

### Agenda





- Introduction
- Report Launch
- Slidedeck summary
- Discussion
- Next webinars
- Closing

## **Dutch** Blockchain Coalition

connect and create

- # dutchblockchaincoalition.org
- @BCcoalitionNL
- **n** Dutch Blockchain Coalition

Kern partners



























































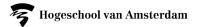
















































### **Dutch Blockchain Coalition**



Mission: to increase both knowledge and use of blockchain technology in the Netherlands, thereby speeding up the decentralisation of digital infrastructure.

Bringing together the ecosystem

How: The Triple Helix: Collaboration between the government, businesses, and educational institutions, with the Dutch Blockchain Coalition (DBC) as a driving force

(DBC serving as the "4th party" in the triple helix) 2019-2020 **FIRST USE-**CASES 2017-2018 Public-private partnerships **STARTING PHASE** 

2020-2025...

# AND COLLABORATION

Continued development of the foundation for sustainable innovation and collaboration in the field of blockchain and decentralized technologies.

### Missiedoorsnijdende bouwblokken voor het NPE



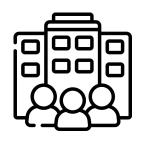
Blockchain as part of the key technologies in the Top Sector ICT has led to a number of fundamental building blocks that can be used to help achieve the energy transition.



Identities for digital...



Individuals



**Organizations** 



Things



Tokens for digital...



Ownership



Value transfer Shareholding





Voting power

5





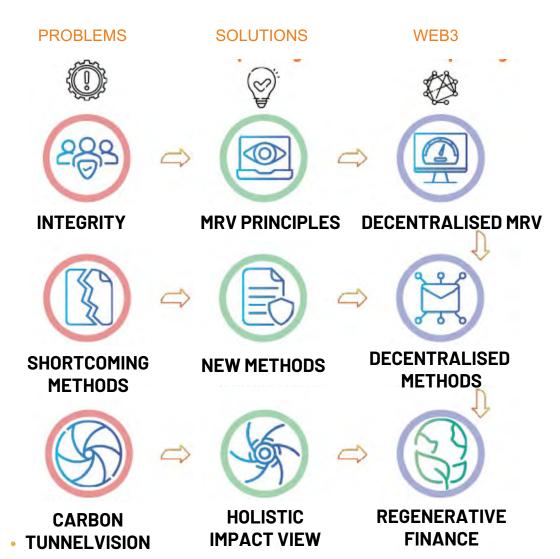
## Launched!

- What are carbon markets?
- Critique on carbon markets
- Proposed solutions
- Web3 contributions
- Should we actually pursue this?
- What DBC partner do
- How to continue from here

### **Summary of the report**



- To maintain integrity in the carbon market, new principles are being developed, for which web3 solutions are essential building blocks
- Current methods raise questions about feasibility in reaching climate goals, and have operational issues, that proposed web3 solutions can help solve.
- A sole focus on carbon as a lever for change omits important contextual factors that create perverse incentives. The web3 space of ReFi takes a broader approach to climate impact.



### What are carbon markets?



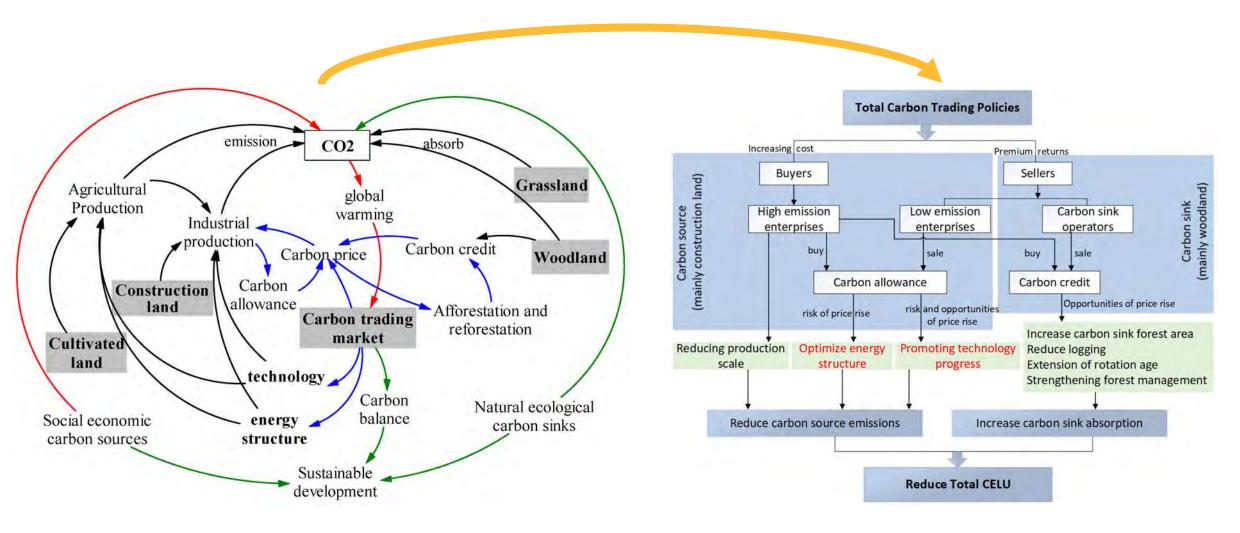
Carbon markets are systems through which countries or industrial players buy and sell permits or credits to emit carbon dioxide, incentivizing reductions in greenhouse gas emissions by assigning a monetary value to each ton of emissions produced.

- Regulated vs voluntary
- Methodologies
- Registers
- Exchanges



### Capturing a physical system in an economic incentive





Xia, Q.; Li, L.; Dong, J.; Zhang, B. Reduction Effect and Mechanism Analysis of Carbon Trading Policy on Carbon Emissions from Land Use. *Sustainability* **2021**, *13*, 9558. https://doi.org/10.3390/su13179558

### Global Trend in regulated markets / taxations



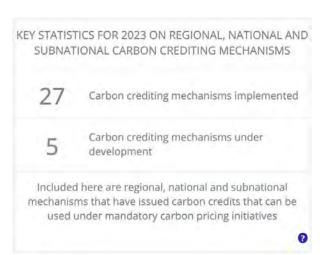
73 Carbon pricing initiatives selected

39 National jurisdictions are covered by the initiatives selected

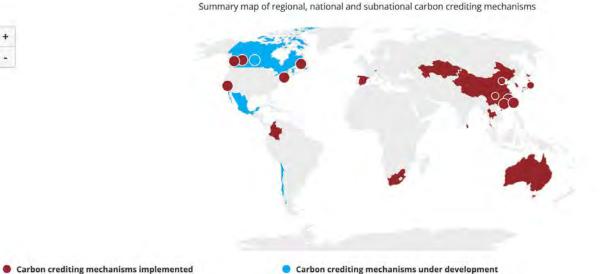
33 Subnational jurisdictions are covered by the initiatives selected

In 2023, these initiatives would cover

11.66 GtCO<sub>2</sub>e, representing 23% of global GHG emissions







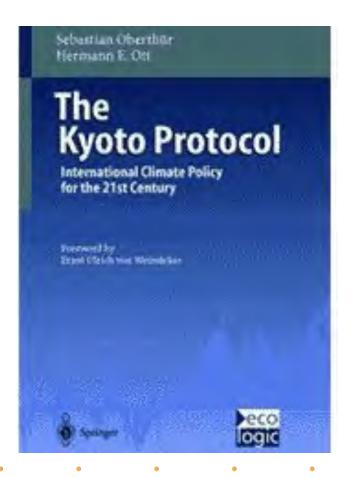
https://carbonpricingdash board.worldbank.org/ma p data

### The Origins



Voluntary came before regulated, but is recuperating in the last years.





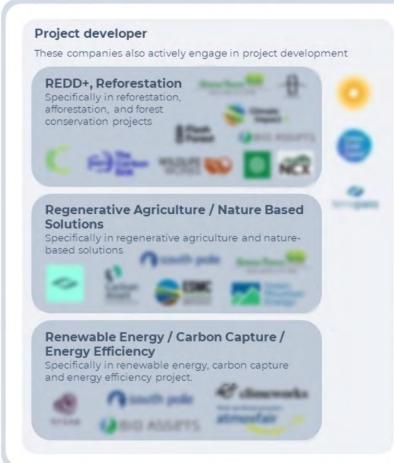
### **Voluntary Carbon Market**





### VOLUNTARY CARBON MARKETPLACES

MARKETPLACE LANDSCAPE FOR THE PURCHASE OF CARBON OFFSETS





https://darcypartners.com/r esearch/voluntary-vscompliance-carbon-markets

### **Voluntary Carbon Market**



Climate & Energy | Sustainable Markets | Exploration & Production | Refining | Transport Fuels

# Petrobras to use carbon credits to decarbonize premium gasoline

By Fabio Teixeira

October 25, 2023 9:41 PM GMT+2 · Updated 2 days ago





A logo of Brazil's state-run Petrobras oil company is seen at their headquarters in Rio de Janeiro, Brazil October 16, 2019. REUTERS/Sergio Moraes/File Photo <u>Acquire Licensing Rights</u> [2]

### What themes registries issue on



Name of the mechanism	Credits issued (MtCO <sub>2</sub> e)	Registered activities	Average price (USD)	Secto	rs cove	ered								
American Carbon Registry	7.30	15	5.36	2	CO.	<b>7</b>	**	(1)	444	A		<u>*</u>		Ī
Climate Action Reserve	4.61	33	2.34	2		43	**	(4)	444	and a	~	<u>a</u>	[]g	Ū
Gold Standard	34.35	59	5.27	2		<b>7 .</b>	*	1	000	and the same		<b>#</b>	وارا	Ī
Verified Carbon Standard	140.37	127	1.62	2		<b>7 .</b>	*	(1)	444	A		<u>*</u>		Ū
Clean Development Mechanism	74.00	15	2.02	2	ÇŌ,	<b>7</b> 🖺	*	(1)	444	A		<b>#</b>		Ī
Joint Implementation Mechanism	-	-	N/A	2		<b>7</b> ≧	*	(1)	444	A		<b>#</b>		Ū
Alberta Emission Offset System	8.40	17	15.92 - 21.49	2	(Q)	<b>7</b>	44	(4)	444	y		<u>*</u>		Ū
Australia Emissions Reduction Fund	16.30	128	12.02	2		<b>7 L</b>	44	(4)		J.A.		4		Ū
Beijing Forestry Offset Mechanism	-	-	2.10 - 9.28	2	(0) 7L	73	*	(4)	000	STORE OF THE PERSON NAMED IN				ij
Beijing Parking Offset Crediting Mechanism	-	N/A	N/A	D	(E)	78		(4)	000	a Paris		<u>a</u>		ij
British Columbia Offset Program	1.60	3	6.37 - 11.94	2		<b>7 .</b>	*	1	000	A.		<u>a</u>		Ū
California Compliance Offset Program	46.00	62	13.71	2		72	*	(2)	444	Alexander		1		Ü
China GHG Voluntary Emission Reduction Program	ı -	-	1.52 - 3.04	D		<b>7</b> L	*	(1)	144	The		<u>#</u>		Ī
Fujian Forestry Offset Crediting Mechanism	0.16	=	1.52 - 3.04	9	(EO)	73	**	(1)		and the same		at		Ū
Guangdong Pu Hui Offset Crediting Mechanism	0.60	10	2.59	D		73	*	(1)		a Paris		<b>#</b>	[ob]	Ū
J-Credit Scheme	0.30	16	13.54 - 19.78			<b>7 .</b>	44	1	100	and the same		<u>*</u>		Ū
Québec Offset Crediting Mechanism	0.11	1	14.6	2		VB.		(4)		O. A.		<u>a</u>		Ī
Republic of Korea Offset Credit Mechanism	17.61	308	20.31 - 36.02	2		<b>7 .</b>	$\triangle$	(4)	444			<b>#</b>		Ī
RGGI CO <sub>2</sub> Offset Mechanism	0.01	-	5	D		<b>7 .</b>	AA	(A)	000	and the same		4		Ū
Saitama Forest Absorption Certification System	-	-	N/A	2		73	*	(4)	000	J. San		<u>a</u>		ij
Saitama Target Setting Emissions Trading System	1.00	-	4.23	2		<b>7</b> L	AA	(4)	144	A		1		Ū
South Africa Crediting Mechanism	-	-	N/A	2	(F)	<b>7 .</b>	44	(1)	000	CO TO	~	<u>*</u>		Ī
Switzerland CO <sub>2</sub> Attestations Crediting Mechanism	2.10	8	59.19 - 159.61	27		<b>7</b> ₽	44	<b>A</b>	14	JA.		<u>*</u>		Ū
Thailand Voluntary Emission Reduction Program	6.01	156	0.64 - 9.46	2	4	<b>7B</b>	**	(4)	144	File		<u>*</u>		Ū
Tokyo Cap-and-Trade Program	-	12	1.62 - 57.77	20	(a)	78	AA	(1)		J.A.		<u>*</u>		Ō
Joint Crediting Mechanism	0.03	9	N/A	6.7	(60)	<b>7</b> ₽,	AA	A	i	A	- 6			E



Crediting mechanisms:

IndependentInternationalDomestic

Agriculture

"World Bank. 2021. State and Trends of Carbon Pricing 2021. © Washington, DC: World Bank. http://hdl.handle.net/10986/35 620 License: CC BY 3.0 IGO."

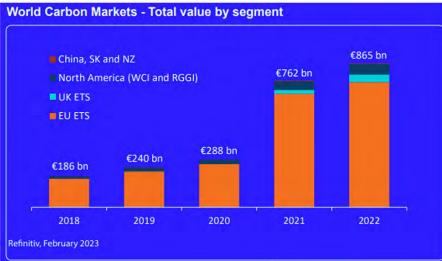
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### **Market size**



Figure 1. Voluntary Carbon Market Size by Value of Traded Carbon Credits, pre-2005 to 31 Dec. 2021





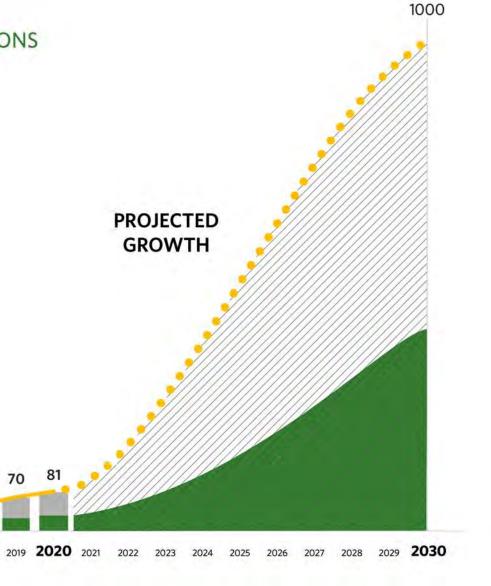
### **Projected growth**



- NATURAL CLIMATE SOLUTIONS
- OTHER

2010 2011

(total, in millions of metric tons)



https://www.climatepolicyinitiative.org/deliciousand-abundant-yes-were-talking-about-voluntarycarbon-markets/

### What are the critiques?



**PROBLEMS** 





INTEGRITY



SHORTCOMING METHODS



CARBON TUNNELVISION



Carbon markets have received negative feedback due to investigations into the effectiveness of the mechanisms as well as the negative side effects this creates. The main issues are:

- Integrity
- Shortcoming Methods
- CarbonTunnelvision

### Framing of challenges



- Lack of transparency, integrity and confidence in the monitoring, issuance, sale, retirement and benefits distribution of carbon credits, as well as in third-party certifications -> INTEGRITY
- Insufficient scale to meet climate commitments -> SHORTCOMING METHODS
- Inaccessibility, inequity and lack of participation in carbon markets by women, local communities, smallholder land stewards, Indigenous people and other vulnerable populations -> CARBON TUNNELVISION



## **Integrity**

Trust, fraud and profit at all cost.



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### Scrutiny in the media



New Zealand's carbon cre Australia's carbon credit scheme FINANCIAL TIMES scheme a farce, says Mort a sham', says whistleblower who rein it in Foundation report





Get our free news app; get our morning email briefing



The organisation's founder, Gareth Morgan, says New Zealand has done little to redu Photo / John Borren



Professor Andrew Macintosh is an environmental law and policy expert at The National University (ANU). Australia. Photograph: Energy Transition Hub



April 26, 2007 3:00 am

### Carbon markets create a muddle

The Kyoto protocol to fight climate change expires in 2012. The shape of a successor treaty is still in doubt, but one aspect seems certain; carbon trading will play a major role. A Financial Times investigation today reveals that carbon markets leave much room for unverifiable manipulation. Taxes are better, partly because they are less vulnerable to such improprieties.

Climate change poses a classic spill-over problem: individuals do not suffer the full burden of producing carbon dioxide, but society does. To equate the private cost to the higher social cost, governments can create markets for carbon, by using tradeable permits, or impose a tax.

So far, the preferred method has been tradeable permits. Creating markets for carbon has political advantages. They are easy to sign into law and even easier to execute. Instead of the optimal method of auctioning permits, governments have given them away. It is no wonder that energy producers are keen to participate in these schemes.

While short-term politics favour markets, taxes would be better in the long term, because industry needs certainty for investments years hence. A government committing to painful taxes signals the seriousness of its intentions.

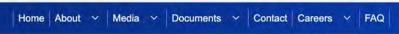
### EU Fraud ...and a bit of realism







### The independent public prosecution office of the EU



Translate this page

Home > News > Bulgaria: EPPO probes into multi-million euro fraud regarding greenhouse gas emissions

### Bulgaria: EPPO probes into multi-million euro fraud regarding greenhouse gas emissions

Published on 27 February 2023

The European Public Prosecutor's Office (EPPO) in Sofia (Bulgaria) is today carrying out dozens of searches and investigative measures, in a probe into possible fraud regarding the EU Emissions Trading System (EU ETS), with losses of millions of euro to the EU and national budgets.

A private company responsible for verifying the greenhouse gas emissions of thermal power plants and heating plants in Bulgaria is under investigation for allegedly submitting falsified reports to the competent national authorities.

According to the investigation, from 2017 to date, the company knowingly submitted false data and documentation for the annual reports on greenhouse gas emissions produced by thermal power plants and heating plants in Bulgaria, in order to under-declare their emissions output, under the EU ETS.



**ERCST** Roundtable on Climate Change and Sustainable Transition

2022 27 October

### The EU ETS is not going to solve the energy crisis, but can provide inspiration.

ERCST has recently held a series of roundtables with stakeholders. This document captures in a very brief manner the sentiment that emerged from the discussions.

The situation of the EU industry is increasingly challenging. In some sectors, part of industry is shutting down and imports are increasing at an alarming rate. That comes from an ERCST stakeholder discussion. EU society is asking for urgent measures to solve the current crisis as a consequence of the shock of supply in raw materials and increase of production costs.

EU institutions have proposed different short-term measures to address this situation. Others perceive this as an opportunity to correct current loopholes in the EU climate policy and propose to accelerate the transition as the right solution.

EU ETS installations are suffering from a higher electricity price. This additional burden in the short term will decrease their current capacity to make the relevant investments needed to abate in the long term. Investments in low carbon technologies are required now to reduce the CO2 footprint in the future.

Recognising the negative impact of the electricity cost on the carbon abatement potential is a must. The carbon market, and policy discussions are important for the future, but they will not solve the energy crisis. There needs to be clarify that while there is overlap, they are different, and the discussion needs to be focused on the right issues in the right forum.

Not only will choosing the wrong platform (the EU ETS) to discuss the energy crisis adds little value to the revision of the current EU ETS Directive, but it will also do little to provide the policy guidance we need to overcome the dramatic economic situation. We have to find the right balance. Furthermore, a Member State cannot tackle the EU energy crisis in isolation.

The EU ETS has been a very powerful and consolidated system tool since its creation in 2005. Even though both electricity and carbon markets are not interlinked and both systems are different in nature and governance (i.e., EU ETS with EU market approach vs electricity market with national approach), there are common elements.

The situation is seen as dramatic primarily due to the energy prices. ETS cannot solve that, but this cannot lead to becoming an afterthought, and adopting solutions that will hit worse when the energy crisis subsids and then prices come back in the center of discussion.

### **Voluntary Carbon Market Critiques**



22

# As carbon offsetting faces 'credibility revolution', shoppers should be wary *Patrick Greenfield*

'Carbon neutral' claims are often based on credits certified by Verraand investigation has suggested many are worthless

 Biggest carbon credit certifier to replace its rainforest offsets scheme



The Guardian's joint investigation into the rainforest credits indicated that many of them are worthless and often do not prevent any deforestation at all. Photograph: Pedro Pardo/AFP/Getty Images



27 JANUARY 2023 - (1) 23 MIN

## Showcase project by the world's biggest carbon trader actually resulted in more carbon emissions



For years, South Pole – the world's most influential climate consultancy – sold essentially concocted emission rights to hundreds of companies, including Gucci, Volkswagen and energy supplier Greenchoice. As a result, part of the climate achievements of many prestigious companies exist only on paper. Said carbon credits generated tens of millions of euros for South Pole. The company is in crisis: employees want the error to be acknowledged, while management is sweeping it under the rug.

### Reaching the general public and the court







### Carbon Offsets: Last Week Tonight with John Oliver (HBO)



∰ GOV.UK

### Collaborative enforcement: Jail for carbon credit fraudsters

Joe Peacock, 17 November 2021 - Company investigations, Disqualification, Enforcement, Fraud

I'm Joe Peacock and I'm a Senior Investigator within the Insolvency Service's Investigation and Enforcement Services. I work in the Company Investigations Live team, a team that undertakes confidential investigations into companies which are active and trading normally.

My team played an important role in the recent criminal case involving Paul Seakens. Paul Seakens is a convicted fraudster who has been jailed for 13 years and banned from running a limited company for 12 years.

### Web3 is not innocent





### FINANCIAL TIMES

HOME WORLD US COMPANIES TECH MARKETS CLIMATE OPINION WORK & CAREERS LIFE & ARTS HTSI

Carbon-linked crypto tokens alarm climate experts



Published on 28/01/2022, 3:17pm

UK-based cryptocurrency venture Save Planet Earth has convinced investors it can make them rich and fix the climate, but its tree-planting vision is a long way from reality







MOTHERBOARD

### This Company Is Launching Indigenous-Branded Crypto Carbon Credits. It's Greenwash, Critics Say.

"This 'initiative' is greenwash, topped with more greenwash, garnished with blockchain," said one expert.



### Web3 leads to zombies?



## What happened when crypto companies entered the carbon market?



Fabio Teixeira, Avi Asher-Schapiro
Published: September 13, 2022

EXPLAINER





Cryptocurrency players have created digital tokens based on carbon credits but doubts surround their green claims.

- · Crypto firms aim to bring liquidity to carbon market
- · But they have fueled speculation and instability
- · Tokenization of carbon credits has been suspended by Verra

RIO DE JANEIRO/LOS ANGELES - In 2021, crypto companies were riding high. Last November, the world's largest cryptocurrency, bitcoin, jumped to a record high of around \$69,000 as investors piled into a bull run.

Meanwhile, blockchain - the distributed ledger technology behind cryptocurrencies - was being touted as a solution to many of the world's problems, including climate change, by increasing transparency and facilitating the sale of carbon offsets.

Monday, 18 April 2022

### Crypto-based carbon offsetting: Don't believe the hype



Others start with the best of intentions... Within months of its launch, crypto platform Toucan accounted for more than a quarter of all purchases of carbon credits verified by Verra, the world's largest verifier of carbon offsets, Bloomberg reports. The aim of Toucan's developers was to allow retail investors to "sweep the floor": in other words, buy up low-quality carbon credits issued for projects that weren't really helping reduce emissions, thereby driving up market prices and leaving only impactful credits available for big polluters to buy.

...But then quickly backfire: Analysts say Toucan is exacerbating the issue it set out to solve. Rather than getting rid of cheap credits, its users are driving demand for them. The fresh demand is incentivizing bad actors to sell more useless tokens — particularly for so-called "zombie" projects that are decades old, don't need funds, and don't make an impact.

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### **Perverse incentives**





https://www.context.ne ws/net-zero/longread/fears-of-subprimecarbon-assets-stallcrypto-rainforestmission

### **Shortcoming methods**

Trust, fraud and profit at all cost.



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**Dutch** 

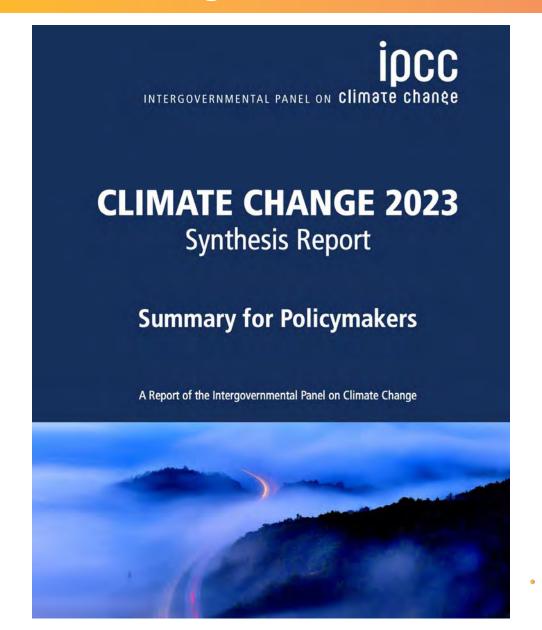
connect and create

Blockchain

**Coalition** 

### What if reduction is not enough?





### Wind farms out of operation



Study: Outdated carbon credits from old wind and solar farms are threatening climate change efforts

14 January 2021

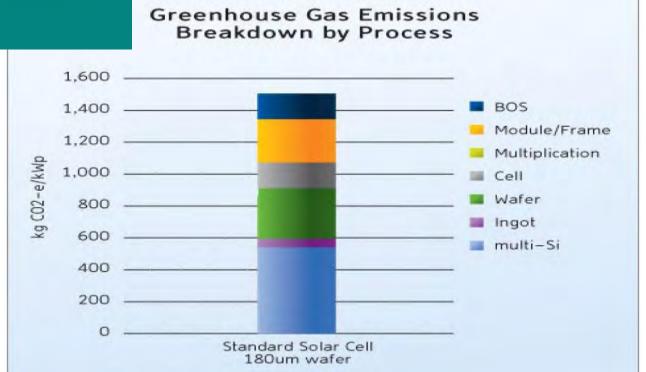
But here's the problem: that wind farm has been operating since 2011 and has already issued more than 2 million tonnes of these so-called "carbon credits". A project like this clearly happened nine years ago without the additional funding from selling credits to Total, so it is highly unlikely that the recent purchases resulted in additional removal of carbon from the atmosphere.

These kinds of projects are why many scientists and environmentalists remain sceptical of companies buying credits to reduce emissions elsewhere in the world instead of reducing emissions themselves. This is why Mark Carney, the former governor of the Bank of England, has set up a private sector taskforce to establish a "credible" carbon offsetting market in 2021 so buyers can have confidence that their investments really will remove greenhouse gases from the atmosphere.

### Payback time of solar panels



Solar Photovoltaics - Cradleto-grave analysis and environmental cost.





A typical solar panel will save over 900kg of CO<sup>2</sup> per year that results in a carbon payback period of ~ 1.6 years. As solar panels have an expected life of 25 years, even in areas where the sun's radiation is received at less than 550kWh per m<sup>2</sup> such as the northern UK, a typical solar panel takes around 6 years to pay back its energy cost. A

## **Consumption behaviour**











### What can go wrong whilst planting a tree













How we get tree planting wrong | It's Complicated





544K weergaven 1 jaar geleden #plantingtrees #climatechange #trees







### Registries adapting



### Verra Response to Guardian Article on Carbon Offsets

### **18 JANUARY 2023**

- The Guardian, based on work with Die Zeit and SourceMaterial has incorrectly claimed that Verra-certified <u>REDD projects</u> are consistently and substantively over-issuing carbon credits.
- The claims in this article are based on studies using "synthetic controls" or similar methods that do not account for project-specific factors that cause deforestation. As a result, these studies massively miscalculate the impact of REDD projects.
- Verra develops and continually improves methodologies based on the bestavailable science and technology through rigorous consultations with many academics and experts. This ensures that project baselines used to calculate carbon credits are robust and a credible benchmark against which to measure the impact of REDD projects.

Verra is disappointed to see the publication of an article in the Guardian, developed with Die Zeit and SourceMaterial, incorrectly claiming that REDD projects are consistently and substantively over-issuing carbon credits. Verra worked closely with both publications in the run-up to the publication to explain why this claim is untrue, as it is based on studies that use a "synthetic control" approach or similar methods. We want to share this information with our stakeholders and the wider climate community.

## Biggest carbon credit certifier to replace its rainforest offsets scheme

Verra's rainforest carbon credit methodologies, which Guardian investigation found were flawed, will be phased out by mid-2025

 As carbon offsetting faces 'credibility revolution', shoppers should be wary



☐ The investigation indicated that many claims based on the rainforest credits were largely meaningless Photograph: Angela Ponce/The Guardian

### **Carbon Tunnelvision**



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### Why are we planting again?



de zeen

Planting trees "doesn't make any sense" in the fight against climate change due to permanence concerns, say experts

Marcus Fairs

Planting 'millions of trees' may not be the

answer to deforestation

B B C NEWS

Tree-planting: Why are large investment firms buying Welsh farms?

offer little biodiversity and can impact y and local land rights, writes **Prof Tim** 

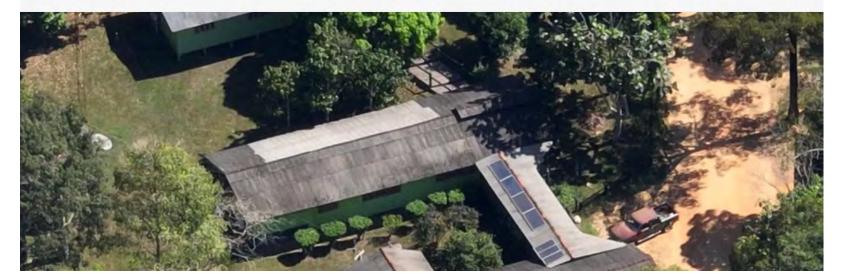
### Labour rights under pressure



The Thomson Reuters Foundation investigation draws on internal company records and interviews with former employees, market players and experts, as well as a visit to FSM, where de Quadros Lima was subcontracted to work for one of Moss's main carbon-credit suppliers.

In 2012, when FSM applied to get its carbon credits certified, the project description said it would provide "formal employment" and related benefits, as well as social programs for the local community in Colniza.

But critics say it yielded none of those for people like de Quadros Lima. After nearly a decade, it relied on subcontracted workers like him, paid them a near minimum wage, and did not provide insurance against accidents.



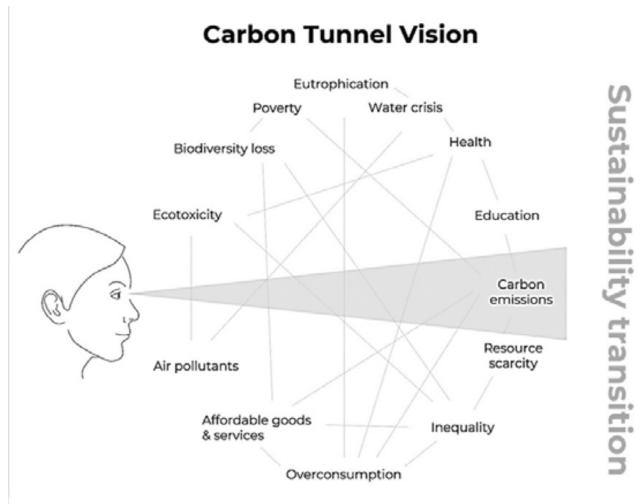
https://www.context.news/netzero/long-read/fears-ofsubprime-carbon-assets-stallcrypto-rainforest-mission

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### Reality is more complex



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Graphic by Jan Konietzko

### What are the future solutions?











**TUNNELVISION** 

 $\Rightarrow$ 



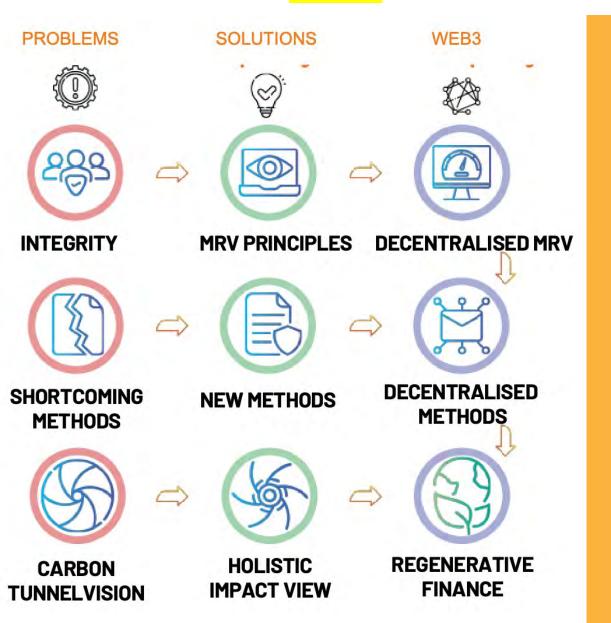
HOLISTIC

The critiques
have been felt. A
large and diverse
ecosystem on
global and local
scales have been
looking for
solutions.



## What are the web3 solutions?

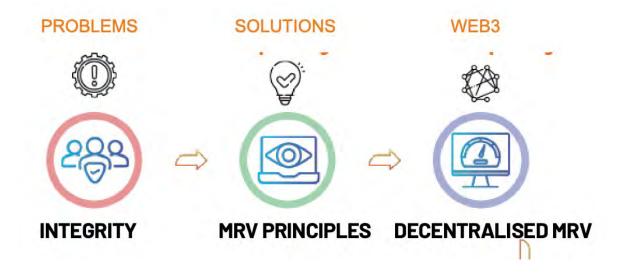






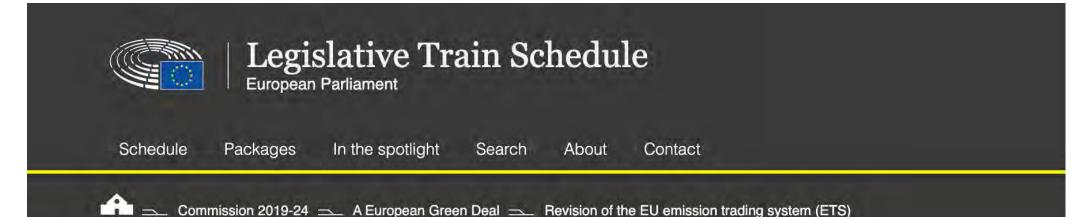
### MRV – Digital / Decentralised / Participatiry





### **ETS** is adapting





### Revision of the EU emission trading system (ETS)

In "A European Green Deal"

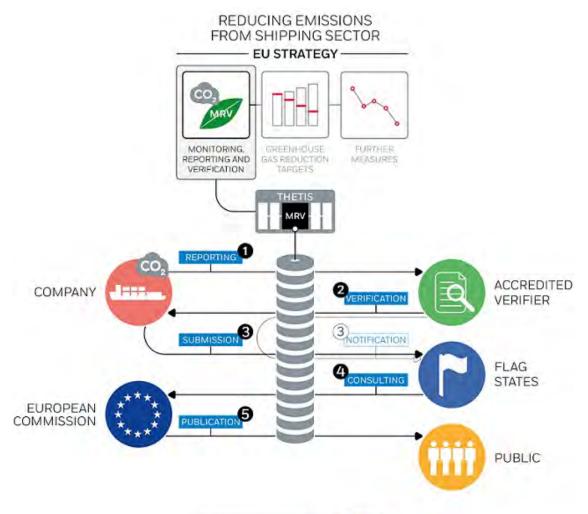
The Commission proposal to amend Directive 2003/87/EC concerns the ongoing phase 4 of the ETS (2021-2030). It consists of five main elements:

- 1. a reduced cap and more ambitious linear reduction factor for GHG emissions,
- 2. revised rules for free allocation of allowances and the market stability reserve
- 3. extension of the ETS to maritime transport
- 4. a separate new ETS for buildings and road transport
- 5. increase of the Innovation and Modernisation Funds and new rules on use of ETS revenues

### **MRV Principles**







### **Principles for the voluntary market**



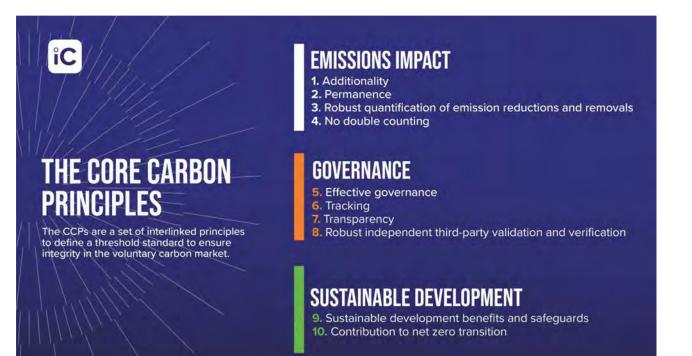
43



Version 2.0







#### Methodology for assessing the quality of carbon credits

21 March 2022

Quality objective		Criteria	
1	Robust determination of the greenhouse gas (GHG) emissions impact of the mitigation activity		lity ility (applicable to collapsed markets only) uantification of emission reductions and removals
2	Avoiding double counting of emission reductions or removals	.2 Avoiding	double issuance double use double claiming
3	Addressing non- permanence		nce of non-permanence risks ess of approaches for addressing non-permanence risks
4	Facilitating transition towards net zero emissions	.1 Enhancin	g adoption of low, zero or negative emissions technologies ices
5	Strong institutional arrangements and processes of the carbon crediting program	.2 Transpar .3 Public co	rogram governance ency nsultation nird-party auditing
6	Environmental and social impacts	social sat	ess of the carbon crediting program's environmental and feguards ple development impacts of the project type or project ion to improving adaptation and resilience (optional)
7	Host country ambition	.2 Stringeno	ntry commitment to the global temperature goal by and coverage of the host country's current NDC the carbon crediting approach to enable the host country to of the emission reductions to achieve its own NDC

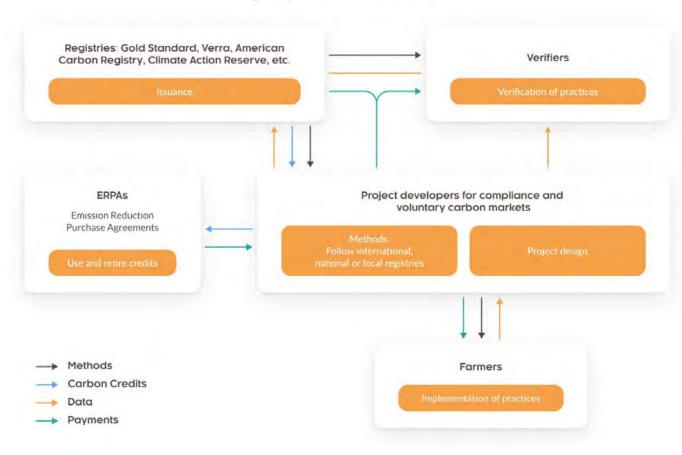
https://files.worldwildlife.org/wwfcmsprod/files/Publication/file/9okv1wuk47 MethodologyFor AssessingTheQualityOfCarbonCredits v2.0.pdf

https://icvcm.org/the-core-carbon-principles/

### Already complex proces with more burdens



#### Legacy Carbon Credits' Flow



Traditional carbon credit industry. Source: Plastina Alejandro (2022). How do data and payments flow through Ag carbon programs?

### **MRV** Principles



FEATURE STORY | JULY 27, 2022

# What You Need to Know About the Measurement, Reporting, and Verification (MRV) of Carbon Credits



- **Costly** It is, and many low-income countries new to emissions reduction transactions lack the capacity to do MRV themselves. Many rely on international firms, which can be costly and undermine sustainability and country ownership. MRV capacity building figures heavily into the grants that trust funds provide to countries to prepare emissions reduction programs.
- **Complex** But MRV requires careful measurement, reporting, and verification to ensure results are real before payments are made. <u>MRV systems are complex and require multiple steps to get from emissions reduced on the ground to payments received in hand.</u>
- **Manually intensive** <u>Verifiers often need to sift through large volumes of data</u>, so well-documented results that thoroughly demonstrate accuracy, transparency, and compliance with the standard can help smooth the process.
- Inflexible A carbon credit does integrate continuous monitoring of emission reduction sites.
- Long The entire MRV cycle can take <u>a year or more to complete</u>.

### **Digital MRV?**



FEATURE STORY | JULY 27, 2022

## What You Need to Know About the Measurement, Reporting, and Verification (MRV) of Carbon Credits



#### How is technology innovating MRV?

Digital MRV will be a game changer! Current methods to measure, report, and verify emission reductions can be costly and time-consuming, often relying on manual operations. Digital technologies can streamline data collection, processing, and quality control in MRV processes, helping to reduce the cost and time to ERC issuance. The World Bank is helping to expand the use of smart sensors, satellites and drones, cloud computing, artificial intelligence, and blockchain encryption.

Digital MRV systems are still complex and expensive to implement, but long-term, they will reduce the cost of generating carbon credits while increasing transparency and security. They will enable more efficient verification and the move toward real-time generation of carbon credits. Innovations in MRV can help expand climate action worldwide and unleash the potential of climate finance and the carbon marketplace to combat climate change.

### Deeper into Digital MRV



**Digital MRV** 

Making use of remote sensing and machine learning practices that have low marginal cost and remove manual labour

Decentralised MRV

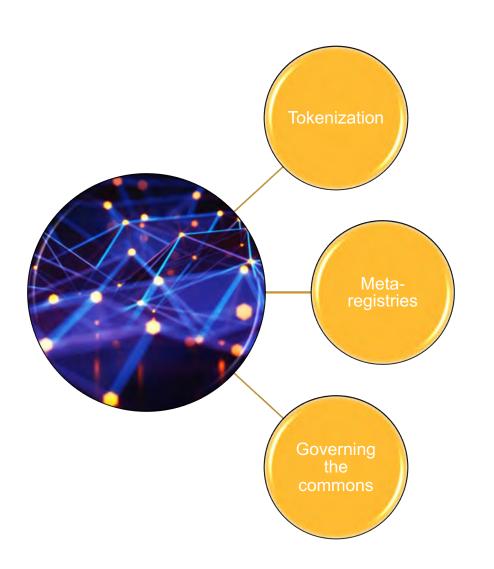
Making use of multi-party and transparent MRV processes creating a more open ecosystem that is able to build on itself and others

Participatory MRV Making use of a group of participatory MRV systems, using local actors from emission reduction sites and data collection, interpretation, analysis and verfication

• • • • • • 4

### WEB3 Elements within Decentralised & participatory MRV





converts carbon credits into digital tokens, facilitating transparent, and easily tradable or trackable transactions of ownership. This process enhances market accessibility and integrity, ensuring credits are verifiably managed and retired

interconnected digital platforms that synchronize various carbon credit registries worldwide, preventing double counting of emissions reductions by providing a unified, transparent tracking system. This overarching system ensures integrity and enhances the reliability of carbon trading markets by maintaining a singular, accurate count of all issued, traded, and retired carbon credits globally.

through decentralized autonomous organizations (DAOs) ensuringa community-driven approach where rules and decisions about natural assets are made collectively without central authority, ensuring sustainable and equitable management. This method empowers local stakeholders, reduces bureaucratic inefficiencies, and utilizes transparent, consensus-driven governance models to preserve shared environmental resources.

### Global Support for Tokenization of Carbon Credits



Tokenization is in line with the core carbon principles, according to the world bank and the WEF



#### BOX 9

#### What is tokenization?

Tokenization is the process by which an issuer creates a digital representation of something of value on a distributed ledger or blockchain, which represents either digital or physical assets. Tokens can only be sold or transferred by their owners, ensuring they represent unique and unforgeable

represen how they with ther ensure ir security data and been pro

If tokens accessibited information be made longer by the impartment be process a emission

real, add

uniquely

demand-side use

### 2.2 An accessible marketplace, product definition and clarity

Effective markets can create the conditions for the emergence of dynamic and adaptable products to solve the challenges facing diverse stakeholders. But this functionality is possible only if purchasers can effectively distinguish signal from noise. Bringing this clarity to carbon products requires reducing obstacles, redundancy and confusion while streamlining and defining the underlying benefits to climate and society.

Ensure carbon markets adopt a common baseline taxonomy to provide clarity.

Carbon credits should have standardized and detailed labels to enable ease of understanding and comparability." Important non-carbon attributes, such as achieving the Sustainable Development Goals, including enhanced biodiversity and meaningful community benefits, should be clearly defined and easily identifiable.

Expand carbon markets to include efficient price discovery and the creation of innovative new financial products and "beyond-carbon" tradable assets including factors such as biodiversity, social value and Indigenous rights.

Digital carbon credits can expand the market by trading on open and accessible exchanges that highlight the auditable data-backed differences

among the credits. This promises to remove the considerable friction and uncertainty surrounding buying and selling credits that currently exists, to increase visibility for price discovery and make it easier to fund the market's expansion.

Use an "end-to-end" digital environment, including DLT, to enable efficient data capture, analysis and auditability.<sup>3</sup>

Using technology-based data collection tools such as digital decentralized measurement, reporting and verification (MRV), and making such data available in an open-source and human-readable format (e.g. on a blockchain-based ledger with a non-technical interface), can resolve challenges associated with trust, transparency and interoperability in current systems. This can lead to enhanced confidence in the market, better and more seamless participation for both sellers and buyers and greater scale.

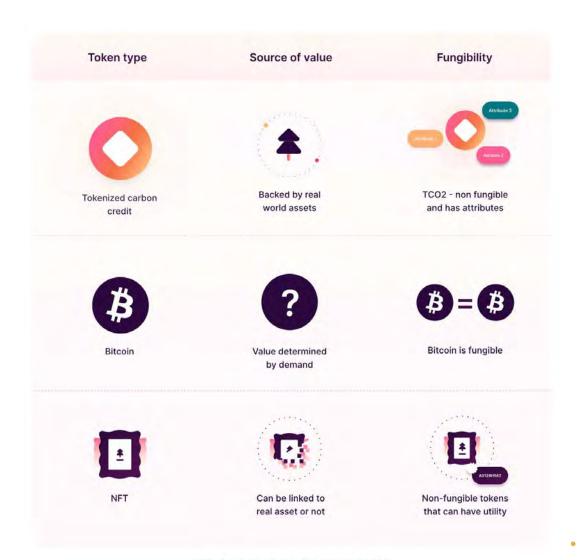
Digital carbon credits can enable unique demandside use cases. Everyday purchases can more easily and credibly have the cost of their emissions baked into their purchase, as seen already with airline bookings and some e-commerce platforms. Industries can integrate the retirement of digital carbon credits directly into their operations so that emissions are compensated for in real time, rather than on a quarterly or annual basis.

https://openknowledge.worldbank.org/entities/publication/a1abead2-de91-5992-bb7a-73d8aaaf767f

https://www3.weforum.org/docs/Recommenda tions\_for\_the\_Digital\_Voluntary\_and\_Regulat ed\_Carbon\_Markets.pdf

### How to tokenize carbon credits





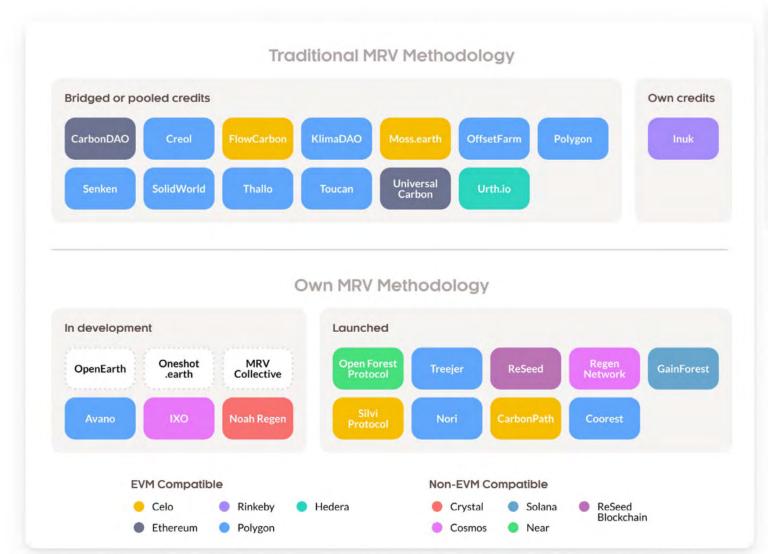


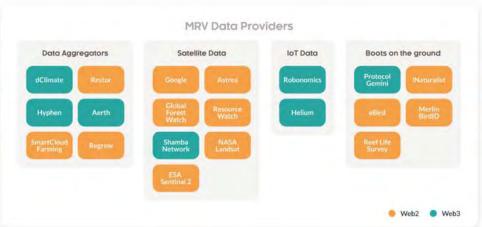
https://blog.toucan.earth/tokenization-of-carbon-credits-explained/

### Tokens from the Decentralised MRV ecosystem



MRV for Web3 nature-based environmental assets

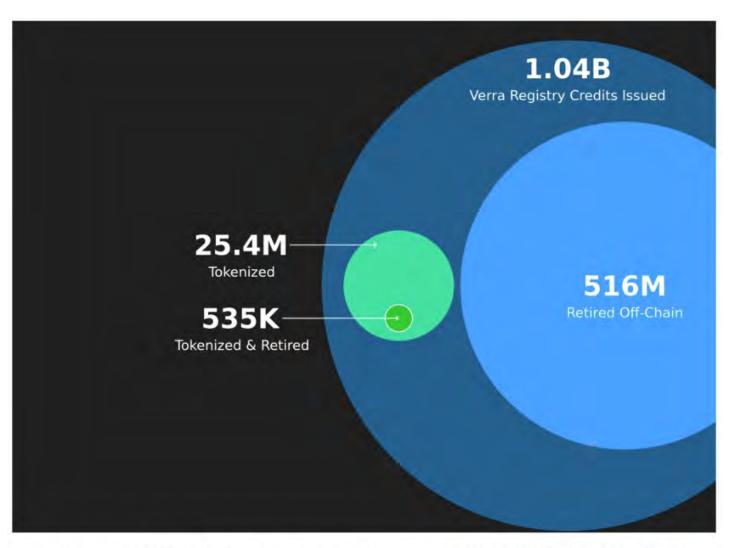




A joint publication by **The Kolektivo Network** & **Curve Labs** With support from **The Celo Foundation** 

### Relative size of the tokenized market





### Registries responding



News · Supply chain

## Carbon credit standards body Verra suspends blockchain, crypto tokenization

May 26, 2022 · by Ledger Insights





Gold Standard announces proposals to allow creation of digital tokens for carbon credits

Gold Standard launches consultation on proposals to allow the tokenisation of carbon credits



### Registries reflecting



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Verra's Approach to Third-Party Crypto Instruments and Tokens: Q3 2022

### SUMMARY OF PUBLIC COMMENTS: VERRA'S APPROACH TO THIRD-PARTY CRYPTO INSTRUMENTS AND TOKENS



# CONDITIONS FOR CONSENTING TO TOKENISATION OF GOLD-STANDARD ISSUED CREDITS

SUMMARY OF CONSULTATION FEEDBACK AND NEXT STEPS

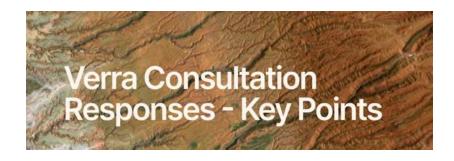
March 2023

https://verra.org/wp-content/uploads/2023/01/Verras-Approach-To-Third-Party-Crypto-Instruments-And-Tokens-Public-Consultation-Summary-of-Comments-1-1.pdf

https://www.goldstandard.org/sites/default/files/documents/consultati on\_feedback\_report\_-\_tokenisation\_-\_feb2023\_0.pdf

### Registries reflecting





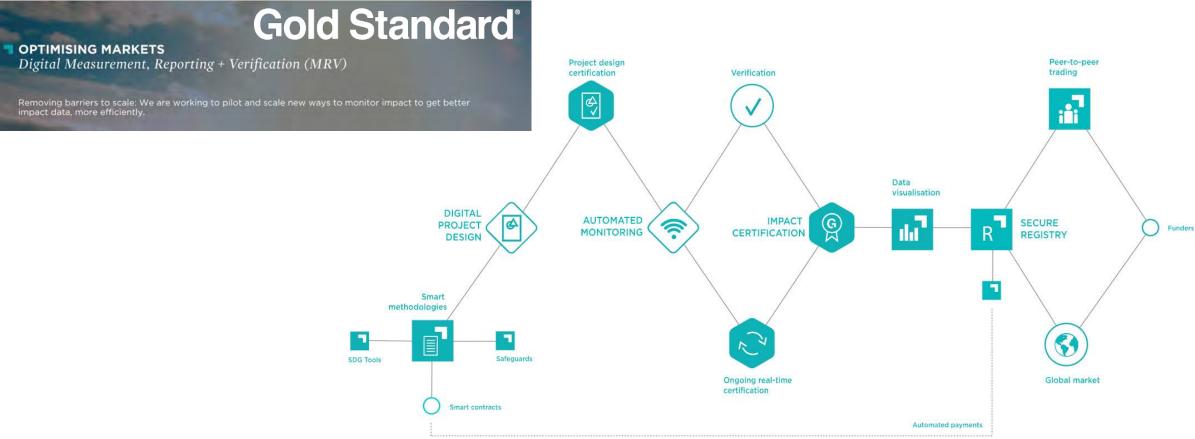
**An important step** to collaboration between web3 and the legacy market! Discussions are not settled on issues like:

- KYC
- Double Issuance and counting
- Reactivation of credits
- Fractionalization of credits
- Energy footprint
- Safety & Compliance

https://blog.toucan.earth/verra-consultation-summary/

### A digitized and decentralised form of MRV













### Token-based exchanges



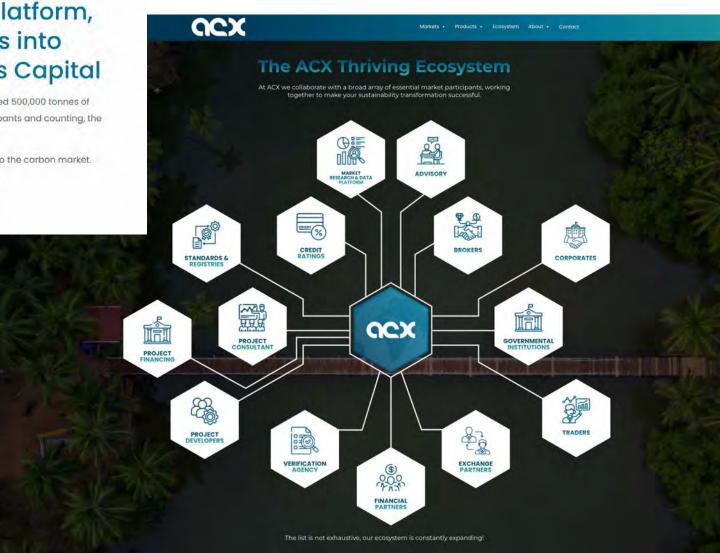
Singapore based AirCarbon Pte Ltd ("ACX"), the world's first fully digital carbon trading platform, securitizes CORSIA Eligible carbon credits into CETs (CORSIA Eligible Tokens) for Viridios Capital

Against the backdrop of the US rejoining the Paris Accords, AirCarbon and Viridios Capital this week securitized 500,000 tonnes of CORSIA eligible carbon credits into the world's first CORSIA Eligible carbon Tokens (CET). With over 55 participants and counting, the exchange serves as a central marketplace for investors to trade and gain exposure to the carbon markets.

AirCarbon applies traditional commodity exchange architecture and block chain settlement and clearance to the carbon market. With trading fees of less than 1/2% of notional, AirCarbon is the world's lowest priced carbon trading platform.

- Lowest trading commissions in the market at \$3 per 1000tCO2
- . ACX is the world's first fully for voluntary carbon offsets

"The Exchange also utilises the speed and efficiency of the blockchain to achieve atomic T-0 trade execution, clearing and settlement. The Exchange's core matching engine can currently match trades in the order ~10k per second."



### Fragmentation and lack of interoperability



#### Why data infrastructure is key for a transparent carbon market

GEMMA TORRAS VIVES | MARCH 07, 2023



- While the bottom-up nature of the Paris Agreement gives flexibility to countries in managing and tracking their climate action, there is no guidance on how to connect disparate registry systems.
- A common data system is needed to collect and structure all openly accessible data on the lifecycle of carbon credits to enhance transparency, trust, and integrity.

https://blogs.worldbank.org/climatechange/why-data-infrastructure-key-transparentcarbon-market?cid=ccg tt climatechange en ext

### Meta-registries & multi-party verification ecosystems



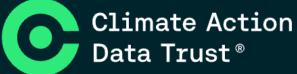
Some point to the idea of a "metaregistry" - a long-term vision espoused by Toucan, Regen, and other players in the carbonbridge space - whereby anyone can add a carbon credit to the blockchain. Rather than a few establishment gatekeepers like Verra and Gold Standard verifying most voluntary credits, this meta-registry approach would theoretically lead to the proliferation of a new class of offsetting projects for whom existing verification methods are too restrictive.

https://www.coindesk.com/layer2/202 2/03/27/crypto-carbon-canblockchain-networks-fix-carbonoffsets/



### **Connecting registries**





A decentralised metadata platform that links, aggregates and harmonises all major carbon credit registry data to enhance transparent accounting in line with Article 6 of the Paris Agreement.

The CAD Trust open-source metadata system uses blockchain technology to create a decentralised record of carbon market activity with the aim to avoid double counting, increase trust in carbon credit data and build confidence in carbon markets through improved transparency.

Fully operational Data Dashboard coming in Q4 2023

aggregates and ata to enhance of the Paris

sees blockchain frazbon market increase trust in arbon markets

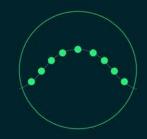
Today's carbon markets are complex and fragmented. A prevalence of independent private registries, and national-level carbon markets, combined with a lack of centralised registries between voluntary and compliance markets poses a serious challenge to ensuring maximum transparency in the market.

To future-proof the market, CAD Trust offers a decentralised, blockchainpowered digital infrastructure that connects these registries and provides public access to the information in a harmonised and user-friendly format. Our objective is to maximise the transparency of carbon credits, minimise the risk of double counting, and enhance the overall integrity of the markets.

With a decentralised and secure digital infrastructure, the services built by the public and private sector such as compliance reporting, transacting, and benchmarking can be easier and more effective.



01 A common data taxonomy that enables reconciliation of data from registries. Through blockchain technology, it facilitates a peer-topeer connection among decentralised registries with the aim to link, aggregate and harmonise the underlying data.



02 Provide visibility into corresponding adjustment procedures and the lifecycle of carbon offsets from issuances to retirement, which will safeguard against double counting and ease reporting requirements.



03 Surface publicly-available information on MOs and record status changes to provide information on how MOs are used.



04 Enhance transparency and trust among market participants and enable tracking of MOs and reduce double counting risk. The Climate Warehouse would not hold assets or directly facilitate.



05 Help to operationalise processes under Article 6 of the Paris Agreement such as compliance reporting and registry data model development.









•

### **How Chia markets itself**



### **Blockchain Technology Built the** Way It Was Meant to Be

Hi, we're Chia. We've architected a better technology from the ground up, solving the challenges of conventional blockchains to enable widespread use.

We believe in three non-negotiables for worldwide adoption:

#### How We Solved It

The transparency and equitable access offered by blockchain technology



#### What is Proof of Space and Time?

1 year ago - Updated

Proof of Space is a cryptographic technique where provers show that they allocate unused hard drive space for storage space. In order to be used as a consensus method, Proof of Space must be tied to Proof of Time. PoT ensures that block times have consistency in the time between them and increases the overall security of the blockchain.

#### Farm $\rightarrow$ Rewards $\rightarrow$ Repeat

Mine Farm from your home using spare hard drive storage, without the huge electric bill.

Help secure Chia's decentralized blockchain and get rewarded.

#### How It Works



Using Chia's app, plot files are generated with random hashes and transferred to a hard drive, filling up spare storage space.

Once proofs in the plot files are validated, a farmer creates a block to add to Chia's blockchain. Farming Basics -

Plot files are continuously scanned for valid proofs using a lightweight process through Chia's native app.

REWARDS \*

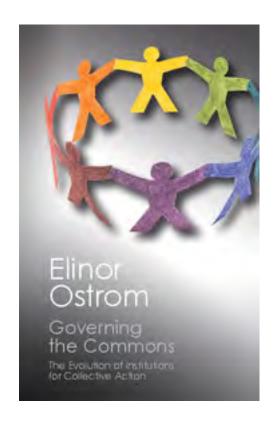
You can get rewarded with XCH Join a pool (farming community) for more frequent reward opportunities.

About Pooling ->

### **Governing the Commons**



62



One of the principles for being governing commons, according to Elinor Ostrom, is:

Develop a system, carried out by community members, for monitoring members' behavior.

FELLOWSHIPS & AWARDS

- A Practical Framework for
- Applying Ostrom's Principles to
- Data Commons Governance

AMMAMA

By Greg Bloom, Dr. Angie Raymond, Willa Tavernier, Divya Siddarth, Gary Motz, Melanie Dulong de Rosna, and Anguk Ruhask I Dec. 6, 2021

Tranlating this to managing data commons on top of natural commons, is that effective monitoring by monitors who are part of, or accountable to, the appropriators it required. This means that compliance with the rules established is monitored and that users of the commons have an active role in monitoring compliance. With regard to data commons, this includes monitoring of data production processes — ongoing validation of data integrity, verification of data quality, — as well as monitoring data access and use.

https://foundation.mozilla.org/en/blog/a-practical-framework-for-applying-ostroms-principles-to-data-commons-governance/

### **Measure to Earn**

Dutch Blockchain Coalition

and create



### Conservation Basic Income, Mapped and Measured

GainForest is a Swiss non-profit organization focused on transparent environmental protection.



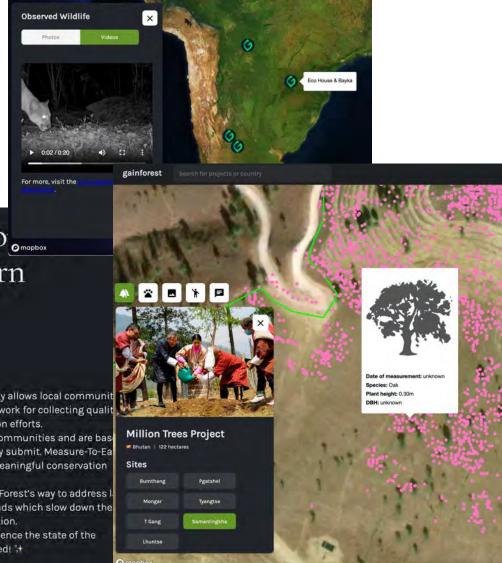


What is GainFo omeopoon Measure-To-Earn Technology?

#### Summary Points:

 GainForest's Measure-To-Earn technology allows local communit to receive direct eco-payments for their work for collecting qualit data of their restoration and conservation efforts.

- The payments are directly wired to the communities and are bas the measured and verified data that they submit. Measure-To-Ea to set the right incentives and reward meaningful conservation action
- The Measure-To-Earn technology is GainForest's way to address I of data and inefficiency in allocating funds which slow down the progress on climate and biodiversity action.
- Long story short: You collect data to evidence the state of the ecosystem, therefore, you will be rewarded! ;†



### Building new data collection and validator networks









BENEFITS

Earn validation fee



Offer services that through the OFP

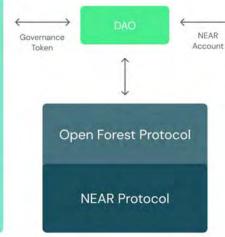


Make a strong impact in the fight against climate change



Become a part of a growing community











#### STEP 1

Project operators register, on OFP, land plots with forestation projects.



#### STEP 2

Field agents collect monitoring data on the ground using the OFP field mobile app.



#### STEP 3

Validators around the world check the legitimacy of ground monitoring data.





#### STEP 4

All monitoring information is stored permanently on the blockchain.



#### STEP 5

Forestation projects gain an unprecedented amount of transparency and trust.



#### STEP 6

Project operators can get access to carbon financing if forestation project data is validated

### Economic and Legislative embedding of communities around natural assets



#### The Kolektivo Framework

**Decentralized Exchange Trading Systems** 



Curve Labs & Kolektivo Labs

Original: June 2021 Last updated: August 2022 (v.3)

#### 2.3 System Overview

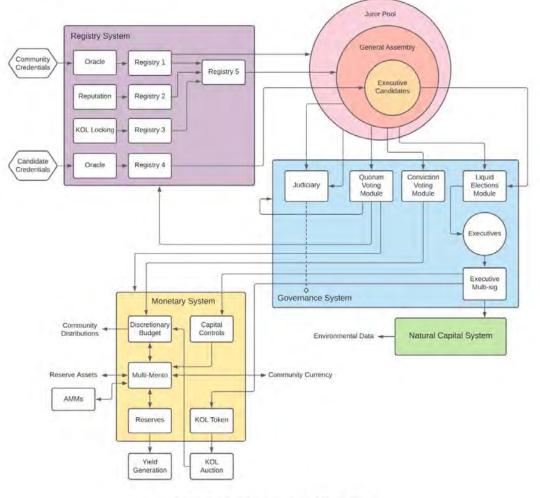


Figure 4: A high level overview of the DETS.

### Community-driven equals science



PLoS One. 2015; 10(6): e0130529.

Published online 2015 Jun 30. doi: 10.1371/journal.pone.0130529

PMCID: PMC4488351

PMID: 26126186

#### Validating Community-Led Forest Biomass Assessments

Michelle Venter, 1,2, Oscar Venter, 3,4 Will Edwards, 2,3 and Michael I. Bird 1

Runguo Zang, Editor

Abstract Go to: >

The lack of capacity to monitor forest carbon stocks in developing countries is undermining global efforts to reduce carbon emissions. Involving local people in monitoring forest carbon stocks could potentially address this capacity gap. This study conducts a complete expert remeasurement of community-led biomass inventories in remote tropical forests of Papua New Guinea. By fully remeasuring and isolating the effects of 4,481 field measurements, we demonstrate that programmes employing local people (nonexperts) can produce forest monitoring data as reliable as those produced by scientists (experts). Overall, non-experts reported lower biomass estimates by an average of 9.1%, equivalent to 55.2 fewer tonnes of biomass ha<sup>-1</sup>, which could have important financial implications for communities. However, there were no significant differences between forest biomass estimates of expert and non-expert, nor were there significant differences in some of the components used to calculate these estimates, such as tree diameter at breast height (DBH), tree counts and plot surface area, but were significant differences between tree heights. At the landscape level, the greatest biomass discrepancies resulted from height measurements (41%) and, unexpectedly, a few large missing trees contributing to a third of the overall discrepancies. We show that 85% of the biomass discrepancies at the tree level were caused by measurement taken on large trees (DBH ≥50cm), even though they consisted of only 14% of the stems. We demonstrate that programmes that engage local people can provide high-quality forest carbon data that could help overcome barriers to reducing forest carbon emissions in developing countries. Nonetheless, community-based monitoring programmes should prioritise reducing errors in the field that lead to the most important discrepancies, notably; overcoming challenges to accurately measure large trees.

### **Towards decentralised methods**



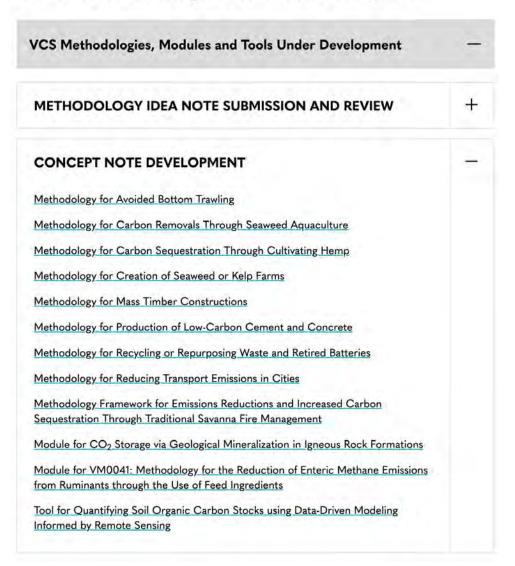
67

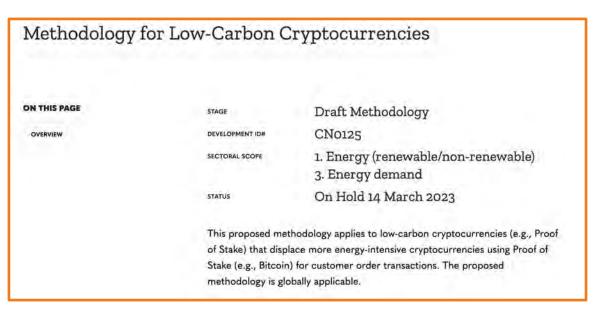


### Anything can be a methodology



A number of VCS methodologies are currently under development.





• For a rough calculation, if we had an outdated figure of 50 million tonnes of CO2 for the annual carbon footprint of Bitcoin mining, and one carbon credit was worth \$20 USD, then:

50,000,000 tonnes CO2 x \$20 USD/tonne CO2

= \$1 billion USD in carbon credits anually if Bitcoin would switch to PoS.

(as if that would happen, also the methodology was put on hold)

### New possibilities with decentralised technologies



69



Web3 infrastructures are allowing us to imagine new methodologies. Some examples are:







Granular Energy Certificates



Proof of unused oil reserves



Micro carbon removal certificates



Emissionless procurement through product passports



Tiny Forests



ETS for residential emissions

### **Carbon Debits**



"Credits are a loan on the future promised carbon removal...debits are actual carbon removal"

- Tree planting
- Proof of Life
- High ROI tree programs
- Gamification
- Supporting locals / Social Impact
- Increase trust with blockchain technology
- Certification/audits and data API for accountability

### The Global Carbon Standard (GCS)

The world's first standard and methodology for Carbon Debits is a great achievement in the fight against climate change. Global Carbon Standard.

100% transparency through tracking and reporting of carbon emissions is crucial in addressing climate change. Global Carbon Standard.

Being a Carbon Debit, the GCS only approves verified proof of absorbed carbon, not merely a promise of future absorption. Global Carbon Standard







#### Earthood

Carbify Validation Repor FOR.DDR.23.11



n Report of "Global Carbon Standard and Methodology for Assessment of Carbon Capture"



Time sources pluming as of Q2 2023

#### Proof of Life

Proof of Life (PoL) is requested at regular intervals to maintain adherence to GCS requirements throughout the project's contract terms.



### **Granular Energy Certificates – 24/7 Carbon Free**



#### Also called Time-based energy attribute certificates



#### Can 24/7 carbon-free energy become a global standard?

Google and Microsoft want to buy clean energy around the clock. EnergyTag plans to bring the same option to mass markets.









### FlexiDAO Academy

The Academy is a tailored educational experience for professionals that want to eliminate their energy related emissions, 24 hours a day, 7 days a week.



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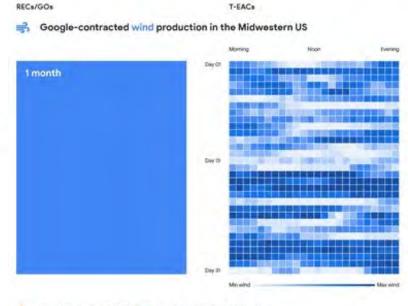
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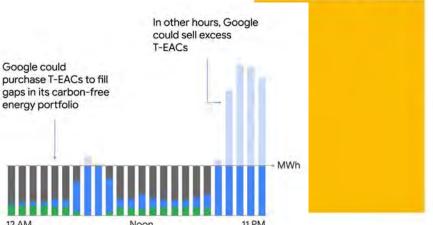
ree energy

acted wind e-contracted wind

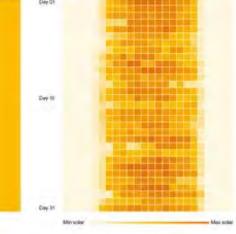
#### **Granular Certificate** Scheme Standard

The GC Scheme Standard provides the first version of the criteria that those implementing Granular Certificate Schemes need to meet in order to prove, through a third party gudit, that they are \*Compliant with the EnergyTag



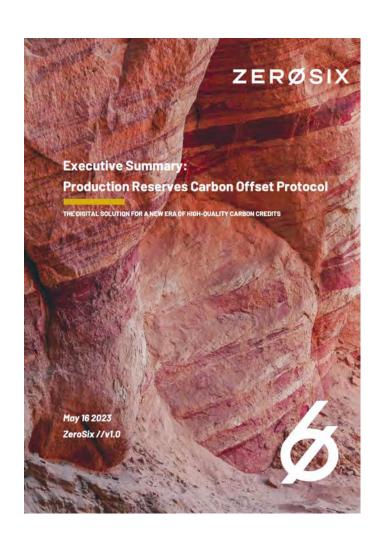


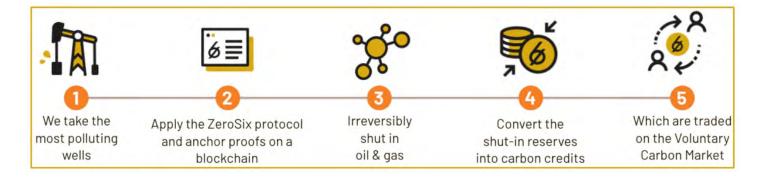
Google-contracted production in Denmark



### Proof of unused oil reserves







The protocol is embedded in a digital solution that guarantees compliance and independent verifiability Compliance with the protocol is controlled and digitally recorded using a blockchain-based decentralized application, the ZeroSix digital solution. The ZeroSix digital solution ensures:

- Aspects of project governance, including overall adherence to the protocol
- Project verification, with digital signatures from independent third-party verifiers
- Transparency, by publicly storing project documentation on the InterPlanetary File System (IPFS), which is an immutable and tamper-proof distributed file storage system
- Minting and distribution of the ZeroSix tokens
- Tracking and elimination of double counting.

#### Micro Carbon Removal





#### How our carbon removal platform works



Our carbon removal suppliers develop carbon net-negative processes or products. In other words, they remove carbon from the atmosphere.



Puro.earth certifies suppliers based on the Puro Standard. Removal is independently verified by a third party and CO<sub>2</sub> Removal Certificates (CORCs) are issued through the Puro Registry.



Climate-conscious companies buy CORCs directly from suppliers or through a thirdparty marketplace of their choice.



Buyers retire CORCs in the Puro Registry to support their sustainability or net zero claims, ensuring transparency and avoiding double claims.





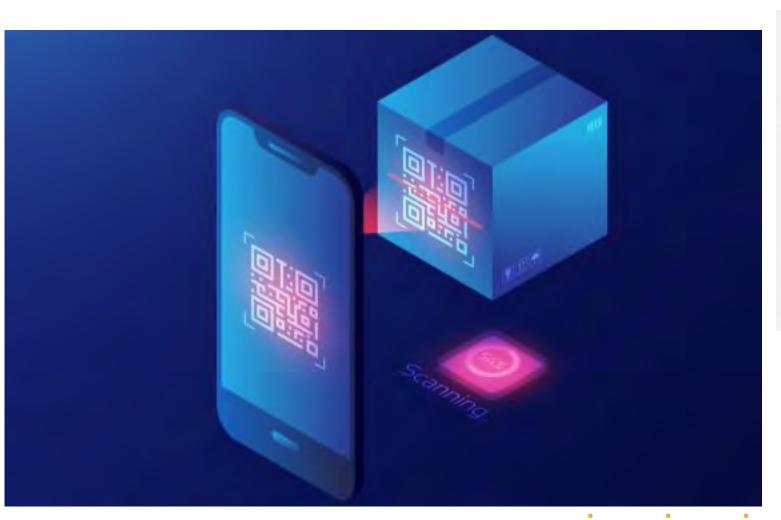
February 7, 2023

PUBLISHED IN: Press Releases



# **Emissionless procurement (product passports)**





# A sustainable future: Using blockchain for digital product passports

December 30, 2022 - by Phil Brown (op-ed)





#### **ETS for individuals and Households**



# Blockchain Potential: Digital ETS for Individuals

- The transition needs to be 'just' or it is just not going to happen
- Change needs to be incentivised but one needs to consider impact on households and individuals
- An ETS for households might also be used as a financial mechanism/incentive to facilitate just transition
- A Digital ETS covering directly small emitters and individuals could be not only an effective market mechanism tool, cutting down GHG emissions, but also an important climate justice instrument



### **Tiny Forests**



# Fast-growing mini-forests spring up in Europe to aid climate

Miyawaki forests are denser and said to be more biodiverse than other kinds of woods



A Miyawaki forest being planted on the outskirts of Paris, France. Photograph: Courtesy of Boomforest

Tiny, dense forests are springing up around Europe as part of a movement aimed at restoring biodiversity and fighting the climate crisis.

Small-scale forestry and carbon offset markets: An empirical study of Vermont Current Use forest landowner willingness to accept carbon credit programs

ALL PROJECTS Saint-Médard Reforestation project Project Operator Donate 7 Type Reforestation June 2025 Stage 5 June 2024 Stage 4

OFP ECOSYSTEN

The OFP Explorer will act as a web2 public interface to access all project from all OFP Projects

https://static1.squarespace.com/static/606cb05a7a012f3e0371e0a4/t/63c 5157c1aa905392bdf6ba0/1673860510286/2023-01 OpenForestProtocol WhitePaper.pdf

Alisa E. White , David A. Lutz, Richard B. Howarth, José R. Soto

## **Towards Regenerative Finance**

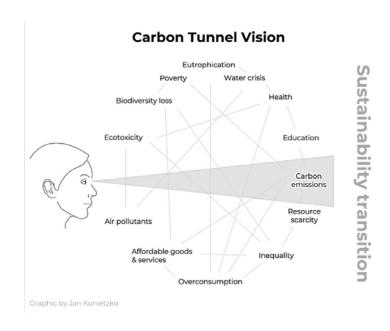


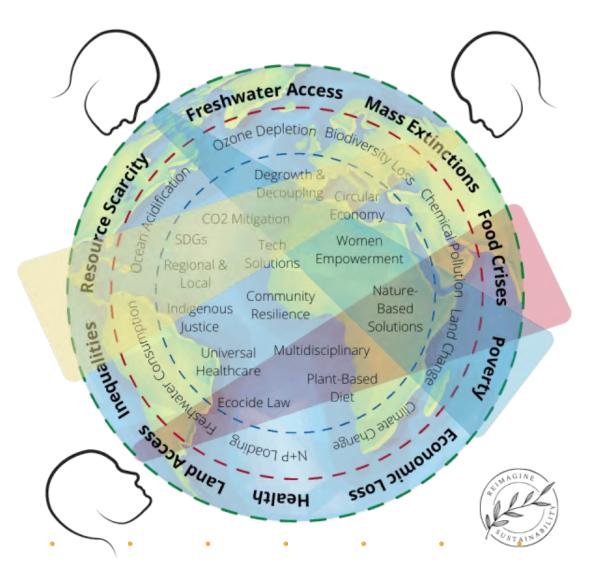
77



## Taking a holistic perspective

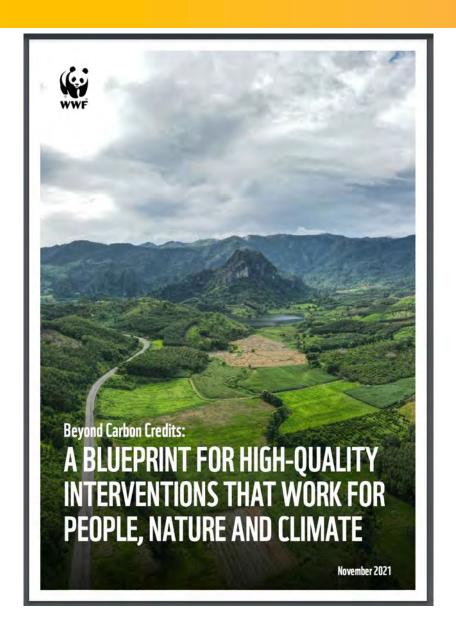








79





https://files.worldwildlife.org/wwfcmsprod/files/Publication/file/3xmko1y5k5\_wwf\_\_\_beyo nd\_carbon\_credits\_blueprint.pdf



# Comment: Why biodiversity is about to go mainstream in ESG investing

By William Attwell

October 26, 2023 11:03 AM GMT+2 · Updated 21 hours ago



Industry Insight from Ethical Corporation Magazine, a part of Thomson Reuters.



A bee covered with pollen rests on a blade of grass. REUTERS/Heinz-Peter Bader Acquire Licensing Rights [7]

October 25 - Biodiversity and nature are as critical as climate change for determining humanity's long-term prospects, but until now they have played a relatively minor role in sustainable investing. That's

https://www.reuters.com/sustainability/land-use-biodiversity/comment-why-biodiversity-is-about-go-mainstream-esg-investing-2023-10-26/

## A data strategy for impact information management



February 8, 2022









Dr. Jan Konietzko Manager, Sustainability Services, Cognizant

Jan Konietzko is a sustainability expert on a mission to help organizations thrive within planetary boundaries. His focus is on life cycle assessment (LCA), circular economy strategies and decarbonization pathways.

lan.Konietzko@cognizant.com

Moving beyond carbon tunnel vision with a sustainability data strategy

To get past a carbon-only approach, businesses need a data strategy that helps them manage information on a range of environmental and social impacts.

Visit our ESG web page

In November 2021, I posted a graphic (see below) on LinkedIn that reflects a frequent debate around environmental sustainability: that companies seem overly and narrowly focused on carbon emissions. The graphic was shared more than 1,000 times and reached over 600,000 people. It turns out I'm not the only one concerned about carbon tunnel vision.

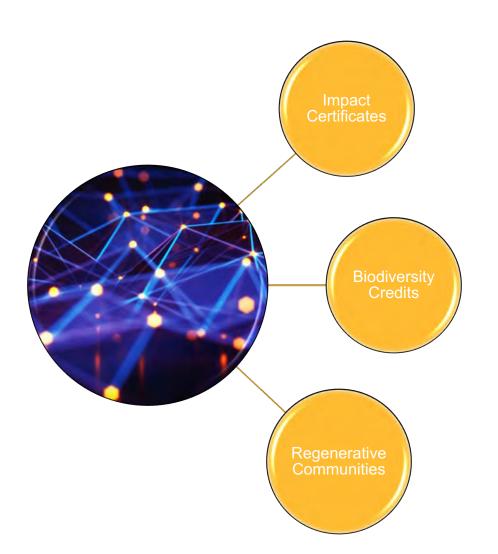
#### Data: a key sustainability enabler

Linking different impacts in interventions requires more variables to track. And collecting new data on these variables can be tedious and costly. A clear data strategy helps manage this increased complexity. It ensures that data collection efforts and technologies are easy to use and integrated in the day-to-day workflows of the people that own the data, and that these people have clear incentives to contribute. The data strategy also needs to adhere to the highest ethical standards to ensure trust, fair practices and data privacy compliance.

## **ReFi Building Blocks of Interest**



82



General purpose infrastructure for creating impact markets

The most developed ecosystem surrounding ecosystem impact

A new model for organising around public goods, where the people themselves are public goods too.

## Why impact certificates?



KelloggInsight

KELLOGG SCHOOL OF MANAGEMENT AT NORTHWESTERN UNIVERSITY

**BUSINESS INSIGHTS** 

LEADERSHIP & CAREERS POLICY & THE ECONOMY

SOCIAL IMPACT ORGANIZATIONS HEALTHCARE

AUG 7, 2020

#### Why Well-Meaning NGOs **Sometimes Do More** Harm than Good

Studies of aid groups in Ghana and Uganda show why it's so important to coordinate with local governments and institutions.

BASED ON THE RESEARCH OF

Erika Deserranno Aisha Nansamba Nancy Qian Katharine Baldwin Dean Karlan Christopher Udry Ernest Appiah



Yevgenia Nayberg

SIGNIA

SOCIAL ISSUES

SECTORS

SOLUTIONS

MAGAZINE

GLOBAL EDITIC

Nonprofit Management

#### Are Nonprofits Getting in the Way of Social Change?

Solving major social problems is now possible, but not unless the organizations that have been most responsible for making a difference change significantly.

SHARE

COMMENT

ORDER REPRINTS

By Paul Klein

## Impact certificates being suggested





#### **Punk Rock Bio**

#### **Exploring Impact Certificates**

Could a new certificate make funding public goods as successful as venture capital?









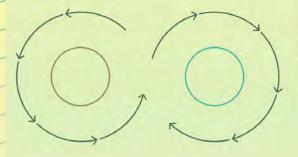
## **General Purpose Impact Infrastructur - Hypercerts**



### **Reward impact with hypercerts**

To solve the challenges we face this century, we need scalable and sustainable financing models for public goods that reward contributors for the positive impact they create.

Using the same hypercert primitive, funders and projects create a scalable, interoperable and transparent funding environment for innovative public goods.

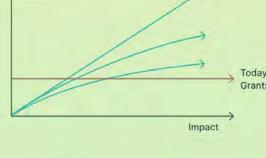


#### Recurring income for public goods

Retrospective funding rewards projects for the impact they have created. As long as projects create impact, they can create hypercerts for the impact and get retrospective rewards for these. In contrast to today's grant systems, projects have recurring income streams.



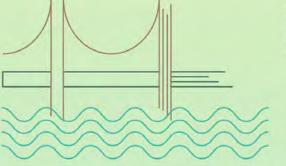
Buying hypercerts retrospectively allows runders to increase their runding in relation to the impact created, incentivizing projects to maximize their positive impact. Funders benefit from a large positive impact and incur project risks. Retrospective funding encourages high-risk/high-potential public goods.



Reward

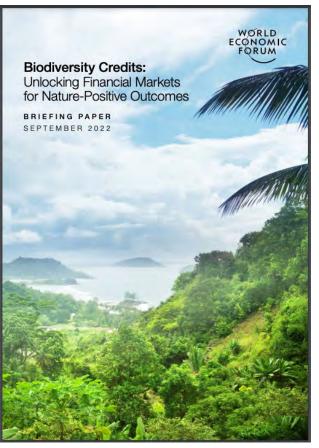
#### De-risking impact-funding

Retrospective funders allocate their funds more effectively as they face less uncertainty about the impact projects had. This is especially important when the impact of public goods doesn't increase linearly. Retrospective funders wouldn't waste funds by rewarding a project for building half a bridge.



### **Biodiversity credits – Institutional initiatives**











• • • • • 8

### **Biodiversity credits - Private initiatives**



#### **Voluntary Biodiversity Credits by Terrasos**

Banco de Hábitat, Bosque de Niebla - El Globo

BIODIVERSITY

#### Description

#### CONTEXT

El Globo is the first project in Colombia to issue Voluntary conservation initiative registered as Habitat Bank by the Colom Cuchilla Jardín-Támesis Integrated Management District (DMI by star" of southwestern Antioquia, this area is within the Antioqui Here, ecosystem preservation, enhancement and restoration impacts on biodiversity.

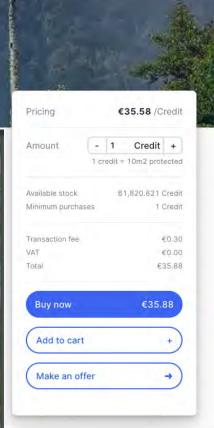
#### RELEVANCE

The fragments of Cloud Forest found within the El Globo are s provide important ecosystem services related to water regulatio These patches of forest also represent an exceptional place to a loss and fragmentation, enabling fundamental biological processe

#### HOW DOES IT WORK?

- Habitat Banks are land where conservation initiatives are adde or restoration actions are implemented to generate quantifiable bi
- The project applied the Protocol for the Issuance of Volunt





# METHODOLOGY FOR QUANTIFYING UNITS OF BIODIVERSITY GAIN

Biodiversity quantification approach developed by the Wallacea Trust

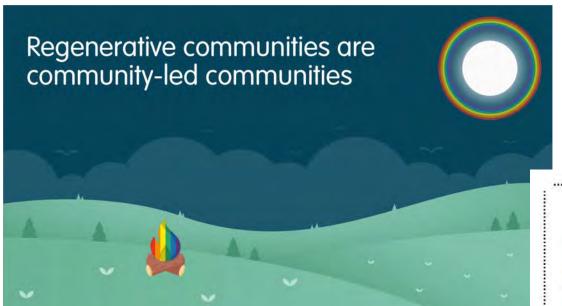
Version 3 (October 2023)

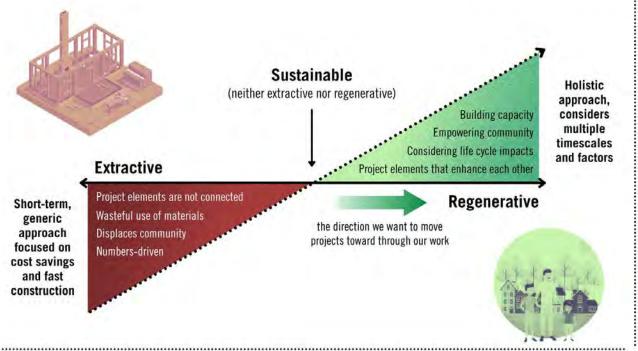
Updates: Version 3 includes several in-text modifications such as:

- Improvements in the list of definitions;
- Improvements on the guidance for Importance scores calculation;
- Improvements on abundance score calculations
- How to proceed if there is no reference site for uplift projects
   Improvements on how to apply a structural metric
- Improvements on uncertainty adjustments;
- Improvement on the guidance to calculate areas of avoided loss
- Improvements on the guidance on how to deal with leakage
- Improvement on the guidance to calculate awardable biodiversity credits
- Development of external independent academic peer review to verify biodiversity claims

## Regenerative communities

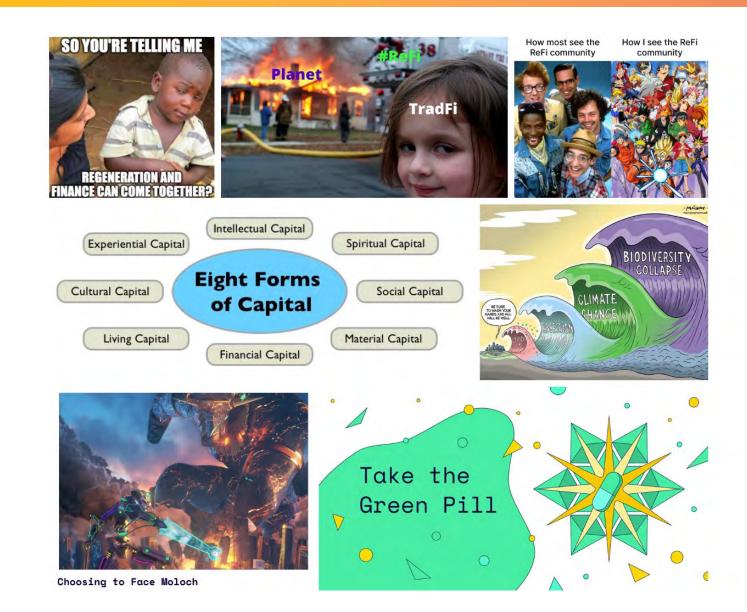






## The Web3 community working on holistic approaches





## The rise of the ReFi ecosystem



# ReFi Impact 2022

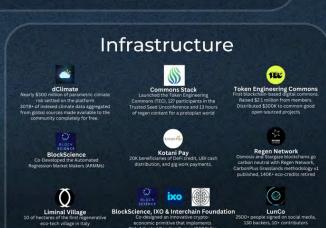
Data collected is self-reported by team members of each organization. No data has yet been received on the following categories: Clean energy, Water crisis, inequality, Air pollutants, Ecotoxicity, Health, Waste & Over-Consumption.



Poverty

Kokonut DAO

PaperTree





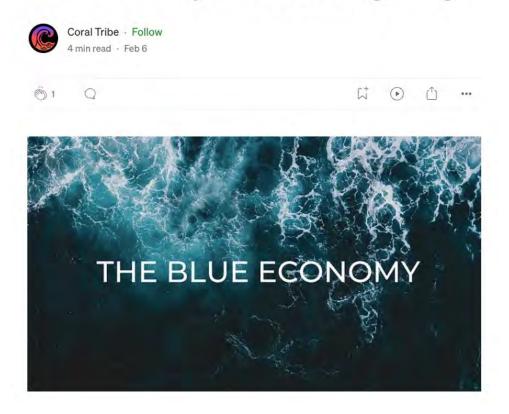


https://blog.refidao.com/refiroundup-2022/

### **Examples of ReFi project**



# From Threatened to Thriving: The Blue Economy is the next big thing





#### **ReFi Communities**



#### About us

#### Purpose

We are individuals and organizations building new models of sustainable public goods funding and value alignment in open source networks. Our good with Funding the Commons is to bridge the public goods community across Web2, Web3, research, philanthropy and industry. We do this by convening builders and practitioners, researchers and academics, and funders and philanthropists, catalyzing innovation in public goods. In the future, we seek to expand our impact by facilitating the creation of a public goods fund tied to impact evaluators, seeding projects that are conceived and incubated by the Funding the Commons community.

#### Vision

We envision a world where the incentives that govern human coordination at scale push our species to develop an economy that prioritizes public goods above all else. This world has top global talent innovating on public goods, supported by welldeveloped impact evaluation systems tied to continuous streams of project capital.





(one green pill at a time)



#### About ReFi DAO

ReFi DAO is a network society on a mission to regenerate the earth.

Our vision is to realize a global regenerative economy rooted in local startup communities that acquire land and other real-world assets.

We do not exist in opposition to other nations, rather as an accelerant to realize the Paris target of a net zero economy by 2050.



# Blog on Conference Funding the Commons





# Highlights of Visiting Funding the Commons Paris

#### Blog Yvo Hunink

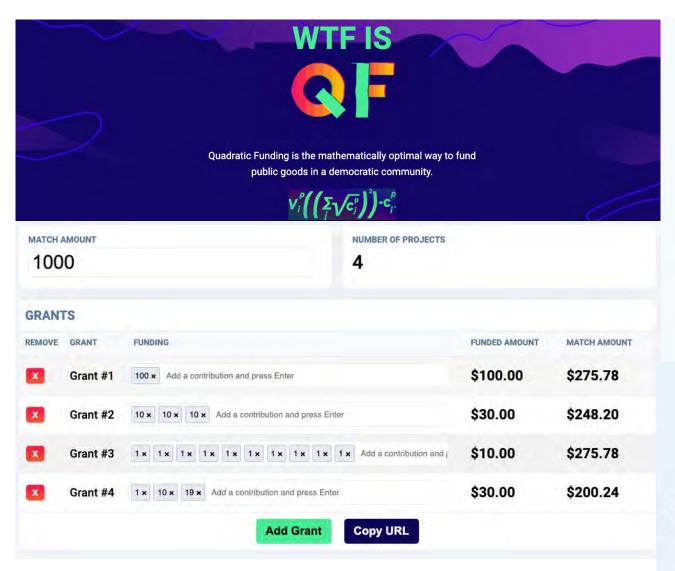
In July 2023, our theme lead for Energy & Sustainability Yvo Hunink, visited the **Funding the Commons** conference in Paris. This event brings together the community around funding public goods and regenerative finance. It is funded by some well-known names in the web3 space, such as Gitcoin, Protocol Labs and Brave.

In this blogpost, the highlights of the workshops and presentations that Yvo attended are given, as he understood the complex material for a non-developer. You will find the following topics:

- Revolutionary coordination systems
- Nature-positive blockchain projects
- Launch of the Ethereum climate platform
- Tokenized carbon credits and impact certificates
- Mechanisms to support indigenous communities in conservation of nature
- A public funding platform backed by a 100K ether staking rewards pool
- Open-source Impact Funding Systems
- And more....

## **Funding Public Goods with Quadratic Funding**





### The secret behind QF

It's the math™

A matching pool is raised, and then a crowdfund campaign is matched according to the QF algorithm:

Number of contributors matters more than amount funded.

This pushes power to the edges, away from whales & other central power brokers.

This creates more democracy in public goods funding decisions!

Want to see the math in action? Use the calculator below!



\$22,907,689

HAS BEEN DISTRIBUTED VIA PROJECTS LIKE:









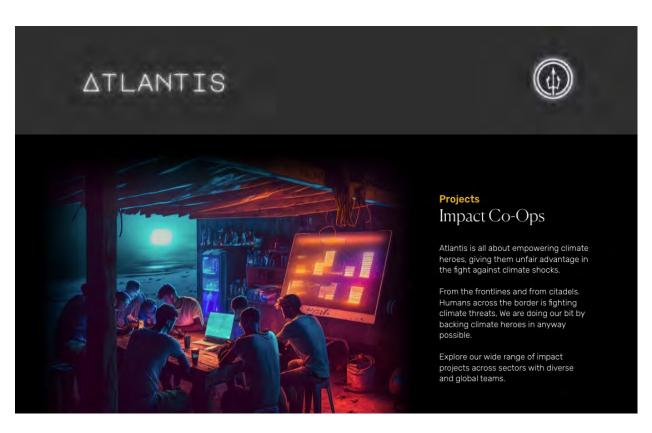
**Gitcoin Grants** \$19,834,000

**Pomelo Grants** \$3,035,689

\$38,000

### **Examples of regenerative communities**







**Building Inclusive And Resilient** 

#### **Ecosystems That Regenerate**





Building on top of local networks to improve resource effectiveness and community involvement.



#### Circulairity of Value

Increasing local value production and circulation to have a profound and lasting impact on all.



#### **Restoring Nature**

Developing in symphony with nature to protect and regenerate natural ecosystems from the ground up.

- Degenerative Past

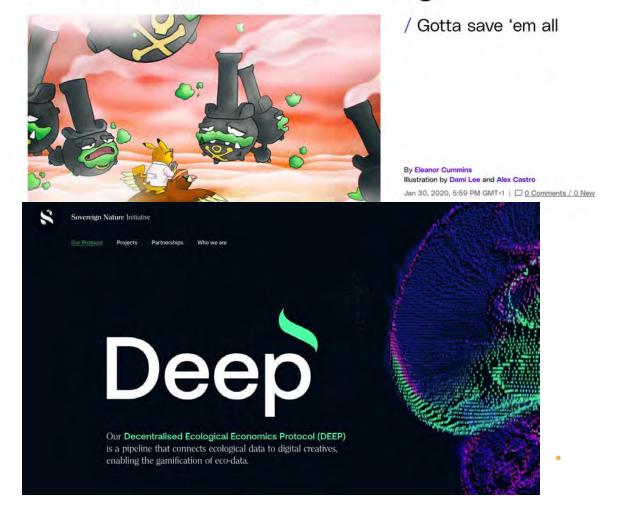
The ecosystem we create

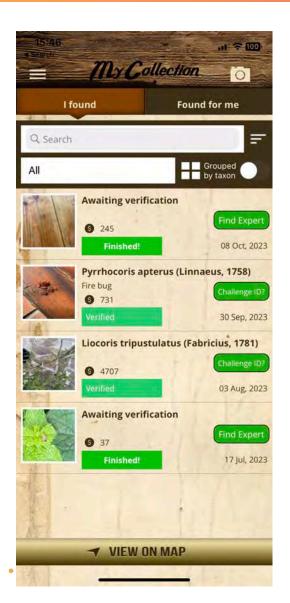
## Gamifying natural conservation



ENTERTAINMENT / GAMING / POKEMON

# What Pokémon can teach us about conservation and climate change





### **Discussion**





Now all that seems nice, but is this really something we should be pursueing? We discuss:

- Illusions of green capitalism
- More or less technology
- Good ideas in practice
- Incentives and behaviour
- Intention vs Image

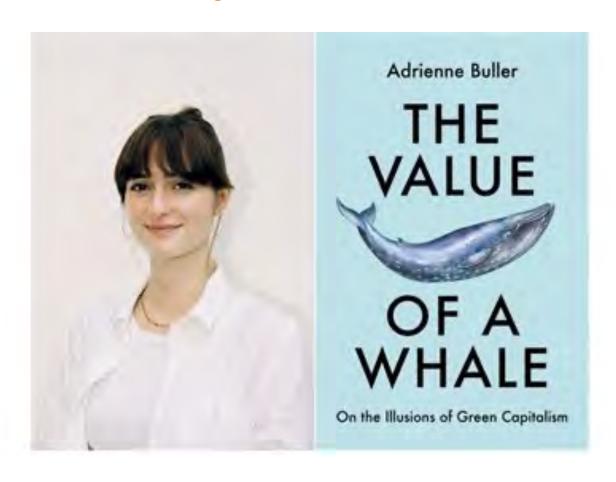
### Illusions of green capitalism



#### Should we make markets out of everything if we can't even figure out carbon?

"The trouble is that green capitalist solutions aren't making a material difference. Emissions aren't falling. Carbon markets aren't working. The carbon offsets market is rife with corruption, exploitation and dubious claims. These false solutions have been a distraction."

https://earthbound.report/2022/07/11/bookreview-the-value-of-a-whale-by-adriennebuller/



### Technology alone is not enough



Technology and needs law to be fully effective. Rights for nature, allows a forest to own itself, the technology can make it operable.

#### terra0

Can an augmented forest own and utilise itself?

Paul Seidler, Paul Kolling and Max Hampshire May 2016 Berlin University of the Arts, Germany

terra0 is a self-owned forest; an ongoing art project that strives to set up a prototype of a self-utilizating piece of land. terra0 creates a scenario whereby a forest is able to sell licences to log trees through automated processes, smart contracts and Blockchain technology. In doing so, this forest accumulates capital. A shift from valorization through third parties to a self-utilization makes it possible for the forest to procure its real exchange value, and eventually buy (thus own) itself. The augmented forest, as owner of itself, is in the position to buy more ground and therefore to expand.

terra0 is a project originally developed in the Digitale Klasse at the University of Arts, Berlin by Paul Seidler an Paul Kolling. This concept paper is written by Paul Seidler, Paul Kolling and Max Hampshire. "We can program it to make a little bit of profit, so it's got some money for a rainy day, but not excessive amounts. We can make it the most moral, socially minded capitalist possible. (...) You would be using an app that goes onto Tradenet and says: 'Here I am, this is where I want to go, give me your best offers,'. (...) The autonomous taxis out there would then submit their best prices, and that might be based on how far away they are, how much fuel they have, the quality of their programming. (...) Eventually you pick one - or your phone does it for you - and it's not just by the cheapest price, but whether the car has a good track record of actually completing rides successfully and how nice a vehicle it is." <sup>3</sup>

In Hearn's scenario, self-owning cars do not operate intelligently, but act in accordance with hard-wired basic rules which favour their own economic interests. Below follows the outlining of a prototype for an autonomously acting, self-



## **Good ideas in practice**



High-powered satellites have made bluecarbon credits a reality. But they still face accuracy and scalability issues.

Tasmin Lockwood ① 10 aug 2023















Seagrass meadows are often overlooked by the public, but they're vital to the ocean ecosystem. Foto: Ben Jones, Author provided



#### Who Verifies the Verifiers?





As the world becomes increasingly more digital and connected, many potential opportunities are opened up to the global population, including some life-changing and essential avenues and services that will not have been available to them before. However, with this comes an equally expanding opportunity for those with ill intent to abuse new systems or scam users. Therefore, it is vital that measures be put in place to ensure people, businesses and their belongings are secure and safe to interact as they enjoy the benefits of worldwide connectivity.

### **Incentives and behaviour**



#### How Centralized Is the Bitcoin (BTC) Mining Sector?

Five BTC mining pools currently control over 85% of the total mining power. How did this happen?



by Simona Ram. Fact checked by: Ciaran Lawler, Editor: Heather Budreviciene

Published: February 7, 2023 | 2:00 PM GMT



### **Intention versus image**





We're happy to share that we've entered a collaboration with Shell to accelerate open-source innovation in the energy sector. Together, we're driving sustainable solutions and making a positive impact on the world. Let's dive in!



4:22 PM · Aug 14, 2023 · 455.3K Views











### Conclusion



#### 10 reasons why carbon offsets are like ice cream

You only get ice cream if you eat your veggies. Similarly, you can use carbon offsets if you take action to abate emissions.



Good ingredients and processes make quality ice cream, and offsets need integrity in the whole value chain from creation to retirement.



Just as there are many flavors of ice cream, multiple types of offsets can coexist.



In both ice cream and carbon offsets, buyers make choices based on attributes and outcomes they want, and pay accordingly.



Sorbet is not ice cream. Minimum offsets standards are also necessary.



Responsibility for a contaminated batch of ice cream lies with the producer, so buyers of offsets must not be responsible for the process.



Just like choosing generic vs. artisan brands, need to distinguish quality of offsets to help make appropriate choices.





Just as overconsumption can lead to obesity, abatable emissions that aren't yet reduced must carry more stringent requirements for use.





You can pay extra for nuts, fruits, and candy, so SDG impacts should be considered to enhance quality and appeal of offsets.





To make offsets as widely available as ice cream, we need a liquid market with variety, multiple purveyors, industry standards, buyer choice, and consequences for bad quality and excess use.

Source: Climate Policy Initiative

### How do we continue?



- A carbon credit working group with 2Tokens and Pando Exchange
  - Designing a tokenized credit for households using solar panels following the Core Carbon Principles
- Exploring Climate Funding with Quadratic Funding & Gamification
  - Webinars on 7th and 14th of November
- Exploring the need for a ReFi NL community
  - Send me a message if you want to be part
- Connecting to other DBC projects
  - Product passports, organisational wallets, identity wallets

# **Dutch** Blockchain Coalition

connect and create

- # dutchblockchaincoalition.org
- @BCcoalitionNL
- **n** Dutch Blockchain Coalition

Kern partners





































































