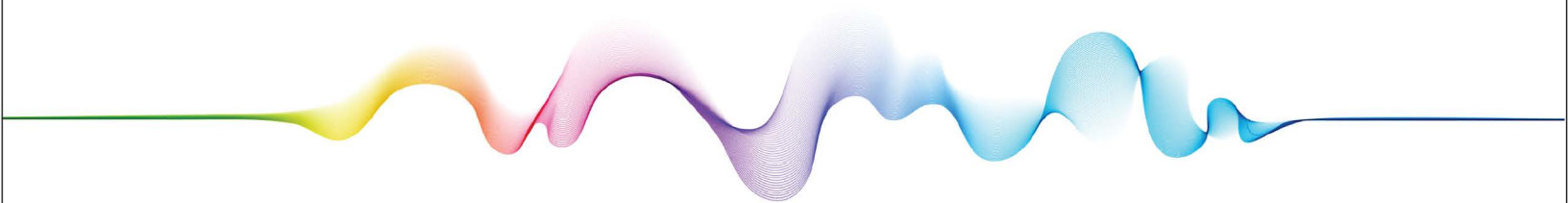


I N S I G H T R E P O R T

AN OVERVIEW OF CARBON MARKET AND TRADING PLATFORMS



C L I M A T E S C I E N C E



TAG Insights Report: An Overview of Carbon Market and Trading Platforms

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Introduction

This TAG Insights Report on *Carbon Market and Trading Platforms* is intended to help companies, managers, practitioners, researchers, investors, and commercial vendors better understand current trends, issues, and market opportunities in this area. A list of representative commercial vendors working in various areas of the carbon market and trading platforms is included. The five specific areas covered in this report include:

1. Emission Reduction Verification Services
2. Carbon Offset Project Development
3. Carbon Credit Exchange Program
4. Blockchain-Based Carbon Trading
5. Carbon Taxation Solutions

This report is intended for general and unrestricted use, but interested readers are encouraged to connect with the TAG research and advisory team for more information on the private [TAG Research as a Service \(RaaS\)](#) community that covers, discusses, and shares information on these topics in more depth and includes a wider range of startups, vendors, and companies.

TAG Climate Taxonomy

Our advisory work at TAG is guided by our TAG Climate Taxonomy which includes twenty different market categories, with one hundred associated subcategories – all developed consistent with our research into emerging and existing commercial offerings. Subscribers to

TAG Research as a Service (RaaS) have access to the more detailed specifics of the taxonomy and the full set of companies working in each area.

The taxonomy is intended to be interpreted as a market guide for commercial (and in some cases, open source) platforms, tools, products, and services. The day-to-day tasks of any practitioners focused on sustainability will include many considerations, not typically represented in our taxonomy, such as dealing with regulators, addressing compliance issues, and keeping up with legislation that will. We focus here on products and services.

TAG Climate Taxonomy V2.0 – 1Q2024

1 Renewable Energy 1.1 Solar and Wind Power Generation 1.2 Fission and Fusion 1.3 Hydropower Innovations 1.4 Geothermal Energy Technologies 1.5 Bioenergy and Biomass Systems	6 Water Management 6.1 Water Purification and Filtration 6.2 Smart Irrigation and Agriculture 6.3 Industrial Water Recycling 6.4 Stormwater Management 6.4 Desalination Technologies	11 Climate Data Analytics 11.1 Climate Modeling and Prediction 11.2 Weather Forecasting Technologies 11.3 Environmental Monitoring Services 11.4 Climate Risk Assessment Service 11.5 Carbon Footprint Assessment Tools	16 Eco-Friendly Consumer Products 16.1 Sustainable Fashion and Textiles 16.2 Eco-Friendly Personal Care Products 16.3 Biodegradable Packaging 16.4 Energy-Efficient Appliances 16.5 Sustainable Electronics
2 Energy Efficiency 2.1 Building Energy Management 2.2 Smart Grid and Energy Storage 2.3 LED Lights/Energy-Efficient Appliances 2.4 Industrial Process Optimization 2.5 HVAC and Cooling Solutions	7 Sustainable Agriculture 7.1 Precision Farming Technology 7.2 Organic Farming Solutions 7.3 Soil Health and Nutrient Management 7.4 Vertical Farming and Aquaponics 7.5 Crop Monitoring and AgTech	12 Sustainable Food and Beverage 12.1 Plant-Based and Lab Grown Meat 12.2 Sustainable Seafood Production 12.3 Food Waste Reduction Technologies 12.4 Eco-Friendly Food Packaging 12.5 Sustainable Ingredients and Oils	17 Clean Air and Pollution Control 17.1 Air Quality Monitoring Services 17.2 Air Purification Technologies 17.3 Pollution Source Tracking 17.4 Emission Control Systems 17.5 Indoor Air Quality Solutions
3 Sustainable Transportation 3.1 EV Charging Infrastructure 3.2 Sustainable Urban Mobility Solutions 3.3 Fleet Electrification Services 3.4 Alternative Fuel Technologies 3.5 EV Battery Recycling and Repurposing	8 Circular Economy 8.1 Recycling and Waste Management 8.2 Product Lifecycle Assessment 8.3 Sustainable Packaging Solutions 8.4 Reusable and Repairable Products 8.5 Upcycling and Repurposing Services	13 Eco-Tourism and Recreation 13.1 Eco-Friendly Accommodations 13.2 Sustainable Travel Booking Platforms 13.3 Adventure Tourism/Conservation Focus 13.4 Wildlife Monitoring/Conservation Tours 13.5 Eco-Friendly Outdoor Gear	18 Climate Education and Services 18.1 Climate Change Education workshops 18.2 Sustainability Training 18.3 Climate Industry Advisory 18.4 Climate Intelligence Software 18.5 Climate Insurance
4 Carbon Capture and Utilization (CCU) 4.1 Direct Air Capture incl. Point Source 4.2 Carbon Removal and Sequestration 4.3 Carbon Mineralization 4.4 Enhanced Oil Recovery (EOR) 4.5 Soil-Based Sequestration	9 Carbon Market and Trading Platforms 9.1 Emission Reduction Verification Services 9.2 Carbon Offset Project Development 9.3 Carbon Credit Exchange Program 9.4 Blockchain-Based Carbon Trading 9.5 Carbon Taxation Solutions	14 Green Energy Storage 14.1 Advanced Battery Technologies 14.2 Advanced Fuel Cells 14.3 Energy Storage for Electric Vehicles 14.4 Grid-Scale Energy Storage Solutions 14.5 Hydrogen Energy Storage	19 Sustainable Supply Chain 19.1 Sustainable Sourcing/Procurement 19.2 Supply Chain Transparency 19.3 Ethical Labor Practices 19.4 Circular Supply Chain Solutions 19.5 Eco-Friendly Transport in Supply Chain
5 Green Building and Infrastructure 5.1 Sustainable Architecture and Design 5.2 Green Building Materials and Concrete 5.3 Zero-Emission Construction Equipment 5.4 Green Roofing and Insulation 5.5 Sustainable Urban Planning	10 Sustainable Finance and Investment 10.1 Green Bonds and Sustainable invest. 10.2 ESG Analysis 10.3 Impact Investment Platforms 10.4 Carbon Disclosure and Reporting Tools 10.5 Sustainable Investment Advisory	15 Biodiversity and Conservation 15.1 Wildlife Habitat Restoration 15.2 Conservation Tech for Monitoring 15.3 Anti-Poaching Solutions 15.4 Sustainable Forestry Practices 15.5 Marine Conservation Initiatives	20 Green Technology Integration 20.1 IoT for Sustainability 20.2 Autonomous Electric Vehicles 20.3 Blockchain/Transparent Supply Chain 20.4 3D Printing for Sustainable Manufact. 20.5 Space Tech for Climate Monitoring

Figure 1. TAG Climate Taxonomy

Overview of Carbon Market and Trading Platforms

The following emerging global commercial opportunities for carbon market and trading platforms are covered in this report, including the listing of several viable commercial entities providing solutions on the market today:

- Emission reduction verification services play a crucial role in the carbon market by ensuring the integrity and accuracy of reported emission reductions. They audit and validate the effectiveness of measures taken to reduce greenhouse gases, thereby establishing trust and credibility in the carbon credits that are subsequently traded on the market.
- Carbon offset project development contributes to sustainability by creating new projects that reduce, remove, or sequester emissions, such as reforestation or renewable energy projects. The carbon offsets generated from these projects can be

sold on carbon markets, providing financial incentives for further emissions reduction initiatives.

- Carbon credit exchange programs facilitate the trade of carbon credits by providing a platform where credits can be bought and sold. This helps to efficiently allocate financial resources towards the most cost-effective emission reduction projects, promoting a market-driven approach to achieving carbon neutrality.
- Carbon trading and the use of blockchain technology enhances transparency, traceability, and security of transactions. It reduces the likelihood of double counting and fraud, making the trading process more reliable and potentially reducing transaction costs.
- Carbon taxation solutions impose a cost on carbon emissions, incentivizing businesses and individuals to reduce their carbon footprint. The revenue generated from carbon taxation can be used to fund environmental projects or to lower other taxes, thus promoting sustainable practices within the economy.

Focus Area: Emission Reduction Verification Services

Emission Reduction Verification Services are the backbone of credibility in the carbon market and trading platform. These services ensure that claims of reduced or avoided emissions meet established standards and protocols. They employ scientific methods to assess projects' actual impact on greenhouse gas (GHG) reductions. This verification process is critical as it prevents overstatement of achievements and ensures that each carbon credit represents a real, quantifiable, and verifiable unit of GHG reduction.

By employing third-party auditors, these services foster transparency and independence in the reporting process. The auditors assess everything from the initial baseline calculations to the ongoing monitoring of project outputs. Their meticulous examination and subsequent approval provide the necessary assurance to both buyers and sellers that carbon credits have real environmental value. This builds trust in the carbon market, encouraging more entities to participate in carbon trading as a viable strategy for mitigating climate change.

Furthermore, verified emission reductions can be used by companies to showcase their commitment to sustainability, thus enhancing their brand value and corporate reputation. In terms of market mechanics, these services filter out less credible projects, ensuring that only high-quality carbon credits circulate in the trading systems. This, in turn, helps to establish a fair price for carbon, reflecting its true cost to the environment.

Focus Area: Carbon Offset Project Development

Carbon Offset Project Development is a dynamic segment of the carbon market that facilitates the translation of emission reduction initiatives into tradable carbon credits. Developers identify, design, and implement projects that can range from afforestation and reforestation to renewable energy and energy efficiency programs. Each project is meticulously planned to comply with rigorous standards that quantify the amount of carbon emissions reduced, avoided, or sequestered.

The process of developing a carbon offset project is intricate, requiring a deep understanding of local conditions, scientific methodologies for quantifying GHG reductions, and adherence to certification standards. Projects must not only demonstrate environmental integrity but also ensure that they contribute to sustainable development goals, such as improving biodiversity, supporting local economies, and respecting the rights of indigenous peoples.

Once a project is operational, it generates carbon credits, which are essentially certificates representing a reduction of one metric ton of CO₂ or its equivalent in other greenhouse gases. These credits can then be sold to entities looking to offset their own emissions, thereby injecting vital funds back into the project for its continuation and expansion. This creates a virtuous cycle, where successful projects not only contribute to climate change mitigation but also become self-sustaining through the revenues generated from the sale of carbon credits.

Focus Area: Carbon Credit Exchange Program

A Carbon Credit Exchange Program acts as a marketplace for the buying and selling of carbon credits. It serves as the intermediary between entities that need to offset their emissions and those that create carbon credits through GHG reduction projects. By providing a standardized and regulated platform for transactions, it ensures liquidity in the market, making it easier for companies and individuals to meet their carbon neutral goals.

The exchange program operates under stringent rules to maintain market integrity, including registration requirements, trading rules, and compliance mechanisms. These rules are designed to prevent fraud, ensure transaction security, and maintain market confidence. Moreover, the program often provides market data and transparency, which is essential for participants to make informed decisions regarding the purchase or sale of credits.

As companies face increasing pressure from regulations, stakeholders, and consumers to reduce their carbon footprint, these programs offer a vital service by matching demand with supply. They facilitate the transfer of funds from entities that can afford to pay for offsets to those that can deliver emission reductions most efficiently. This not only drives investment in environmentally beneficial projects but also encourages global collaboration in the fight against climate change.

Focus Area: Blockchain-Based Carbon Trading

Blockchain-based carbon trading is an innovative segment that utilizes distributed ledger technology to enhance the carbon market's efficiency and integrity. Blockchain's inherent characteristics—decentralization, immutability, and transparency—provide a robust foundation for recording and verifying transactions without the need for central authority. This technology can revolutionize carbon trading by making it more accessible, reducing the risk of double counting and fraud, and lowering transaction costs.

The use of blockchain in carbon trading allows for the creation of smart contracts, which automatically execute trades when certain conditions are met, reducing the need for intermediaries. This streamlines the trading process, allowing for real-time settlement of transactions. Moreover, the transparency provided by blockchain technology enables all participants to track the ownership and transfer of carbon credits, ensuring that each credit is retired only once, thereby maintaining the environmental integrity of the market.

Blockchain also opens the market to a broader range of participants by enabling peer-to-peer transactions. Smaller projects that may have been excluded from traditional markets due to high entry barriers can now access a global pool of buyers directly. This market democratization encourages more emission reduction projects, driving innovation and competition.

Focus Area: Carbon Taxation Solutions

Carbon Taxation Solutions impose a direct fee on the carbon content of fossil fuels and, in some instances, other GHG emitting activities. By putting a price on carbon, they effectively incorporate the social cost of emissions into the economic system, providing a financial incentive for emitters to reduce their carbon footprint. The price signal created by a carbon tax encourages businesses and consumers to shift towards cleaner technologies and practices, fostering innovation and driving the transition to a low-carbon economy.

Revenue generated from carbon taxes can be substantial and is often used to fund green infrastructure, renewable energy projects, or to lower other taxes. This can create a double dividend by not only reducing emissions but also by improving economic efficiency through the reduction of other, more distortionary taxes. Furthermore, carbon taxation can be designed to be revenue-neutral, with the government redistributing the proceeds back to the population through rebates or dividends, thus offsetting the regressive nature of the tax and ensuring a fair transition for all sections of society.

Carbon taxation also complements other elements of the carbon market by establishing a floor price for carbon, ensuring that market prices do not fall below a level that would deter investment in low-carbon alternatives. This solution provides a predictable and steadily increasing cost of carbon, giving businesses the certainty they need to invest in long-term strategies for emission reduction.

In sum, carbon taxation is a versatile policy tool that can be tailored to national contexts and preferences. When implemented effectively, it can be a powerful driver for reducing global GHG emissions and spurring sustainable development. In recent years several pieces of legislation have been introduced in the US Congress, many of which had bipartisan sponsors. Though these proposed bills did not pass into law, they clearly signal that carbon pricing may be inevitable, and companies should prepare for various scenarios.

Companies and Contributions

The companies listed below emerged as part of our research at TAG Climate. Our goal in listing these fine firms is to provide a starting point for buyers, advocates, stakeholders, and researchers trying to make sense of the commercial landscape for carbon market and trading platforms as a means for driving toward a more sustainable future.

Emission Reduction Verification Services Vendors

1. [Applus+ Certification](#): Provides robust greenhouse gas accounting programs and certifications to ensure quality and credibility in voluntary carbon markets.
2. [Bureau Veritas](#): A global leader in testing, inspection, and certification services, helping clients meet the growing challenges of quality, safety, environmental protection, and social responsibility.
3. [Control Union](#): Offers a range of certification programs to facilitate sustainable development in various sectors.
4. [DNV](#): An independent assurance and risk management provider, operating in more than 100 countries to help customers make the world safer, smarter, and greener.
5. [Toitu Envirocare](#): Provides comprehensive environmental certification to companies across the globe.
6. [First Environment](#): A strategic environmental and engineering consulting firm that operates climate change and sustainability programs.
7. [Intertek](#): Provides Total Quality Assurance to industries worldwide, ensuring products meet quality, health, environmental, safety, and social accountability standards.
8. [NSF International](#): Dedicated to being the leading global provider of public health and safety-based risk management solutions.
9. [Perry Johnson Registrars](#): Offers a full suite of certification services including ISO standards, proving commitment to quality, environmental management, safety, and security.
10. [Rainforest Alliance](#): Works to conserve biodiversity and ensure sustainable livelihoods by transforming land-use practices, business practices, and consumer behavior.
11. [SCS Global Services](#): Specializes in third-party verification and validation of environmental, sustainability, stewardship, food quality, food safety, and food purity claims.
12. [SGS](#): A leading inspection, verification, testing, and certification company recognized as the global benchmark for quality and integrity.
13. [TÜV SÜD](#): Offers a range of certification, testing, auditing, advisory, and training services to ensure that products and systems comply with international standards and regulations.
14. [Verra](#): Verra operates the Verified Carbon Standard (VCS) Program, the world's leading greenhouse gas crediting program, aiming to drive finance toward activities that reduce and remove emissions.

Carbon Offset Project Development Vendors

1. [3Degrees](#): With over 15 years in the field, 3Degrees works on various carbon offset projects, including landfill gas capture, and offers strategic partnership for entities looking to build a portfolio of carbon reduction and removal projects.
2. [Anew](#): Anew operates in the US, Canada, and Europe, focusing on offset credits from forest management, carbon capture, and other environmental commodity projects.
3. [Anthesis Group](#): Specializes in developing carbon projects that create a credible impact and focuses on nature-based solutions, among other sustainable initiatives.
4. [Climate Impact Partners](#): Creates tailored solutions that match sustainable development and commercial goals with a focus on carbon offsetting.
5. [ClimeCo](#): A leader in the management and development of environmental commodities, including project development for offsets.
6. [Cool Effect](#): Funds high-quality carbon reduction projects around the world, with a focus on transparency and project effectiveness.
7. [Finite Carbon](#): North America's leading developer of forest carbon offsets, working with landowners to develop projects that generate carbon credits.
8. [GreenTrees](#): Works on reforestation and improved forest management projects to sequester carbon.
9. [Native](#): Provides carbon offset solutions with a focus on projects that create sustainable impact for communities and the environment.
10. [Nori](#): Utilizes a blockchain-based platform to create a transparent and reliable way to pay for carbon removals, focusing on regenerative agriculture projects.
11. [South Pole](#): A leading provider of global sustainability financing solutions and services, including project development.
12. [Terrapass](#): Engages in various projects aimed at reducing carbon footprints, including methane capture, renewable energy projects, and direct carbon capture.

Carbon Credit Exchange Program Vendors

1. [AirCarbon Exchange \(ACX\)](#): Utilizes blockchain technology for trading carbon credits in the aviation industry.
2. [Carbon Trade Exchange \(CTX\)](#): Offers user-friendly spot trading and various carbon standard integrations for carbon credits.
3. [Carbonplace](#): Currently in development, aimed at providing secure transfers of certified carbon credits.
4. [Chicago Mercantile Exchange \(CME\)](#): Launched the Global Emissions Offset (GEO) futures contract for the voluntary emissions market.
5. [Climate Impact X \(CIX\)](#): A forthcoming exchange for trading quality voluntary carbon offsets.
6. [Intercontinental Exchange \(ICE\)](#): Provides a platform for a variety of futures exchanges, including carbon credits.
7. [NCX](#): Connects landowners to various natural capital programs, facilitating engagement with environmental solutions.
8. [Toucan Protocol](#): Integrates carbon markets with decentralized finance by tokenizing carbon credits.

Blockchain-Based Carbon Trading Vendors

1. [AirCarbon](#): A Singaporean startup that has developed a blockchain-based carbon trading platform. It offers tokens backed by carbon credits that are eligible under the Carbon Offset and Reduction Scheme for International Aviation (CORSA).
2. [Carbonplace](#): Backed by major financial institutions, Carbonplace is developing a blockchain-based settlement platform for voluntary carbon credit trading, aiming to bring transparency and integrity to the market.
3. [ClimateTrade](#): A Spanish startup that enables companies to meet carbon emissions offsetting goals by connecting them with developers of sustainability projects, offering full automation, speed, and traceability.
4. [Flowcarbon](#): A climate tech company that tokenizes carbon credits to drive investment in projects that remove carbon from the atmosphere, leveraging blockchain to enhance transparency and democratize access to the voluntary carbon market.
5. [Offsetgo](#): India's first blockchain-based Carbon Marketplace, offering a holistic path for emissions mitigation and reduction, life cycle assessment, ESG reporting, and carbon project development.
6. [Pathzero](#): An Australian company providing a carbon management platform for small and medium-sized businesses to access high-quality projects for offsetting residual emissions and reaching net zero.
7. [Prolitus Technologies](#): They offer development services for blockchain-based carbon credit platforms, aiming to create secure and transparent marketplaces for buying, selling, and trading carbon credits.
8. [BCG](#): Offers consulting services that cover climate and carbon strategies, potentially including carbon taxation.

Carbon Taxation Solutions Vendors

1. [KPMG](#): Offers advisory services on tax rates, regulations, and compliance related to environmental and carbon taxes.
2. [Climate Focus](#): A consultancy specializing in climate policy, finance, and law with expertise in carbon pricing.
3. [Deloitte](#): Advises on strategic decisions around carbon pricing mechanisms, including tax implications.
4. [Guidehouse](#): A Navigant company that offers consulting on climate policy, energy, and carbon market mechanisms.
5. [Ernst & Young \(EY\)](#): Assists companies in understanding the financial impact of carbon taxes and sustainable tax planning.
6. [ICF](#): Provides policy design and analysis for environmental and energy regulations, including carbon taxation.
7. [McKinsey & Company](#): Provides insights on carbon pricing and its implications for corporate strategies and operations.
8. [NERA Economic Consulting](#): Offers economic consulting services, including the assessment of carbon tax policies.

9. [Perspectives Climate Group](#): Offers consulting on carbon markets and climate policy, which may include carbon tax strategies.
10. [PwC](#): Provides consultancy services on tax reform, including considerations for carbon taxes and their impact on businesses.
11. [The Carbon Trust](#): Helps organizations prepare for a low-carbon economy, potentially including navigating carbon taxation.
12. [McKinsey & Company](#): Advises on economic policy, with a focus on climate change, including the implications of carbon taxes.

About TAG

TAG is a trusted next generation research and advisory company that utilizes an AI-powered SaaS platform to deliver on-demand insights, guidance, and recommendations in cybersecurity, artificial intelligence, and sustainability to enterprise teams, government agencies, and commercial vendors.

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