



## **Carbon Market Watch inputs to the Article 6.4 Supervisory Body's consultation on removals (July 2023)**

Brussels, 1st August 2023

Dear Members and Alternate Members of the Article 6.4 Supervisory Body,

Carbon Market Watch welcomes the opportunity to provide inputs to the Supervisory Body on specific questions pertaining to removal activities. Our inputs respond to questions from the document ['Guidance and questions for structured consultation on recommendations for activities involving removals'](#).

While we have given specific answers to the consultation's technical questions and indicated our preference for certain options, this should not be misconstrued as endorsement of buffer pools and of similar complementary measures to purportedly guarantee permanence. Many of the options detailed in this consultation for buffer pools, direct credit replacement, and insurance systems are drawn from current approaches in carbon markets to address non-permanence risks, which are neither compelling nor robust enough to support offsetting claims made on the back of credits with impermanence risks (whether these risks are from removal or reduction activities, or a mix). For a significant range of activities, there is a fundamental inability to guarantee permanence and the related monitoring on the scale required (i.e. minimum 2-3 centuries), given that these credits risk being used to offset real ongoing emissions.

Prior to finalising any recommendations on these matters, we would call on the SB to first request the Secretariat to produce a comprehensive concept paper on buffer pools, direct credit replacement, insurance/guarantees, liability, and other issues, analysing risks and drawing on a range of literature and observer submissions, including the various challenges we have outlined in our response to this consultation.

\*\*\*

## Monitoring and reporting

### 5. Should the activity proponent be required to periodically update its monitoring plan every five years and/or at the end of the crediting period?

The monitoring plan should be updated periodically, in conjunction with the submission of the monitoring report. This update will serve to take into account developments and improvements in monitoring technologies and methodologies when these have implications for the monitoring plan, thus ensuring the monitoring plan stays up to date. Moreover, as reversal risks are prone to change depending on global as well as local social and environmental circumstances, the monitoring plan should be adjusted accordingly. **At a minimum, the monitoring plan should be updated every 5 years.**

It should also be a requirement for monitoring plans to be updated following a reversal event (activity-level risk assessment must also be reassessed after a reversal event).

### 6. Should monitoring reports be submitted within the first [2] [5] [X] years of activity implementation? After the first report, at least once every [2] [5] [X] years?

Monitoring reports should be submitted every 2-3 years, especially for activities with high reversal risk, although the frequency of submission could be set in such a way that it is determined by the level of estimated reversal risk. A project with no reversal risk could submit its monitoring report every 5 years, while a project with high reversal risk should submit at a minimum every two years.

Independent of the activity type however, **the monitoring report should be submitted before the end of the NDC implementation period in which the ERs covered by that monitoring report were achieved.** This is because all authorised A6.4ERs must be used within the same NDC implementation period as when the mitigation outcomes occurred. This may imply that a monitoring report could be required at a time-frame that is even shorter than 2 years: e.g. within 1 year of the activity's implementation, if the activity's crediting period commences near the end of the NDC implementation period.

### 7. Do the "reversal notification" reports referred to in SB 003 recommendations involve, e.g. digital notification of an observed event that could lead to a possible reversal of removals; submission of notification within [90] [120] [X] days of the observation; follow-up submission of a full monitoring report within [6 months] [1 year] [X timeframe]?

The reversal notification, as it does not require any quantitative information, can be and should be given within a short timeframe from the moment of observation of a potential reversal event. **The notification should be given as soon as possible, and no later than 30 days after discovery of the start of the potential reversal event.**

In addition, **the mechanism registry account of the project developer should be temporarily frozen by the UNFCCC secretariat upon initial notification of the reversal event as an initial precaution, meaning that no ERs shall be further transferred or retired until the SB has unfrozen the account, following an appraisal of the situation:** if a massive reversal event takes place but the project proponent's account is not frozen, then its ERs may be further traded and retired, which subsequently may threaten the availability of the project proponent's remaining ERs to compensate for any reversals that have gone beyond the share of ERs initially set aside in the buffer pool by the activity.

For the follow-up full monitoring report, it is important that this is submitted quickly in order to gauge the implications of the reversal for the A6.4ERs. To allow time to adequately quantify the reversal event, **this should be submitted within 3 months of the submission of the reversal notification. In case the reversal event is still ongoing** (some reversal events may last for an extended period of time), **then the proponent must continue to submit follow-up monitoring reports every 3 months until the end of the reversal event, when a final monitoring report is also due.** If the proponent fails to deliver monitoring reports according to the above schedule and in case the SB had unfrozen the proponent's mechanism registry account after its initial temporary freeze upon submission of the reversal notification, then the mechanism registry account should be frozen again, and any credits they have been issued from the activity in question or from other activities should be blocked from being transferred or retired until the relevant monitoring reports have been submitted and reviewed.

In case the reversal event occurs while a DOE is in the process of verifying ERs, or while ERs are in the process of being certified for issuance by the SB, then the reversal notification must occur immediately upon discovery of the potential reversal event. This is important, since discovery of a potential reversal event during the verification/certification process requires these processes to be temporarily halted until the reversal event is adequately assessed and corrective actions are taken where necessary.

**8. To ensure and demonstrate the continued existence of removals, are activity proponents required to undertake monitoring and address reversals:**

**(a) Only during active crediting period(s) or**

**(b) Also [15] [X] years after the last active crediting period?**

**(c) The longer of [9(a)] [9(b)] or a timeframe specified by the host Party (e.g. communicated in LoA or earlier)**

Decision 3/CMA.3 specifies that activities involving removals shall apply a crediting period of a maximum of 15 years, renewable a maximum of twice. Limiting the monitoring of removals only to the length of the crediting period would therefore imply a maximum monitoring period of 45 years, and likely much shorter, whereas these removals will be

used to offset CO<sub>2</sub> emissions with a lifespan of multiple centuries. This incongruousness would result in an extremely long period during which A6.4ERs are purportedly compensating for real emissions, without any monitoring for reversals of the underlying mitigation outcomes taking place.

**Monitoring must therefore be extended well beyond the end of the final crediting period** (not just the “last active crediting period”), to ensure any reversals are accounted for accurately and in a timely manner, as well as to address perverse incentives or moral hazard for project proponents to implement an activity without the need to maintain the impact over a period longer than the crediting period. The **responsibility and requirement for monitoring should be that of the project proponent for a period of at least 100 years**<sup>1</sup>, with additional measures in place to guarantee permanence over a longer duration thereafter. For example, a 100-year monitoring period after final issuance is required by California’s Compliance Offset Program:

“The Offset Project Operator or Authorized Project Designee must conduct monitoring activities in accordance with the Regulation and this protocol. (a) Monitoring is required for a period of 100 years following the final issuance of any ARB offset credits to an offset project.” (p.78, California Air Resources Board, [Compliance Offset Protocol U.S. Forest Projects](#), 25 June, 2015).

The costs associated with the project proponents’ long-term monitoring responsibility could be reflected in the A6.4ER sale price, since this approach to monitoring would provide a more credible guarantee to the buyer and since the buyer should also be liable to contribute to long-term monitoring. Thus, part of the cost of long-term monitoring could be covered by the buyer.

However, even 100 years do not cover the lifetime of atmospheric CO<sub>2</sub>: therefore, after a 100-year period, there must be continued monitoring and liability for reversals, for which however, solutions are not obvious given the complexities involved (see answers to questions 10, 14 and 15, for more on liability for monitoring and reversals).

### **9. Is simplified annual reporting required to ensure and demonstrate the continued existence of removals? In what cases and how long?**

While simplified annual reporting could be required, this must not in any way replace detailed and regular monitoring reports verified by an independent third-party.

---

<sup>1</sup> A 100-year monitoring responsibility for the project proponent serves as a way to come closer to “true permanence” requirements, but this of course raises core credibility concerns regarding the institutional strength and longevity of any process, especially a project developer or company, to continue any kind of monitoring for 100 years. The time-scales involved for “true permanence” (centuries to millennia) again underscore that the “permanence” sought out for offsetting purposes (purporting to equate carbon storage to emission reductions/removals) is not credibly achievable.

**10. Are measures required to address the residual risk of reversals beyond the monitoring timeframe? If so, for how long, and what are the options for, e.g. the mechanism(s), responsible entity(ies), oversight?**

**It should be noted that transferring the monitoring and compensation obligation to host Parties at the end of the project proponent's monitoring period, comes with significant implications for equity.** It would be unfair to allow buyers to claim neutrality or meet emission reduction targets with credits that are associated with mitigation outcomes facing a risk of reversal, and then make the host Party liable for maintaining that carbon stock intact indefinitely. That is particularly the case given that many host Parties are also developing countries, while buyers are typically richer Parties or organisations. Two possible ways to help address this could be:

- i) Application of a **top-off fee at issuance that goes to the host Party, and serves to cover the costs of future monitoring and compensation.** The fee could be set depending on the level of reversal risk of the activity.
- ii) The UNFCCC secretariat could also play a role in supporting Parties in monitoring for reversals following the end of the monitoring period of a project. **The Secretariat could establish and manage a long-term monitoring system operating on satellite imagery (and/or other methods depending on activity type), funded through a share of proceeds levied on the issuance of credits that involve carbon storage,** which could be tied to the expected durability / risk rating of an activity.
- We therefore **recommend the SB to consider these two options and to request the Secretariat to assess the feasibility of various options to potentially deliver on longer-term monitoring,** including a possible combination of the 2 options we have proposed.

Please also see our responses to questions 14 and 15.

# Addressing reversals

## General

11. What type of risk rating is used to calculate an activity's buffer contributions?

- (a) The results of an individual activity's risk assessment;
- (b) A standard rate determined by the 6.4SB;
- (c) Either measure could be appropriate, depending on the circumstances (in this case, what factors should determine the use of an activity-specific or standard risk rating)?

As we have detailed previously,<sup>2</sup> **we would first underscore that buffer pools are by no means a foolproof method of impermanence risk management. They do not constitute a robust way of guaranteeing the permanent storage of carbon in a sink.** Risk assessments determining the share of buffer pool contributions are not necessarily set in a scientifically robust manner in certain systems, which can lead to undercapitalisation of the pool: research into California's buffer pool, for example, suggests it is already heavily undercapitalised.<sup>3</sup> At best, buffer pools can strengthen the credibility of guaranteeing storage for a medium duration of time, if properly constituted and managed, but they cannot guarantee permanence. **If the SB is considering implementing a buffer pool (pooled or several), we would call on the SB to first request the Secretariat to produce a concept paper on the subject, analysing risks and drawing on a range of literature.**

That said, in the event the SB pursues buffer pools as a way to purportedly address impermanence risks inherent in removal activities, then **a combination of both b) and a) should be pursued so that the risk rating should be stabilised by a baseline (standard rate) and further individualised depending on activity-specific risk factors.**

A standard minimum rate is important to help ensure that a minimal level of risk for all removal activities is incorporated into the rating, serving as a baseline. This baseline can

---

<sup>2</sup> See for example: our submission during the consultation on removals from 5-19 June 2023, <https://unfccc.int/sites/default/files/resource/CarbonMarketWatch.pdf>; our inputs to Article 6 negotiators ahead of SB 56, <https://carbonmarketwatch.org/publications/carbon-market-watch-recommendations-to-article-6-negotiators-on-removals/>.

<sup>3</sup> <https://grist.org/wildfires/california-forests-carbon-offsets-reduce-emissions/>; Badgley et al. (2022): "California's forest carbon offsets buffer pool is severely undercapitalized", *Frontier in Forests and Global Change*, volume 5, <https://www.frontiersin.org/articles/10.3389/ffgc.2022.930426/full>

then be adjusted upwards if the reversal risk measured at activity-level is higher than that baseline. A standard rate alone is not enough to account for the highly varied risks associated with different removal activities, and geographies.

Therefore, **on top of a standard rate, activity-specific risk assessments must also be conducted, acknowledging and capturing the risk variation of different removal activities.** As this risk assessment tool is being developed by the SB, it is essential that it includes mandatory independent verification of the risk assessment results by a DOE, who must verify site-specific information/data as well as relevant literature when conducting validation/verification/monitoring of the activity. The risk rating should be completed and made public before the issuance of credits.

**12. What are the options for circumstances/triggers and/or periodic milestones for reviewing and possibly updating activity baselines, risk assessments (so, risk ratings), and monitoring plans, including in relation to:**

**(a) Verified reversals of removals; and**

**(b) The stages of activity cycle implementation?**

The review of these elements should occur on a regular basis, regardless of specific triggers or milestones. This will ensure that the review process is consistent across activities, so that an activity with a longer crediting period and thus fewer milestones does not result in less frequent review. **Complementary to the regular periodic review, specific triggers and milestones could give rise to additional review.**

**Triggers may be set off by region-, country-, and/or activity- specific circumstances that should be further defined by the Supervisory Body.** A requirement to update an activity's risk assessment and monitoring plan could be triggered by various circumstances, for example: if a historic or particularly intense period of drought takes place; if a period of intense rainfall increases the frequency of landslides; if invasive species or diseases or other risks are newly introduced that had not been previously observed (or that had been little observed); if seismic activity increases or becomes more frequent. **Various other circumstances could be envisaged, which the SB could request the Secretariat to expand upon for further deliberation.**

In addition to being set off by observed phenomena, **triggers could also be initiated by the publication of relevant studies (e.g. in scientific journals)** that project an increase in a given risk or that indicate a risk has previously been underestimated, which would call for an activity's risk rating to be reviewed and subsequently updated as appropriate.

Finally, **a reversal event should be a trigger in and of itself to review the activity's reversal risk assessment.**



**13. On what basis could requirements provide for the use of simplified / standardized elements or mandate the use of more frequent, full, or activity-specific elements and what are the requirements that may be relevant?**

- (a) Activity type or category;**
- (b) Risk rating level (e.g. above versus below a given %-based threshold);**
- (c) Risk assessment contents (e.g. nature, number, variety of risk factors);**
- (d) Monitoring plan (e.g. complexity, frequency, responsible entity).**

Please see responses to previous questions, especially question 11.

**14. Should procedures take the same or different approaches to instances of reversals that are (a) intentional/planned versus (b) unintentional / unplanned?**

Different approaches should be taken for intentional versus unintentional reversals. In the event of any reversal, the corresponding amount of ERs should be drawn from the buffer pool. Whether the reversal is intentional or not subsequently impacts how the buffer is replenished:

- **In case of unintentional reversals, the project proponent must replenish the buffer pool equivalent to any reversals in excess of the share of ERs that the activity initially contributed to the buffer pool.** For example: a project with a risk rating of 20% had contributed 2,000 ERs to the buffer out of a total issuance of 10,000 ERs; it experiences an unintentional reversal event eliminating the equivalent of 3,000 ERs; it must then replenish the buffer with 1,000 ERs.
- **In case of intentional reversals, the project proponent must fully replenish the buffer pool equivalent to all reversals.** Adapting the example above to the case of an intentional reversal, the project proponent would be required to fully replenish the buffer with 3,000 ERs.
- Moreover, **in the event of an intentional reversal, the mechanism registry account of the project proponent must be frozen such that all issuances/transfers/retirements of any credits from the project proponent, including from other projects and previously issued ERs, are halted** until all reversals are fully addressed and until a follow-up investigation is conducted to determine the reason and nature of the intentional reversal, as well as to determine disciplinary/corrective measures (if a proponent repeatedly causes intentional reversals, e.g. to harvest and sell timber, it may be required to ban this proponent from Article 6.4, to cancel any unused credits they have been issued, and to replenish the buffer with the equivalent of any of their credits that have been used previously, and perhaps more). In addition, a public notification/tag should be made available on the mechanism registry regarding the project proponent (and any



activities they are involved in) that has caused an intentional reversal, including the results of any investigation into this.

**(a) How/would other tools to address reversals involving direct credit replacement (including use of insurance / guarantees) be used in combination with a buffer pool?**

In the event a buffer pool is established by the SB, then direct credit replacement should also be required such that the project proponent replenishes the buffer pool continuously after a reversal occurs.<sup>4</sup> **However, the finer details of direct credit replacement are complex and raise significant doubts about the appropriateness of both direct credit replacement and buffer pools more generally as a way to purportedly guarantee permanence** (which cannot credibly be guaranteed, as indicated elsewhere in this submission and in our past submissions).

For instance, would the project proponent be required to replace credits from their own project only, or from a project of the same activity type, or a different activity type with a lower reversal risk rating? It may be that there will be far fewer credits issued from projects with a low reversal risk rating (e.g. on the voluntary carbon market, most credits are issued from projects involving nature-based sequestration that face potentially high reversal risks). Would there be provisions to require that the replacement credits are acquired from a different country/region in case the two projects are both of the same activity type (to mitigate risks that the reversal event impacting the first activity does not similarly impact the second activity providing the replacement ERs)? These questions are complex to answer and would have significant repercussions for the viability of direct credit replacement.

It is also important to consider what would occur **if a massive reversal event impacting a large-scale activity (or several activities) wipes out the buffer pool**, and the project proponent cannot afford to replace all the reversed ERs with ERs from another activity. In such a scenario, **it seems there would need to be further legally-enforceable guarantees that the reversed ERs will be replaced. This would imply attributing clear liability over very long time-frames, which is neither clear to determine, nor realistic to guarantee, nor even perhaps possible to enforce - all of which raises the question of whether activities with a high reversal risk should even be credited** given these will be used for offsetting. Can the SB legally require proponents or insurance companies to address reversals if they refuse or are unable to? And if that fails and the liability falls to the host Party, is it fair or even possible for the SB to require the Party to address the reversals?

---

<sup>4</sup> As indicated in the response to the previous question: if it is an intentional reversal, then the project proponent must fully replenish the buffer for the entirety of the reversal; if it is an unintentional reversal, the project proponent must replenish the buffer equivalent to any reversals in excess of the share of ERs initially contributed to the buffer by the activity.

**Suggestions for a backstop guarantee from the host Party may appear appealing at first glance, but this is not a silver bullet and raises new problems** since it risks passing on all liability to the host Party rather than liability being better split between the proponent, the buyer and other private actors. **A backstop host Party guarantee raises equity questions** since many host Parties may well be developing countries with conditional NDCs and more limited resources as compared to developed countries, who are likely to actually be the main source of demand, whether towards their NDC or for use by their companies (OIMP).

Therefore, **when units are authorised for NDC use, the SB should formulate rules passing on the responsibility for future monitoring and compensation to the acquiring Party, ideally in full**, since this can mitigate some of the equity issues detailed (though not all). The buyer Party would hence be liable if a reversal is detected in a project from which it has purchased a unit. This will incentivise the acquiring Party to purchase credits from activities with a lower reversal risk. **When units are authorised for OIMP, the SB should consider different ways in which to split the liability between the buying entity and other private actors, such that the backstop guarantee does not fall entirely to the host Party.** We would recommend the SB to request the Secretariat to produce an assessment of different options.

Having a **separate add-on commercial insurance may also appear appealing**, but this approach i) would need to be paid for by the project proponent (and perhaps indirectly reflected in the price of the ER and thus passed partially on to the buyer), and ii) more importantly, it is **not actually a simple or compelling solution given the multi-century time frames required as well as the fact that many reversal risks are likely to increase in the future due to climate change, consequently threatening underwriters' long-term financial resilience**: for example, in May 2023, State Farm, the largest car and home insurer by premium volume in the US, halted the sale of new home insurance policies in California due in part to “rapidly growing catastrophe exposure” as a result of wildfires.<sup>5</sup>

In addition the risk of a large-scale reversal event (or events) capable of wiping out the entire buffer pool should not be underestimated. If this were to occur it must clearly constitute a trigger in and of itself for the SB to review and completely overhaul its rules on reversals and permanence, but at that stage it may be too late to correct the damage.

The stakes are extremely high if the Supervisory Body decides to pursue a buffer pool as an approach to purportedly guarantee permanence – if this route is taken, a robust risk assessment/management approach (entailing both standard and activity-level risk ratings)

---

<sup>5</sup> The Guardian (27 May 2023), “Insurance giant halts sale of new home policies in California due to wildfires”  
<https://www.theguardian.com/us-news/2023/may/27/state-farm-home-insurance-california-wildfires>

that is regularly updated is absolutely essential, since this serves to underpin the resilience of a buffer.

If the SB is considering direct credit replacement in combination with insurance/guarantees, then **we would call on the SB to request the Secretariat to produce a concept paper or similar analysis on the risks posed by these different options**, including by expanding on the non-exhaustive list of design questions/concerns that we have detailed.

## Reversal risk tools—General: Buffer pools, direct credit replacement, insurance / guarantees

### 15. Regarding reversal risk buffer pools, direct credit replacement, and insurance / guarantees:

**(a) What is the current practice with these reversal risk tools, including the extent and nature of their use (respectively and in combination), transaction costs and how these are financed, and potential roles of the Host Party in multi-decadal compensation requirements;**

**(b) The circumstances under which the use of a given tool may be required or supplemental—for example, for intentional versus unintentional reversals, or during versus beyond the last active crediting period—and rationales.**

As mentioned in response to questions 11 and 13, **we would call on the SB to first request the Secretariat to produce a concept paper on these subjects, drawing on a range of literature and analysing the risks and complexities of these options, which we have underscored in a non-exhaustive manner.**

In addition, as indicated in response to question 10, we **also recommend that the SB request the Secretariat to assess the feasibility of various options to potentially deliver on longer-term monitoring**, for example:

- i) by applying a top-off fee at issuance that goes to the host Party, and which serves to cover the costs of future monitoring and compensation (the fee could be set depending on the level of reversal risk);
- ii) and/or by establishing a long-term monitoring system through satellite imagery (and other methods as relevant depending on activity types), managed by the Secretariat, and funded through a share of proceeds levied on the issuance of credits that involve carbon storage, which could be tied to the expected durability / risk rating of an activity.

## Reversal risk tools: Specific

### 16. What are options for robust buffer pool design, including conditions and procedures for its use, ER composition, replenishment, and administration.

Please see responses to previous questions. As mentioned before, we would ask the SB to request the Secretariat to produce a concept paper covering all these elements of buffer pool design, drawing on a range of literature and analysing the risks and complexities of different options, which we have underscored in a non-exhaustive manner.

Furthermore, we reiterate that the potential resilience of a buffer pool is directly linked to the robustness of the risk assessment/measurement process, which should be conservative and continually updated, as indicated previously in our submission.

### 17. The need for additional procedures and guidance for the 6.4SB, PPs, insurers/ guarantors to implement options for direct ER replacement, including for insurance or guarantees.

Please see response to question 14 on the complexities and challenges associated with direct ER replacement and insurance systems.

## Treatment of uncanceled/unused buffer ERs

### 18. Are uncanceled ERs in the buffer pool returned to the activity proponent to incentivize performance and/or automatically cancelled, and is this done periodically throughout activity cycle or only after the end of the activity lifecycle or the host Party NDC timeframe?

**Unused ERs in the buffer pool should be automatically cancelled, once monitoring has stopped** (supposing of course that monitoring for reversals continues well beyond the end of the final crediting period, as we have detailed previously). **No uncanceled buffer ERs should be returned to the proponent.** Cancelling unused buffer pool ERs is essential to ensure reversals are better accounted for, given that buffer pools and related insurance systems are already unlikely to be able to guarantee permanence on a required timescale of several centuries. Regularly cancelling unused buffer pool ERs also reduces the risk that the buffer pool incorrectly appears over-capitalised, which is relevant for effective management of the buffer pool and stress-testing.

**19. Whether the options for treatment and timing are mutually exclusive or could be applied in combination (e.g. returning some but not all ERs to proponent).**

See response to question 18. No ERs from the buffer pool should be returned to the project proponent, even after the end of the crediting period or monitoring period.

**20. Possible basis for periodically returning ERs to proponents (e.g. metrics for activity performance, activity cycle milestones).**

See response to questions 18 and 19. No ERs should be returned to project proponents from the buffer pool.

**21. Procedures for the SB's periodic review and ongoing management of buffer contributions (e.g. buffer composition, stress-testing the sufficiency of risk coverage).**

Should the SB develop a buffer pool under Article 6.4, it should **regularly undergo stress-testing to assess the pool's integrity and its resilience towards a range of different plausible future reversal risk scenarios affecting the activities linked to the pool**. Stress tests should **regularly occur – e.g. at least every 3 years, and possibly more frequently**, for instance if a high rate of reversals occurs. The specific rate of reversals to trigger a stress test and review of the buffer pool could be determined by the SB based on analysis from the Secretariat of common practice on stress-testing in carbon crediting and other contexts ([the European Central Bank, for instance, conducts annual stress tests](#)).

In addition to regular stress-testing, **the SB should also publish on an annual basis the composition of the buffer pool, including the share of credits by vintage, region and country, activity type, crediting methodology, and specific activity.**

\*\*\*

**Contact**

Isa Mulder  
[isa.mulder@carbonmarketwatch.org](mailto:isa.mulder@carbonmarketwatch.org)

Jonathan Crook  
[jonathan.crook@carbonmarketwatch.org](mailto:jonathan.crook@carbonmarketwatch.org)

