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Blue Carbon Credits-
a way to finance restoration of mangrove ecosystems
?

SAIME Workshop 13.2.2023
Udo Censkowsky, bluesensus

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Global Carbon Markets („Aiming to fight climate change and to keep the 1.5 ° goal“)

Net Zero

Compliance Carbon Markets (CCM)

- European Emission Trading System (ETS)

- government defines max. emission limits (allowances, credits) for certain sectors

- companies have to either reduce their emissions or to buy emission allowances

- to incentivize transformation towards net zero emissions and to meet national climate goals (NDC‘S)

- buying/selling of carbon credits possible between companies (e.g. Tesla) and between nations (see article 6 of the Paris Agreement)

Voluntary Carbon Markets (VCM)

- Organizations, individuals compensate GHG emissions by buying carbon offsets voluntarily

- Various standards in place (Gold Standard, VERRA VCS, Plan Vivo, Mexican Forest Protocol etc.) to approve carbon credit projects.

- Mandatory application of defined methodologies to calculate carbon removal/ avoidance

- Project holder needs to register for approval: Project Description-Validation-Verification

- Technical solutions, Nature based solutions

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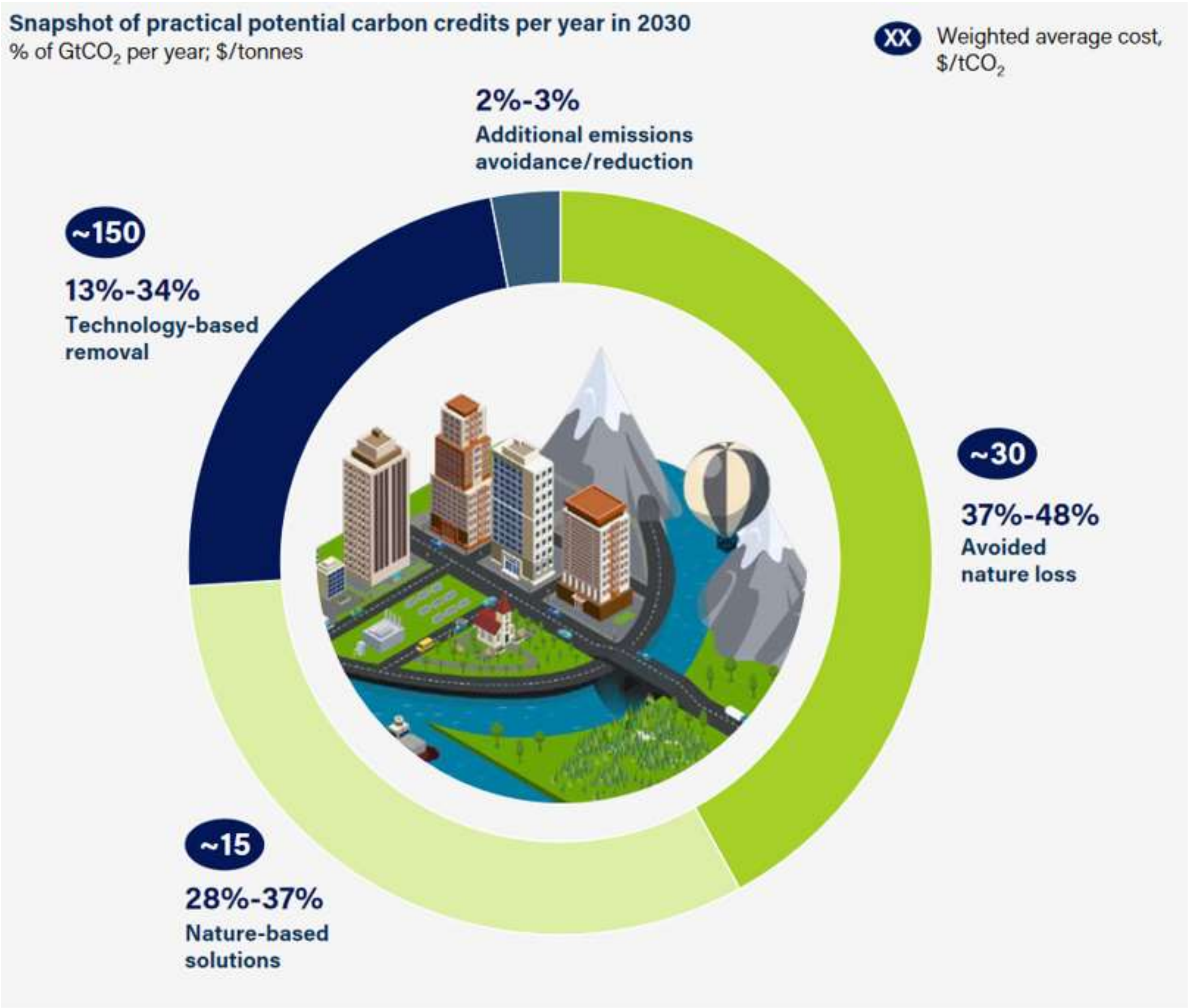
- **Technology-based removal**
- **Nature-based solutions (NbS)**
  - Avoidance
  - Removal


WIRTSCHAFT

Titelthema: Der Klima-Betrug

Grün getarnt

Weltweit setzen Unternehmen zum Erreichen ihrer Klimaziele auf Kompensationen. Dabei haben sie sich offenbar über Jahre mit Zertifikaten freigekauft, die viel weniger CO_2 einsparen als versprochen. Die Geschichte eines globalen Skandals



Source: McKinsey Nature Analytics (2021)

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Blue Carbon

- Saltmarsh, **Mangroves**, Seagrass

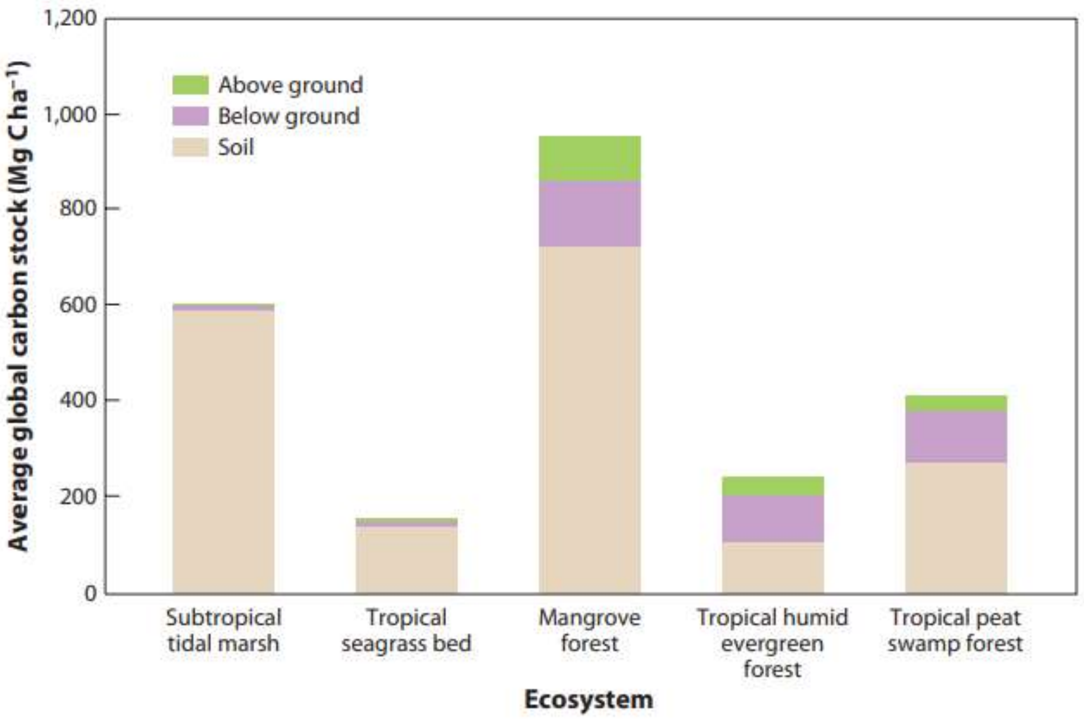

Figure 1.1 Blue carbon ecosystems: mangroves (top left, © Sterling Zumbrunn, CI), seagrasses (bottom left, © Miguel Angel Mateo), and tidal salt marshes (right, © Sarah Hoyt, CI)

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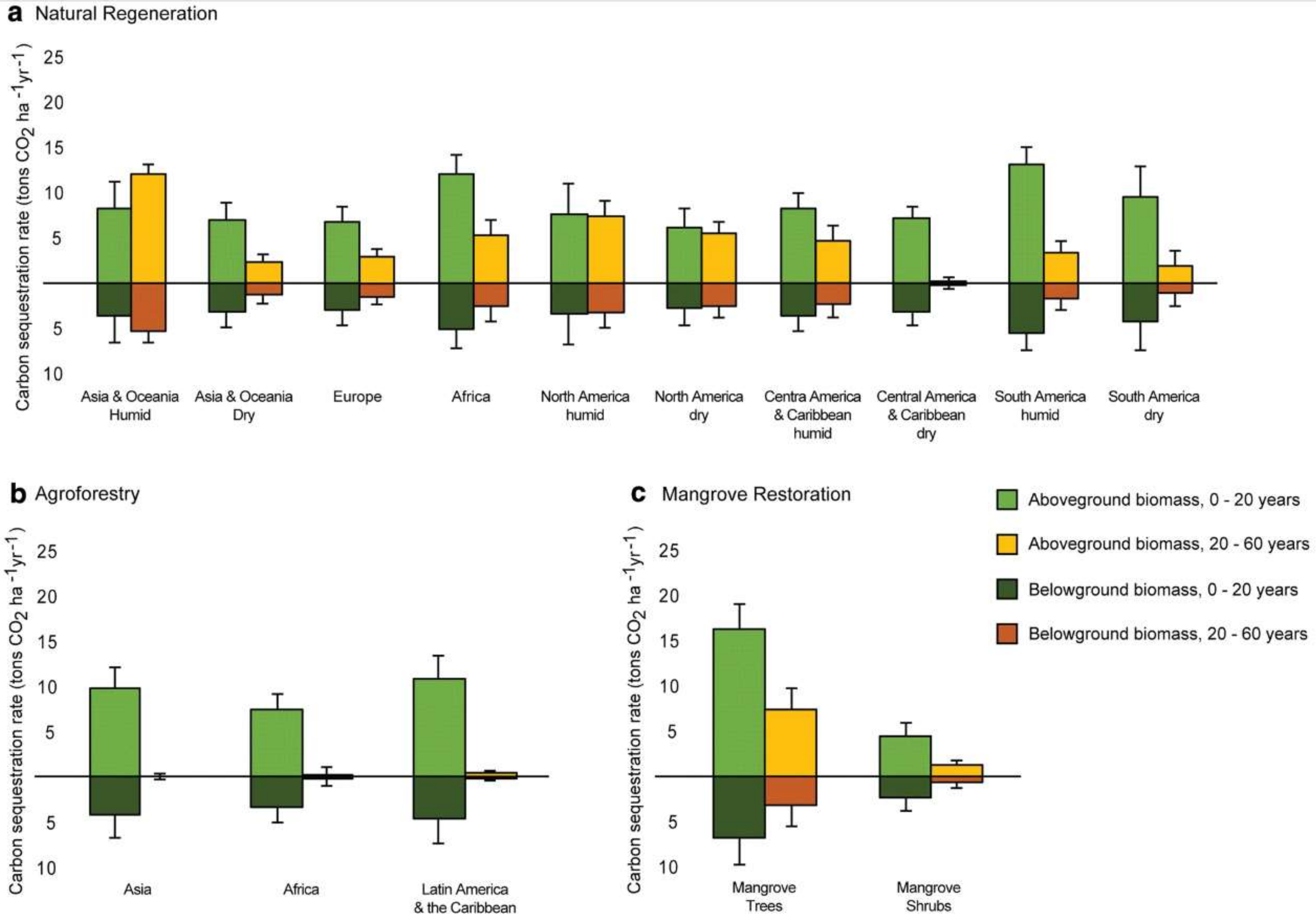
CO2 Removal-Raten im Vergleich

1. Planted Forests
   4.5. to 40.7 tCO2/ha/year
2. Mangroven Trees
   up to 23.1 tCO2/ha/year
3. Natural Regeneration (Wald)
   9.1 – 18.8 tCO2/ha/year
4. Agroforestry
   10.8-15.6 tCO2/ha/year
5. Mangrove shrubs (sub-tropics)
   6.7 tCO2/ha/year



Source: https://cbmjournal.biomedcentral.com/articles/10.1186/s13021-018-0110-8

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Major conditions to get a (blue) carbon project certified:

- Additionality
- Permanence

Calculation of CO2 sequestration

- Independent from the standard, it is important to select the methodology for a **baseline calculation** (requires a definition of the boundaries and/or Carbon pools: **ABG, BGB, SOC**)
- In a second step the annual removal rate will be calculated in all three carbon pools over the entire crediting period (20 years) at the project beginning (**ex-ante**)
- IPCC allows to calculate with default values (**IPCC Guidelines 2006 and the 2013 Wetland Supplement** differentiate between three categories).

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Standards, Methoden und Anzahl der Blue Carbon Projekte

- Strong increase of Blue Carbon (Mangrove)-Projects in den letzten 2-3 Jahren

Identifizierte Blue Carbon Projekte

Methode	Anzahl	Zertifiziert	Titel Methoden Bezeichnung
AR-AM0014	18	5	Afforestation and reforestation of degraded mangrove habitats (large scale)
AR-AMS0003	1	0	Afforestation and restoration activities on wetlands (small scale)
VM0007	14	2	REDD+Methodology Framework (REDD+MF)
VM0033	5	0	Methodology for Tidal Wetland and Seagrass Restoration
VM0015	1	0	Methods for monitoring GHG emissions and removals in REDD
Plan Vivo	11	2	Verschiedene Methoden
Ohne/Mix	2	0	
Mexican Climate Protocol	2	0	Mexican Climate Protocol
Summe	54	9	

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Costs for Blue Carbon (Mangrove) Projects

- Cost estimations go from **3.000 US-$ to 14.000 US-$ per ha**
- 1.000 ha mangrove project → 8.5 Mio US-$ investment

Costs factors:
- High-Level negotiations with government, partner, areas and stakeholders)
- Pre-feasibility and scoping studies: approx. 30.000 bis 50.000 US-$ je Studie
- Project Description (PD): approx. 100.000 US-$
- Fees (VERRA, Plan Vivo)
- Validation and Verification
- Planting costs (incl. labour cost)
- Monitoring (incl. labor cost)
- Country management
- etc.

Around 6.3 US-$ per tCO2eq. to cover costs

file:///C:/Users/User/Downloads/VCS-Project-Description-Template-v4.1%20TCP%20210722_clean-1.pdf

Year	Estimated GHG emission reductions or removals (tCO_2e)
2021-22	-
2022-23	12,606
2023-24	15,964
2024-25	20,252
2025-26	24,902
2026-27	29,616
2027-28	36,449
2028-29	42,767
2029-30	49,339
2030-31	56,103
2031-32	63,005
2032-33	73,717
2033-34	82,539
2034-35	91,721
2035-36	1,01,249
2036-37	1,11,106
2037-38	1,21,282
2038-39	1,31,765
2039-40	1,42,544
2040-41	1,53,610
Total estimated ERs	1,360,536
Total number of	20

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Price für Blue Carbon Credits

- **30-US$ at the moment**
- **Example: 1.360.536 CO2eq.:**

40,816,080 US-$ minus costs = 32,316,080 US-$

- **Benefit-Sharing Model:**

50% **16,158,040 US-$** for local development and empowerment**,** 50% for the investor over a period of 20 years.

Voluntary Carbon Market - Carbon Prices - Summary Table ($/tCO₂e)

Source: Abatable as of August 2022. References to minimum, median and maximum carbon prices are illustrative only and reflect indicative prices observed by the Abatable team during the procurement activities on behalf of its clients. Reference benchmarks provided by CBL Xpansiv, S&P Platts, CME, Allied Offsets have also been considered, as well as prices from other carbon offsetting marketplaces monitored by Abatable. Prices are based on estimates and are not representative of past or future performance.

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Fishermen in Honduras are protesting because the MoE stopped a blue carbon project

Legal framework

- Ownership of the land
- Unclear in many countries
- Moratorium in Honduras, Indonesia, Malaysia…
- Export Ban for carbon credits in India

High Risk classification of Blue Carbon Projects

- Dynamic (changing) legal frameworks
- Dependency on functioning local goverments
- Natural disasters (cyclones, flooding)
- Complex interaction with governmental bodies and stakeholder organizations

Los pescadores necesitan una firma del ICF para continuar el proyecto.


Vielen Dank für Ihre Aufmerksamkeit!
Thank you very much for your attention!
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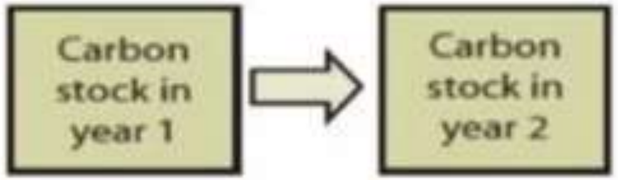
1) Stock-difference approach



$$\Delta C = (C_{t2} - C_{t1}) / (t_2 - t_1)$$

Where

ΔC = Anual carbon stock change in pool (tC/yr)

ΔC_{t1} = Carbon stock in pool at time t_1 (tC)

ΔC_{t2} = Carbon stock in pool at time t_2 (tC)

IPCC Tiers – The IPCC has identified three tiers of detail in carbon inventories that reflect the degrees of certainty or accuracy of a carbon stock inventory (assessment).

Tier 1 – Tier 1 assessments have the least accuracy and certainty and are based on simplified assumptions and published IPCC default values for activity data and emissions factors. Tier 1 assessments may have a large error range of +/- 50% for aboveground pools and +/- 90% for the variable soil carbon pools.

Tier 2 – Tier 2 assessments include some country or site-specific data and hence have increased accuracy and resolution. For example, a country may know the mean carbon stock for different ecosystem types within the country.

Tier 3 – Tier 3 assessments require highly specific data of the carbon stocks in each component ecosystem or land use area, and repeated measurements of key carbon stocks through time to provide estimates of change or flux of carbon into or out of the area. Estimates of carbon flux can be provided through direct field measurements or by modeling.

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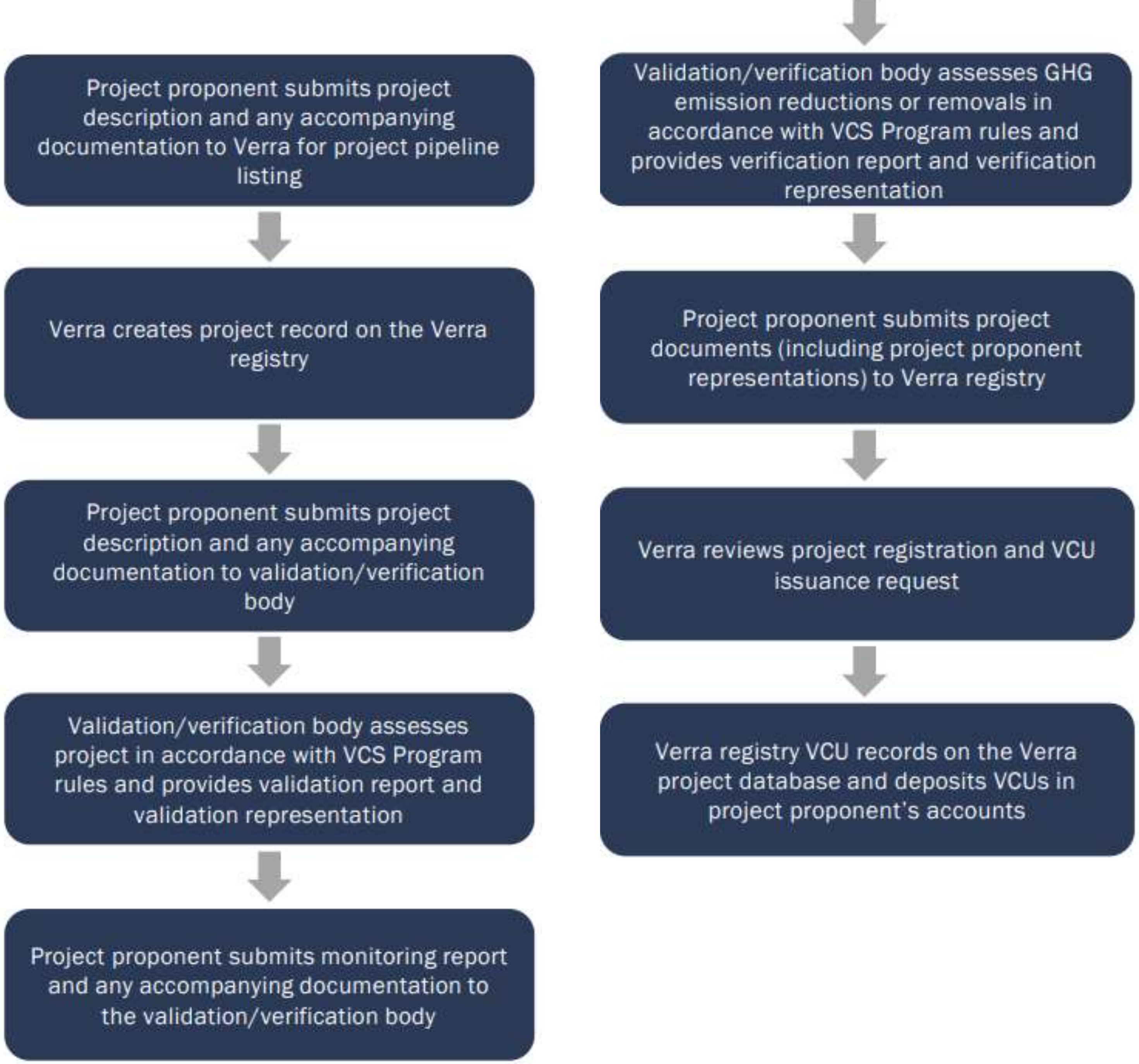
VERRA VCS Project Life Cycle

- Project preparation not included (Legal situation, partner, areas and stakeholder)
- Pre-feasibility study
- Scoping study
- High-Level negotiations with governments
- etc.



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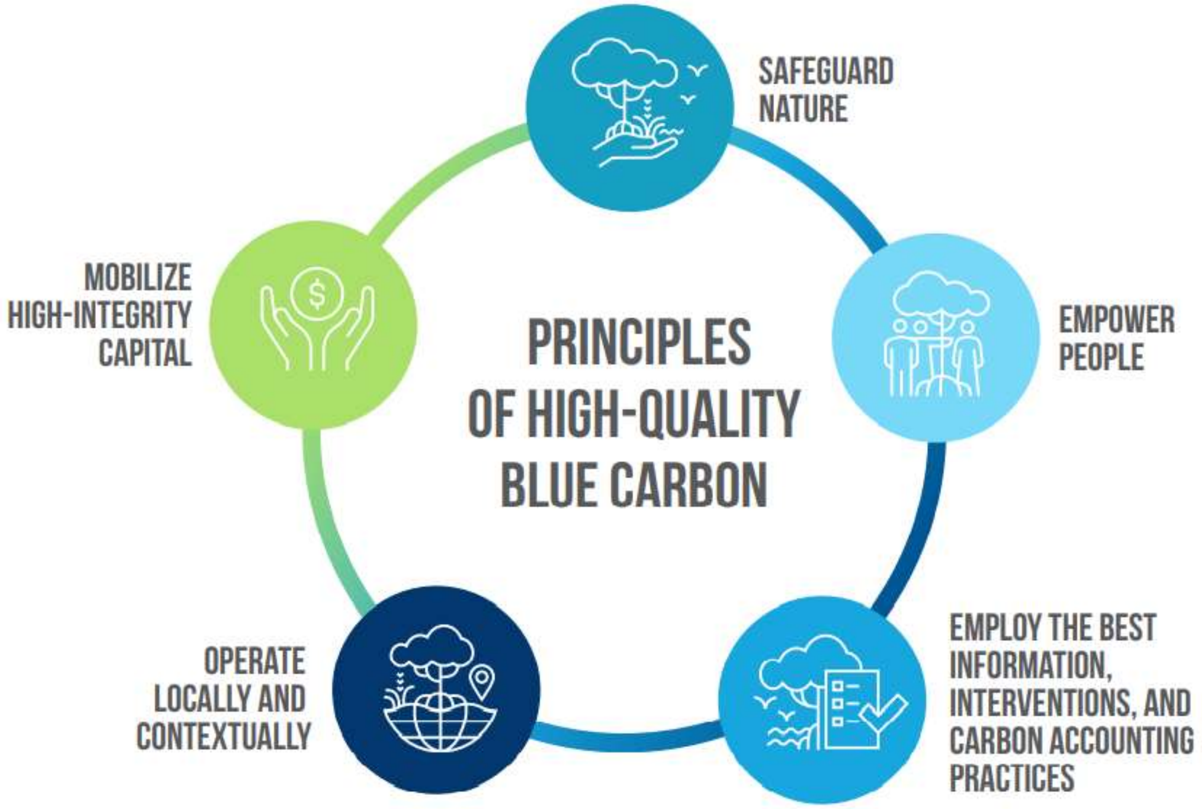
High Quality Blue Carbon Principles

- Presentation of the **High Quality Blue Carbon Credit Buyers Alliance** during COP 27



DURABILITY AND RISK OF REVERSAL

All natural climate solution projects are subject to some risk pertaining to durability. Blue carbon projects face marine-specific risks, including sea level rise and fall, extreme storms, ocean temperature change, and other climate change scenarios that play out over multiple timescales. Scientific models for these threats to durability should be used to estimate durability horizons and communicate the associated level of uncertainty or risk associated with those horizons.

ADDITIONALITY AND BASELINES

If the resource protection interventions do not involve the management of carbon assets, or are not being fully implemented, then a blue carbon project may be able to demonstrate additionality. For example, in a marine protected area where fishing regulations are enforced but regulations on mangrove extraction are not enforced, a project can demonstrate additionality. Projects must continue to assess the circumstances over time and adapt accordingly.

CONSERVATION AND RESTORATION

Conservation and restoration projects in blue carbon ecosystems have very different characteristics with regards to the quantity of credits that can be generated, the cost to generate those credits, the challenges in carbon accounting for generating credits, and the timelines to deliver credits.

ACCURACY AND GREENHOUSE GAS ACCOUNTING

There are diverse greenhouse gas fluxes and stocks in blue carbon ecosystems. Fluxes include air-sea gas exchange, photosynthesis, both aerobic and anaerobic respiration, and physical transport of dissolved and particulate forms of carbon. Relevant carbon stocks include both above-ground biomass (leaves, stems, trunks, etc.), below-ground biomass (roots), and soil (varies from peat to sandy substrates) carbon stocks.

ADAPTIVE MANAGEMENT

Adaptive management plans for blue carbon projects will likely need to account for one or more of the following long-term changes in marine and coastal environments: sea level rise and fall, warming seas, and more frequent and intense storms.

MITIGATING RISK OF REVERSAL

One measure to mitigate marine-specific risks is to take a landscape, seascape, or "ridge-to-reef" approach. By protecting and restoring neighboring ecosystems, projects can enhance the resilience of the blue carbon ecosystem. For example, a healthy coral reef can protect a seagrass bed or mangrove forest. Likewise, a healthy upland forest and watershed can enhance the resilience of a mangrove forest downstream.