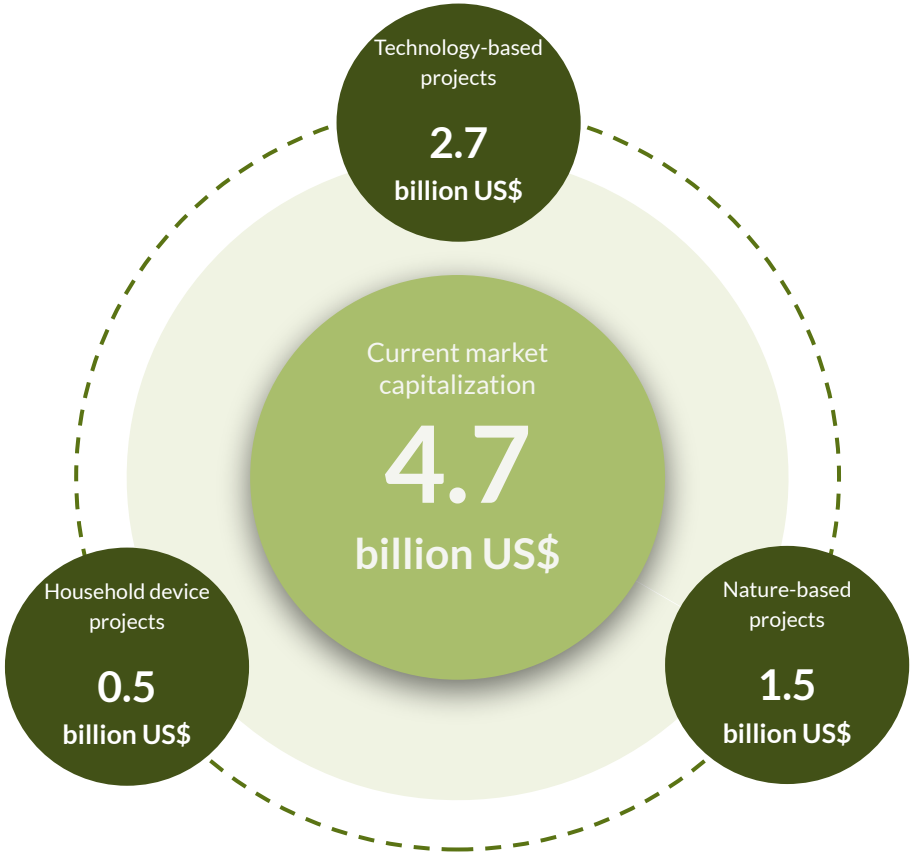
# VCM Market Cap

March 2024

# Executive summary




- The size of the Voluntary Carbon Market is significantly greater than commonly reported
- The current market capitalization of the Voluntary Carbon Market is estimated to be **US$ 4.7 billion**, with 56.2% allocated to technology-based projects, 32.3% to nature-based projects, and 11.5% to household devices projects
- The market capitalization surge in H2 2021 aligns with the strong price rally observed at that time, while the decrease since June 2022 indicates a contraction. Figures observed today are still higher than June 2021

# Market size estimation

Market size estimations in the voluntary carbon market have been typically based on market surveys and contributions of carbon credit transactions from market participants.

One example is the work done by Ecosystem Marketplace's State of the Voluntary Carbon Markets report.

All market participants appreciate the work done by Ecosystem Marketplace over the years, providing a highly needed anchor for market intelligence in this historically opaque market.

We estimated the capital retired for year 2023 [1] and 2022 [2] was **US$ 926 million** and **US$ 1.22 billion** respectively. These findings prompted us to apply similar methods to assess the market size.


[1] https://medium.viridios.ai/lets-delve-into-the-retirement-data-and-pricing-data-of-viridios-ai-to-analyze-the-capital-flow-380c972e9db3

[2] https://medium.viridios.ai/capital-retired-in-the-voluntary-carbon-market-in-2022-af76387a0f42

# Scope

We take the position that a more valuable estimation for the capitalization of an OTC (over-the-counter) market such as voluntary carbon should focus on the total outstanding value of its assets, in this case, carbon credits. In this report we take a more direct approach to market capitalization estimation. We achieve this by combining actual issuances, retirements and cancellations of carbon credits with market prices at any point in time. We are able to do this as VAI publishes vintage level prices for over 16,000 projects on a daily basis. As a result, our estimation also includes the historical evolution of the market capitalization in the voluntary carbon market.

Defining the scope of this analysis:

**Standards:** We have included the following standards: VCS (Verra), GS (Gold Standard), ACR (American Carbon Registry), CAR (Climate Action Reserve) and CDM (Clean Development Mechanism)

**Vintages:** We have considered vintages from 2010 (vintages prior to 2010 have very little value and are very unlikely to be purchased and retired in 2024

# Outstanding carbon credits

The quantity of outstanding credits exhibited exponential growth between 2010 and mid-2013, and from mid-2013 to the present, its expansion has followed a more linear trajectory.

Zooming in on the data since January 2021, it is evident that the outstanding quantity has increased from 1,768,000,000 credits to nearly 2,394,000,000 credits today (i.e. 35% increase).

However, the rate of growth has begun to decelerate since early 2023 (mostly due to the fact that the quantity issued in 2023 was lower than previous years).

# Outstanding carbon credits by categories

We have categorized credits into three distinct groups for a detailed analysis of their individual trends. The definitions for these categories are as follows:

Nature-based (NbS) includes REDD/REDD+, afforestation/reforestation, blue carbon, and regenerative agriculture.

Household devices (HHD) includes improved cookstoves, solar cookstoves, and other household devices or technologies meant to reduce biomass consumption relevant items.

Technology (TECH) includes renewable energy, gas abatement, and energy efficiency measures beyond household devices, focusing solely on avoidance.

# Outstanding carbon credits by categories

Whilst the quantity of outstanding credits for nature-based and cookstove projects remains relatively small, when compared to technology-based projects, it is indisputable that their growth rates are significantly higher over the last 3 years. As of now, the outstanding quantity for nature-based credits is approximately 2 times higher than that for household devices credits and the surplus for technology credits is more than 5 times than the combined outstanding quantity of nature-based and household devices credits.

**Outstanding carbon credits (tCo2e) breakdown by category**

# Methodology

In order to establish the valuation of this outstanding quantity over time, we need to estimate the current and past dollar values.

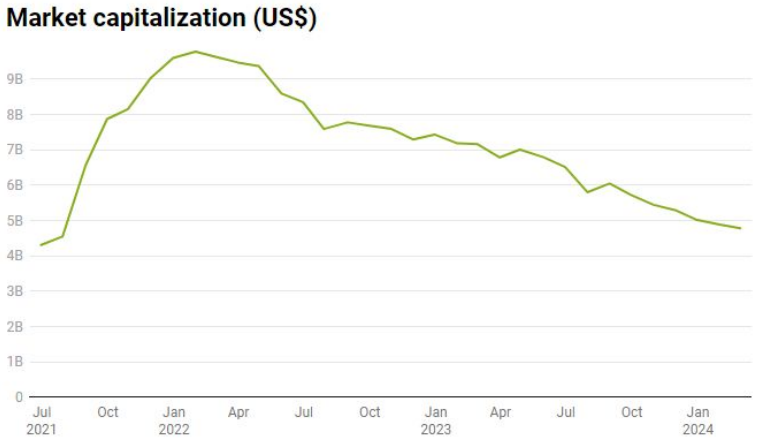
To do this we multiplied the quantity for each project/vintage by the prevailing price of each carbon credit, with the value being contingent on the specific carbon project and vintage (e.g., VCS902–2019, where VCS902 represents the standard/project ID and 2019 indicates the vintage).

Whilst this process is cumbersome as an isolated exercise, the VAI platform provides carbon credit pricing at the vintage level for over 16,000 projects, making it feasible to achieve.

# Market capitalization

The dollar value plot reveals a trajectory that is very different from the outstanding credits trend. This difference is influenced not only by the quantity at different points in time, but also by the variations in carbon credit prices. In this exercise, we found that the market capitalization peaked in January 2022, reaching an impressive **US$9.7 Billion**.

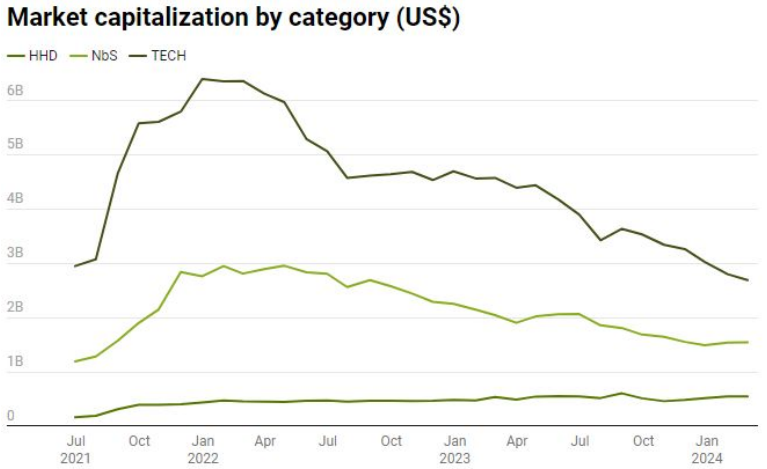
The surge in market capitalization during the latter half of 2021 corresponds to the notable price rally witnessed during that period. Conversely, the observed price decrease since June 2022 has led to a contraction in market capitalization from June 2022 to the present. However, it is essential to highlight that the current market capitalization is still higher than it was in June 2021 (**US$ 4.784 billion as of 29 Feb 2024** vs US$ 4.309 billion tCo2 as of 30 Jun 2021; i.e. 11% more).



# Market capitalization by category

Examining the previously defined categories, we can conclude interesting trends. In 2023 and early 2024, cookstove projects faced a significant volume of negative publicity. However, despite this, the market capitalization of household devices projects has increased, since the end of January 2022.

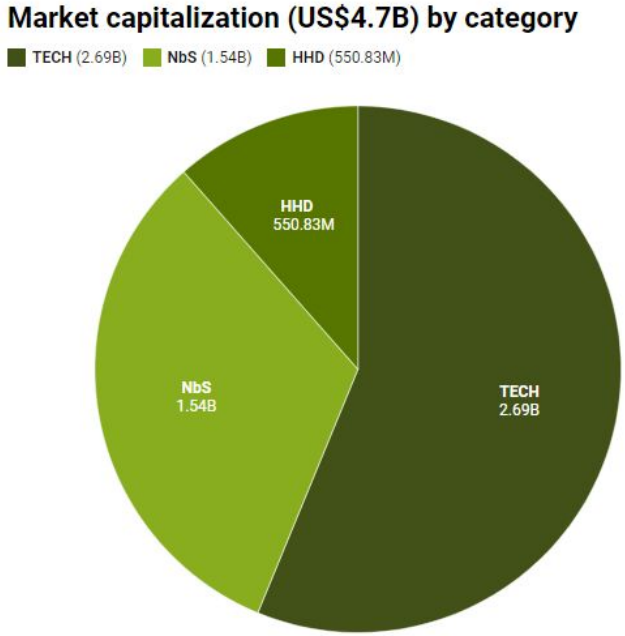
Conversely, the diminished demand and subsequent price decrease for technology-based projects have led to a notable contraction in the market capitalization for this category. REDD/REDD+ projects present a middle-ground profile: experiencing a surge in the second half of 2021 and then gradually contracting since June 202s is clear in the below chart.



# Current market capitalization by category

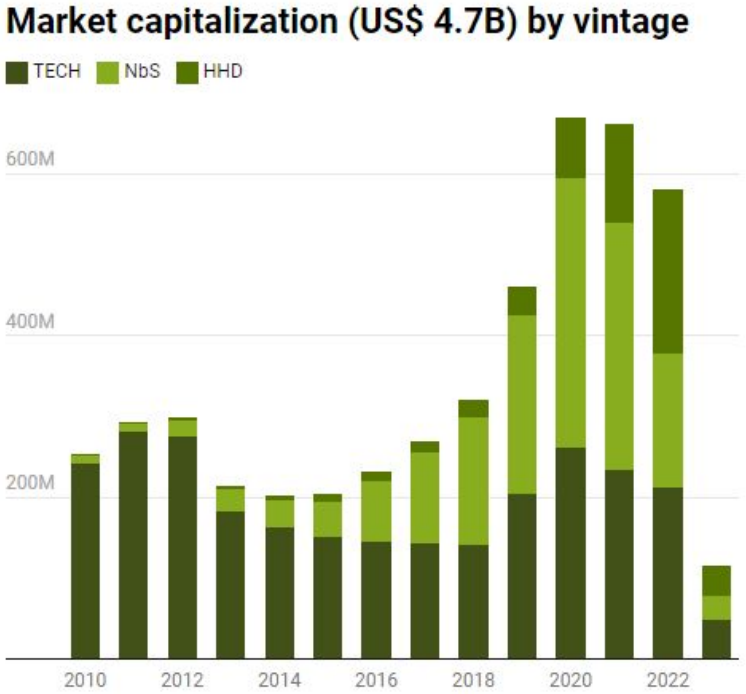
Delving into the current market capitalization of the Voluntary Carbon Market as of end of February 2023, we can conclude that the total market value of 4.7 billion USD can be segmented into:

| Technology | Nature | Household devices |
|---|---|---|
| 56.2% | 32.3% | 11.5% |



# Current market capitalization by vintage

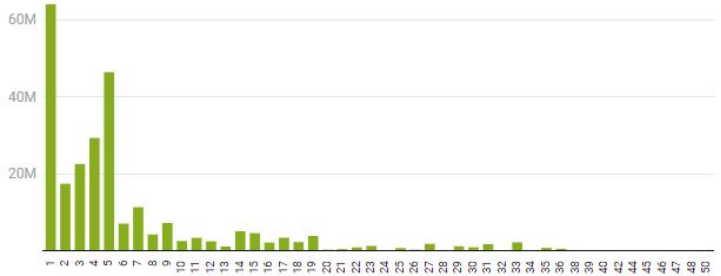
A more granular examination of the data by vintage reveals that, at the present time, vintage 2020 holds the majority of the market value. This breakdown, presented in a bar chart categorizing by vintage and category, illustrates the transformation of the voluntary carbon market: until vintage 2014, the VCM was almost exclusively reliant on technology-based credits, gradually giving way to an increasing dominance of nature-based credits (with nature surpassing technology credits in vintage 2018 for the first time) and household device credits. Simultaneously, the market share for household devices has consistently expanded since vintage 2011.



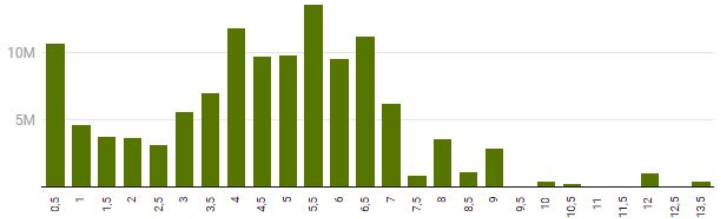
# Outstanding credits by price bucket

The surplus, categorized according to price ranges, reveals a distinct pattern. The chart below indicates that the majority of the current surplus consists of credits within the $1 to $2 range, with the average price for **technology estimated at $1.30**. Notably, the majority of these credits belong to the technology category, underscoring the influence of the average price of technology-based projects. In contrast, **nature-based projects** exhibit a broader distribution with a substantially higher **mean price of $6.10**. Lastly, **household devices credits** maintains an average price of **$4.55**.

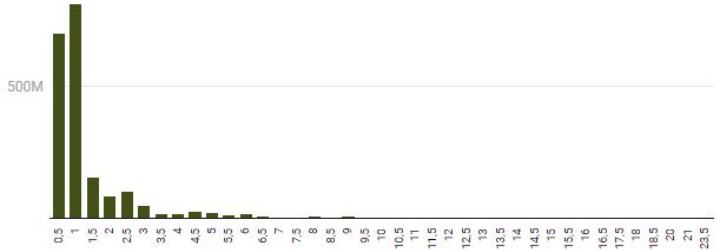
**Nature-based carbon credit surplus (tCo2e) by price bucket**




**Household device carbon credit surplus (tCo2e) by price bucket**




**Technology carbon credit surplus (tCo2e) by price bucket**



# Closing thoughts

We have gained valuable insights into the components that contribute to the present market capitalization of the Voluntary Carbon Market.

We plan to refine and continually update this methodology. It's important to note that the current analysis does not include technology removals. Although we are eager to incorporate this aspect into our analysis, it is anticipated that it won't significantly alter the past numbers due to the relatively low volume involved.

We are also planning to expand this analysis by adding more standards to the scope and by estimating future issuances of already registered projects and early stage project not yet registered by any market standard such as Verra or Gold Standard (this is particularly important given that a sizable portion of contractual agreements happen as forward offtake agreement).

# Do you want to drill further into the VCM Market Cap ?

Sign-up for a trial and discover the following:

- Investigate outstanding carbon credits across various jurisdictions and project types, as well as by vintages.
- Conduct an analysis of surplus and market cap by vintage to understand the dynamics of supply and demand.
- Slide and dice market cap by region, sub-region and country
- Identify projects with largest surplus

# Contact us to learn more

With a few simple clicks, access **project data, pricing data and accurate insights** all on one screen

- Access historical pricing data at the project/vintage level
- Slice and dice our project database by standard, project type, project activity, geography, etc.
- Use our similarity model to uncover similar projects
- Explore our Analytics product to explore price trends and supply/demand patterns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