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# Nikolaus Wohlgemuth

Carbon Markets Expert, Carbonfuture





Carbonfuture

# Building Trust in Biochar Carbon Removal: Accelerating Progress Towards Net-Zero Goals

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Nikolaus Wohlgemuth, Head of Supply at Carbonfuture

1. **Accelerating**  
Progress Towards  
Net-Zero Goals

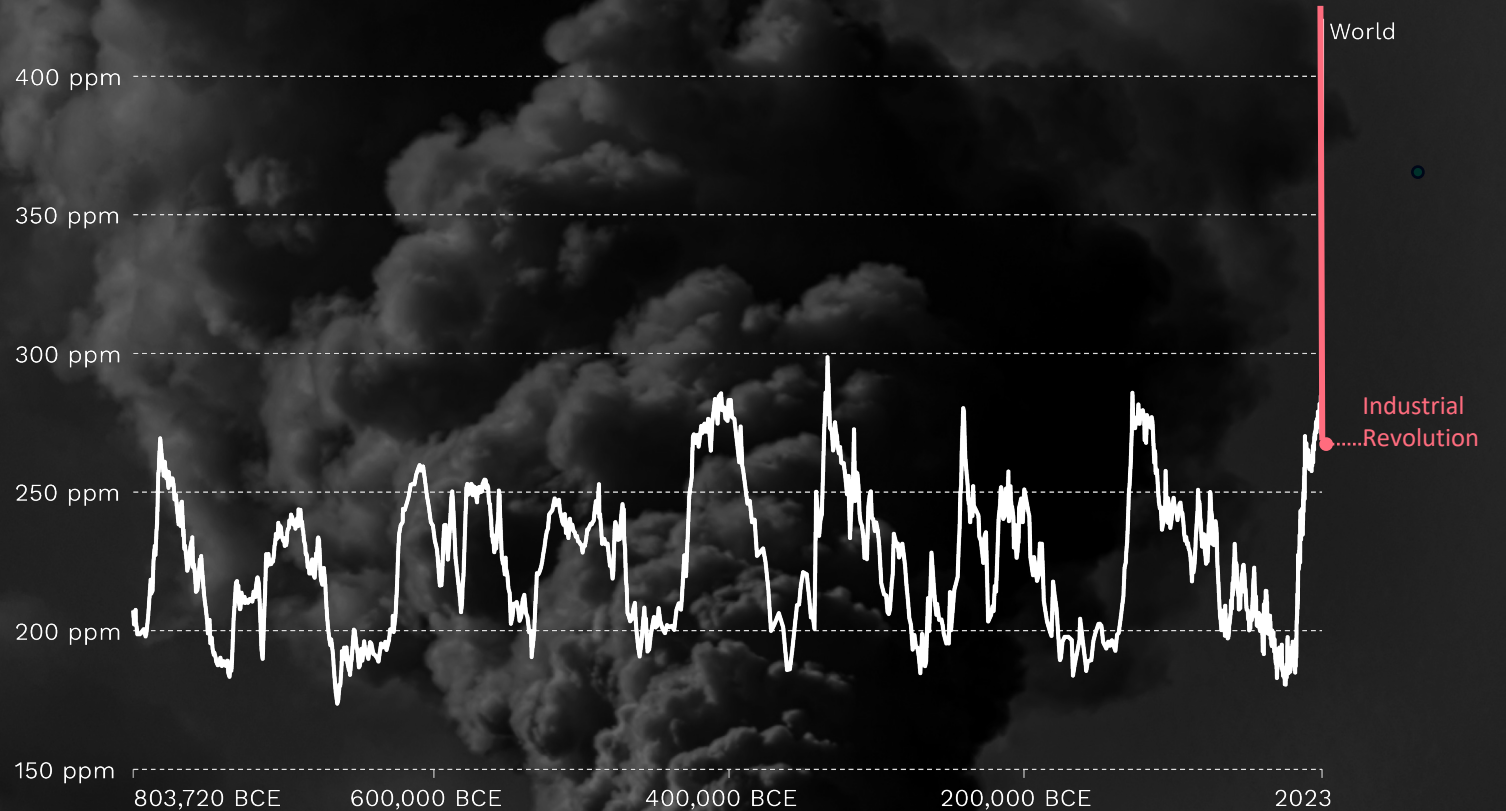
2. Building **Trust** in  
Biochar Carbon  
Removal



# Tackling the **Climate Crisis**, Humanity's Greatest Challenge

**Acceleration of action desperately needed**

### Global atmospheric CO<sub>2</sub> concentration

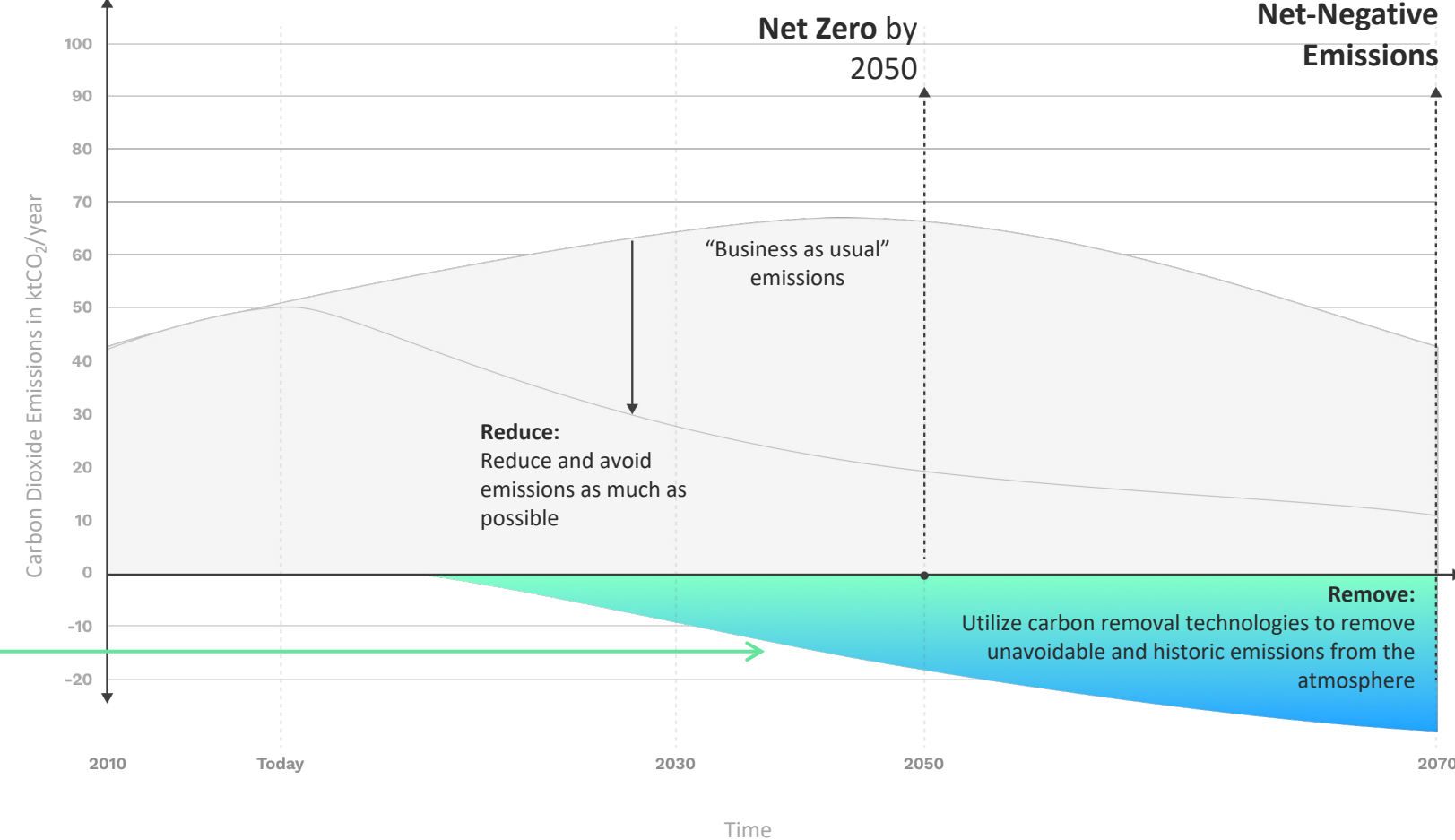


Source: National Oceanic and Atmospheric Administration (NOAA)

CC BY

# Carbon Removal Is an Essential Puzzle Piece to Mitigating the Climate Crisis

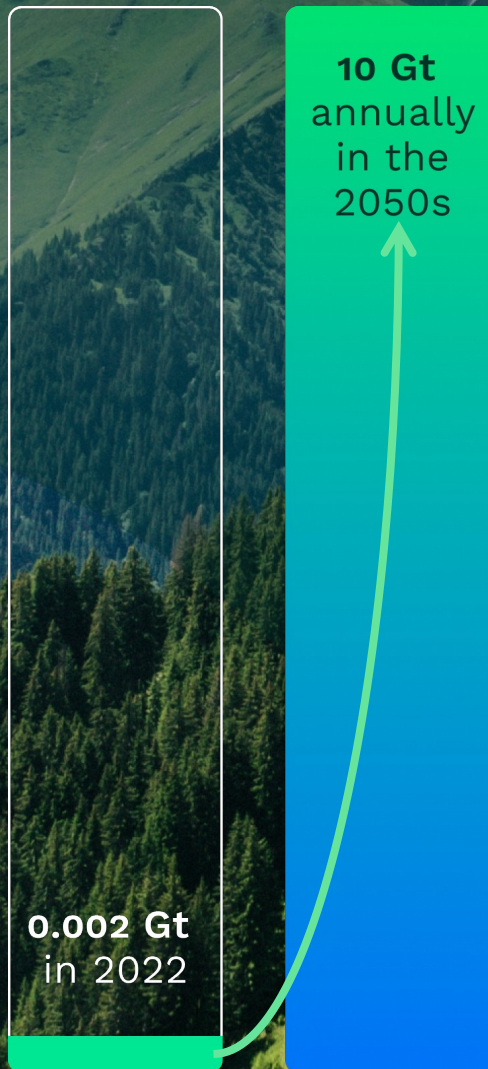
*Carbonfuture focuses only on carbon removal to help accelerate a high-quality, durable CDR market.*



Sources: IPCC & South Pole  
Further reading: like-for-like removals, [Blog post by Robert Höglund](#)

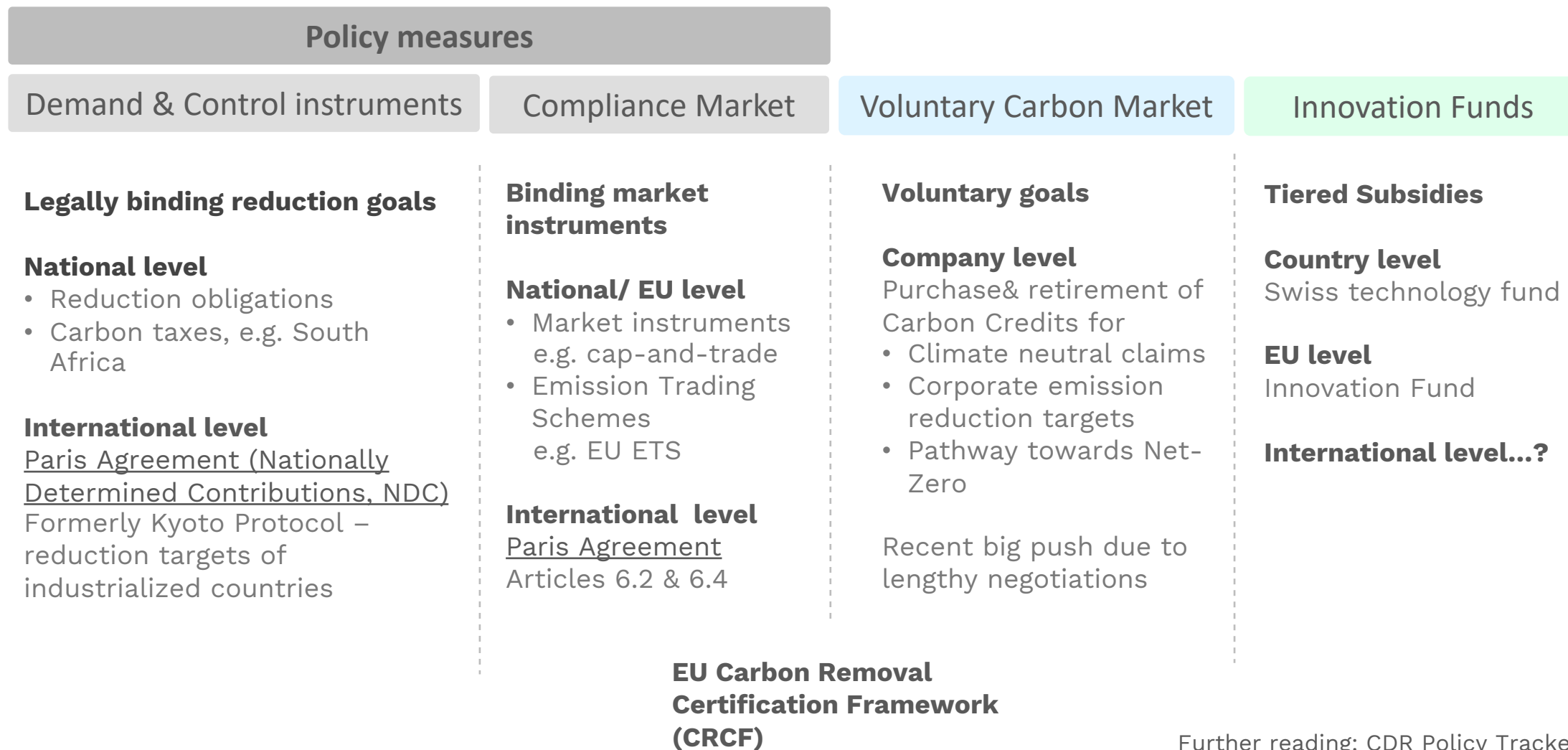
From Crisis to Action:  
Rising to the  
Tremendous Challenge  
of Scaling Up Durable  
Carbon Removal 5,000x  
for a **Net-Zero Future**

*Carbonfuture catalyzes  
high-integrity durable carbon  
removal by focusing on  
quality & scale.*



Source: The State of Carbon Dioxide Removal 2022

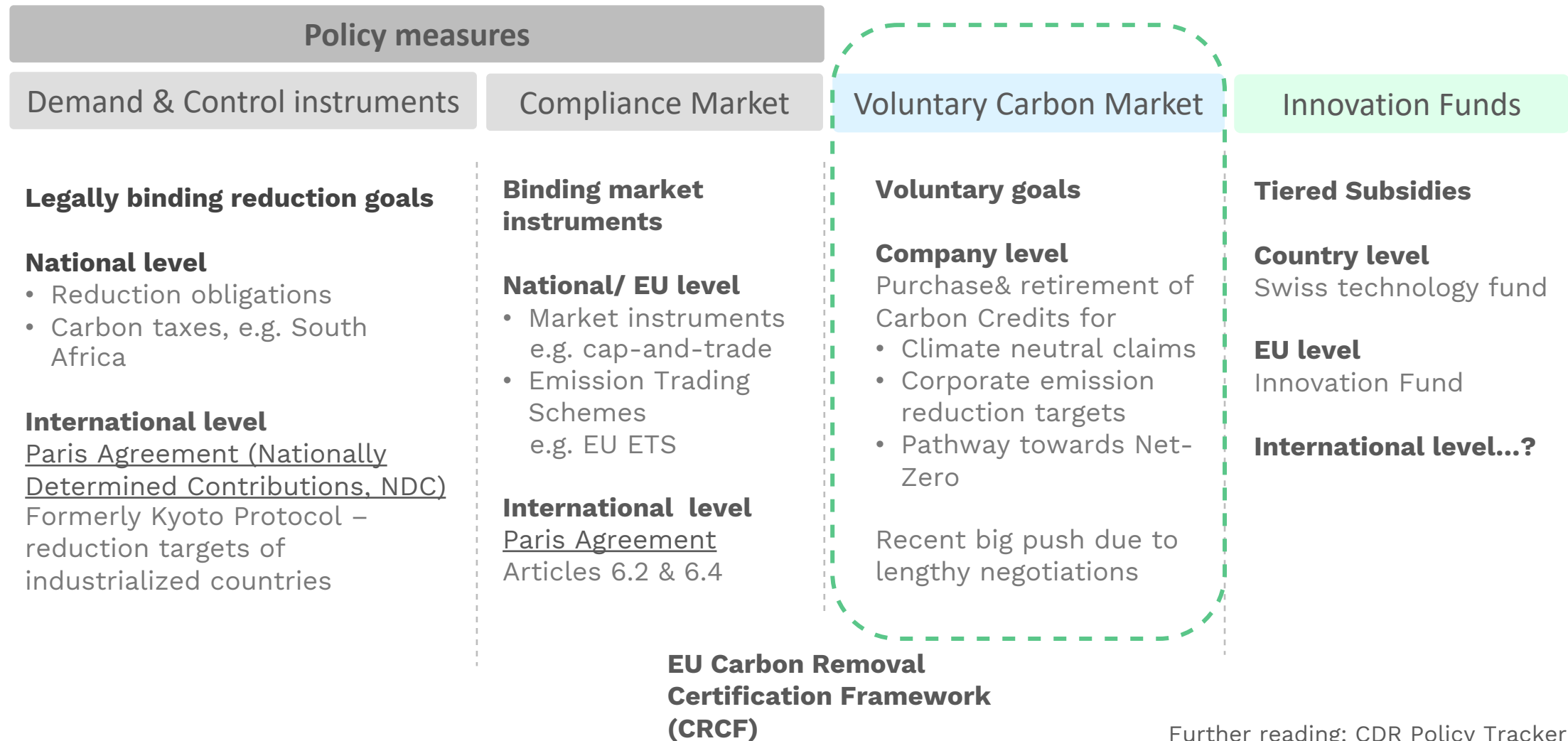
# Standardisation & Regulation for the CDR Industry **accelerate**



Further reading: CDR Policy Tracker:  
<https://tracker.carbongap.org>



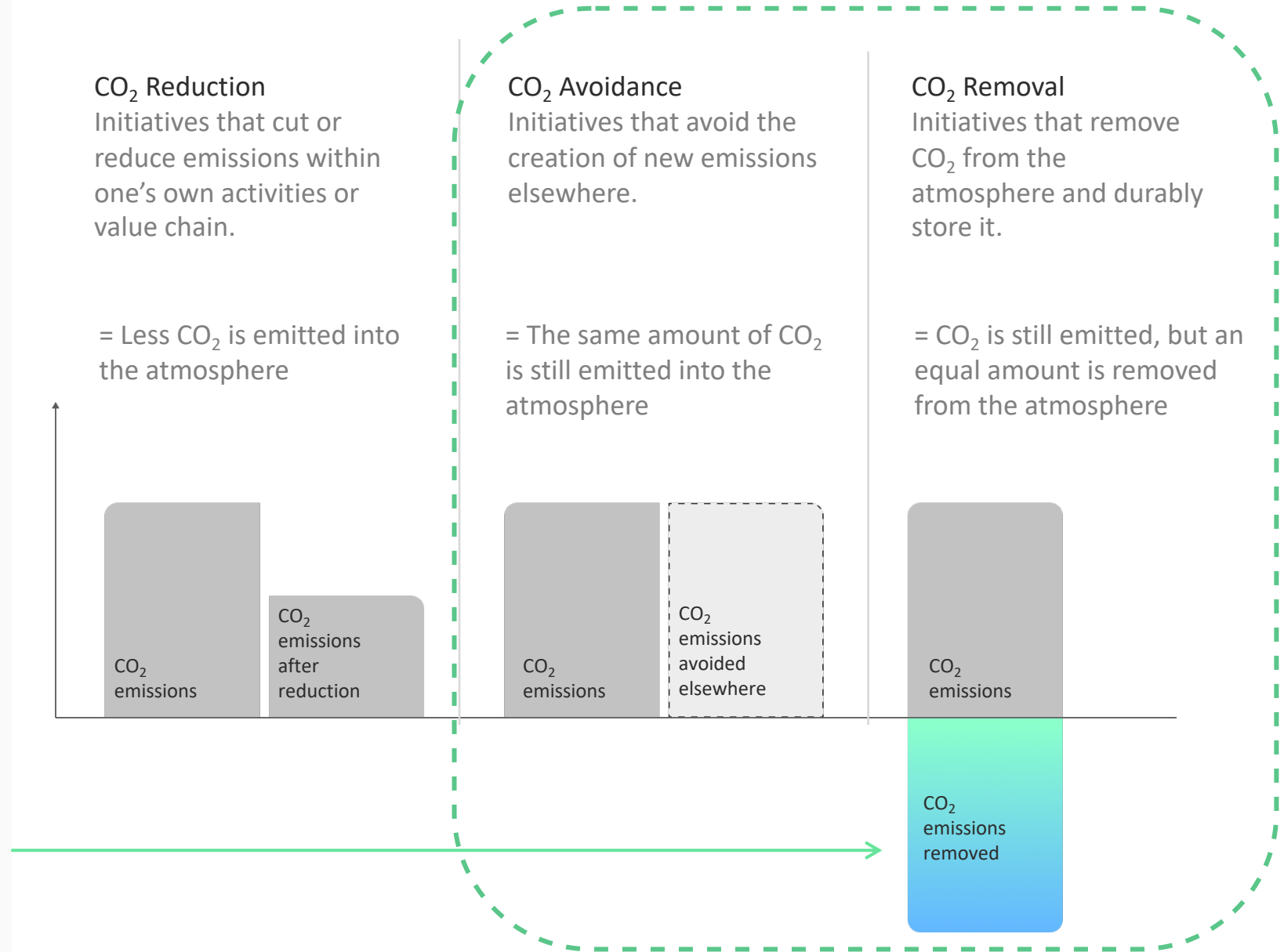
# Standardisation & Regulation for the CDR Industry **accelerate**



Further reading: CDR Policy Tracker:  
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# The Path to Achieving the Paris Climate Goals: Reduce, Avoid, **Remove**

*Carbon Removals are indispensable in achieving net zero.*

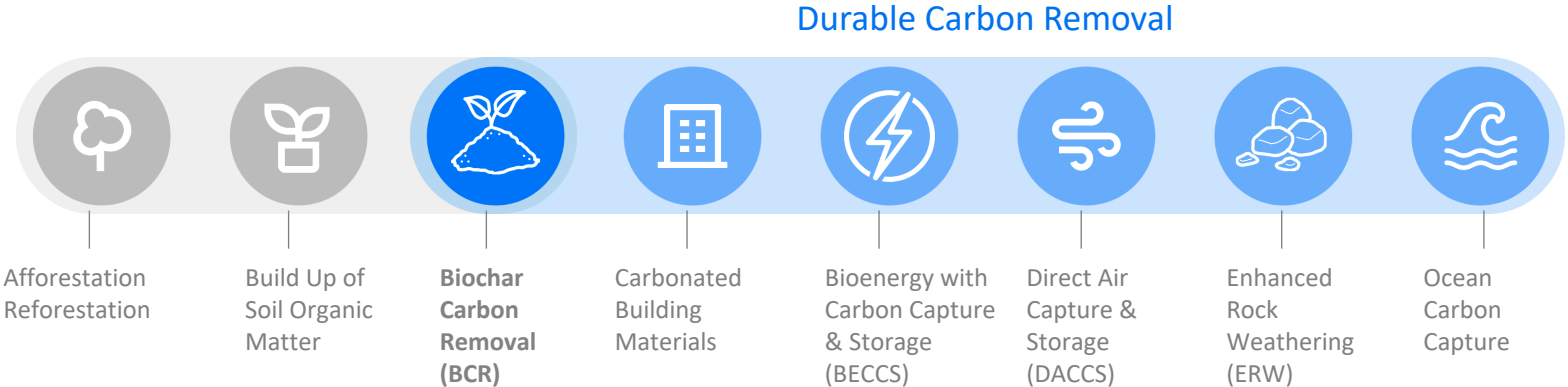


## Voluntary Carbon Market – avoidance vs. removal

# Addressing the Climate Crisis Requires a Diverse Range of **Durable Carbon Removal Technologies**

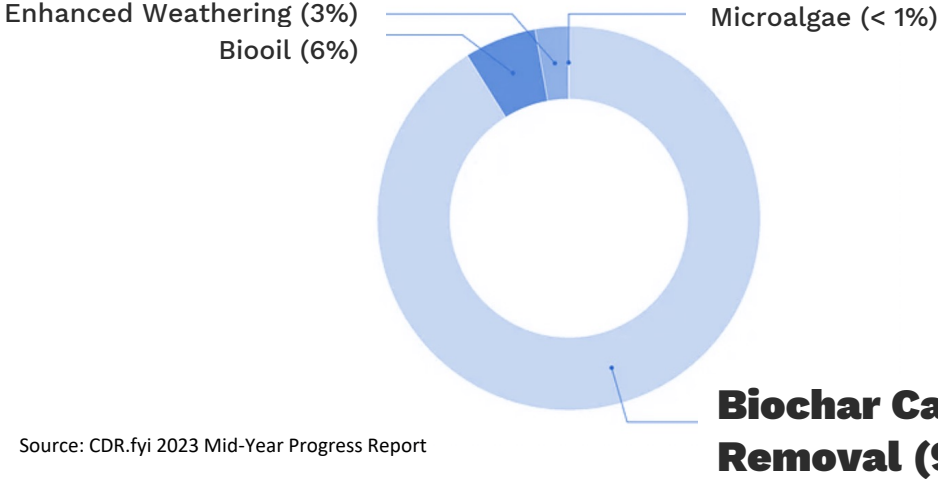
*Biochar Carbon Removal is in a sweet spot of durability, co-benefits, availability & scalability currently*

## Carbon Dioxide Removal (CDR) Technologies



### 2023 CDR Deliveries by Method

Total tonnes delivered by method shown as a % of all delivery volume



Source: CDR.fyi 2023 Mid-Year Progress Report

# Accelerating CDR



## Accelerating CDR



.....without losing traction



1. **Accelerating**  
Progress Towards  
Net-Zero Goals

2. Building **Trust** in  
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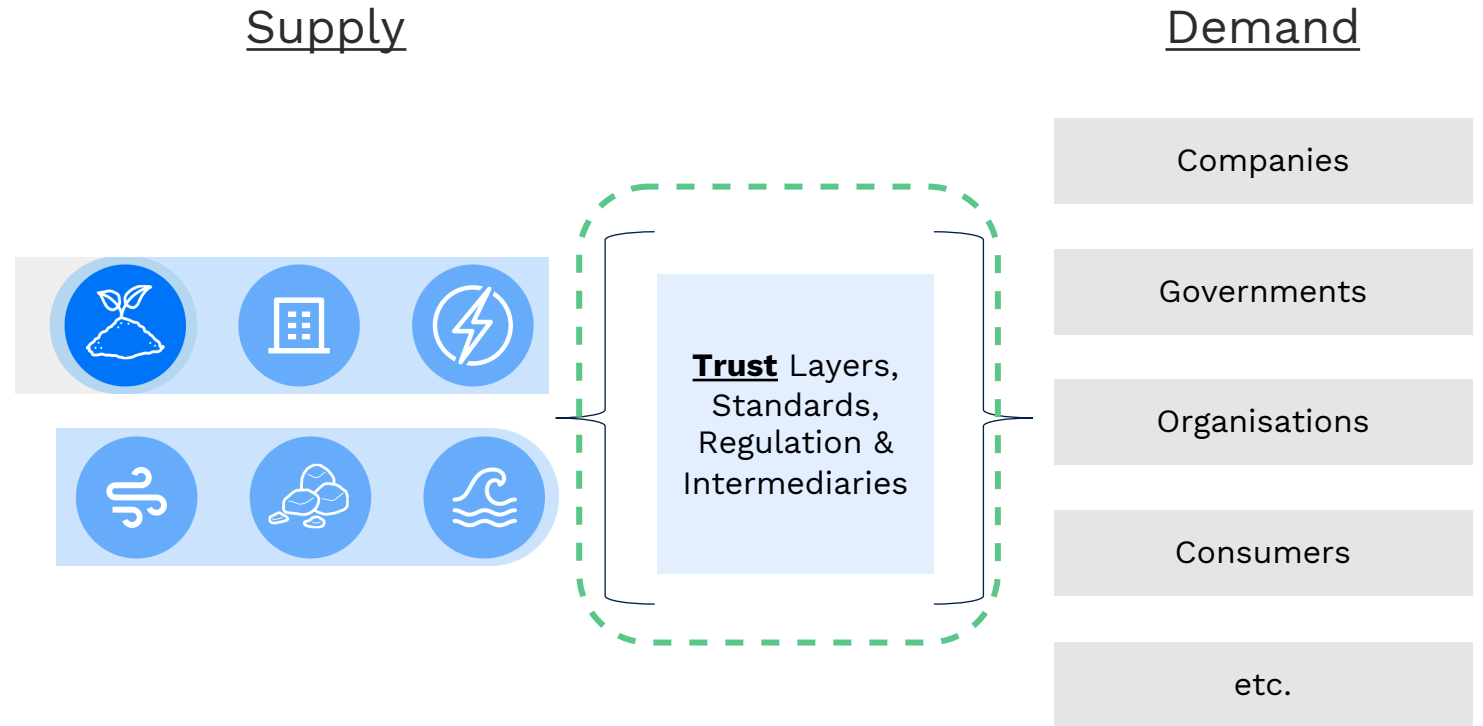
# The **Voluntary Carbon Market**

acts as innovation spark & sand box

*Purchases and deliveries of durable CDR growing rapidly, i.e 11.5x and 3x increase YoY respectively*

## Voluntary Carbon Market (VCM)

Extremely simplified



\*

# The Race to Net-Zero Demands **Effective** Carbon Removal

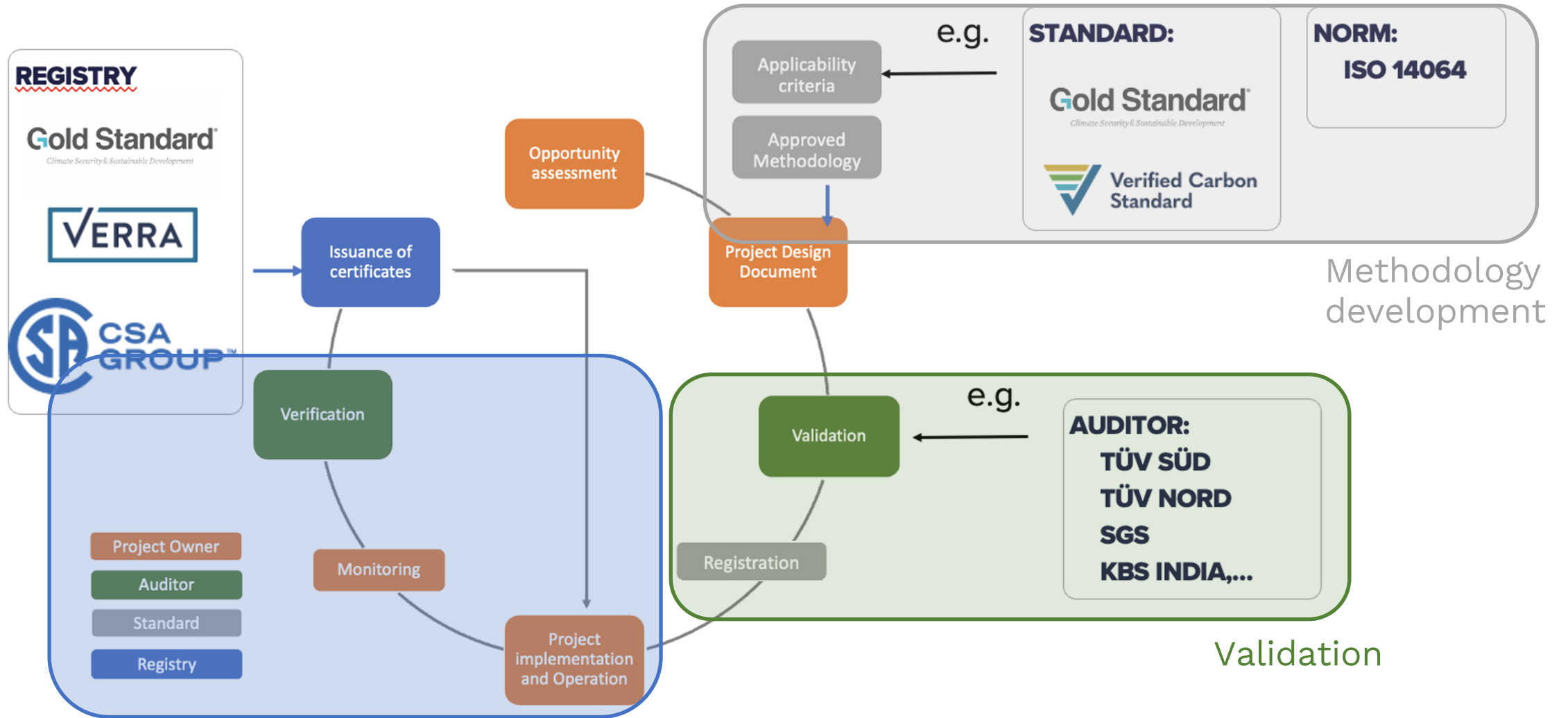
*CO2 is the most durable waste of  
our society....*

*Unlocking the power of **real  
climate action**: embracing  
carbon removal tracking to scale  
a high-quality CDR market*





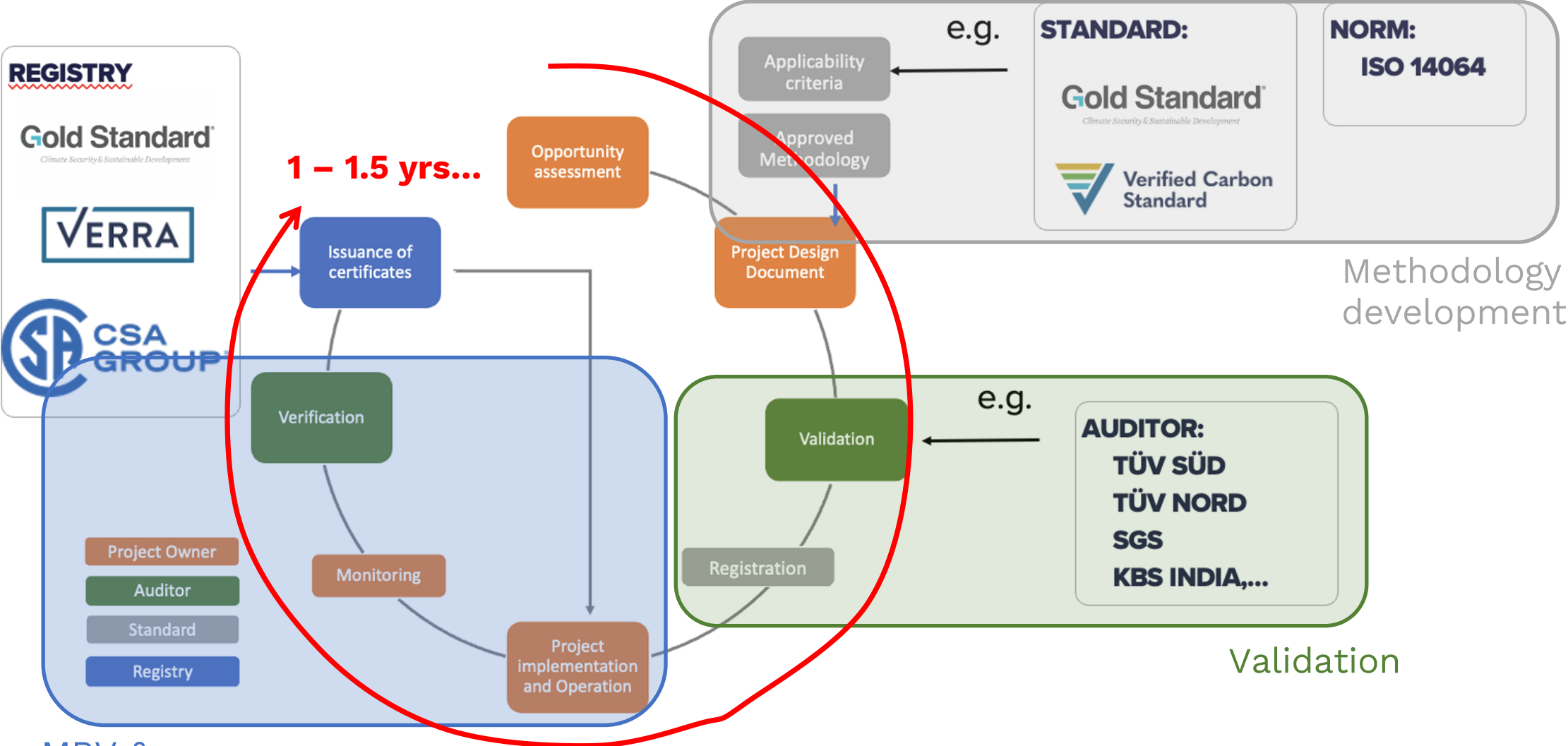
# How can this be achieved?



MRV &  
issuance

Through a well established certification cycle...

# Can this scale fast enough...?



MRV & issuance

...probably not

# Can trust be provided for CDR?

*Trust can only be achieved with four-eyes-principle and independent entities!*

Current focus on the VCM

## Yes, if....



**Technologies**, achieve permanent and accountable removal



**Removal activities** are audited by independent, accredited and skilled auditors



**Credits are issued** by independently operating standards with sound governance



**Trustworthy credit registries**, which manage ownership, retirements, etc.

1. **Accelerating**  
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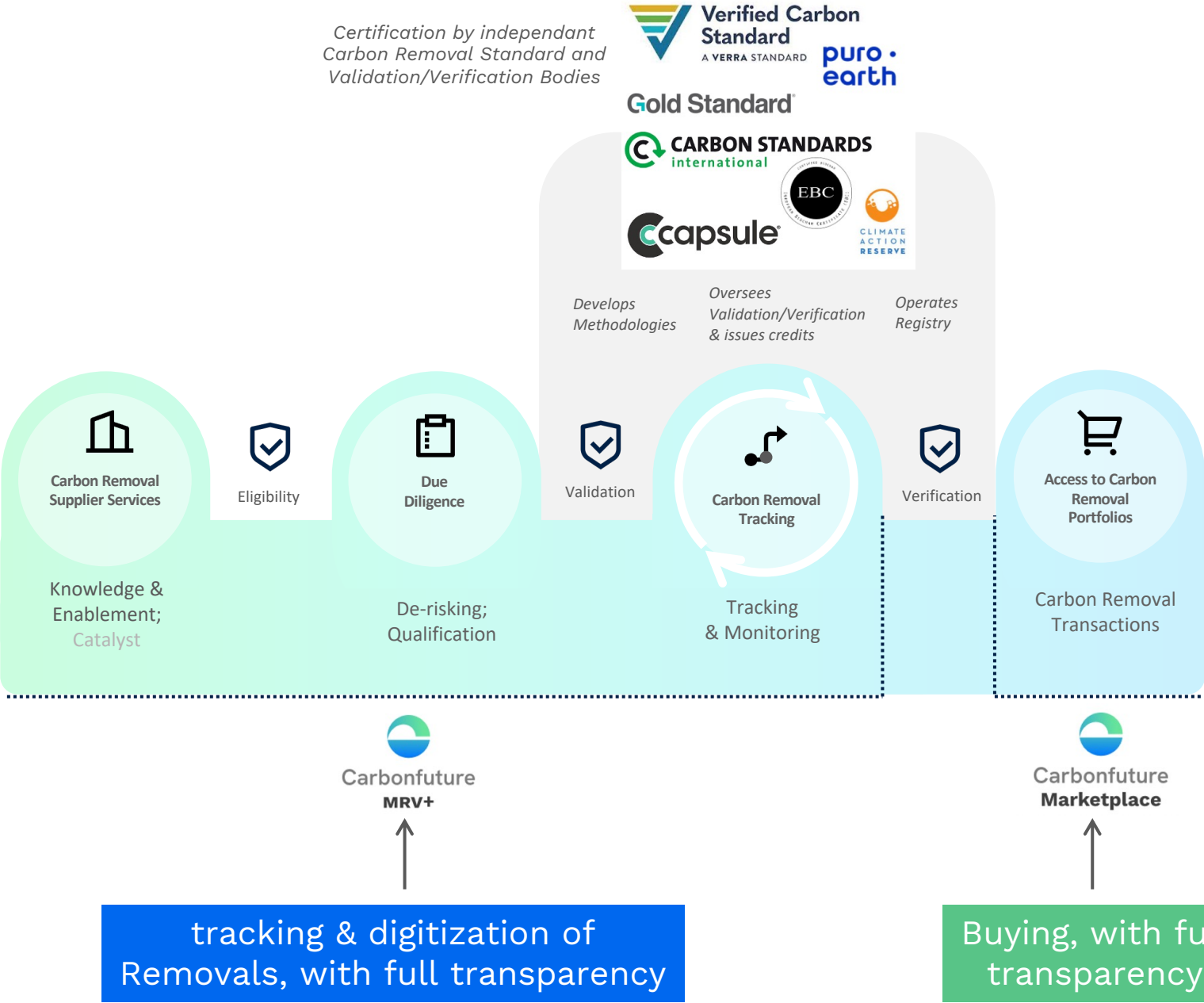
2. Building **Trust** in  
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**Acceleration and  
Trust Need  
Digitization!**



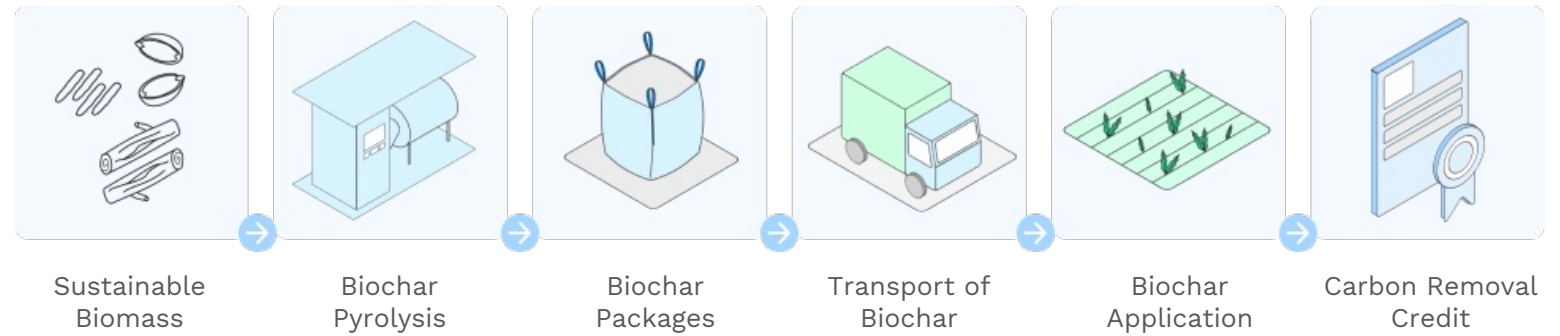
# Trust Infrastructure & Standards on the VCM

*Carbonfuture offers a marketplace and trust infrastructure based on due diligence, individual support, transparent tracking and external Validation & Verification.*



# Digital MRV Facilitates the Issuance of Carbon Removal Credits in Near-Real-Time

## Tracking Biochar Carbon Removal



*Measuring, Reporting, and Verification (MRV) of environmental impact is key to scaling CDR to climate-relevant level.*

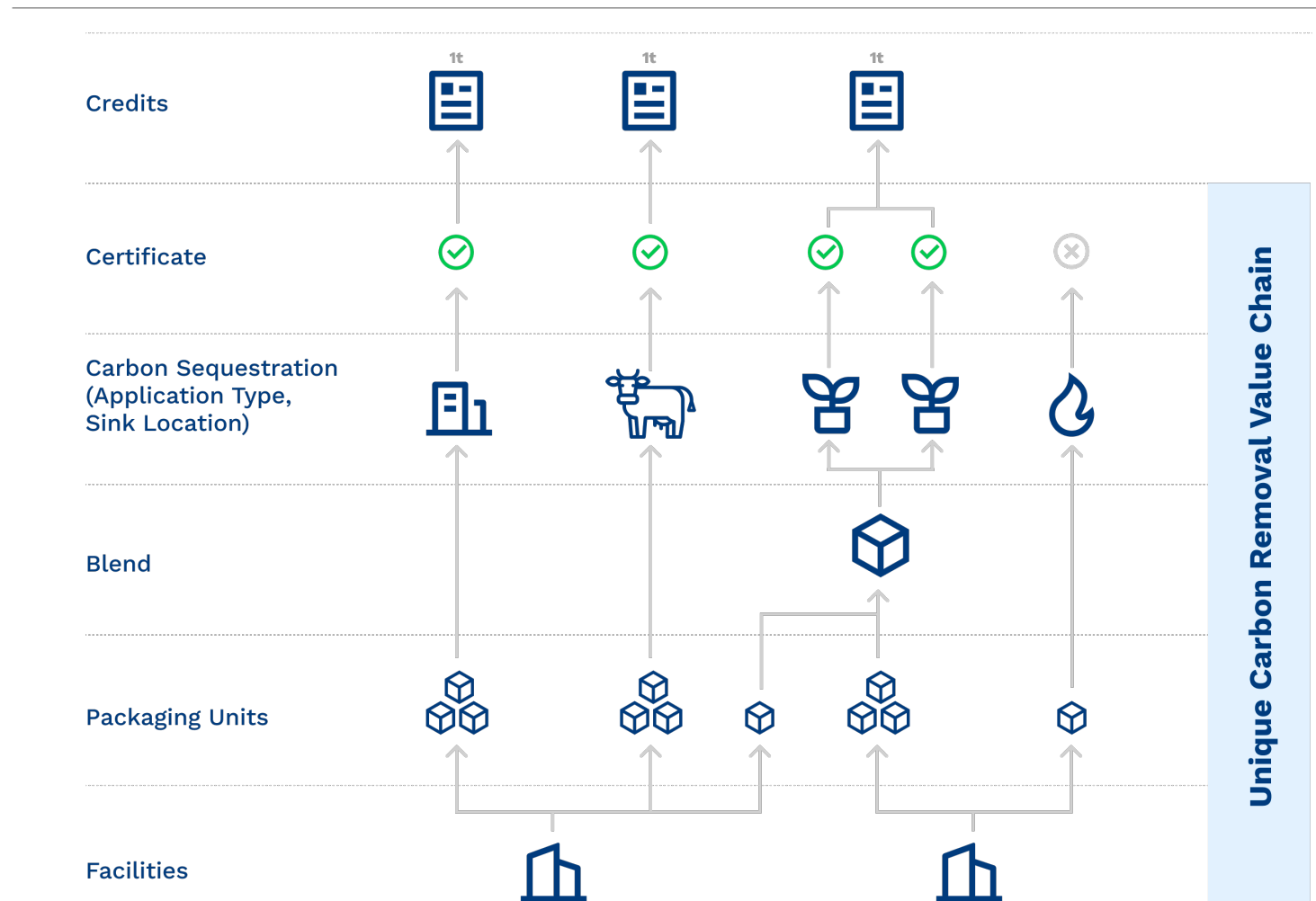
For each removal certificate, tracking records:

1. All data necessary for calculating the net removal value in tCO<sub>2</sub>eq, e.g. the gross removal potential and all emissions caused within the activity scope,
2. A closed chain of contracts documenting ownership of carbon removal physical product outputs (basis for preventing double counting carbon removal claims),
3. A verifiable carbon storage attestation, confirming the creation of the durable carbon storage

# Carbon Removal Tracking for Durable CDR

- Tracking erstellt zu jedem Schritt transparente Nachverfolgung von Emissionsdaten & Eigentumsansprüchen entlang der Wertschöpfungskette
- **No gaps along the chain of custody**
- **No certificates for „lost sinks“**
- **No double-claiming**

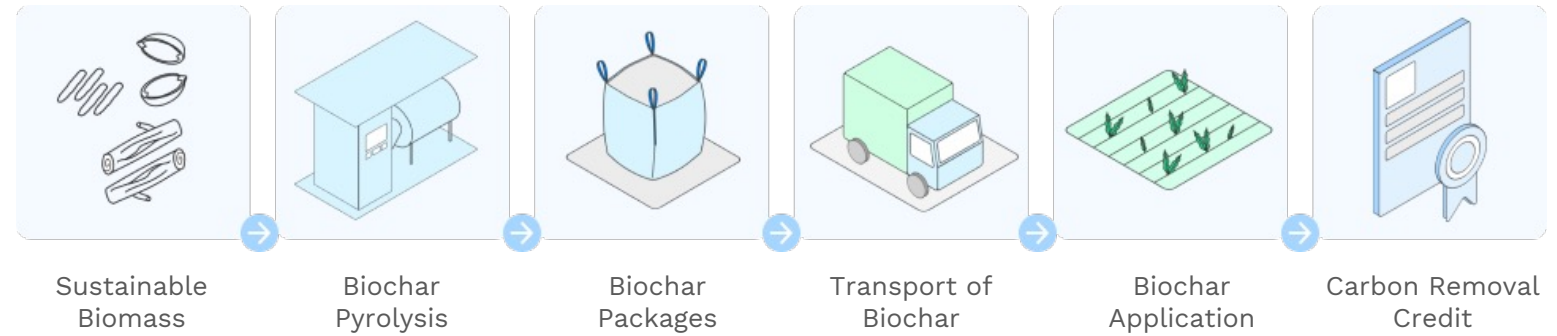
Carbon Removal Tracking Graph for Biochar Carbon Removal



# Tracking the removed carbon in the real-world

– Only purchase what is tracked.

## Example: Tracking Biochar Carbon Removal



Carbonfuture | Environment: Int | Alex Brown (Bioenergy Products GmbH) Supplier

### Inventory

Tracking ID	Production Date	Ready for delivery since	Received at	Delivered from	CF-Certificate	Carbon Storage Attestation created
1MMKCPXR	Nov 7, 2022	Nov 7, 2022, 11:49:40 AM	Nov 8, 2022, 4:48:51 PM	Energy GmbH	3.48tCO <sub>2</sub> e (Nov 23, 2022)	Nov 15, 2022, 4:39 PM
YH8UKTDD	Oct 31, 2022	Oct 31, 2022, 3:13:25 PM	Oct 31, 2022, 3:20:45 PM	Energy GmbH	0.99tCO <sub>2</sub> e (Oct 31, 2022)	Oct 31, 2022, 3:23 PM
8KCEM8PC	Oct 7, 2022	Oct 7, 2022, 8:41:31 AM	Oct 7, 2022, 9:44:36 AM	Energy GmbH	2.0tCO <sub>2</sub> e (Nov 3, 2022)	Oct 7, 2022, 9:49 AM
ES9WTSMU	Oct 4, 2022	Oct 4, 2022, 1:21:55 PM	Oct 4, 2022, 1:26:26 PM	Energy GmbH	0.79tCO <sub>2</sub> e (Oct 4, 2022)	Oct 4, 2022, 1:26 PM
TY2X5T5K	Nov 3, 2022	Nov 3, 2022, 2:35 PM	Nov 3, 2022, 2:35 PM	Petra Private (Carbonfuture Certifier GmbH)		

### 8KCEM8PC

QR Code: [QR Code]

Request-of-Certification

### Summary

Type: Biochar  
 Tracking ID: 8KCEM8PC  
 Created at: Oct 7, 2022, 9:39 AM  
 Production Date: Oct 7, 2022  
 Ready for delivery since: Oct 7, 2022, 9:41:31 AM  
 Gross Weight/Volume/Net: 4 t / 20 m<sup>3</sup>  
 Methodology: EBC-Desk  
 Incoming Delivery: 12345

### Received on Oct 7, 2022

Company Name and Legal Form: Bioenergy Products GmbH  
 Street: Lochmühle 5  
 City: Lochnühle 5  
 State: Baden-Württemberg  
 Country: Germany

### Certification Requests

Oct 25, 2022, 12:46 PM  
 Certification Status: Declined  
 Processed: Oct 25, 2022, 12:47 PM  
 Certifier: Certy Flar

Nov 3, 2022, 2:35 PM  
 Certification Status: Accepted  
 Processed: Nov 3, 2022, 2:35 PM  
 Certifier: Petra Private (Carbonfuture Certifier GmbH)

### Timeline

- Created: Oct 7, 2022, 9:39 AM
- Measure: Oct 7, 2022, 9:44 AM
- Ready for delivery: Oct 7, 2022, 9:41 AM
- Packaging Unit changed owner: Oct 7, 2022, 9:44 AM
- Carbon Storage Attestation created: Oct 25, 2022, 12:46 PM
- Certified: Nov 3, 2022, 2:35 PM

### Carbonfuture Carbon Storage

Type of Application: Bedding for farm animals

Responsible Person: Robert Fäße, Grenzstraße 7810 Freiburg im Breisgau, Germany

Sink Registrar: Bioenergy Products GmbH, Lochmühle 5, Lochnühle 5, Baden-Württemberg, Germany

Sink Location: 79286 Glottertal, Baden-Württemberg, Germany

### Carbon Sequestration

CF-Certificate: 8127638b-577c-40e7-92fb-57777a8f4023  
 Certified at: Nov 3, 2022, 2:35 PM  
 Start Year: 2022  
 End Year: 2025  
 Amount: 2.01 tCO<sub>2</sub>e

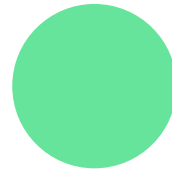
Sequestration Curve: [Line graph showing carbon sequestration amount over time from 2020 to 2140]



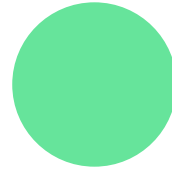
# How does dMRV help scale Biochar Carbon Removals?

*The fundamentals of creating trustworthiness in MRV*

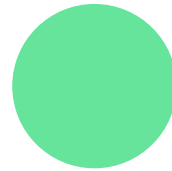
Carbonuture's approach to building trust in carbon removal is anchored in **five key dimensions**; the **principle trust proof points** are



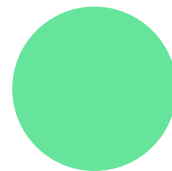
**Quality:** comprehensive rules in Standards & Methodology (set the clear basis for all)



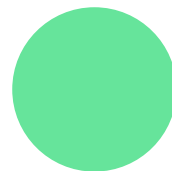
**Transparency:** make rules & outcome commonly known to all actors; (Registry, Reports)



**Impact:** Include 3rd party checks following a clearly structured audit protocol (mitigate manipulation incentives)



**Innovation:** IoT, digitisation, automated data-pipelines (mitigate data manipulation opportunities)

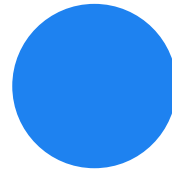


**Collaboration:** work together to implement above

# What do we need to scale CDR?

## Conclusions

### For the VCM



#### Standards getting into dMRV and accrediting systems

- **Methodologies** considering dMRV
- Improved **registration procedures**
- Streamlined **verification** respecting dMRV efforts
- **Continuous issuance** of credits



**VVBs** able to audit (with) a dMRV system



Projects liaising with **dMRV partners** like Carbonfuture to access carbon finance



**Registries**, allowing for data lookthriugh

Benefit from Our Global Network of **Leading Buyer Brands**



SEITENBAU



# About Us

- Founded in 2020 in Freiburg, Germany
- Additional offices in Zurich, Switzerland, and San Francisco, USA today
- Team growth from 4 employees in 2020 to a global team of more than 35 people with diverse perspectives and backgrounds





**Maximize** the impact  
of your carbon  
removal efforts  
today!

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[nikolaus@carbonfutre.earth](mailto:nikolaus@carbonfutre.earth)

