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Draft Methodological tool: Reversal risk assessment

Item	Section no. (as indicated in the document)	Paragraph/Table/Figure no. (as indicated in the document)	Comment (including justification for change)	Proposed change (including proposed text)
1	-	Cross cutting comment	A6.4-MEP014-A07 is a substantial step towards a quantified basis for permanence management, and the Carbon at Risk (CaR) team, at the LSE Grantham Research Institute and University of Exeter, supports its development. We would raise one cross-cutting point, which concerns how the ratings are used once they exist. The tool sizes the Reversal Risk Buffer Pool Account by summing ratings assessed activity by activity. A sum of activity-level ratings gives the pool's expected loss. It does not give the pool's tail, since the tail depends on which activities reverse together rather than on what each is expected to lose on its own. Sizing to expected loss is reasonable under a particular set of conditions: that exposures are numerous, that losses are largely independent and if emergency capital is available from a sponsor or reinsurer. We would encourage the MEP to test the mechanism against these conditions explicitly as a design decision is best taken before methodologies and registry systems are built around a per-activity sum. Addressing this would not necessarily raise costs, and may lower them. A buffer made up only of credits that cannot be sold is a static reserve: it cannot grow, so the whole of the cover must be purchased upfront. A reserve held partly as capital can be invested so that the pool's capacity grows over time in concordance with the climate risk. We are working with the American Forest Foundation and Kita on a mechanism of this kind, a not-for-profit vehicle that holds both reserve carbon and capital against future reversals. We would encourage the MEP to treat the portfolio-level use of these ratings as a question in its own right, and to consider it alongside the reversal risk assessment rather than after it. www.carbonatrisk.org	-

2	5. Reversal risk assessment	22	The Carbon at Risk (CaR) research team, at the LSE Grantham Research Institute and the University of Exeter, does not think natural and human-induced reversals can be assumed independent, and so does not think the two ratings should be summed. Consider fire-induced reversal in a forest, conventionally treated as a natural risk. Fires are more likely in hot, dry years, and such years are more frequent in higher-warming futures. The same warming drives the human-induced channel: a large literature links higher temperatures to lower agricultural yields and reduced labour productivity, which raise the economic pressure to clear protected forest. Conditional on a high-warming future, both rates rise together. They are two responses to the same underlying state of the world. The CaR approach avoids having to choose a combination formula. Rather than rate each category separately and then combine them, it simulates every activity jointly along shared paths for the common drivers, principally the temperature trajectory and the quality of the institutions protecting a project, so the dependence between natural and human-induced reversal arises by construction. The buffer requirement is then read directly off the joint tail of total reversals, which reflects whatever correlation the drivers induce. Extending this to a further driver means modelling how that driver reaches carbon, but not revisiting how its rating combines with the others. Reduction factors should attach to an activity's own reversal model rather than to the drivers. Protections such as secure tenure or enforcement capacity change how much an activity loses under a given pressure; they cannot change the pressure itself, and in a future where institutions have broken down they may do very little. A measure that lowers an activity's individual exposure can therefore leave its exposure to a common shock largely unchanged. We are candid about the difficulties. Joint dependence is hard to calibrate: the historical record is short relative to the tail of interest, the sign and magnitude of several channels remain uncertain, and the correlations are non-stationary. Our approach rests on strong assumptions with a professional judgement component, and	Replace equation (1) and its accompanying text with a requirement that the combined reversal risk rating be derived from the joint distribution of natural and human-induced reversal outcomes, evaluated at a confidence level specified by the Supervisory Body, rather than by summing the two ratings. Suggested wording: The parameter $F_{buffer,i,t}$ shall be determined from the joint distribution of natural and human-induced reversal outcomes for reservoir i, evaluated at a confidence level specified by the Supervisory Body. The applicable confidence level shall be stated.

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			does not represent all possible dependencies. The framework is being developed as an open-source, modular structure and we are working on a paper that will present our findings and methodology. It spans both risk channels and the portfolio level, but it is on human-induced risk and the correlation between the two channels that we think we are best placed to help. We acknowledge that the MEP's draft tool covers activities that reduce non-renewable biomass consumption, for which we hold no methodology, but the risk it addresses is forest carbon, which our forest methodologies do model. We would welcome engagement with the MEP to establish whether the approach can usefully be adapted here, or whether a different one would serve better. https://www.carbonatrisk.org/	

3	5. Reversal risk assessment	22	The Carbon at Risk team would suggest deriving default values from a transparent mapping between jurisdiction-level institutional quality and reversal risk, rather than fixing a single default rate. In the Carbon at Risk approach, reversal risk is driven by projects' shared exposure to a small number of common risk drivers. Human-induced risk is carried by one of them: the quality of the institutions that protect a project, which we measure with a jurisdiction-level governance index. Rather than fix a single default rate, we specify a transparent mapping from that index to a project's reversal risk, anchored to empirical reference points and interpolated between them. The value for any given project is then read off its own jurisdiction's institutional quality through the mapping. Our prototype implements this for the methodologies where human-induced risk is material. For the forest methodologies, institutional quality maps to an annual governance-breach hazard, an absorbing loss of protection, which then combines with the jurisdiction's historical deforestation rate to give the reversal; this mapping is anchored to reference points from the governance-and-deforestation literature and interpolated across the index. For Direct Air Capture and Carbon Storage (DACCS), institutional quality at inception maps to a storage-security (leakage) severity, interpolating between the high- and low-governance endpoints coded in the underlying storage-security curve. A related asymmetry bears on how these defaults should be set. Natural reversals in forest systems are frequently transient: a stand that burns will in many settings regenerate, and the carbon is recovered over time. Human-induced reversals are more often persistent, because the loss of protection that permitted the clearing tends to persist alongside it, and land converted to another use tends not to revert on the timescales relevant here. The implication is that human-induced risk factors cannot be set by analogy with natural ones even where the headline fraction of carbon lost appears similar, because the same loss carries a different expected duration depending on the channel that produced it. Where a reversal is transient the assessment should reflect	Default values for human-induced reversal risk factors shall be determined from a documented mapping between systematic drivers of reversal risk and project specific risk factors, rather than from a uniform default. The mapping, its reference points and its functional form shall be published. Values shall be specified at jurisdiction level and reported with an associated uncertainty range rather than as point estimates. Where values are projected forward, they shall reflect the projected institutional trajectory of the jurisdiction concerned rather than a common global path.

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			the expected recovery; where it is not, it should not. These mappings are the hard part to calibrate, and we do not claim precision. More work and research is needed to determine both the risk drivers, the methodology-specific risk models and the mapping functions. The value of the approach is that it is transparent and modular: the reference points, the functional form, and the index are all explicit and can be updated as evidence improves, and we rely on sensitivity analysis rather than a single point value. On jurisdiction variation our answer is clear the values must vary by jurisdiction. Institutional quality and land-use pressures genuinely differ across countries and regions, and that variation is of first order importance. This variation is the mechanism that generates spatial correlation in reversals, since projects in the same jurisdiction share a governance path and move together. A single global default would erase that correlation and mis-size the buffer. For the same reason, forward-looking default values should track each jurisdiction's projected institutional trajectory, not a common global path. We plan to set out our approach in a paper that we will also submit for peer review. The mappings, reference points and index will be documented, and we will be able to share them with the MEP as we develop them, in particular for the methodologies addressed in the forthcoming modules. We mention this because the draft tool records an absence of analytical basis for projecting human-induced reversal risk, the work is offered for scrutiny rather than for adoption. https://www.carbonatrisk.org/	

4	5. Reversal risk assessment	22	The Carbon at Risk team would argue that human-induced reversal risk reduction factors should be determined on the same basis as the risk itself, and within the same structure. In the Carbon at Risk (CaR) approach, human-induced reversal risk is driven by the quality of the institutions that protect a project, which we measure with a jurisdiction-level governance index and map to the project's risk through an explicit function anchored to the available evidence. A reduction factor is naturally represented within that same structure, not as a standalone discount but as a lowering of the project's effective exposure to the institutional driver: a project with credible protections (secure tenure, enforceable legal status, active monitoring) faces a lower governance-breach hazard and enters the calculation on that basis. Its default value should therefore be set the same way as the risk itself, through a transparent mapping from observable, jurisdiction-level characteristics, anchored to empirical evidence on what measurably reduces human-induced reversal. In practice this is difficult. The evidence for how much a given intervention actually reduces reversal is thin and often confounded, so we would urge conservatism, a modular and transparent construction (explicit reference points and functional form, updatable as evidence accrues), and extensive sensitivity analysis rather than precise point values. The values should certainly vary across jurisdictions. The effectiveness of a given protection depends on the local institutional and land-use context, so the same measure buys more risk reduction in some places than others. Because projects in the same jurisdiction share these conditions, this variation also shapes how their reversals co-move, and a single global reduction factor would misstate both the level of risk and its spatial correlation. Defaults should therefore be grounded in jurisdiction-specific empirical data wherever it exists, and should be transparent about the limitations where such data does not exist. https://www.carbonatrisk.org/	Human-induced reversal risk reduction factors shall be determined on the same basis as the human-induced reversal risk factors themselves, through a documented mapping from systematic drivers of risk. A reduction factor shall be applied to the risk channel on which the measure acts, and should not be applied as a deduction from a combined reversal risk rating. Values shall be specified at jurisdiction level, and shall be set conservatively where the evidence base for a given measure is limited.
5	3. Normative and informative references	47	The Carbon at Risk (CaR) team agrees that it is appropriate not to apply an upper limit for reversal risk ratings. This is because exclusion on the basis of a high rating could	There is no upper limit on the parameter Fbuffer,i,t. Where an activity's reversal risk rating exceeds a level determined by the Supervisory Body, the Supervisory Body may

			create a strong incentive to present an activity as falling just below it. A continuous schedule, in which a high risk rating translates to a correspondingly high buffer contribution should be sufficient and it is highly likely that market dynamics would result in projects with very high risk ratings becoming uncompetitive. Furthermore, it is likely that caps would be applied on a per project basis but as we have argued the sufficiency of the buffer pool account depends on how activities reverse together (correlated risk). An activity with a high standalone rating whose reversals are largely uncorrelated with the rest of the pool may add less to the pool's tail than a moderately rated activity whose reversals coincide with everything else in it. Thus a threshold set on the standalone rating could even concentrate the pool in a smaller number of correlated exposures. If the Supervisory Body is concerned that very high risk activities could weaken the Reversal Risk Buffer Pool Account, the appropriate response is additional assurance rather than exclusion. Instruments of this kind include insurance, third-party guarantees and monetary permanence reserves, and they can be required alongside or in place of a buffer contribution above a given risk level. The design space here is developing rather than settled, and we would encourage the MEP to avoid foreclosing it and to set a defined point at which the question is revisited. One instance under development is a permanence trust, which holds capital and reserve carbon against future reversals and replaces reversed tonnes under warranty. We disclose that the CaR team is working with the American Forest Foundation and Kita on the development of this mechanism. Underlying these is a point about the form of the calculation. The tool currently derives Fbuffer,i,t by summing rating factors drawn from tables. A table can record what an activity's risk is, but it cannot record how that risk relates to the risk of everything else in the pool, and it is that relationship which determines whether the pool holds in times of reversal. Moving from additive tables to a portfolio model would allow the mechanism to be more conservative where it should be, since correlated exposures require more cover than their sum implies, while giving	require additional permanence assurance alongside or in place of a contribution to the Reversal Risk Buffer Pool Account.

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			credit for genuine diversification across jurisdictions and methodologies. Neither adjustment is available within a table-based structure, because both depend on quantities a table does not carry. Our published work on Carbon at Risk sets out how buffer requirements can be derived at portfolio level from a stated confidence level rather than from summed point estimates. This comment applies to future iterations of the Reversal Risk Assessment that extend to other activities, where our work on cross-methodology diversification on foresty, biochar, ERW, and DACCS will make the point more material. www.carbonatrisk.org	