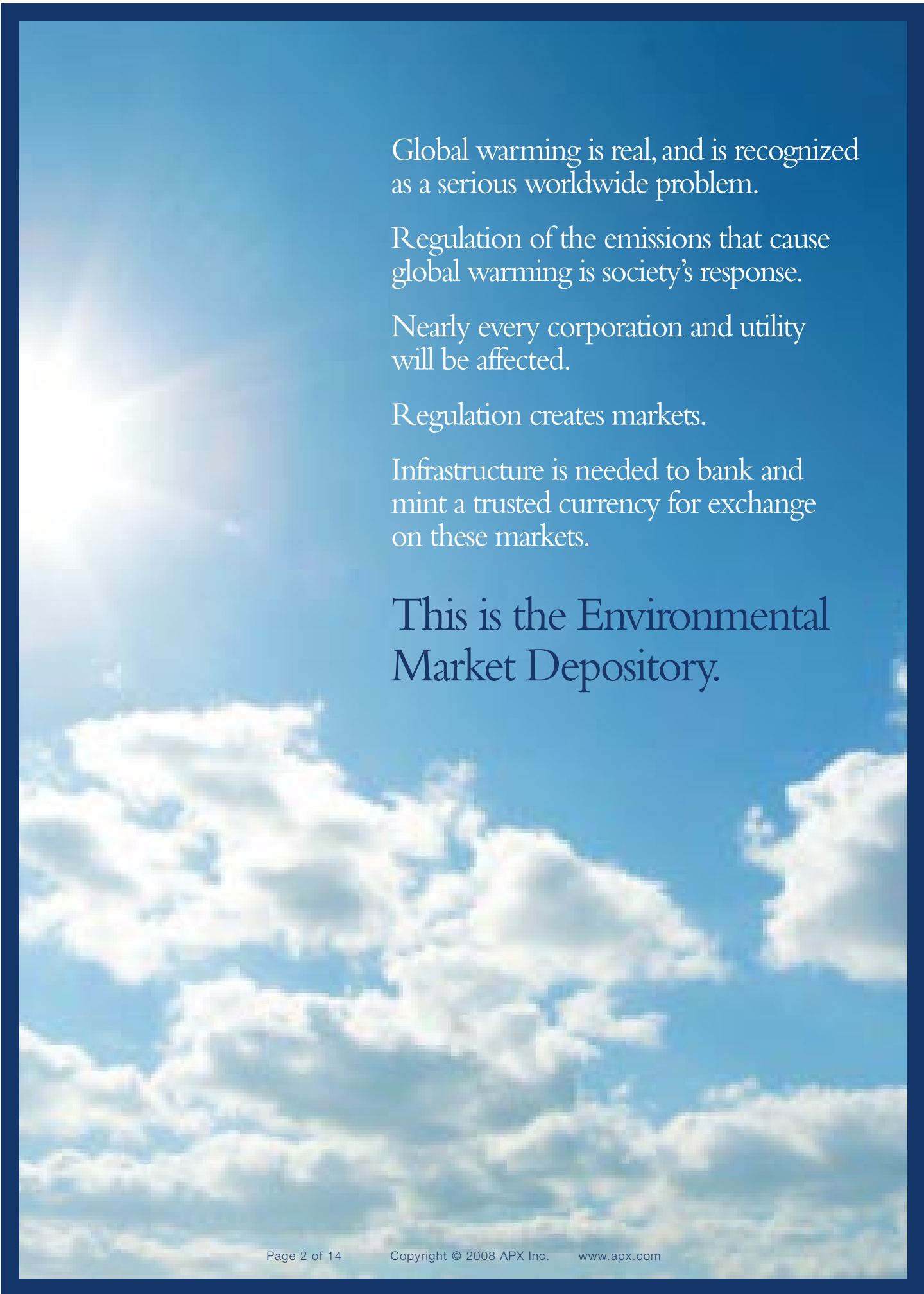


Creating a Trusted Environmental Commodity



A guide to the **APX Environmental Market Depository™** and its pivotal role in how environmental commodities are created, verified, and managed





Global warming is real, and is recognized as a serious worldwide problem.

Regulation of the emissions that cause global warming is society's response.

Nearly every corporation and utility will be affected.

Regulation creates markets.

Infrastructure is needed to bank and mint a trusted currency for exchange on these markets.

**This is the Environmental
Market Depository.**

Environmental Commodities

Environmental Commodities represent the **largest and fastest growing new commodity market** in North America. They capture in dollars and cents much of the value that our society places on safeguarding the environment and national energy independence.

The new Environmental Commodities include:

- Renewable Energy Certificates
- Energy Efficiency & Conservation Certificates
- Carbon Emission Reduction Credits & Allowances

The purpose of these financial instruments is to drive a flow of funding that provides investment incentives for:

- Clean Power Generators (typically wind, solar, geothermal, water, or biomass projects)
- Energy Efficiency & Conservation Programs
- Greenhouse Gas Emissions Reduction and Sequestration Projects (such as industrial process changes, reforestation, landfill gas, fuel switching, and other projects)

Let's learn more about these Environmental Commodities.

Definitions

An Environmental Commodity is not a physical commodity. It is an intangible asset that is nevertheless real and has value. The new Environmental Commodities include:

Renewable Energy Certificates represent 1 megawatt hour of power generated by a renewable resource, such as a wind turbine or solar power. These are also known as RECs, Green Tags or sometimes called renewable energy credits.

Energy Efficiency & Conservation Certificates represent 1 megawatt hour of power conserved or load reduced. These are some times called EE certificates, EE credits, or White Tags™.

Carbon Emission Reduction Credits typically represent a 1 metric ton reduction in CO₂ equivalents emitted. The notion of equivalent emissions of CO₂ is useful when quantifying emissions that relate to global warming because many different gases contribute to global warming, including methane, nitrous oxide, hydrofluorocarbons, and many others. The environmental impact of these gases can be converted to an equivalent CO₂ basis (CO₂e) using standard and generally agreed upon formulas. These Credits are some times called simply Carbon Credits, Carbon Offsets, Verified Emission Reductions (VERs), or Certified Emission Reductions (CERs). They are typically related to specific projects that have reduced emissions of greenhouse gases. In the future, **Allowances** may also be allocated or auctioned by regulators to companies. It is likely that emitting companies will then be required to have allowances and credits in amounts sufficient to cover their greenhouse gas emissions.

Markets for these Environmental Commodities have **grown dramatically** in the last 5 years.



US Environmental Markets

The US today has two broad categories of Environmental Markets. Both are important and growing:

- Compliance Markets, also called Mandatory Markets
- Voluntary Markets

State governments have led the nation in the development of the environmental Compliance Markets which mandate performance, set industry compliance rules, enforcement, and penalties. In contrast, Voluntary Markets have been driven by corporations that place a high value on social responsibility, a positive environmental brand image, or wish to gain valuable experience and recognition through early action.

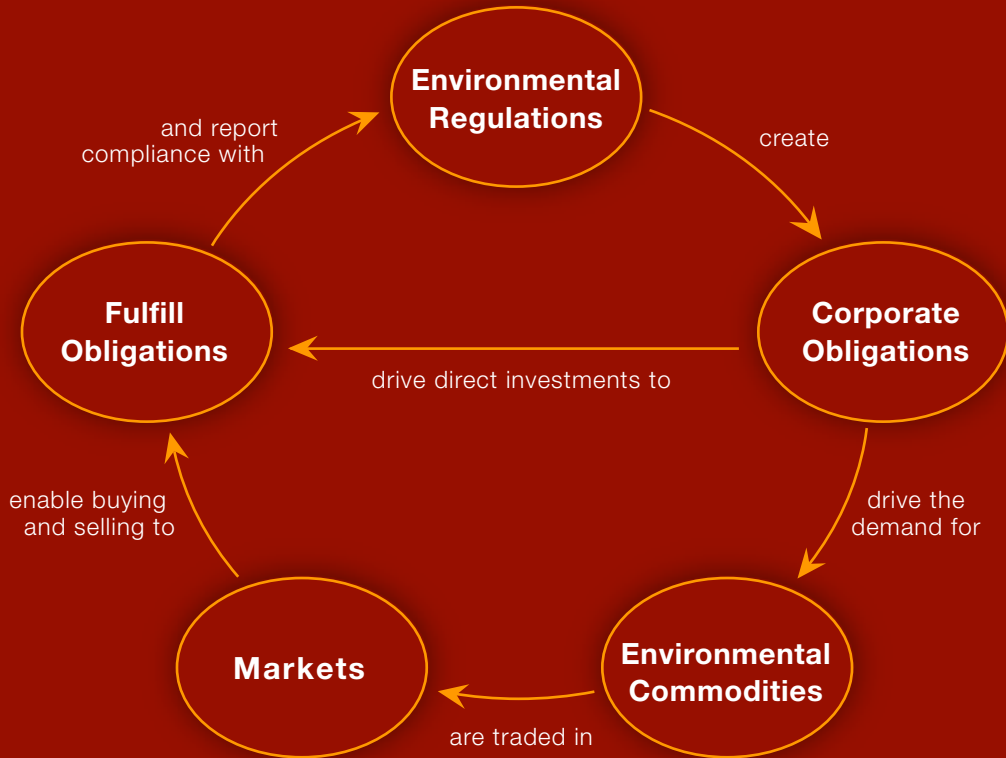
For both Compliance and Voluntary Markets, the sellers of the environmental commodity are renewable energy generators or project owners for carbon emission reduction or energy efficiency projects. However, a key difference between markets is in the nature of the buyers:

In Compliance Markets, buyers of RECs are load serving entities (typically the companies that sell power to end-use consumers) that serve states with a renewable portfolio standard or other regulatory requirement with which they must comply. In carbon markets, buyers can also be generators or non-power sector companies.

In Voluntary Markets, buyers are corporations or individuals seeking to offset their carbon footprint, support renewable energy, and in some cases lower US dependence on foreign oil. Many companies are also taking voluntary action to anticipate or shape future mandatory actions. In the case of carbon, this includes recording emissions reductions to get credit for early action under future regulatory programs.

US Compliance Markets are currently many times larger than the Voluntary Markets, because company participation is mandated. More significantly, in Compliance Markets the price of an Environmental Commodity is typically higher than the price of an equivalent environmental commodity in a Voluntary Market. This difference is due to the greater demand for Environmental Commodities in Compliance Markets, which forces buyers to compete for limited environmental assets. In mandatory carbon markets, for example, prices will be higher because regulators restrict the supply of allowed emissions. Further, mandatory environmental targets are often tiered by regulators to become more stringent over time. The end result is that the Compliance Markets have proven to be a more effective means to drive investment and behavior to achieve environmental goals.

The overwhelming majority of trades between buyers and sellers are bilateral transactions – through brokers, marketers or via direct transactions. In all cases, the basis for the transaction is an essential **trust in the environmental commodity**.



Freedom to Choose: A market based approach allows companies to choose how to satisfy environmental compliance rules. To fulfill their obligations, companies can either (1) make direct operational changes and investments, or (2) purchase environmental commodities. Examples of direct investment include the purchase and installation of technology to reduce the greenhouse gas emissions of a manufacturing process, or a utility's investment in a wind farm to generate renewable power.

Over time, as regulators tighten emissions caps and increase requirements for renewable generation, the value of environmental commodities will tend to increase, making direct investment and investment in resources that generate environmental commodities more economically attractive.

Establishing Trust

Buyers need to be certain that the Environmental Commodity they are buying is real, verified, unique, and valid. These attributes are the basis for trust in the marketplace, and trust is essential for the continued rapid growth of effective environmental markets.

Real

The actual source of the environmental attribute being traded must be undisputed. This means different things for each of the Environmental Commodities:

- The renewable energy certificate must originate from a real source of renewable energy that actually generated power – a specific wind farm or solar array, for example.
- The energy efficiency certificate must be the result of an actual conservation project, such as a technology upgrade that saves energy.
- The carbon credit must be from a real emissions reduction at a specific site, such as a manufacturing process change that reduces greenhouse gas emissions.

Verified

The environmental commodity must be metered or measured by automated systems, and then tracked and recorded. For manually measured or calculated values, quantities must be entered into the database and verified by a trusted independent source or third party. In all cases, the data related to the environmental commodity must be created and entered into the database via established procedures, with all necessary attestations and related documentation. In the case of Voluntary Markets, the ultimate goal is often to be rigorous enough to satisfy future anticipated regulatory requirements.

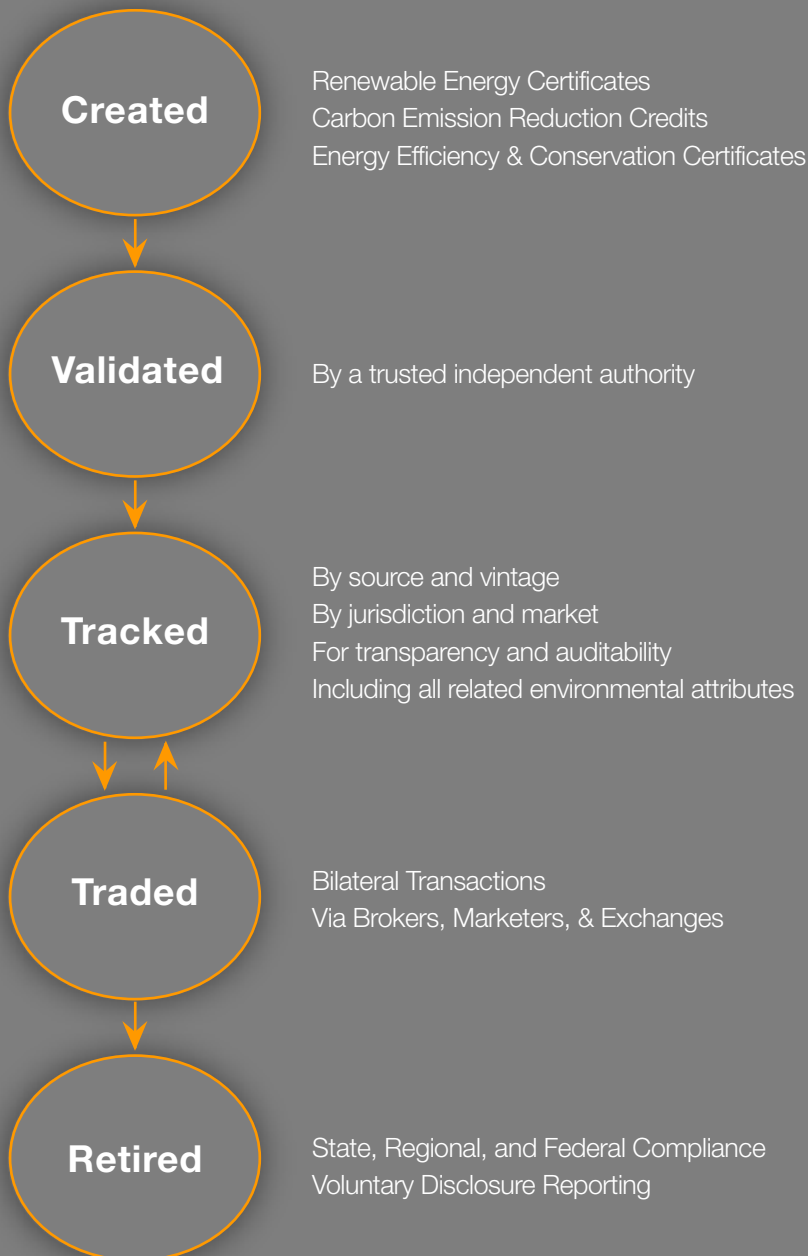
Unique

The environmental commodity must be given unique serial number, and tracked from inception to retirement. This ensures that the environmental attributes are not double counted and/or sold multiple times to multiple buyers, or used to fulfill multiple regulatory requirements

Valid

If the environmental commodity is being purchased to fulfill a requirement of a certain state or region, then it must comply fully with the required rules of the jurisdiction where it will be applied. Or if it is being purchased to fulfill a social or marketing goal, then the pedigree of the environmental commodity must be transparent and known, so that a buyer can have full confidence that they will achieve their desired marketing or social objective.

The Lifecycle of the Environmental Commodity



How the Environmental Market Depository™ Establishes Trust

The **Environmental Market Depository** performs several essential functions that establish trust in the Environmental Commodity:

- Creating the Commodity
- Verifying the Commodity
- Tracking the Commodity
- Managing the Commodity's Jurisdictional Validity

The Depository is not a brokerage or an exchange. Rather, it is an essential supporting infrastructure for corporations, brokers, marketers and exchanges to ensure the smooth, cost effective, and efficient functioning of Environmental Markets.

Creating the Environmental Commodity

The Depository records the creation of the Environmental Commodity and assigns it a unique serial number, whether it be a renewable energy certificate, energy efficiency & conservation certificate, or carbon emission reduction credit. The unique serial number is essential in eliminating the problems associated with double counting.

This function enables buyers to have high confidence that the commodity they are purchasing is authentic and unique.

Verifying the Environmental Commodity

Each commodity is created at a verified source at a specific location and date (known as vintage). The quantity (specified in MWh for RECs and energy efficiency certificates; and metric tons for carbon credits) is measured & metered, or manually entered by a certified third party according to established rules and procedures. Documentation and/or the location of documentation related to each certificate is tracked along with the certificate itself.

The Environmental Commodities are verified according to the guidelines of trusted organizations, such as Environmental Resources Trust, the Center for Resource Solutions, State and Regional authorities and others. The Environmental Market Depository is an infrastructure that is available to these trusted third parties to support their verification and policy work.

This function enables buyers to have confidence that the environmental benefit is real, and that the amount is accurately quantified and recorded.



Tracking the Environmental Commodity

The ownership of each certificate or credit is tracked in the account of a registered Account Holder within the Depository. Account Holders are

- Companies that create and sell the certificates or credits, such as power generators, operating companies, and carbon project owners, for example.
- Companies and individuals that buy certificates or credits to satisfy voluntary or mandatory compliance rules, such as state renewable portfolio standards, energy efficiency standards, or carbon emission reduction targets, for example.
- Marketers, brokers, and traders of Environmental Commodities who need an infrastructure to manage their own book or operations on behalf of their clients.

The Depository can provide “cradle to grave” tracking of the Environmental Commodity, from its creation to ultimate disposition. An Environmental Commodity reaches the end of its useful life when it fulfills a mandatory or voluntary environmental requirement. Examples include the fulfillment of a state renewable portfolio standard for a specific year, or fulfillment of a company’s corporate objective in offsetting a portion of the company’s carbon footprint. When such conditions are met, the Commodity is transferred to a Retirement Account by the Account Holder, indicating that no further transactions around that serialized certificate or credit will occur.

A wide range of reporting capabilities are available to Account Holders, and these reports can be published for internal company use, or made publicly available at the discretion of the Account Holder.

This function enables all market participants to have a total understanding of their current position in Environmental Commodities, with full audit trail capabilities and transparency within their own organization.

Managing the Environmental Commodity's Jurisdictional Validity

Keeping track of the rules and regulations regarding where an Environmental Commodity is valid is complex because of the many state, regional and federal guidelines that are in place across the markets. In addition, many non-governmental organizations have programs and policies that establish guidelines as well. This means that each certificate or credit has its own set of jurisdictional attributes that define the states, regions, and programs where it is valid. These jurisdictional attributes define where the credit or certificate can be used to fulfill an environmental requirement.

The Environmental Market Depository enables the efficient and painless management of this complexity for all Environmental Commodities.

This function enables commodity sellers to know where they can sell each unique environmental commodity. It also ensures that buyers are purchasing environmental commodities that are valid to meet their mandatory or voluntary environmental objectives.

Environmental Market Depository

How the APX Environmental Market Depository™ Works

Technology

The Environmental Market Depository is a hosted, web-based technology service. The system is secure, auditable, and geographically redundant.

Signing Up

Potential Account Holders may request an account in the Depository via a secure web-based registration mechanism, which requires completion of a standard agreement & terms and acceptance of the public and published operating rules and procedures. The purpose of the Depository is to support corporations, although registration of individuals is considered on a case by case basis.

Verification and Certification of Environmental Commodities

Creation of the Environmental Commodities occurs via automated or electronic interfaces, or via manual entry of Commodities via a trusted third party verification and certification entity. In all cases, certificates or credits must be verified by an approved third party or state or regional authority.

Enabling Brokers, Marketers, Measurement, Certification, and Verification companies to support Corporate Clients

A corporate client can designate another firm to view and manage the Environmental Commodities in their account on their behalf. For example, a company may allow a third party verifier to create Commodities in their account on their behalf. Or they may allow a marketer to have visibility into their portfolio and even perform transactions on their behalf.

Maintaining the Commodity's Jurisdictional Validity

APX Inc is the administrator of the Environmental Market Depository, and has responsibility for maintaining the database of jurisdictional validity for Environmental Commodities. This is a service to all Account Holders.

Fees

The fee structure for the Environmental Market Depository has been developed so that there is a low barrier to entry for market participants – in other words, there is a very affordable fee structure. There is a low initial fee for new Account Holders; there is also a small fee when the environmental commodity is transferred or retired, including a monthly minimum. There are no large implementation or software license fees.

Benefits for Environmental Market Participants & Stakeholders

Market participants and stakeholders derive important benefits as the Environmental **Market Depository** performs its essential role. Market Participants include:

- Energy Companies
- Manufacturing Companies and other Corporate Buyers
- Marketers & Brokers of Environmental Commodities
- Verifiers, Certifiers, and Measurement Companies
- State, Regional, and Federal Regulators

The complexity of tracking and reporting across multiple state and federal jurisdictions for each environmental commodity will remain a reality for years to come. It will likely involve numerous state, regional, federal, mandatory, and voluntary software systems, registries, and reporting mechanisms. The Depository provides companies with a trusted source for origination and management of all the firm's environmental commodities across all jurisdictions, with important benefits.

Benefits to all Market Participants

Reducing the cost of:

- Transactions for companies wishing to track their positions and manage Environmental Commodities.
- Keeping up-to-date with laws and rules for the validity of each Environmental Commodity.
- Technology infrastructure and related services for the management of Environmental Commodities.
- Data integration with emerging environmental Commodity Markets, Brokerages, and Exchanges.
- Compliance with rules and regulations, through efficient, automated web based compliance reporting.
- Verification, certification, and measurement services by promoting the adoption of standards for the industry.

Supporting rapid development of environmental markets with:

- Increased liquidity.
- Improved price visibility.
- Access to additional revenue streams from the sale of Environmental Commodities.
- Greater access to types and sources of Environmental Commodities for purchase.
- A scalable infrastructure to enable "order of magnitude" growth in the business volumes of marketers and brokers
- An infrastructure to enable rapid implementation of environmental policies with market-based approaches for carbon & other greenhouse gases, renewable energy, fuels, energy efficiency and conservation, and water quality.

Benefits for Environmental Market Participants	Corporate Sellers	Corporate Buyers	Brokers & Marketers	Regulators	Verifiers, Certifiers & Measurement Companies
---	--------------------------	-------------------------	--------------------------------	-------------------	--

Cost Reduction

Lower transaction cost for tracking and managing environmental commodities	■	■	■		
Cost of keeping up-to-date with rules and validity of each Commodity	■	■	■		■
Lower cost of technology infrastructure	■	■	■		■
Data integration with emerging marketplaces, brokerages, exchanges	■	■	■		
Streamlined, efficient, accurate compliance reporting		■		■	

Rapid Development of Effective Markets

Increased liquidity	■	■	■		
Increased price visibility	■	■			
Increased environmental market transparency and accountability	■	■		■	■
Access to additional revenue streams from the sale of Environmental Commodities	■		■		■
Greater access to types and sources of Environmental Commodities for purchase		■	■		■
Scalable infrastructure to enable "order of magnitude" growth in volume			■		■
Efficient implementation of environmental policies via market based approaches	■	■	■	■	■

The Future is Cleaner & Brighter

Industry experts agree that the markets for Environmental Commodities are poised for **further exponential growth**.

Carbon: With California's passage of carbon legislation and the east's Regional Greenhouse Gas Initiative underway, many states are active and very likely to follow suit. In addition, Federal action on carbon is increasingly likely, with multiple bills now before Congress. Experts today believe the question is when, not whether a compliance market for carbon will become a reality, alongside today's voluntary carbon market. Most experts believe regulators will first focus on the power and manufacturing industries, because their plants, including electricity generation from fossil fuels, represent one of the nation's largest sources of greenhouse gas emissions.

RECs: In US renewable energy, the nation's mandatory and voluntary REC markets are predicted to grow by a factor of three in the next several years. The National Renewable Energy Lab market report predicts that states will continue to adopt Renewable Portfolio Standards as a means to promote investment in renewable energy, such as wind, solar, geothermal, biomass and other renewable resources.

Energy Efficiency: Finally, the market for energy efficiency and conservation credits is just now emerging, with a huge potential for monetizing energy efficiency savings. Some experts believe that the market potential for energy efficiency and conservation credits is even larger than the REC markets, because EE is applicable across all states & industries and the MWh savings potential is much larger.

By all accounts, the Environmental Markets are poised to become the largest new commodity markets in the US in the next 20 years.

The essential infrastructure provided by the **APX Environmental Market Depository™** enables the markets for trusted Environmental Commodities to develop rapidly. At the same time, it is designed to meet the needs of market participants and support the policy objectives of states, regions, and the US Federal government. It is proven technology that is here today to support a cleaner and brighter future.

For further information contact:

Reiner Musier
Vice President & CMO
+1 617-699-0929

APX Inc., 5201 Great America Parkway, #522, Santa Clara, CA 95054
+1 408-517-2100 www.apx.com