

Organic Waste Digestion Project Protocol version 1.0

Webinar will begin shortly

For audio, please dial (312) 878-0218

Access code: 452-514-185



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Max DuBuisson
Business Development Associate

Syd Partridge
Policy Manager



Today's presentation

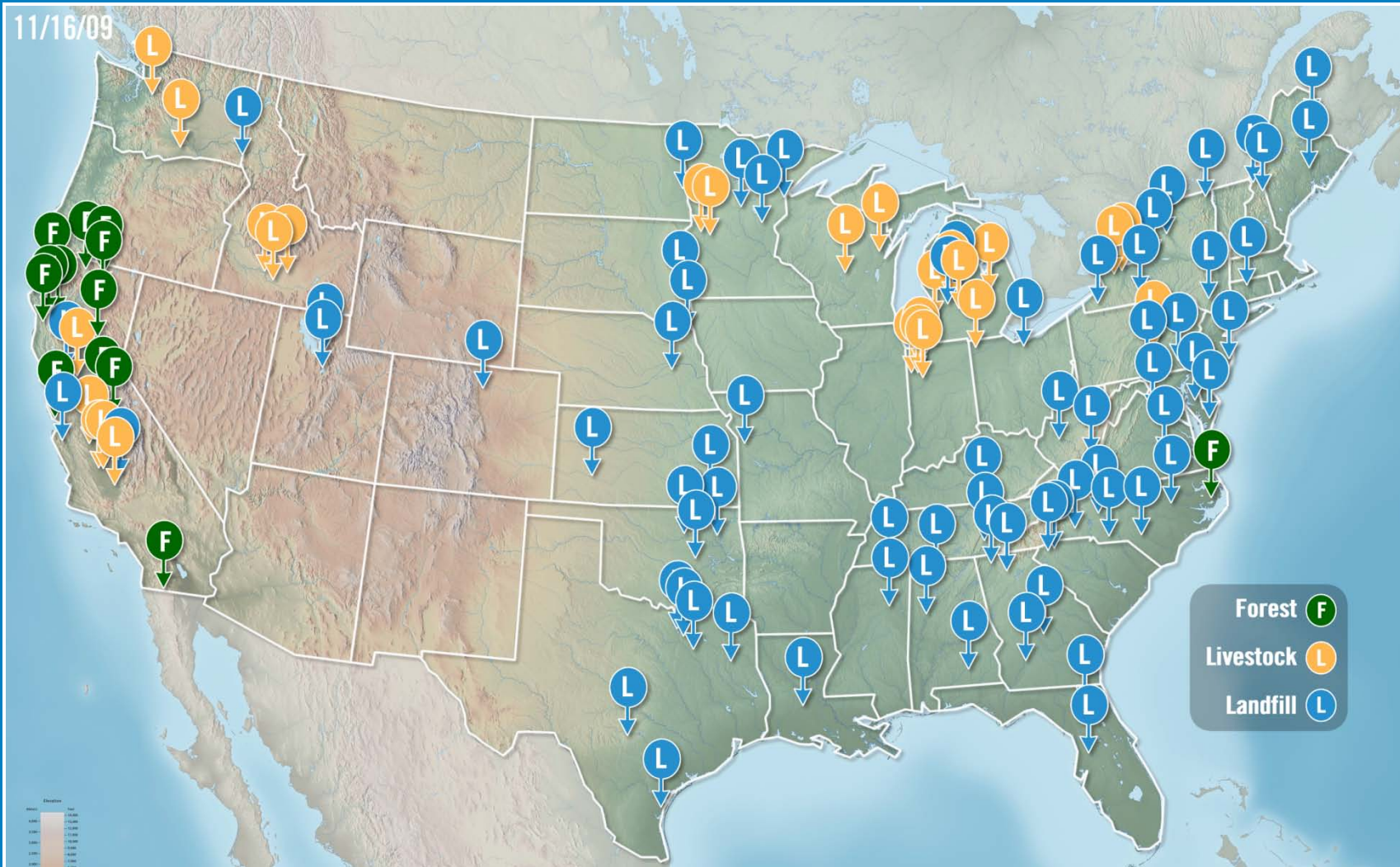
- Organic waste digestion projects
 - Definition
 - Eligibility
 - Monitoring/metering
- Assumes background knowledge about the Reserve
- Ask questions using question window
- Slides will be e-mailed later today



Current Statistics

- Reserve launched: **May 2008**
- Account-holders: **177**
- Total submitted projects: **170**
 - Located in **39** states
- CRTs issued: **~1.8 million**
- Recent average price: **\$7 - \$8 per CRT**
 - According to *The Forestry Source*, September 2009

Listed & registered projects





Today's Speaker

- **Syd Partridge**
 - Policy Manager for the Reserve
 - Led the development for:
 - Organic waste digestion protocol
 - Livestock protocol
 - Coming soon: Composting protocol

The Organic Waste Digestion Protocol

Syd Partridge, Policy Manager



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Our Protocols

- Developed with broad public input through a quasi-regulatory development process
- Goal is to create a uniform standard that is widely recognized and builds on best practice
 - We incorporate the best elements of other protocols
 - We do not accept protocols from other programs (i.e. CDM, Gold Standard, VCS, etc.)
- Designed as step-by-step instructions on project development

Principles of Reserve Project Accounting



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- **Real:** Reductions have actually occurred, and are quantified using complete, accurate, transparent, and conservative methodologies
- **Additional:** Reductions result from activities that would not happen in the absence of a GHG market
- **Permanent:** Reductions verified ex-post, risk of reversals mitigated
- **Verified:** Emission reports must be free of material misstatements, confirmed by an accredited verification body
- **Owned unambiguously:** Ownership of GHG reductions must be clear
- **Not harmful:** Negative externalities must be avoided
- **Practicality:** Project implementation barriers should be minimized



The Standardized Approach

Benefits to a top-down approach:

- Low up-front costs to project developers
- Efficient review and approval of projects
- Transparency and consistency
- Same approach applies across projects
- Prescriptive guidance to eliminate judgment calls

But... high initial resource investment to program



Direct vs. Indirect GHG Reductions

- Direct reductions: occur at the same location where the reduction activity is implemented, and/or at sources owned or controlled by project participants.
- Indirect reductions: occur at a location other than where the reduction activity is implemented, and/or at sources not owned or controlled by project participants.



Direct vs. Indirect – GHG Accounting

Direct reductions

- Clearer project boundaries
- Better Access to Data
- Clearer ownership
- Less risk for double counting

Indirect reductions

- Potentially more difficult to establish baselines
- Restricted access to data
- Challenges in establishing ownership
- Potentially greater risk of double counting

Indirect Emission Reduction Challenges



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Challenge:

OWD Protocol:

Difficulty establishing baselines	Uses a <i>conservative and highly standardized</i> approach to estimating baseline emissions
Restricted access to data	Imposes requirements to ensure verifier has access to all necessary data and facilities
Challenges in establishing ownership & Potentially greater risk of double counting	Requires that project developers attest to exclusive legal claim of GHG reductions resulting from the project, and requires that project developers have mechanisms in place to ensure no claims will be made to the GHG reductions from other entities.

OWD Protocol Development Goals



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- Develop a *standardized* approach for quantifying, monitoring and verifying GHG reductions from projects that avoid methane emissions to the atmosphere by diverting organic waste and/or wastewaters to Anaerobic Digesters (A-D)
- Maintain consistency with or improve upon existing methodologies
- Ensure accuracy and practicality of projects



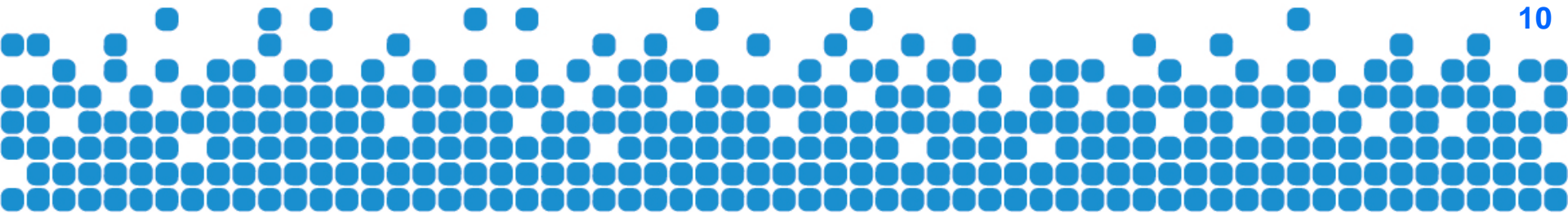
Protocol Development Process

- Internal protocol scoping
- Form multi-stakeholder workgroup
- Draft protocol
- Send draft through workgroup process
 - Workgroup provides feedback, consensus is built
 - Can be iterative process
- Draft protocol released for public review
- Public comments incorporated
- Protocol submitted to Reserve Board for adoption



Workgroup Members

- Atmosclear.org
- Bluesource Canada
- California Air Resources Board
- California Integrated Waste Management Board
- Californians Against Waste
- Cantor CO2e
- City of Los Angeles
- City and County of San Francisco
- Climate Check
- CR&R Inc.
- East Bay Municipal Utility District
- First Environment, Inc.
- Greenhouse Gas Services, LLC.
- Humboldt Waste Management Authority
- Microgy, Inc.
- Recology, Inc.
- Ryerson, Master and Associates, Inc.
- TerraPass, Inc.
- Tetra Tech
- University of Washington
- Waste Management, Inc.
- Western United Dairymen





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Intro to the Organic Waste Digestion Project Protocol

Project Protocol Components



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Define the GHG reduction project	Section 2
Determine eligibility	Section 3
Establish the GHG assessment boundary	Section 4
Calculate GHG reductions <ul style="list-style-type: none">• Baseline emissions• Project emissions	Section 5
Monitoring requirements	Section 6
Reporting requirements	Section 7
Verification guidance	Section 8



Project Definition

*The digestion of one or more eligible organic waste and/or agro-industrial wastewater streams in an **operational** biogas control system (BCS) that captures and destroys methane gas that would otherwise have been emitted to the atmosphere in the absence of the project.*

*A BCS is **operational** on the date at which methane is first destroyed upon completion of a start-up period (within a 6 month window from date eligible waste is first digested in the digester)*

Includes:

- Co-digestion with manure
- Centralized digesters

Excludes:

- Ineligible organic waste materials (e.g. digester feedstocks that are commonly managed through non-anaerobic methods)
- Treatment other than digestion with biogas capture (i.e. combustion, composting, gasification etc.)



Eligibility Rules

I:	Location	→	U.S. and its territories
II:	Project Start Date*	→	Within 6 months of project becoming operational (back to October, 7, 2007 for initial 12 month grace period)
III:	Anaerobic Baseline (for wastewater treatment)	→	Demonstrate anaerobic baseline conditions
IV:	Additionality	→	Meet performance standard
		→	Exceed Legal Requirements
V:	Regulatory Compliance	→	Compliance with all applicable laws
Crediting Period		→	10 years, renewable one time

*See Reserve Website for more info on new project start date policy:
<http://www.climateactionreserve.org/how/program/program-manual/>



Performance Standard Test



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- The PST is passed by meeting a performance threshold representing better than “business-as-usual” waste management
- PS determined based on assessment to determine which waste types are highly likely to result in significant methane emissions under common practice management practices.
- Project passes the PS test if at least one eligible organic waste stream is digested in the project’s biogas control system (BCS)



Eligible Waste Streams

- Eligible Waste Streams:
 - **MSW Food Waste:** *Non-industrial* food waste consisting of uneaten food, food scraps, spoiled food and food preparation wastes from homes, restaurants, kitchens, grocery stores, campuses, cafeterias, or similar institutions)
 - **Agro-industrial Wastewater:** Organic loaded wastewater from industrial or agricultural processing operations that, prior to the project, was treated in an uncontrolled anaerobic lagoon, pond, or tank at a privately owned treatment facility. *Excluded from eligibility are wastewaters produced at breweries, ethanol plants, pharmaceutical production facilities, and pulp and paper plants.*



Legal Requirement Test

- Legal Requirement Test is applied to each eligible waste stream used by the project.
- Project developers required to submit signed Regulatory Attestation for each verification
- If an OWD waste stream later becomes subject to a legal mandate, the waste stream will remain eligible up until the date that the legal mandate takes effect.
 - Similar treatment if waste producing source is subject to cap-and-trade



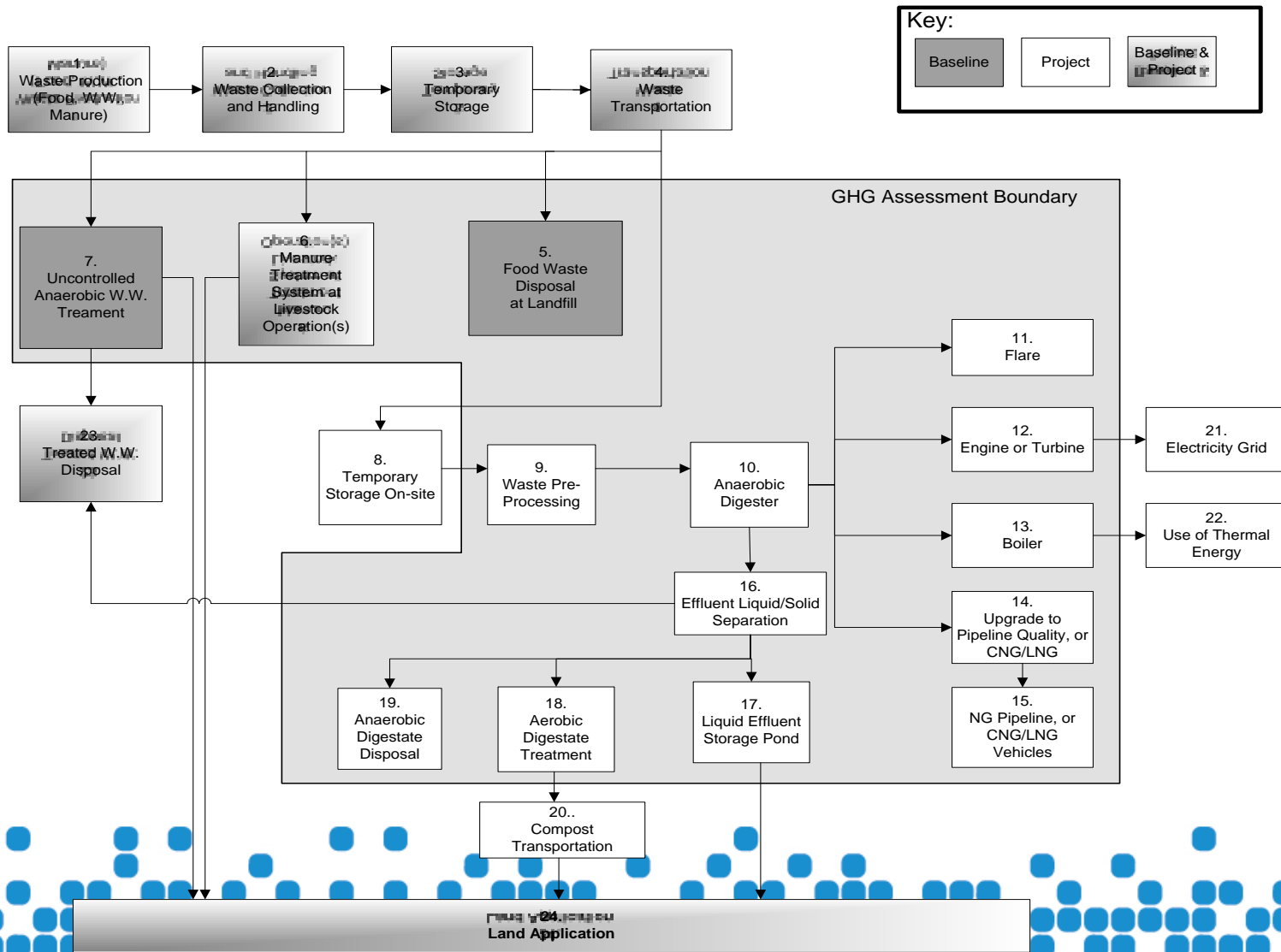
Local Mandates Enacted in Conjunction with an OWD Project

- A food waste stream subject to a local food waste diversion mandate passes the Legal Requirement Test if (and only if):
 - The project has an operational start date prior to, but no more than 6 months before, the date that the food waste diversion mandate is enacted, or
 - The project is *implemented* subsequent to, but no more than 6 months after, the date of passage into law of the local food waste mandate

GHG Assessment Boundary



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Calculating Emission Reductions



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Equation 5.1: Emission Reductions

$$ER_y = BE_y - PE_y$$

Where,		
ER_y	=	Emission reductions during the year y
BE_y	=	Baseline emissions during the year y BE_y = lesser of two values: calculated baseline vs. metered methane destruction
PE_y	=	Project emissions during the year y



Baseline Emissions

- Methane that would have been released to the atmosphere from:
 - Landfilling of food waste
 - FOD Model with standardized assumptions
 - Only site-specific variable is decay rate (k value) – see Figure B.2
 - See Table B.3 for calc results in units of MTCO₂e / MT waste (wet)
 - Uncontrolled anaerobic treatment of W.W.
 - Monthly Chemical Oxygen Demand (COD) Sampling
 - Option to use site-specific Bo based off sampling and lab analysis
 - Default MCF value
 - Uncontrolled Anaerobic manure management
 - Uses Reserve Livestock Protocol Calculation

Baseline Emissions from Food Waste



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- Unique approach based on stakeholder/public support:
 - Avoided emissions are modeled for 10 year time horizon following the initial diversion, and credited upfront in the year that the methane destruction takes place
 - LFG Collection Systems are assumed to be in place at all landfills, and come on-line 3 years after waste is deposited.



Project Emissions

- Project emissions equal the sum of:
 - the CO₂ emissions from mobile and stationary combustion of fossil fuels and/or the use of grid delivered electricity
 - the CH₄ created by the biogas control system that is not captured and destroyed by the control system
 - the CH₄ generated by the digester effluent storage pond
 - the CH₄ and N₂O produced by the aerobic treatment of the residual digestate produced in the digestion process
 - the CH₄ generated by the anaerobic disposal of the residual digestate produced in the digestion process
 - the CH₄ created by manure treatment and storage systems that were affected by project activity



Monitoring and Metering

- Food Waste Streams
 - Wet weight and county of origin by truckload, aggregated annually
 - Weight of Rejected Material, by truckload, aggregated annually
- Agro-Industrial Wastewater Streams
 - Daily volume of W.W. entering digester, aggregated monthly
 - Monthly COD
 - Optional – Bo sampling and analysis once annually
- Digester Liquid Effluent
 - Daily volume of liquid effluent prior to storage pond, aggregated monthly
 - Or, project may use the digester inflow as a conservative approximation of digester outflow
 - Quarterly COD
- Weight of Solid Digestate disposed anaerobically:
 - Wet weight by truckload, aggregated annually



Biogas Monitoring Requirements

- Total flow of Biogas from the digester
 - measured continuously
 - recorded every 15 minutes or totalized and recorded at least daily
- Total flow of Biogas delivered to each destruction device
 - measured continuously
 - recorded every 15 minutes or totalized and recorded at least daily
- Fraction of methane in the Biogas
 - measured with a continuous analyzer or with quarterly measurements (with a handheld device, for instance)

Monitoring, Reporting & Verification



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- Biogas monitoring frequency and instrumentation QA/QC, including:
 - Cleaning, inspection, field checks and calibration schedule
 - Procedure for failed calibration
 - Procedure for missing data
- Record-keeping requirements
- Reporting period/verification cycle = maximum of 12 months; can choose to verify more frequently
- Verify each reporting period with ISO-accredited and Reserve-trained verification body

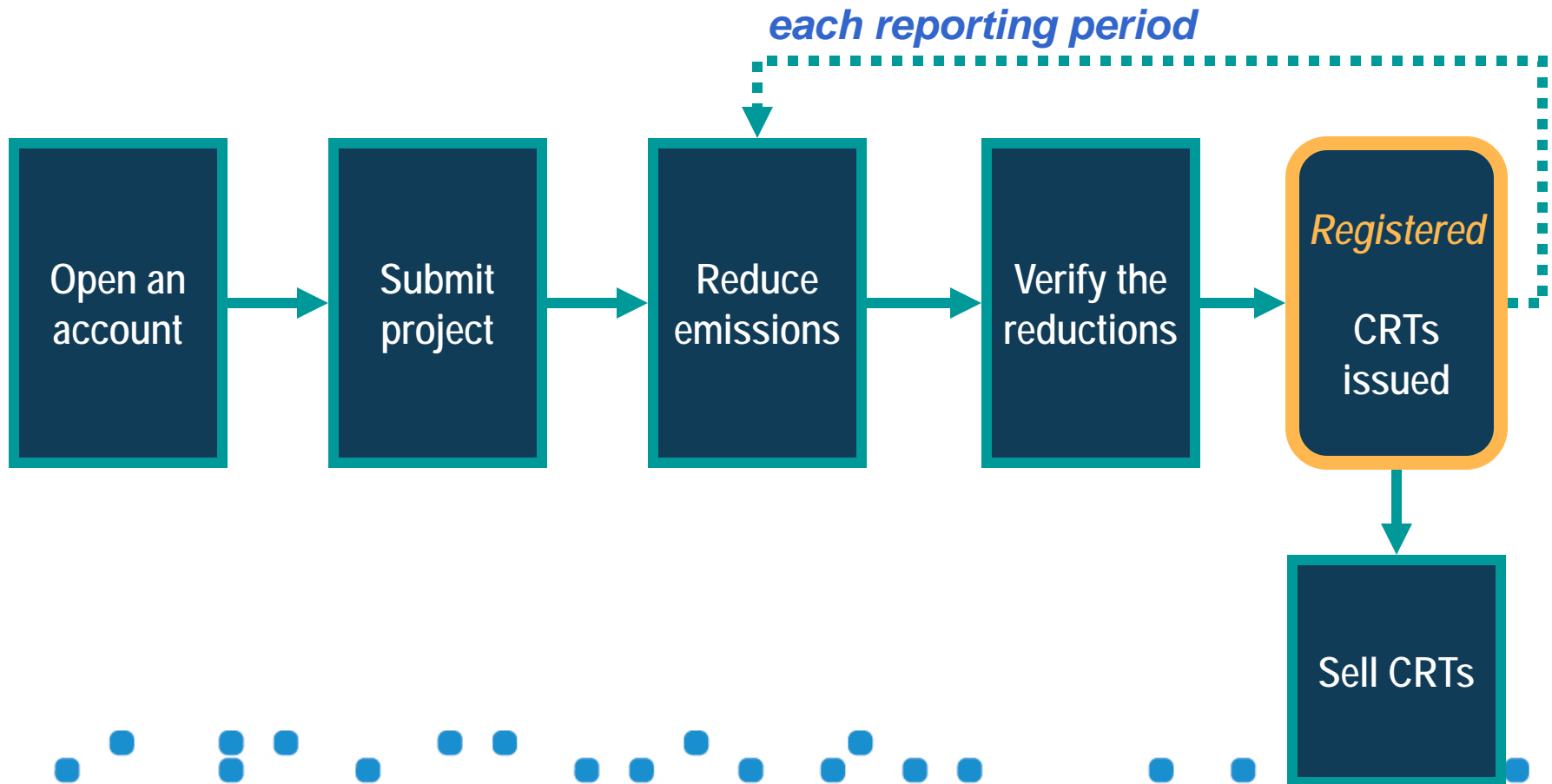


Potential projects (examples)

- Municipal projects that divert and digest post-consumer (MSW) food waste
- Dairy farm or cheese plant digesting manure and cheese wastewater
- Meat/Poultry processing facility installs covered lagoon over pre-existing anaerobic wastewater treatment lagoon
- Centralized Digesters sourcing industrial wastewater and manure for digestion from dairy farms, food processing plants etc.
 - Likely that Not ALL residues digested will be eligible for earning CRTs



Steps to Register a Project





Up Next?

Composting Project Protocol

- Will largely build off the work done for OWD
- Expected Release: Late June 2010
- **Protocol Kick-Off Meeting:**
 - Date: December 09, 2009
 - Time: 10am-1pm PST
 - Location: Portland, OR
 - Remote participation via webinar
- Composting Webpage:

<http://www.climateactionreserve.org/how/protocols/in-progress/composting/>



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Contacts:

General Policy/Protocol Questions:

213-891-1444 x4

policy@climateactionreserve.org

Syd Partridge

Policy Manager

213-542-0294

syd@climateactionreserve.org

