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Voluntary carbon markets and opportunities for African Climatech ventures

MODULE 1

2025

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2 Macro Trends and opportunities in Africa's VCM

3 Buyers of African carbon credits

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MODULE 1

Carbon Market 101 for African Climatechs

Before You Flip Through: What This Module Covers

Welcome to **Module 1: Carbon Market 101 for African Climatechs** — your starting point for understanding how climate tech ventures across Africa can tap into the carbon market, particularly the voluntary carbon market (VCM), to unlock revenue, scale impact, and contribute meaningfully to global climate goals.

This module introduces the basics: what carbon credits are, how the carbon market works, and why it matters for startups. At its core, a carbon credit represents the removal or reduction of one metric ton of CO_2 equivalent (tCO_2e) from the atmosphere. Climate-positive projects — such as clean energy, agroforestry, or improved cookstoves — can generate these credits and sell them to companies or organizations seeking to offset their emissions.

Why is this relevant? For African climate tech startups, carbon markets offer a way to **earn in USD**, diversify revenue, and finance climate solutions without always relying on traditional venture capital or grant funding. Whether you plan to generate credits directly or collaborate with others in the ecosystem, this module helps you understand how to plug in.

We walk through the **core principles** that define a strong carbon project — from **additionality** and **measurability** to **permanence** and **co-benefits** — so you can evaluate if your venture meets the criteria. You'll also get to know the key stakeholders in this space:

- Project developers and certifiers like Verra and Gold Standard,
- Buyers such as Microsoft or Shell,
- Brokers and digital platforms like Patch,
- And ecosystem enablers like financiers, governments, and community partners.

As you move through the slides, you'll see how startups across different sectors — from agriculture and waste management to transportation and clean energy — are already positioned to benefit. The module outlines which project scopes are eligible, and what the process and costs look like to participate — from feasibility to credit issuance.

Importantly, we also break down barriers like certification costs, market volatility, and regulatory alignment — and share practical workarounds, like revenue-sharing with certifiers or working through aggregators.

Whether you're an early-stage founder exploring new revenue opportunities or a scale-up looking to deepen your climate impact, this module equips you with the language, pathways, and players that define Africa's carbon opportunity.

Let's get started.👇

Introduction to Carbon Markets: Key concepts

What are Carbon Credits?

A carbon credit represents the reduction, avoidance, or **removal of one metric ton of carbon dioxide equivalent** (tCO2e) from the atmosphere. These credits are typically generated through projects such as: Renewable energy (solar, wind, hydro), Reforestation and afforestation, Waste-to-energy, etc.

What is the carbon market?

A system designed to reduce greenhouse gas (GHG) **emissions by assigning a monetary value to carbon** emissions. It operates on the principle that those who emit GHGs should compensate by reducing their emissions or **purchasing carbon credits from entities that have reduced or avoided emissions.**

What are the types of carbon markets?

- **Compliance Markets**: Require entities to meet emissions caps by trading allowances or credits. South Africa's program incentivizes local emission reduction projects.
- **Voluntary Carbon Markets (VCM)**: Allow companies, organizations, or individuals to voluntarily offset their emissions by purchasing carbon credits.

Why the VCM and how does it work?

The majority of Africa's carbon supply and demand over the years has been through the VCM, as many countries are still developing their mechanism. In a nutshell, the VCM works as follows:

1. Projects generate verified carbon credits by reducing emissions or capturing CO2.
2. These credits are certified by third-party standards (e.g., Gold Standard, Verra).
3. Buyers purchase credits to offset their emissions, supporting climate-positive projects.

Key Takeaways

Emerging Climatech startups can leverage carbon markets to boost revenue and impact on their users.

Climatechs can also earn in forex (USD) to help cope of local currency devaluations.

Ventures may directly develop projects or explore collaborative approaches such as joint ventures.

Widely accepted requirements for success in the carbon market

01 Additionality

Would the project be financially sustainable without carbon finance?

02 Measurability

Is the project able to demonstrate a measurable reduction of Co2 against an established baseline?

03 Permanence

Are the project benefits likely to be undone over the medium-long term?

04 Leakage

Is the project merely shifting Co2 emissions down the road (ie. negligible net difference to emissions)?

05 Co-benefits

How is the project benefiting local stakeholders besides carbon reduction / sequestration? Does the project also benefit biodiversity and align with other SDG goals?

Key stakeholders in the voluntary carbon market (1/2)

And their roles and relevance viz a viz Climatechs

Project Developer

Role: Design, implement, and manage carbon offset projects. Climatetech startups can self-develop or partner with developers to scale projects and access technical expertise.

Examples: Komaza, Burn Manufacturing, Africa GreenCo

Carbon Standards Certifiers & Verifiers

Role: Set guidelines and certify projects for carbon credit issuance. Developers need certification to generate and sell verified credits. Verification and Validation Bodies (VVBs) verify carbon reduction claims for accreditation and credit issuance.

Examples: Gold Standard, Verra, Puro.Earth

Carbon Credit Buyers (End Users)

Role: Corporations and organizations purchasing carbon credits for offsetting emissions. Potential customers for startups selling carbon credits.

Examples: Microsoft, Eni, Shell, Airlines (More about buyers in module 4)

Carbon Market Intermediaries

Role: Brokers, aggregators, and platforms facilitating carbon credit trading, often with various revenue share models for Startups.

Examples: Nairobi Securities Exchange (NSE), Patch, South Pole

Key stakeholders in the voluntary carbon market (2/2)

And their roles and relevance viz a viz Climatechs

Financiers, Funders, and Impact Investors

Role: Provide funding, technical assistance, capacity building, and advocacy for carbon projects and climate innovations. They can offer grants, partnerships, and local insights critical for startups needing upfront capital for project development.

Examples: Acumen, Blue Orchard, Green Climate Fund, InfraCo Africa, UNDP,

Government and Regulatory Bodies

Role: Create policies, regulations, and incentives for carbon markets. Startups must align with regulations and may access government support.

Examples: African Carbon Markets Initiative (ACMI), Kenya's National Climate Change Action Plan (NCCAP)

Technology Providers and Platforms

Role: Offer digital tools for project monitoring, reporting, and data verification. Startups can adopt or integrate these technologies for efficiency. Climatechs could also play in this space to reduce market frictions

Examples: Pachama, Regen Network, SilviaTerra

Local Communities and Indigenous Groups

Role: Key stakeholders in land use, conservation, and community-based projects. Partnering ensures project success and enhances social co-benefits.

Examples: Octavia Carbon's community engagement strategy for Kenya

Opportunities for African Climatech Ventures

Africa is uniquely positioned to benefit from the carbon market due to its natural resources, growing climatetech ecosystem and workforce, and increasing global demand for high-quality carbon credits. Areas of opportunity include:

Agriculture
Projects reduce emissions from row crops, pastureland, and dairies by increasing soil carbon as well as capturing or reducing methane emissions

Forestry & Land Use
Projects that help with Planting trees and reducing barriers to natural regeneration in non-urban areas

Renewable Energy
Projects focused on leveraging renewable alternatives, such as solar, wind, and hydroelectric power, to reduce reliance on fossil fuels and mitigate greenhouse gas emissions

Carbon Capture & Storage
Projects capture CO2 released in high concentrations from industrial processes for permanent storage underground or in manufactured products

Household & Community
Projects driven by local communities, promoting sustainable practices and generating social and environmental co-benefits i.e. installation of biogas digesters, dissemination of improved cookstoves, etc.

Transportation
Projects include transportation-related initiatives such as mass transit system implementation, fleet efficiency improvements, infrastructure for pedal-driven two wheel vehicles, electrification vehicles, and electric vehicle charging

Chemical Processes
Projects reduce, capture, and/or reuse high potency gasses from manufacturing, consumer goods, and chemical and fuel production

Industrial & Commercial
Projects include industrial energy efficiency, fuel substitution, manufac-turing process improvement, and waste recovery, and efficiency in commercial and municipal building infrastructure

Waste Management
Projects that focus on reducing greenhouse gas emissions through aerobic and anerobic treatment of waste, recycling, capturing & using methane from waste streams, etc.

See appendix for more details on project areas and sample African Climatech ventures that possibly fit into each area

Steps to Participate in the VCM

01 Identify a Suitable Project

Assess the eligibility of your venture aligning with carbon credit generation.

Cost: Free
Timeline: Variable

02 Undertake feasibility studies

Work with individual consultants or organizations like Verra, Gold Standard, or Plan Vivo to verify your project's impact and generate credits.
Cost: $0 - $15,000
Timeline: 2 - 6 months

03 Develop project

Use scientific methodologies and data to calculate your project's carbon savings.

Cost: Variable (next page)
Timeline: 6 - 12 months

04 Access Carbon Markets

Partner with brokers or platforms like Patch or Climate Impact X to sell your credits.
Cost: Variable
Timeline: Variable

05 Engage Corporate Buyers

Market your credits to companies seeking offsets to meet their sustainability goals.
Cost: Variable
Timeline: Variable

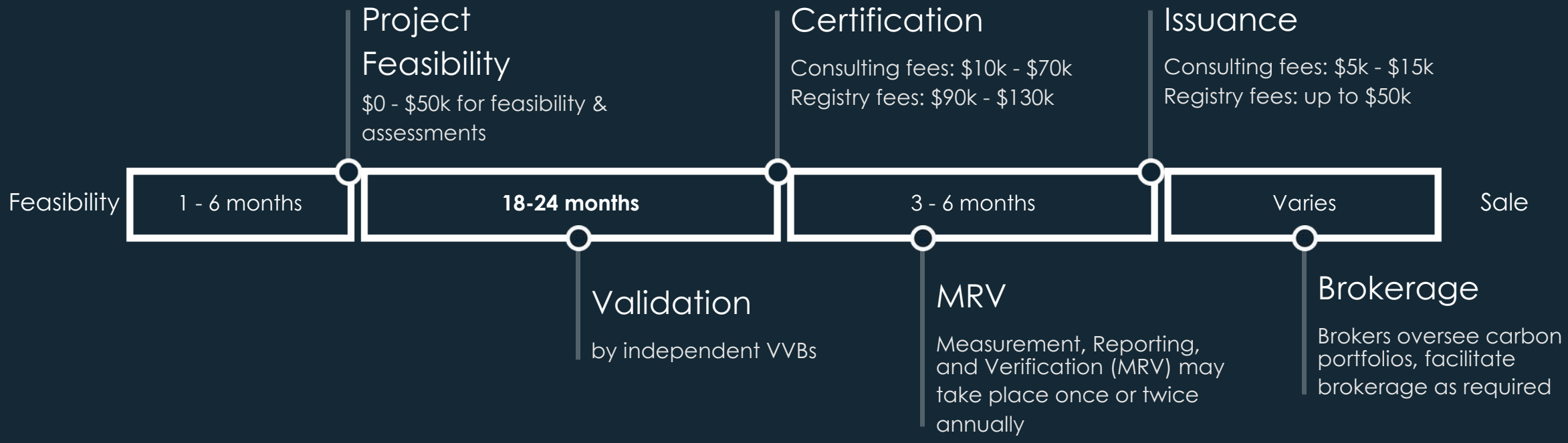
06 Others: Tackling market frictions

Climatechs may also participate by improving market validation and verification processes, among other things.

Key Considerations

- **Certification Costs**: Verification and monitoring can be resource-intensive. However, various business models reduce cost barriers e.g., revenue-share with specialized developers
- **Market Volatility**: Carbon prices in the VCM can fluctuate significantly.
- **Regulatory Landscape**: Ensure alignment with evolving national and international carbon policies.
- **Community and Environmental Impact**: Projects must deliver tangible benefits to local communities and ecosystems.

Depending on the pathway, credit issuance can take up to 3 years costing up to $300k



Note: Registry and consulting expenses may be exchanged for a percentage (usually 20-30%) of future credit earnings.

Source: Press search, interviews with experts, GSMA

Sample ecosystem mapping of African Climatech ventures

Mapping is not exhaustive; samples taken from publicly available data

Agriculture, Forestry & Land Use

EnvoCare
ThriveAgric
ISAR EcoNext
KOMAZA
SAND TO GREEN

Household & Community

KOKO
burn™ life · saving · stoves
Jaza

Waste Management

Scrapays
Bekia
BioBuu
TRASHCOIN

Industrial, Chemical, & CCS

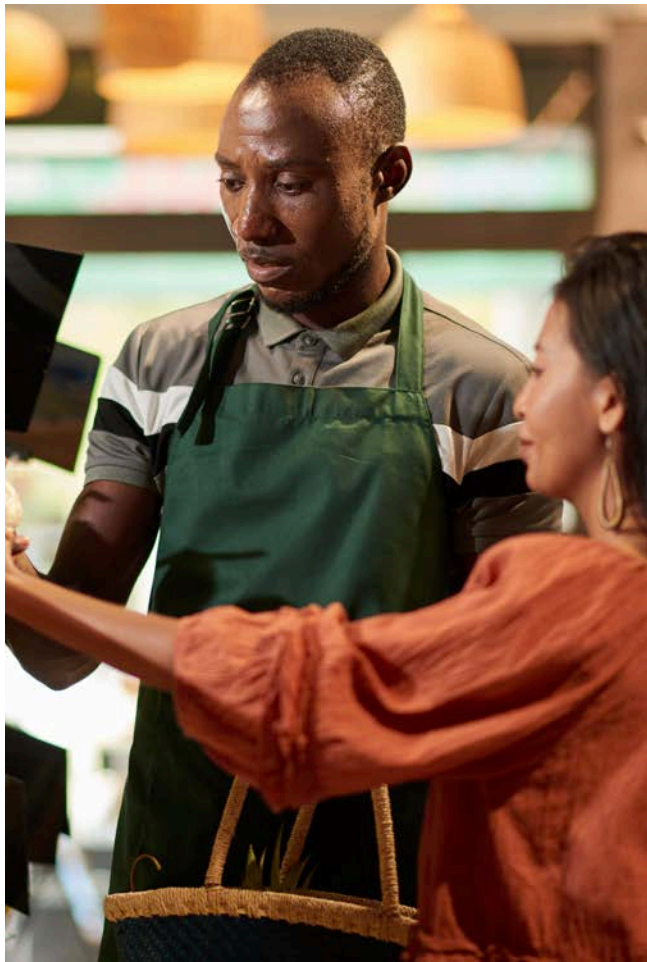
OCTAVIA CARBON
cella
RELEAF

Transportation

Enakl
AMPERSAND
spiro

Renewable Energy

Earthbond
NOORNATION
d.light



Glossary of terms

Additionality

The concept that carbon credits are issued only for projects that wouldn't occur without the finance from credit sales. E.g., a cookstove project reducing deforestation is considered additional, unlike a profitable solar project without carbon credits.

Co-benefits

Social/environmental benefits of a project, such as biodiversity conservation or local community development, in addition to carbon sequestration.

Credits

Units representing one metric ton of CO_2 equivalent (tCO_2e) reduced/removed by a project. These credits are bought, sold, and retired in carbon markets.

End User/End Buyer

Entities purchasing and retiring carbon credits to offset their emissions.

Methodology

Technical guidelines for quantifying greenhouse gas reductions/removals by projects, essential for credit issuance.

Registry

A database tracking issued, retired, or transferred carbon credits.

Removal Credits

Credits from activities like planting trees that physically remove CO_2 from the atmosphere.

Retirement

When a credit is permanently removed from the market, enabling the buyer to claim emission offsets.

Standard

Certification criteria for verifying project design, monitoring, and reporting to issue credible carbon credits.

Vintage

The year when a project's carbon reductions/removals occurred, not necessarily the year credits were issued.

References

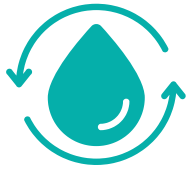
- GSMA - Navigating the Voluntary Carbon Market - A guide for Startups - Link
- Voluntary Registry Offsets Database, v10 - Link
- Neufin Carbon Project Handbook - Link
- Company websites & other press search

Appendix

Agriculture

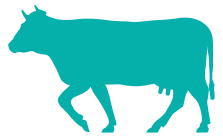
Projects reduce emissions from row crops, pastureland, and dairies by increasing soil carbon as well as capturing or reducing methane emissions

Suitable for: Agritech; Watertech, Animaltech, Weathertech; Waste Mgt Tech



Water and Irrigation Management

- Improved Irrigation Management
- Installing irrigation equipment powered by renewable sources that would have otherwise been powered by fossil fuel sources

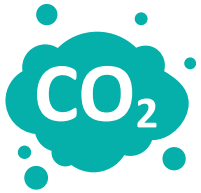


Livestock and Waste Management

- Feed Additives
- **Manure Methane Digester** to capture methane that would otherwise be released to the atmosphere from livestock waste

Soil and Land Management

- Biochar production & application
- Bundled Compost Production and Soil Application
- Compost Addition to Rangelands
- Sustainable Agriculture



Nutrient and Emission Control

- Nitrogen Management
- Rice Emission Reductions
- Solid Waste Separation

Carbon Capture & Storage

Projects that capture CO2 released in high concentrations from industrial processes for permanent storage underground or in manufactured products

Suitable for: Deeptech; Energy; Buildingtech; Waste recycling

Carbon Capture in Plastic

- Capturing carbon dioxide and methane from industrial processes for permanent sequestration in plastics

Carbon Capture in Concrete

- Capturing carbon dioxide from industrial waste gas to facilitate mineralization into concrete during the concrete manufacturing process

Carbon Capture & Enhanced Oil Recovery

- Capturing carbon dioxide from industrial processes followed by compression, transport and injection for permanent storage underground while also enhancing oil recovery

Chemical Processes

Projects reduce, capture, and/or reuse high potency gases from manufacturing, consumer goods, and chemical and fuel production

Suitable for: Chemicals; Processing plants; Renewable Energy; Climatech resiliency financing

Propylene Oxide Production

- Synthesizing propylene oxide out of hydrogen peroxide through a new process coined HPPO technology, with reduced energy consumption and waste generation

N2O Destruction into harmless Nitrogen & Oxygen

- Adipic Acid Production
- Nitric Acid Production

Reduction, elimination, or safe disposal of refrigerants

- Advanced Refrigerants
- HFC Refrigerants Reclamation, Replacement, or Destruction
- Ozone Depleting Substances Recovery & Destruction
- Reducing Emissions from Deforestation and Forest Degradation (REDD+)
- Refrigerant Leak Detection

SF6 Replacement

- Avoiding Sulfur hexafluoride emissions by full/partial replacement of SF6 cover gas to alternate cover gasses

Renewable Energy

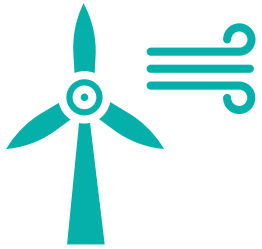
Projects focused on leveraging renewable alternatives, such as solar, wind, and hydroelectric power, to reduce reliance on fossil fuels and mitigate greenhouse gas emissions

Suitable for: Renewable Energy; Energy Financing; Emission control; Climate data

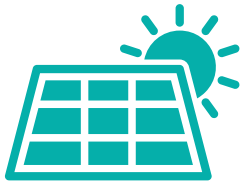
Biomass

Bundled Renewables

Geothermal



Wind



Solar solutions

- Solar - Centralized
- Solar - Distributed
- Solar Lighting
- Solar Water Heater

Hydropower

Forestry & Land Use

Projects that help with Planting trees and reducing barriers to natural regeneration in non-urban areas

Suitable for: Agritech; Foodtech; Animaltech, Sustainable Agriculture

Replenishing or Conserving grasslands

- Avoided Grassland Conversion
- Sustainable Grassland Management

Growing & maintaining forests

- Afforestation and Reforestation
- Improved Forest Management
- Avoided Forest Conversion
- Reducing Emissions from Deforestation and Forest Degradation (REDD+)
- REDD+ Jurisdictional

Restoring Wetlands

- Restoring deltaic and coastal wetlands, including mangrove ecosystems. Restoration can include switching from row crops to rice cultivation designed for deltaic areas and tidal wetland creation

Household & Community

Projects driven by local communities, promoting sustainable practices and generating social and environmental co-benefits i.e. installation of biogas digesters, dissemination of improved cookstoves, etc.

Suitable for: Renewable Energy; Sustainable Cooking fuels; Light and solar heating providers; Watertech; IOT/Datatech

Clean Water Access

- Clean Water - Providing safe drinking water through purification technologies like water filtration and access to centralized water systems
- **Community Boreholes**

Improved Cookstoves

- Building improved cookstoves to replace or minimize the use of dung or firewood for cooking

Biodigesters

- Collecting organic material, in household and community-scale biodigesters to use in other local applications

Energy Efficiency

- Bundled Energy Efficiency
- Lighting
- Weatherization
- Installing multiple energy efficient technologies in residential buildings including weatherization, lighting, refrigeration, air conditioning, heating, pumping, etc

Industrial & Commercial

Projects include industrial energy efficiency, fuel substitution, manufacturing process improvement, waste recovery, and efficiency in commercial and municipal building infrastructure

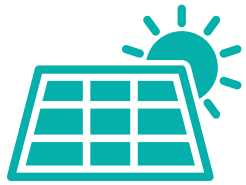
Suitable for: Renewable Energy; Sustainable Cooking fuels; Waste mgt; Emission control; Climate data

Innovative Materials and Recycling

- Carbon-Absorbing Concrete
- Oil Recycling

Alternative Energy and Fuel Management

- Carbon-Absorbing Concrete
- Oil Recycling

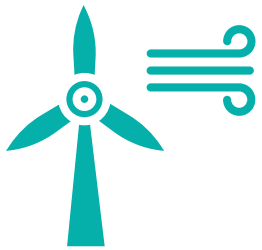


Infrastructure and Expansion

- Grid Expansion & Mini-Grids
- Mine Methane Capture

Energy Efficiency and Recovery

- Energy Efficiency
- Waste Gas Recovery
- Waste Heat Recovery



Emission Reductions (ER) and Pollution Control

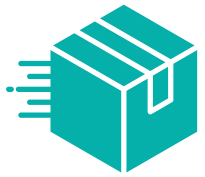
- Aluminum Smelters ER
- Brick Manufacturing ER
- Road Construction ER
- University Campus ER
- Leak Detection & Repair in Gas Systems

Transportation

Projects include transportation-related initiatives such as mass transit system implementation, fleet efficiency improvements, infrastructure for pedal-driven two wheel vehicles, electrification vehicles, and electric vehicle charging

Suitable for: Renewable-powered transport; Transport Financing; Map/Geolocation technologies; Climate data; Reducing transport pollutions

Bicycles



More efficient Shipping

Truck Stop Electrification

Mass Transit

Electric Vehicles & Charging

Efficient Fuel Transport

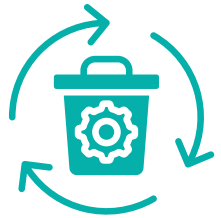
Fleet Efficiency

Waste Management

Projects that focus on reducing greenhouse gas emissions through aerobic and anerobic treatment of waste, recycling, capturing & using methane from waste streams, etc.

Suitable for: Waste management; Building Tech; Foodtech;

Waste Diversion



Waste Recycling

Composting

Methane Recovery in Wastewater

Landfill Methane

Waste Incineration

Thank you!

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