




Certification of Attributes: Advancing Integration of Carbon Markets

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Agenda

- Lessons learned in the success of US mandatory Renewable Portfolio Standard (RPS) markets
- Applicability of RPS markets to the integration of compliance mechanisms in CDM and JI Projects with other environmental markets

APX, Inc. Company Background



- A technology and services firm serving the environmental and energy industries
- APX's environmental market infrastructure is the standard for verifying, certificating, and reporting in the North American clean energy markets
- Largest provider of hosted power market operations systems and support in North America



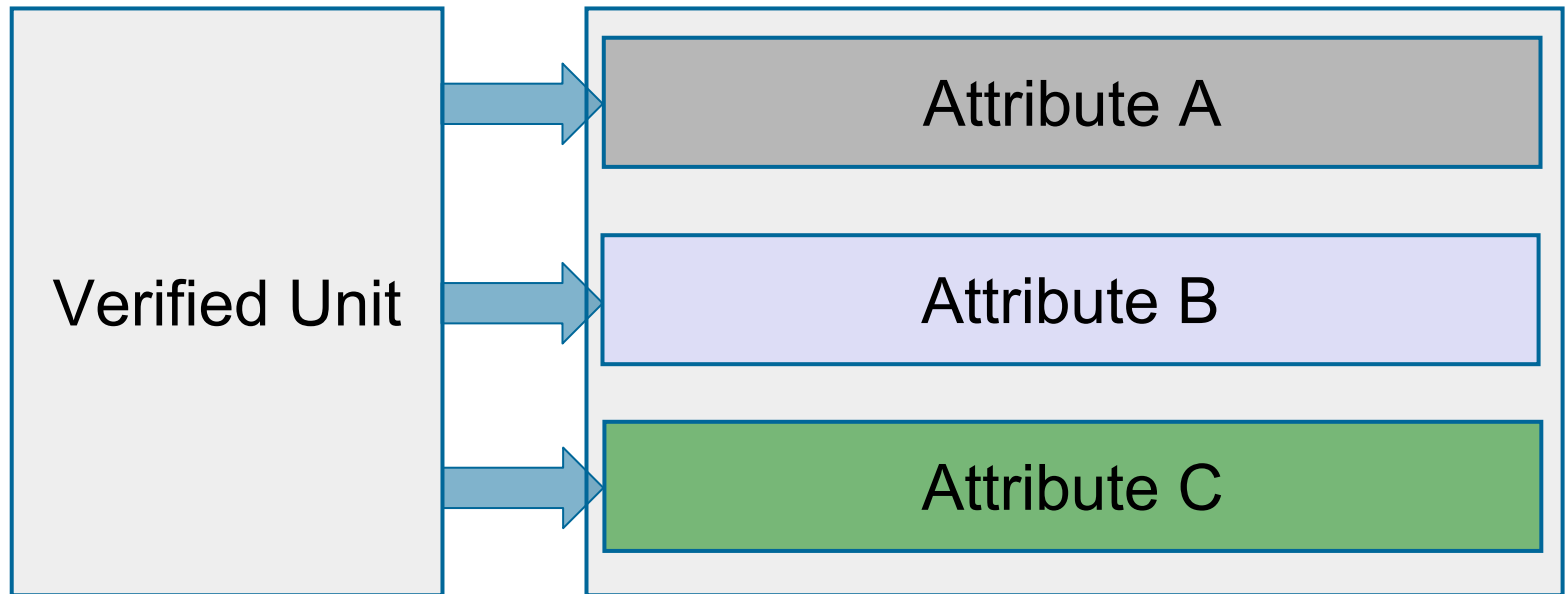
The Certificate-based Approach

Mechanism of Choice for RPS Programs

- All mandatory North American clean energy markets have implemented certificate-based market systems
- Why?
 - Attributes can be traded independently of the market barriers and physical constraints of the base product
 - Stakeholders can compare similar products to quantify the value of attributes across regions
 - Data is validated, tracked, and reported in a simple and clear manner
 - Regulations, rules, and reports can be modified quickly to meet the constantly changing regulatory environment
 - Varying regulations can be administered utilizing a single trusted infrastructure
 - Certificates introduce a “physical commodity”

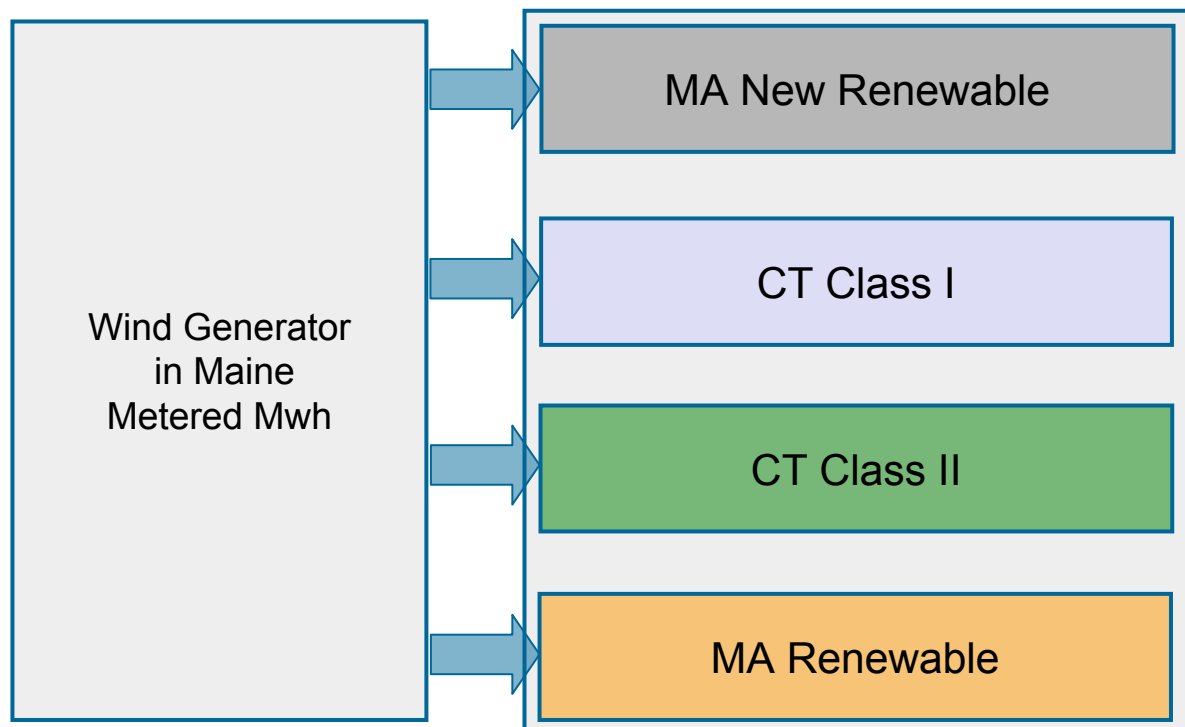
Creating Environment Commodities

Supporting a market-based approach

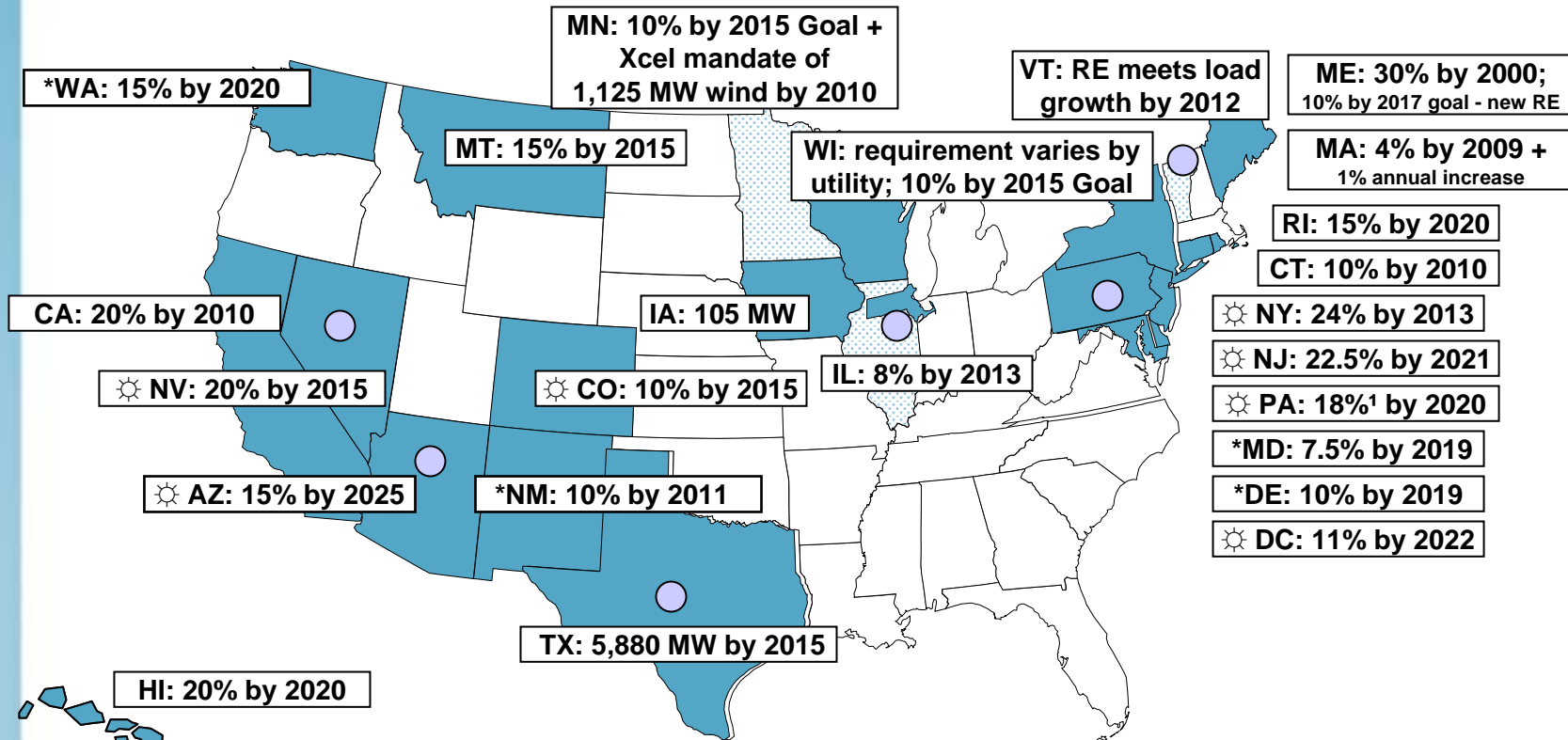


One Unit = One Certificate; can contain varying number of attributes

Tracking Multiple RPS Attributes



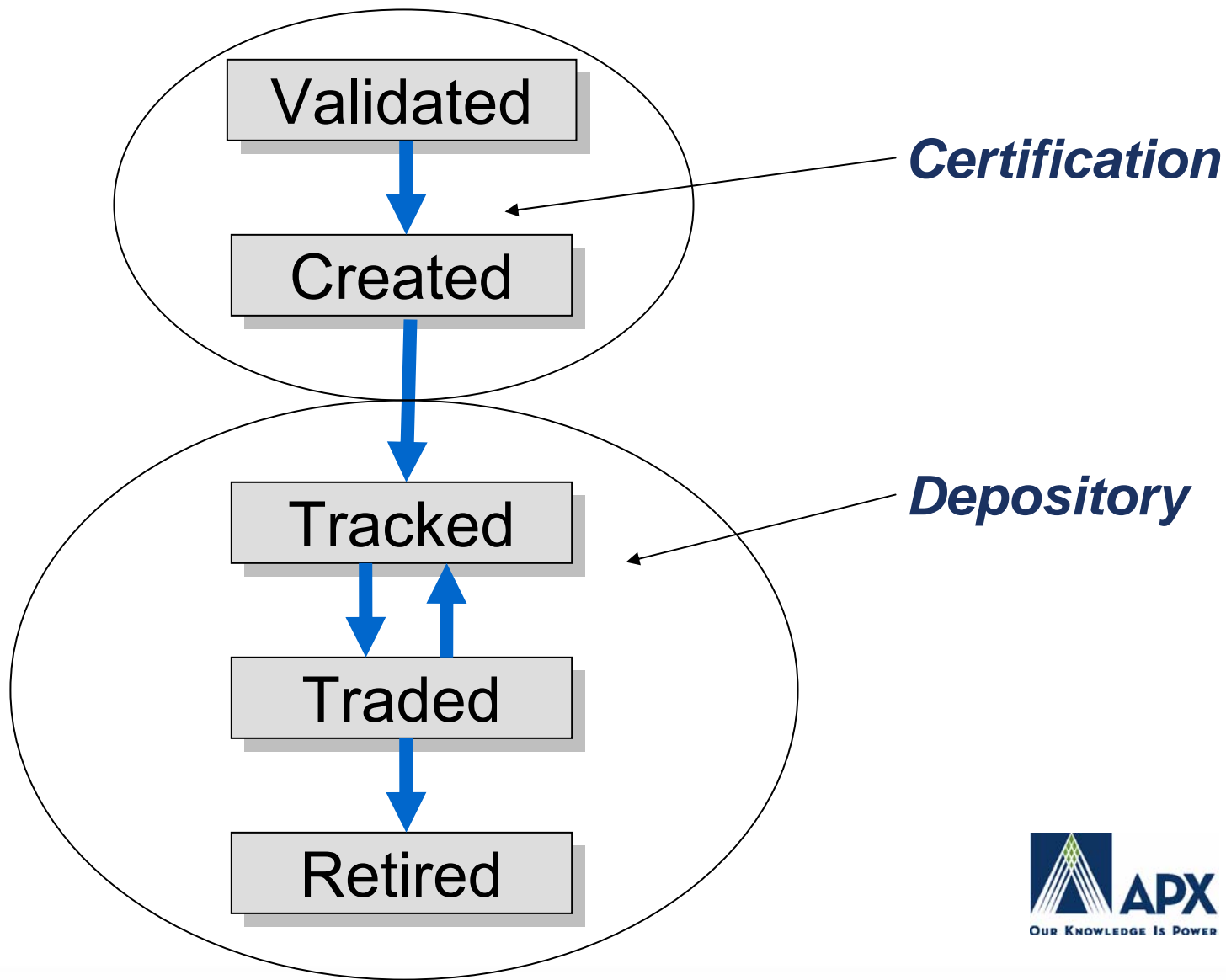
Regulations Differ ... So Do the Prices



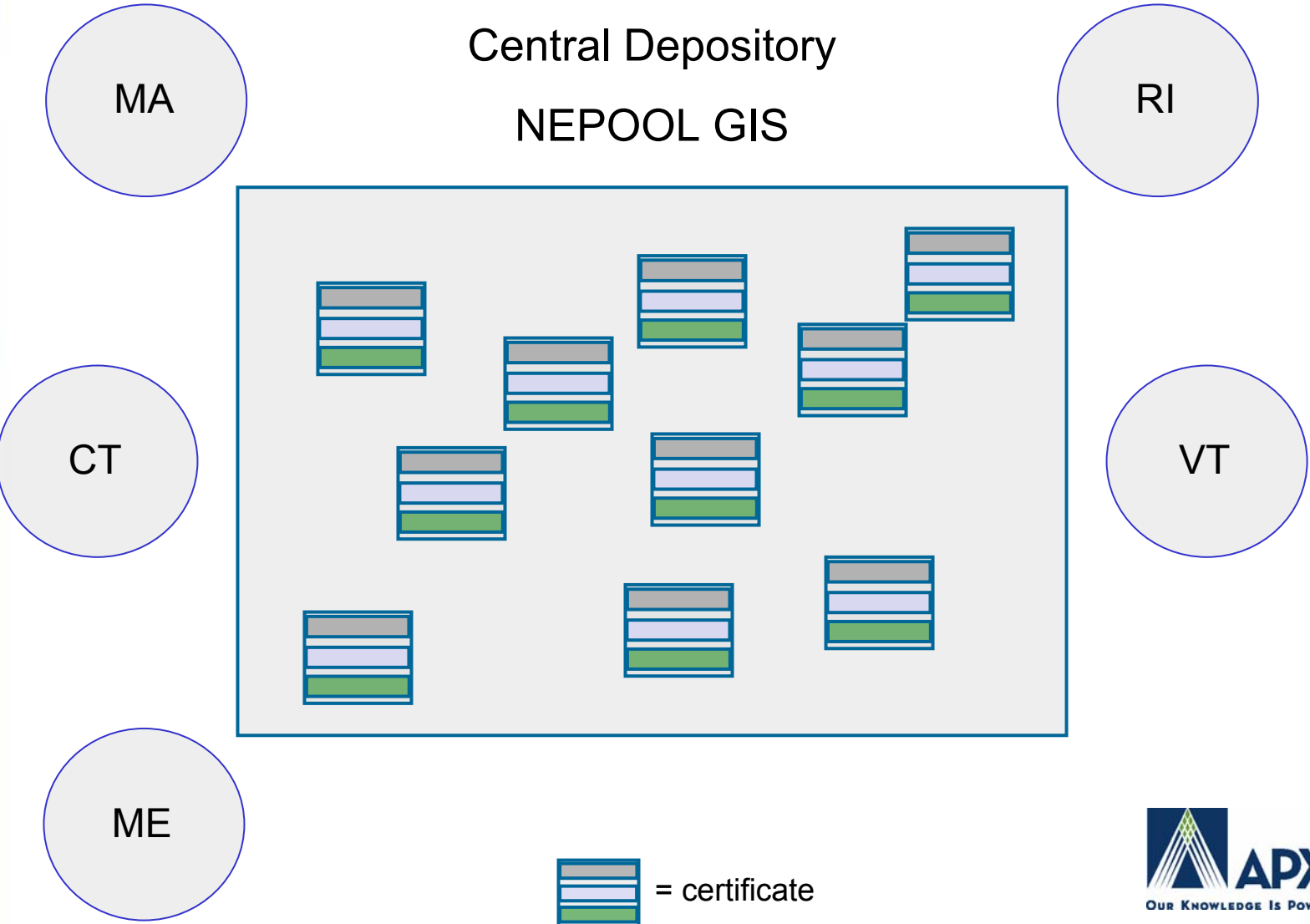
☀ Minimum solar or customer-sited requirement
 * Increased credit for solar or customer-sited
¹PA: 8% Tier I, 10% Tier II (includes non-renewable sources)

■ State RPS
 ■ State Goal
 ● Solar water heating eligible

Lifecycle of the Certificate



Certificates Retire Based on Regulation





RPS Approach

Success Factors

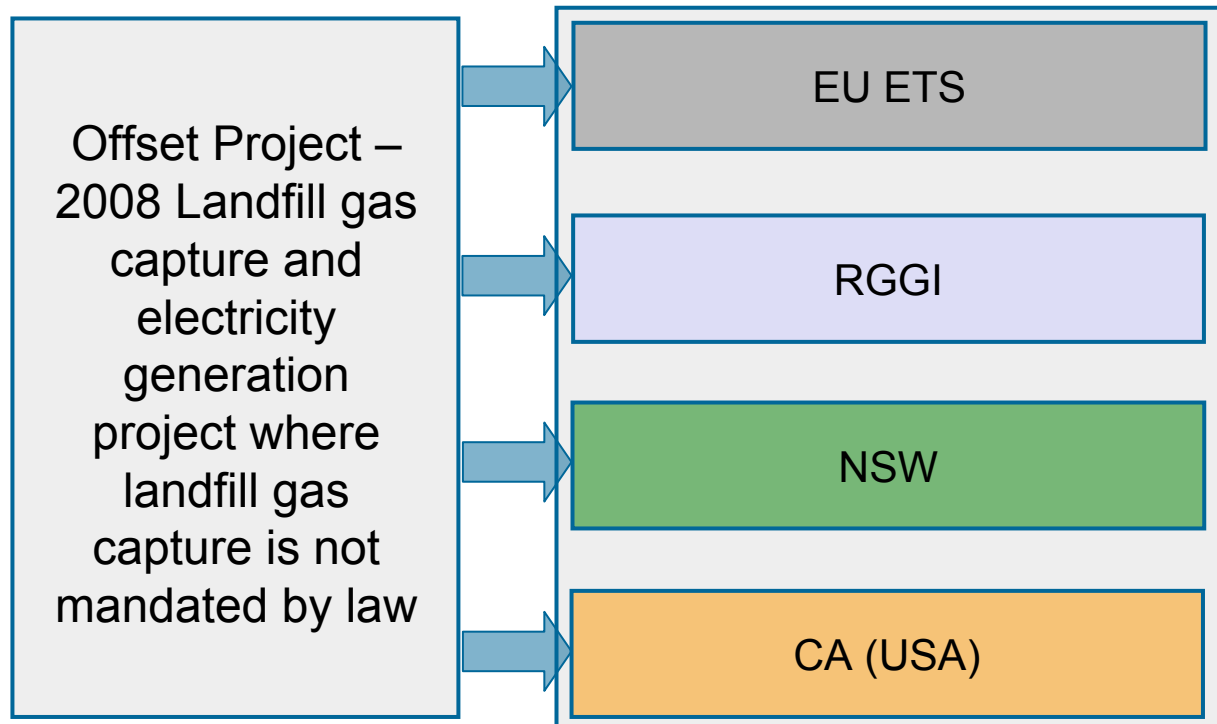
- Regulation creates the obligation
- Certificate Systems enable the market
 - Integrity
 - Stakeholders must be confident that the attribute is actually available to the market
 - Market cannot allow the certificate to be sold more than once
 - Quality of Information
 - Stakeholders need accurate information to manage their risk
 - Information on supply and demand must be readily available
 - Regulators need compliance information
 - Technologically Advanced
 - Systematic web-based management of information
 - Market Based Approach
 - Stakeholders manage their obligations as they see fit



Application of Certificate Based Systems for GHG Markets

- Regulations will differ amongst markets
- Verification and monitoring requirements will not be consistent across markets
- Ownership will need to be policed
- New markets will continue to evolve

Integration by Tracking Multiple Market Attributes





Can Certificate Based Program Help Integrate Carbon Markets?

- Proven effective in the administration of US RPS programs
- Indifferent to emissions source or point of regulation
- Capable of defining attributes at the lowest level (Mt/hour, Mwh, MMBtu, Bbl)
- Create verifiable, serialized certificates which can be traded and retired
- Efficient and cost-effective
- Flexible enough to incorporate future state, regional, and national regulations