



Accelerating the Carbon Market: A Call for a Standardized Rating System for Removal and Avoidance Credits

A Kimmeridge Report – In Partnership with Chestnut Carbon

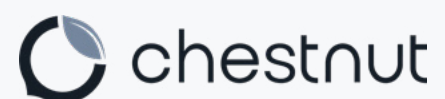


Table of Contents

Summary	1
Removals Will Prove Essential in the Race to Net Zero	2
Building a Market: Transparency, Simplicity and Volume	4
Rating Carbon: It's All About Additionality and Duration	5
Building a Better Rating System	6
Conclusion: It's Time for the Carbon Market to Mature	8

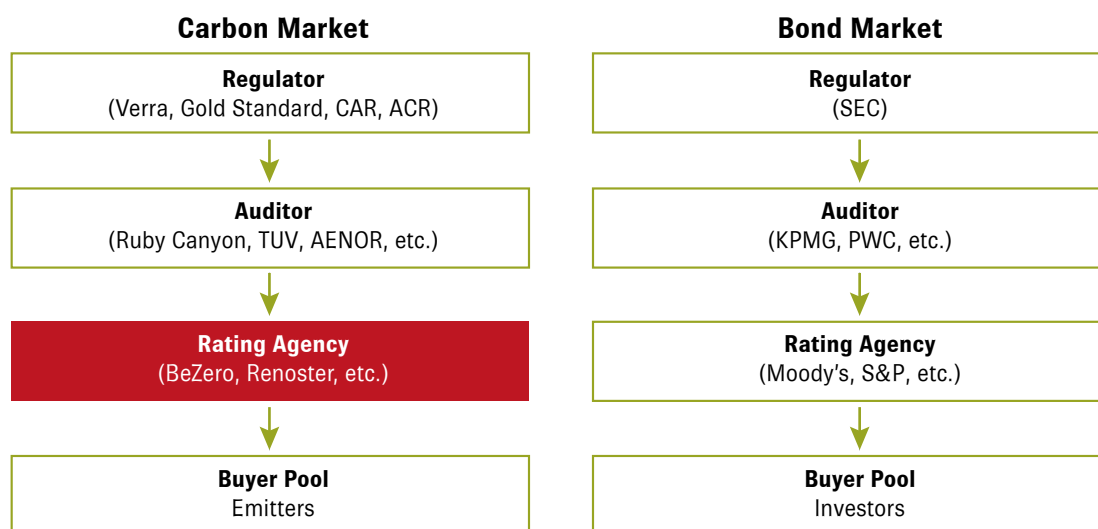
Summary

Carbon emissions must be reduced, and without delay. While carbon reduction must be the primary focus, it will be impossible to reach net zero goals without considerable investment in carbon removal and avoidance activities. However, an inadequately structured market and an often confusing set of choices in carbon removal and avoidance credits has hindered the necessary investment in these activities from corporations, governments and other emitters.

Buyers of credits face a multitude of different carbon projects that vary in type of activity and environmental integrity: removal versus avoidance, and differing levels of additionality, transparency, and duration. While these credits are issued by entities such as Verra and Gold Standard, the separate ratings provided by third party organizations like BeZero and Sylvera present little consistency and fail to provide a simple, objective, and standardized means of comparison. Often, these ratings conflate project co-benefits with the environmental integrity of credits.

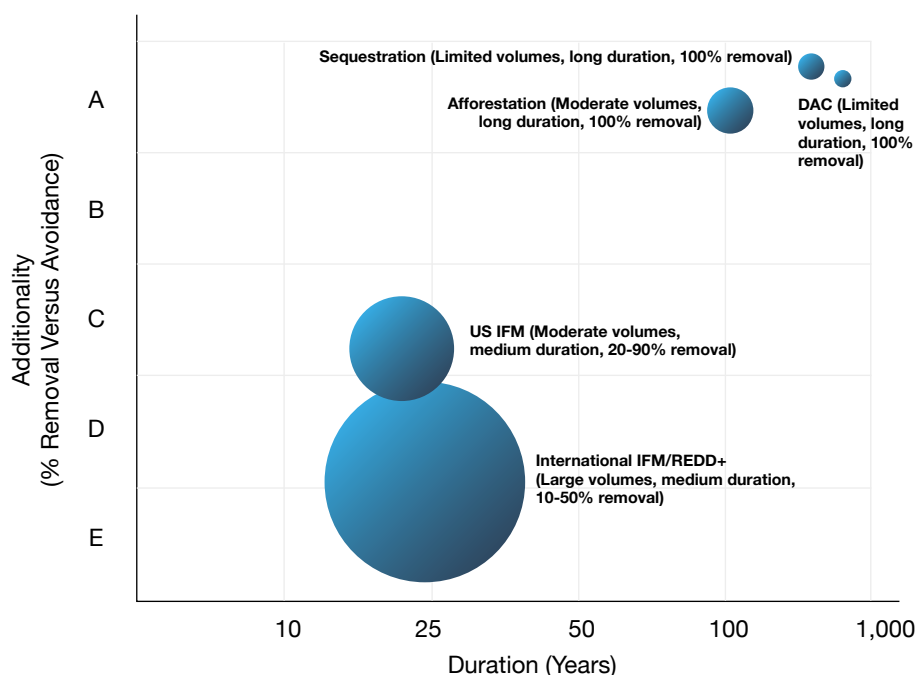
Kimmeridge believes it is time to create a standardized, global rating system for carbon credits, akin to the bond market, with a simple and transparent methodology that accurately quantifies additionality and durability – the two primary drivers of value in environmental integrity. This would ideally be managed by a very limited number of independent entities that become the accepted standard for ratings, similar to the role that S&P and Moody's play in the bond market.

Figure 1: Comparison of the Carbon Market and Bond Market (Problem Area in Red)



A simple ratings system that accommodates all types of credits, based on additionality and duration as indicators of environmental integrity, would allow all projects to be graded. These would include direct air capture (DAC), sequestration, and afforestation, all of which are removal-focused, and improved forest management (IFM) and soil carbon projects that combine both removal and avoidance activities.

Figure 2: Schematic of a Potential Simplified Ratings System



Source: Kimmeridge internal analysis

More importantly, such a system would accelerate the pace of genuine, high-quality carbon removal by giving buyers much greater confidence in the value and effectiveness of credits, and making it easier to establish and finance new removal projects.

Kimmeridge encourages all interested parties active in this area to come together to discuss how to establish and advance such a system.

Note for editors: Kimmeridge is an alternative asset manager focused exclusively on the energy sector. The firm is differentiated by its deep technical knowledge, proprietary research and data gathering. Kimmeridge operates in conventional and renewable energy and, having sought to drive E&P companies towards carbon neutrality, it has been active in the carbon market as both a buyer of credits and an investor in new nature-based removal projects in North America.

Removals Will Prove Essential in the Race to Net Zero

In the fight against climate change, the wholesale reduction of emissions across all sectors including energy, manufacturing and transportation is paramount. This transformation will be enormously complex and will require time – and it must also be accompanied by a huge investment in carbon removals, as completely ridding the globe of all emissions in three decades is simply not feasible, or economically rational.

The reality is that getting to net zero by 2050 – or indeed net zero on any timeline – will simply not be possible without scaling the carbon credit market. When used properly, the carbon market can incentivize companies to remove carbon, generate significant co-benefits and accelerate the energy transition through a market-based

approach. To explain: carbon credits represent units of carbon emissions that are **removed** from the atmosphere or **avoided** elsewhere, purchased by companies to reduce, neutralize, or even reverse their net emissions. It is imperative to recognize the urgency of this task, as the environmental value of a ton of carbon removed today is greater than a ton removed in the future.

Critics of carbon credits claim they are a license to pollute. However, research shows that companies that purchase credits reduce their carbon footprint faster than companies not involved in carbon markets¹, and high-integrity removal credits are most effective at promoting the reduction of corporate emissions. Paying the price for a credit today is a reflective signal for companies to start reducing emissions now, internally, and the voluntary purchase of credits provides companies with a financial incentive to accelerate their emission reductions. Research also shows that companies using high-integrity carbon credits reduce their emissions the most, refuting the assertion that these investments excuse bad behavior.

Companies that are committed to decarbonization should use high-integrity offsets to incentivize internal change. The highest integrity offsets are those that represent verified additional carbon removal from the atmosphere with duration (i.e., how many years they remove and retain carbon). There are four broad categories in which these fall:

- Direct Air Capture (DAC), which uses large industrial fans and chemical reactions to ultimately store carbon underground in a mineralized form in perpetuity. These represent **100% removal credits**.
- Point Source Carbon Capture and Storage (CCS), where concentrated streams of carbon dioxide are redirected to underground storage from industrial plants with ongoing monitoring to ensure permanence. These represent **100% removal credits**.
- Afforestation/Reforestation (A/R), where underperforming land is restored to its natural habitat and conserved. Carbon is stored in new growth of above and below-ground biomass. These also represent **100% removal credits**.
- Other Nature-based Solutions (NBS), where carbon is sequestered in forests, soils and oceans. These solutions are more varied in their additionality and permanence. These represent a **mix of removal and avoidance credits**.

There are considerable trade-offs to the removals presented by each solution. For example, DAC is theoretically infinitely scalable but also prohibitively expensive today. Point Source CCS is significantly cheaper than DAC because the flue gas streams from industrial plants are more concentrated than CO₂ in the atmosphere. However, it is still expensive and only works on large, industrial-sized facilities. Compared to either DAC or CCS, removals from A/R are the least expensive form of pure removal credits but have been limited in their supply.

¹Trove Research. (2023). Corporate emission performance and the use of carbon credits.

Other nature-based solutions are more nuanced in terms of deciphering offset integrity with respect to both the purity of removals and the potential duration of carbon storage. The obvious issue is that those offsets that represent the avoidance of carbon emissions into the atmosphere, due to a purported change in human behavior, are heavily predicated on counterfactual scenarios that are hard to prove. They therefore have less integrity and value. Furthermore, many nature-based solutions (NBS) often have unclear or at least unproven duration. Unfortunately, these complexities create a path for critics to disparage the associated credits. However, whether via avoidance or removal, we believe that improved outcomes stem from transparency and clear, objective measurement.

Building a Market: Transparency, Simplicity and Volume

Building an effective market will require transparency, simplicity and volume. In this respect the carbon market to date has failed its participants. While the development of improved forest management (IFM) has created volume, it has done so at the cost of transparency and simplicity. Sophisticated market participants have understood this, and credits have seen wide price disparities that reflect their respective quality. However, it has been hard for new participants to understand the differences. In addition, it has opened the market to considerable criticism.

While DAC and sequestration are inherently simple in their proposition, nature-based solutions (NBS) are more nuanced. Included under this label are various types of activities that remove carbon or avoid emissions in the atmosphere. Presently, the largest volume of offset transactions in the United States market are those from NBS and are largely associated with forestry activities. While soil-based activities also have the potential for massive scale across agricultural lands, challenges related to the opportunity costs of behavioral change in farming and the ability to precisely measure the climate effects of these activities have resulted in limited adoption.

Forests Can Store Carbon Indefinitely

Compared to trees which are temporary, forests have persisted as durable carbon stocks for a long time and are a proven solution for long-term carbon storage. Estimates suggest there are upwards of a trillion metric tons of carbon currently stored in the world's forests². This amount is more than twenty times the carbon emitted annually on a global scale and dwarfs the amount of carbon that can be stored underground through DAC and CCS. Nature is critical to climate and cannot be ignored in favor of DAC and point-source CCS.

While difficult to conceptualize, forests are an above-ground store of carbon not entirely different from subsurface ones. Carbon is captured in the mass of the tree and held in storage over time, and trees in a functional forest ecosystem perpetuate through natural regeneration as a forest. In a sense, carbon removals from the activity

² Yude Pan, Richard A. Birdsey, Jingyun Fang, Richard Houghton, Pekka E. Kauppi, et al.. A large and persistent carbon sink in the world's forests. *Science*, 2011, 333 (6045), pp.988-993.

of afforestation are no different than from DAC if the resultant forest is maintained in perpetuity. In a forest the carbon trapped is measured by the mass of the forest. Below ground CO₂ is mineralized.

Ultimately, the transition to net zero needs to be low-cost and equitable. Engineered solutions are designed to remove emissions by operating machines. While beneficial for the climate, the capital outlay and operating expense for these machines are significant and they often do not coincide with any co-benefits beyond removing carbon. Given the high cost, complexity, and massive amounts of energy technologies like DAC require, the current potential for scale is limited, even if energy consumption and costs are expected to decline over time. The economics of these differing solutions show that the cost of natural solutions is significantly lower than the cost of engineered solutions, making nature-based solutions the economically rational choice today.

Rating Carbon: It's All About Additionality and Duration

While the economics of natural solutions are clear, perceptions are clouded by fears about the legitimacy of the claimed climate benefits of offsets from NBS. Buyers lack confidence that purported climate outcomes are real, and not simply a mirage that will later be challenged and scrutinized by the media. Too often this is the case. Therefore, to realize the full potential of NBS, the market needs to improve the environmental integrity of offsets. However, this can only be accomplished by using a common measure of integrity across all types of offsets, and then using the measure to appropriately value offsets and send a price signal to suppliers to deliver the required environmental integrity.

Historically, companies evaluating the purchase of offsets have looked to third party standards to define principles for integrity. However, principles differ across standards, with significant variation in how they are employed to determine the number of offsets attributable to each type of activity³. Typically, private companies or organizations define the quantification methodologies. These are then subsequently approved by the governing body of a standard. Examination of the major crediting standards for US-based projects indicates that there are at least fifteen principles related to defining the integrity of offsets. We believe this needs simplification.

Synthesis of the principles that feature across the major crediting standards reveals a set of three common factors:

- **Additionality.** The concept that the quantity of offsets attributable to carbon removal or emissions avoidance would not have occurred in the absence of the activity. This is a generalization of alternative definitions provided by standards which take a binary view, differing in that additionality can be measured on a scale.
- **Durability.** The concept that the quantity of offsets represents carbon storage

³ <https://www.frontiersin.org/articles/10.3389/ffgc.2023.958879/full>

for a period of time. This is a generalization of permanence which measures the time of carbon storage associated with an offset.

- **Transparency.** The concept that the public can openly examine the assumptions and justification of assumptions related to additionality and durability, required by purchasers of offsets to assess offset integrity.

The importance of these three factors in the quantification of offsets is underscored by the relevance of these factors in media coverage. A recent example is The Guardian which published an article criticizing projects that claim offsets from reducing deforestation (Weston et al. 2023), often referred to as REDD+. While not a typical activity type found in the United States, REDD+ is an activity mostly credited for the avoidance of emissions. The article examined the additionality of claims among many REDD+ projects, concluding that 95% had no climate benefit at all. Another article by Bloomberg examined the meaning of durability, inferring that without additionality then durability is meaningless (Elgin 2023). Both articles challenged project assumptions of additionality and durability using outside data sources, and ultimately exposed these projects to overwhelming scrutiny.

Building a Better Rating System

A better rating system for the carbon market is needed, and it must be both transparent and inclusive. No carbon credit should be excluded from the system – to do so would lower volume, which in turn would hurt the development of the market. Rather, by adding transparency and simplicity, it should be possible to create a system where buyers can determine what is wanted, and at what price.

As highlighted above, the core elements of carbon removal are duration and additionality. This is not to say there are no other risks (political stability, land tenure, climate effects, etc.), but these are significantly less relevant.

- For additionality, we propose a scale from A to E that reflects the percentage of removal credits and avoidance credits. A project that is 100% removal credits would score an A, whereas a project that is 90% avoidance (REDD+) might score an E reflecting the counterfactual arguments involved.
- For durability, we propose that the rating system include time. DAC and sequestration with underground monitoring are effectively permanent storage solutions for 100 years plus (100+) and would be designated as such. For afforestation, where the land is owned and in a form of conservation preservation or easement, we would suggest the rating would be 100. For IFM, it would reflect the term of the agreement with the landowner, which could range from 1 year to 100 years.

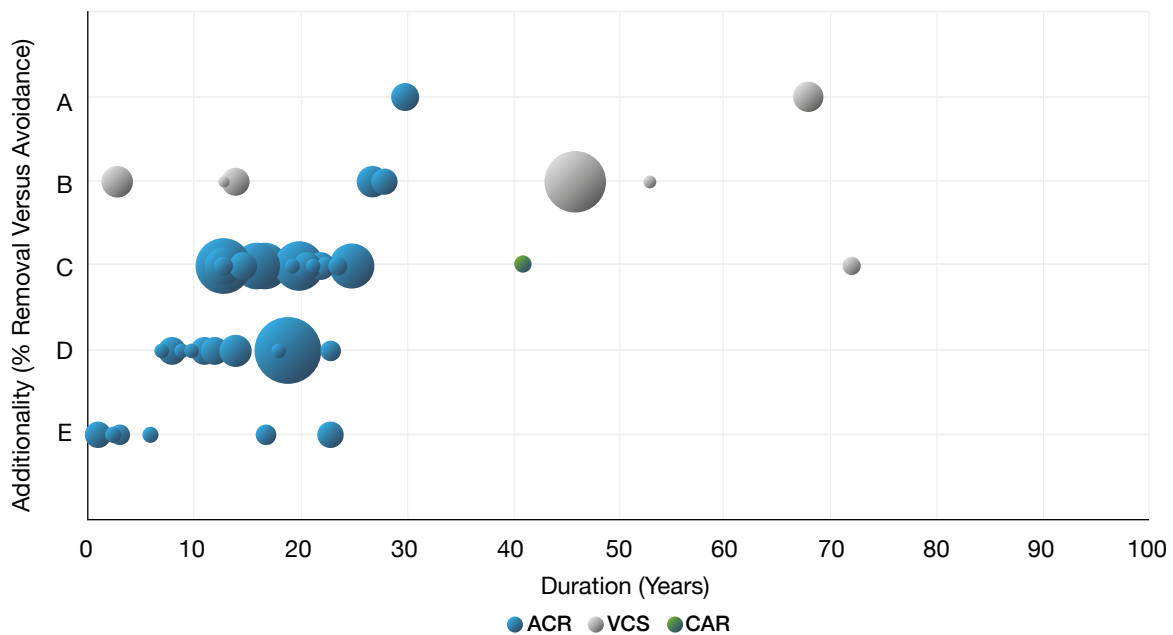
Table 1: Components of a Simplified Rating System

Component: integrity factor(s)	First Component: Additionality and Transparency rating	Second Component: Durability rating
Units of measure	Ordinal letter score A-E or X	Expectation in years
Relevant indicator(s)	When offsets are segregated by carbon removal versus avoided emission, the fraction of offsets attributable to carbon removal relative to the total quantity of offsets to be issued to a project	The remaining term of the contractual obligation for carbon storage adjusted for alignment with future financial incentives (performance and contractual), capped at the IPCC benchmark of 100 years

This is not perfect, but to demonstrate how effective it could be we have ranked the quality of US-based IFM projects listed in the voluntary market to demonstrate its application (see Figure 3). The additional benefit of such a system is that corporates could present one letter and number grade for their weighted average portfolio of credits annually. Each company could choose the duration and scale of its credits as it sees fit, but investors would be able to compare and contrast these efforts easily and with confidence.

Another benefit is being able to meaningfully compare prices by normalizing to the 100-year benchmark established by the Intergovernmental Panel on Climate Change (IPCC). For example, one can now better compare two credits both priced at \$25.

Figure 3: Ranking Existing IFM Projects Under a Simplified System (Bubble size represents the projected volume of credits for each project)



Source: Kimmeridge analysis of project quality under our proposed ranking system leveraging public data from ACR, VCS, and CAR registries

Conclusion: It's Time for the Carbon Market to Mature

Building an effective carbon market is critical to delivering the world's net zero goals. While the existing market has created a good platform, it now needs to mature. To be effective, it needs greater transparency, simplicity, and volume.

The largest roadblock to achieving this today is the absence of a simple, objective and standardized third-party ratings system, akin to the bond market, that is centered on quantifying the environmental integrity of credits using the principles of additionality and durability, the two primary drivers of value. Done the right way, this would create a level playing field for carbon removal developers and buyers, incentivizing the flow of capital into the most economic (and thus additional and durable) carbon removal projects.

Such a system would also allow for the creation of a single benchmark futures price (as for key commodities such as oil and gas) with differentials based on the ratings, further accelerating price discovery and removal of carbon.

Kimmeridge encourages all interested parties active in this area to come together to discuss how to establish and advance such a system. Kimmeridge can be contacted at info@kimmeridge.com

THIS PAPER REPRESENTS THE VIEWS AND OPINIONS OF KIMMERIDGE ENERGY MANAGEMENT COMPANY, LLC AND ITS EMPLOYEES AND AFFILIATES (KIMMERIDGE) AS OF THE DATE HEREOF AND IS SUBJECT TO CHANGE. THE OPINIONS EXPRESSED HEREIN REFLECT OUR VIEWS ON CARBON MARKETS AND RELATED TOPICS AS A WHOLE. WHILE ALL DATA USED IN THIS PAPER HAS BEEN SOURCED FROM PROVIDERS WE CONSIDER TO BE RELIABLE, WE DO NOT REPRESENT THAT THE INFORMATION PRESENTED HEREIN IS ENTIRELY ACCURATE OR COMPLETE AND IT SHOULD NOT BE RELIED ON AS SUCH. THIS PAPER IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY AND IS NOT MEANT TO BE RELIED UPON IN MAKING ANY INVESTMENT OR OTHER DECISION. NOTHING HEREIN IS DESIGNED TO BE A RECOMMENDATION TO PURCHASE OR SELL ANY SECURITY, INVESTMENT PRODUCT OR VEHICLE. THERE IS NO GUARANTEE THAT IMPLEMENTING THE VIEWS PRESENTED IN THIS PAPER WILL YIELD POSITIVE RESULTS FOR ANY INDIVIDUAL OR COMPANY. CERTAIN EXAMPLES PROVIDED IN THIS PAPER CONTAIN THE PERFORMANCE RESULTS OF ONE PARTICULAR COMPANY AND RESULTS COULD DIFFER DEPENDING ON THE PARTICULAR COMPANY USED IN THE EXAMPLE OR WHETHER A PARTICULAR GROUP OF COMPANIES WAS USED IN THE COMPARISON. THE VALUE OF CARBON CREDITS OR OTHER PRODUCTS REFERRED TO IN THIS PAPER MAY FLUCTUATE. PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS. NOTHING IN THIS PAPER REPRESENTS INVESTMENT PERFORMANCE OF KIMMERIDGE OR ANY KIMMERIDGE SPONSORED FUND. INVESTING IN ANY SECTOR, INCLUDING THE RENEWABLE ENERGY SECTOR, INVOLVES SIGNIFICANT RISKS.



New York

15 Little West 12th Street,
5th Floor
New York, NY 10014

Denver

1401 Lawrence Street,
17th Floor
Denver, CO 80202

+1-646-424-4317

info@kimmeridge.com
www.kimmeridge.com