's own words, "creating guaranteed additional emission space for the hardest-to-abate sectors". A further 10 million allowances stand by for the price gap between allowances and removals (recital 33; Article 9c(2)). Operators may additionally offset their own fossil emissions with self-generated BioCCS removals, but "not beyond zero" (new Article 14(1a)); direct integration of removals by operators is deferred to a report due by the end of 2034 (Article 9c(8)). Measured against the liability documented in this dossier, three things follow.

- **The stock stays untouched.** The mechanism's own principle is that "the cancellation of a removal unit replaces the surrendering of an emission allowance, which represents the payment of the price for having emitted a tonne of CO_2" (recital 32): every purchased removal is consumed to legitimise one *new* emission. Removals offset future flows; not one tonne of the already-emitted stock is drawn down — while gross emission space grows by exactly the amount removed.
- **The polluter does not pay.** The removals are bought by the Commission with revenue from newly created allowances — the cost is socialised through the carbon market rather than attached to the emitters whose tonnes must be removed (Art. 191(2) TFEU). Whether operators should procure removals themselves is postponed to the 2034 report.
- **The scale concedes the gap.** 250 Mt of removals for the entire EU over a decade — ramping to 48 million units in 2040 — is less than the 30.6 Mt per year attributable to Germany's 26 planned gas-fired plants alone (Section 3): the whole

EU programme is smaller than a single Member State's new gas fleet. And the arithmetic holds only if removal prices approach allowance prices; at the €388–500/t submitted to the German Constitutional Court, the assigned budget buys a fraction of the promised quantity.

None of this argues against scaling removals — as an industrial instrument the purchase programme is welcome. It shows that the revision, as tabled, does not touch the removal debt this dossier documents: it neither calculates nor discloses nor funds the stock of CO_2 that today's permits will emit. That makes the request in Section 8 more urgent, not less.

8. Our request — independent of the integration model chosen

Whatever integration model the revision adopts, one point holds regardless: the revenue raised through allowances does not remove the CO_2 that has already been emitted. An allowance prices the right to emit; even a reformed ETS that integrates removals governs, at most, the flow of future net emissions. It does not retroactively remove the stock that installations permitted today will emit over their twenty-year lifetimes. That stock is a defined, attributable liability — and it must be made visible and funded. We therefore ask that the revision oblige Member States, **in addition to and separately from ETS allowance revenue**, to:

1. **Calculate and disclose, in their public budgets, the full removal cost of the CO_2 emissions attributable to the installations they permit — their carbon-removal debt.** For Germany this is not hypothetical: the 26 gas-fired power plants currently planned, permitted or under construction emit ≈ 30.6 Mt CO_2/year — that is ≈ €15.3 billion per year, or ≈ €305 billion over twenty operating years at €500/t. This is a conservative floor: it excludes the far larger existing fleet. The figure is known and calculable per installation (Section 3); what is missing is only its disclosure.

2. **Demonstrably ring-fence and spend funds on actual, permanent CO_2 removal in proportion to that debt** — verifiably dedicated to removal (CRCF-certified permanent removals), not merged into general budgets. ETS revenue may contribute, but does not discharge the obligation: it is neither sized to the removal debt nor reserved for it.

Paying for allowances does not discharge the removal cost — and this holds even if the revision is silent on removal. The two are legally distinct layers. An ETS allowance is the price of the *right to emit*; physically removing the emitted tonne, and accounting for that removal's cost, is a separate matter that the allowance neither performs nor pays for. An emitter's ETS compliance therefore does not relieve it of recognising the future removal cost in its financial statements where such a liability exists (IAS 37; § 249 HGB) — a provision that falls due *in addition to* ETS costs under existing accounting law, not instead of them. It follows that if this revision leaves removal unaddressed, it does not make the liability disappear: it merely leaves it exactly where the evidence in this dossier found it — on no one's books. Correcting that silence is what this feedback asks of the co-legislators.

This narrows what the revision actually decides. **The legislator cannot decide whether these costs exist or how large they are** — physics and existing accounting law settle that. It can decide only *who bears them*, and it faces a binary: **(a)** actively relieve the emitters — for example by treating the surrender of allowances as though it discharged the removal duty — in which case the cost does not disappear but shifts to taxpayers, and each Member State must then recognise and disclose it in its budget; or **(b)** state explicitly in the revised Directive that surrendering allowances does *not* relieve emitters of their responsibility for, and provisioning of, the true removal costs — leaving the liability where existing law already places it (IAS 37; § 249 HGB; polluter-pays, Art. 191(2) TFEU). Option (b) costs the public purse nothing and requires only one clarifying sentence; option (a) is the consequential act, because relieving the polluter is not a neutral default but an active transfer of a defined, quantified liability onto future taxpayers. The proposal as tabled takes route (a) — a central, socialised purchase — but without the corresponding disclosure: nothing in it requires Member States to show the remaining removal debt in their budgets. That omission is what this feedback asks the co-legislators to correct.

The polluter-pays principle (Art. 191(2) TFEU) requires that this cost attach to the emitter rather than being socialised silently onto future taxpayers. Where the ETS assigns removal obligations to operators, the liability becomes recognisable and auditable in their financial statements (IAS 37); where it does not, Member States must at minimum carry it, transparently, on their own books. Either way, the €305 billion must appear somewhere. Whatever share of the removal cost the revision places on operators, the remainder falls to the Member State that permitted the installation: the operators’ share plus the public share is the whole cost, and it must be visible in full. The one outcome the revision must not permit is that it continues to appear *nowhere*.

9. Sources

[1] Register with per-plant sources and original documents: https://co2-entnahme.info/register/

[2] All freedom-of-information requests and answers (public): https://fragdenstaat.de/ — linked per plant in [1]

[3] Copernicus/WMO: 2024 first calendar year above 1.5 °C; 2023–2025 mean ≈1.5 °C

[4] IPCC, Sixth Assessment Report (AR6), Working Group I — CO_2 persistence, zero-emissions commitment, TCRE, permafrost carbon feedback

[5] Armstrong McKay et al., Exceeding 1.5°C global warming could trigger multiple climate tipping points, Science 377 (2022), doi:10.1126/science.abn7950

[6] Schleussner et al., Overconfidence in climate overshoot, Nature 634, 366–373 (2024)

[7] PIK cost figures (€388–500/t) as submitted to the Federal Constitutional Court; market prices (e.g. Climeworks) higher; PIK, "The road back to Paris"

[8] German Federal Constitutional Court, order of 24 March 2021 – 1 BvR 2656/18 (intertemporal freedom, budget approach, protection of future generations)

[9] Art. 2(1) Regulation (EU) 2021/1119 (net-negative after 2050, "shall aim"); § 3(2) German Climate Change Act (KSG, "sollen")

[10] Higher Regional Court of Hamm, judgment of 28 May 2025 – 5 U 15/17 (Lliuya v RWE); pending: Regional Court of Heidelberg (39 plaintiffs v RWE and Heidelberg Materials)

[11] International Court of Justice, advisory opinion on climate obligations, 23 July 2025

[12] Fanning & Hickel, Compensation for atmospheric appropriation, Nature Sustainability (2023)

[13] § 5(2) BImSchG; UVP-VwV No. 16.4.1 (federal EIA administrative regulation, April 2025); Art. 30(5a) ETS Directive; Regulation (EU) 2024/3012 (CRCF)

[14] European Court of Human Rights, *Verein KlimaSeniorinnen Schweiz and Others v. Switzerland*, judgment of 9 April 2024 (Art. 8 ECHR)

[15] European Commission / High Representative, Joint Communication JOIN(2023) 19 final, "A new outlook on the climate and security nexus" (climate change as a "threat multiplier"); World Bank, *Groundswell* (2021), up to 216 million internal climate migrants by 2050

[16] IPCC, Sixth Assessment Report (AR6), Working Group II — impacts on health, mortality, ecosystems and displacement

[17] European Commission, Proposal for a Directive amending Directive 2003/87/EC (EU ETS review), COM(2026) 616, 17 July 2026 — new Art. 9c (central purchase of 250 million CRCF removal units financed by a

cap increase, 2031–2040), Art. 14(1a) (own-use BioCCS offset, “not beyond zero”), Art. 9c(8) (report on operator integration by end-2034), recitals 31–34; new Art. 9b (up to 260 million international credits, 2036–2040); LRF 3.7 %/1.7 %

[18] BaFin, freedom-of-information answer of 3 August 2026 (public: fragdenstaat.de, request 374861); IFRS IC agenda decision “Climate-related Commitments (IAS 37)”, April 2024; ESMA, “The Heat is On”, October 2023

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