EPA Road-testing of Landfill Gas Methane Projects

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Landfill Methane

- Almost 25% of U.S. anthropogenic CH_4 U.S. (2007)
- 2% of total U.S. GHG emissions (2007)
- Methane reductions through capture and control equipment
- No regulation for smaller landfills
- 80% of non-regulated landfills do not have gas collection
- Major opportunity for emission reductions, currently make up ~10% of traded volume in U.S. voluntary market

Road-test of Landfill Methane Protocols

	Protocol Version	Year	Number of Projects Listed
Climate Leaders	Version 1.3	2008	None
RGGI	Revised RGGI Model Rule	2008	None
CCX	Chapter 9: Rulebook	2004	>30 registered
Climate Action Reserve (CAR)	Version 2.0	2008	1 registered 14 listed
Clean Development Mechanism (CDM)	ACM0001: Version 10	2008	97 registered 101 at validation or registration request

Eligibility Requirements

Key Differences	Climate Leaders	RGGI	CCX	CAR	CDM
Excluded technologies			√	√	
Emission reductions from fossil fuel displacement	(√)				√
Early Installation			√		
Monitoring of changes in regulation	√	√		√√	√
Changes in regulation for approved projects	Immediate cessation of eligibility	No renewal	Cessation at regulation start date	Cessation at regulation start date	No renewal
Expansion of pre-existing control systems	√	?	?	√	√

Project Boundary

Key Differences	Climate Leaders	RGGI	CCX	CAR	CDM
CO_2	√			√	√
N_2O	√				
Soil oxidation of CH_4	√	√		√	
End use of landfill methane					√
Project-related construction emissions	√				

Leakage

	Climate Leaders	RGGI	CCX	CAR	CDM
Leakage	Considered on case-by-case basis			Limited to activity shifting – assumed to not occur for this protocol	

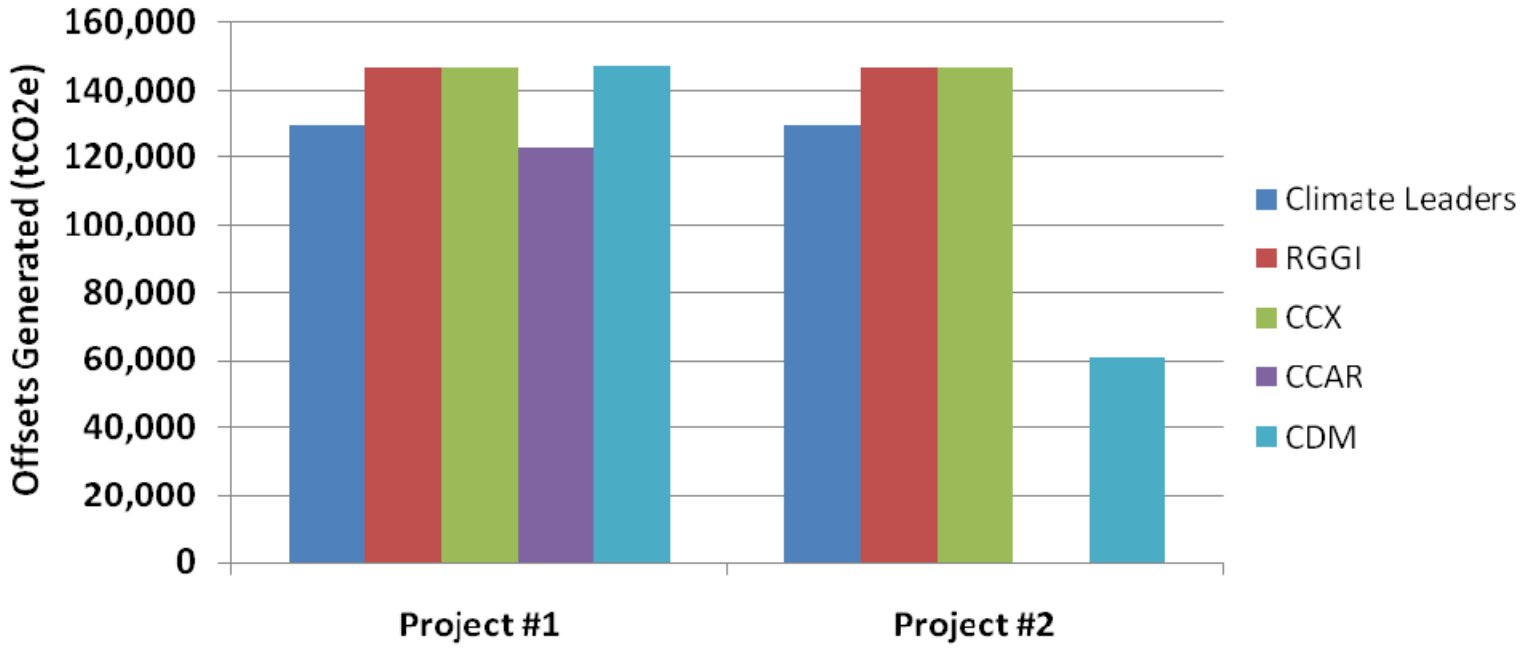
Baseline and Project Emissions Quantification

Key Differences	Climate Leaders	RGGI	CCX	CAR	CDM
Methane GWP	21	23	21	21	21
Methane density	>3% variation				
Methane combustion efficiency	99%	98%	100%	95-99.5%	50-100%
Soil oxidation factor	10%	10%	0%	10% (0%)	0%
Baseline adjustments for pre-existing control systems	Must be physically separate or monitored separately	Not specified	Unclear	Specific equation	Specific equation

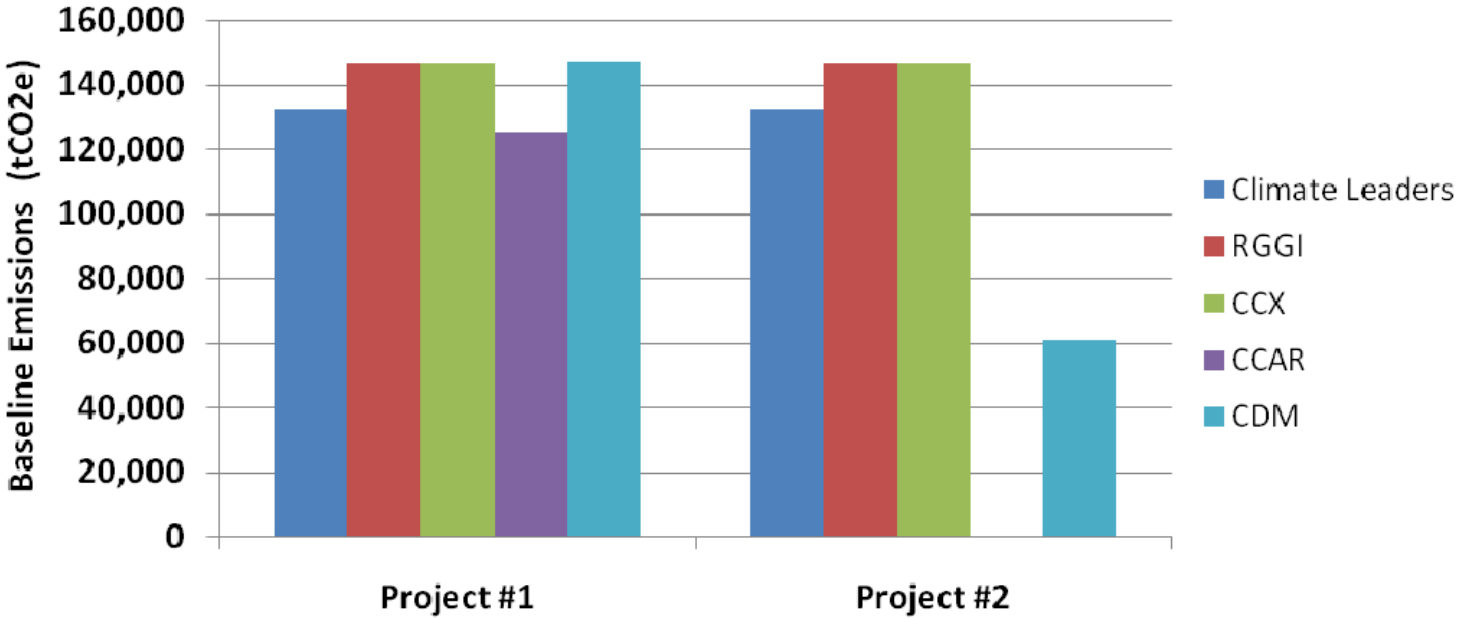
Sample Projects

	Type	Est. Date	Start Date	Energy Production	Relevant Regulation
Project #1	Municipal landfill	1980s	2003	Electricity	Subject to NSPS
Project #2	Municipal landfill	1980s	2003	Electricity	Pre-existing collection and destruction system

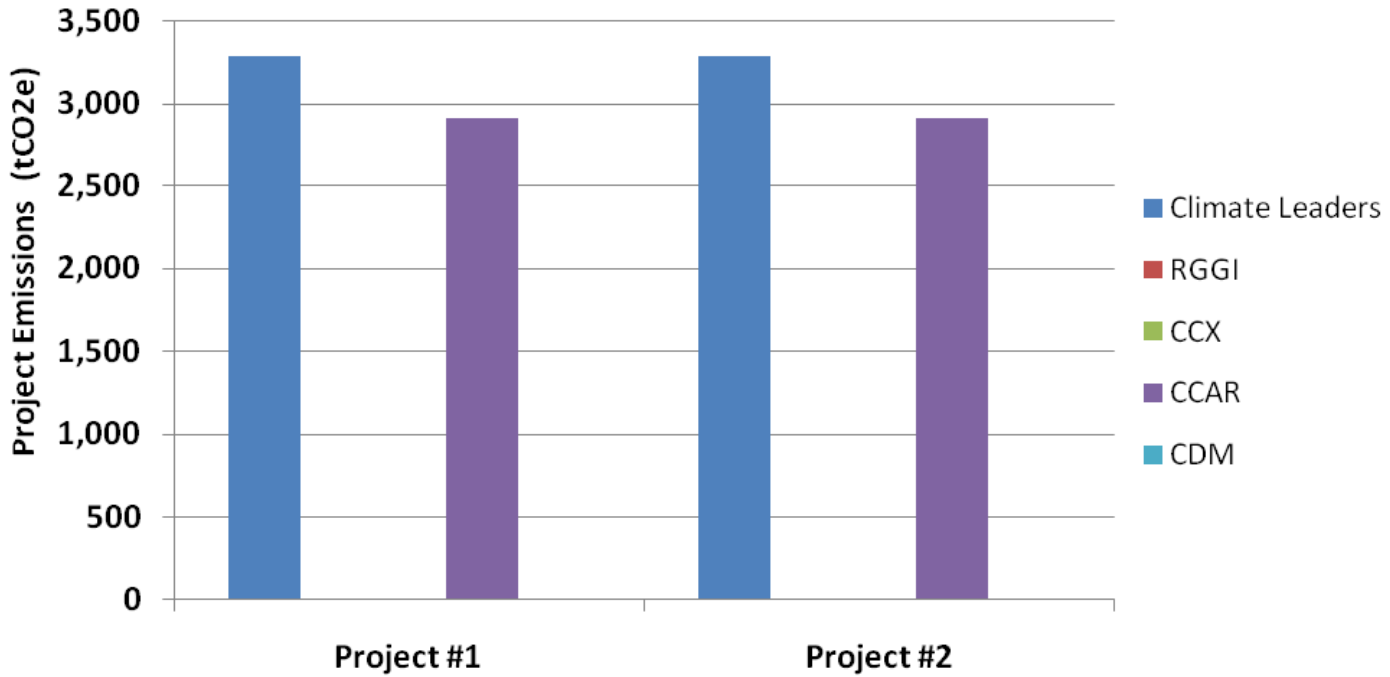
Estimated Offsets



Baseline Emissions



Project Emissions



Conclusions

- Up to 20% variation in offsets generated across protocols under simple and common project circumstances
- Soil oxidation discount
- GWP of methane
- Project emissions
- Combustion technology
- Pre-existing systems

SEI Recommendations

- Projects should be eligible to generate offsets up to, but not beyond, the date that a control system is required by regulation.
- Common default factors for combustion efficiency devices
- Adoption of CCAR's public attestation of regulatory additionality requirement
- Require continuous LFG flow measurement
- Require an uncertainty discount for less accurate measurement methods

Stockholm Environment Institute

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