

# RNG Accounting and Markets

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## GHG ACCOUNTING FRAMEWORKS

# Good policy, claims and thinking must make comparisons within the same accounting framework

	INVENTORY ACCOUNTING (EMISSIONS)	INTERVENTION ACCOUNTING (PROJECT EMISSIONS - BASELINE)
COMBUSTION ACCOUNTING ("BURNER TIP")	<p><b>Markets</b> Corporate accounting and reporting Cap-and-trade Oregon's SB 98 Gas RPS</p> <p><b>Example values</b> Wind/solar: 0 gCO<sub>2</sub>e/MJ Natural gas: ~60 gCO<sub>2</sub>e/MJ RNG: 0 CO<sub>2</sub>/MJ</p>	<p><b>Markets</b> Carbon offsets</p> <p><b>Example values</b> Wind/solar: Grid - 0 RNG: [Natural gas - o] + [Baseline methane - Project methane]</p>
LIFECYCLE ACCOUNTING	<p><b>Markets</b> Low Carbon Fuel Standard</p> <p><b>Example values</b> Wind: ~5 gCO<sub>2</sub>e/MJ Solar: ~15 gCO<sub>2</sub>e/MJ Natural gas: ~80 gCO<sub>2</sub>e/MJ RNG: ~0-50 gCO<sub>2</sub>e/MJ</p>	<p><b>Markets</b> Low Carbon Fuel Standard (for livestock and food waste)</p> <p><b>Example values</b> Dairy: -300 gCO<sub>2</sub>e/MJ</p>

## GHG ACCOUNTING FRAMEWORKS

Many of the RNG specific GHG “issues” require using less common accounting frameworks

	AVOIDED METHANE EMISSIONS	UPSTREAM RNG EMISSIONS
<b>ACCOUNTING METHOD</b>	Intervention	Lifecycle
<b>WHY THIS IS HARD</b>	Based on a counterfactual baseline (art not science)	Uncertainty around leakage Often unfairly compared to natural gas in a combustion framework
<b>POTENTIAL SOLUTIONS</b>	Rely on offset markets instead	Minimum “carbon intensity” thresholds to qualify under combustion framework

## GHG ACCOUNTING FRAMEWORKS

# Accounting frameworks drive RNG pricing currently

	Landfill (45 CI, D3)	WWTP (30 CI, D3)	Food waste (0 CI, D5)	Dairy (-250 CI, D3)	
Incremental LCFS Value (\$/MMBTU)	\$7	\$9	\$15	\$60	← Lifecycle
RIN Value (\$/MMBTU)	\$18	\$18	\$9	\$18	
<b>Combined</b> (\$/MMBTU)	<b>\$25</b>	<b>\$27</b>	<b>\$24</b>	<b>\$78</b>	
Producer 75% (\$/MMBTU)	\$19	\$20	\$18	\$60	
<b>\$/mtCO<sub>2e</sub></b>	\$350	\$375	\$350	\$1,100	← Combustion

Based on September 2020 pricing:

- + LCFS: \$200
- + D3 RIN: \$1.55
- + D5 RIN: \$0.74

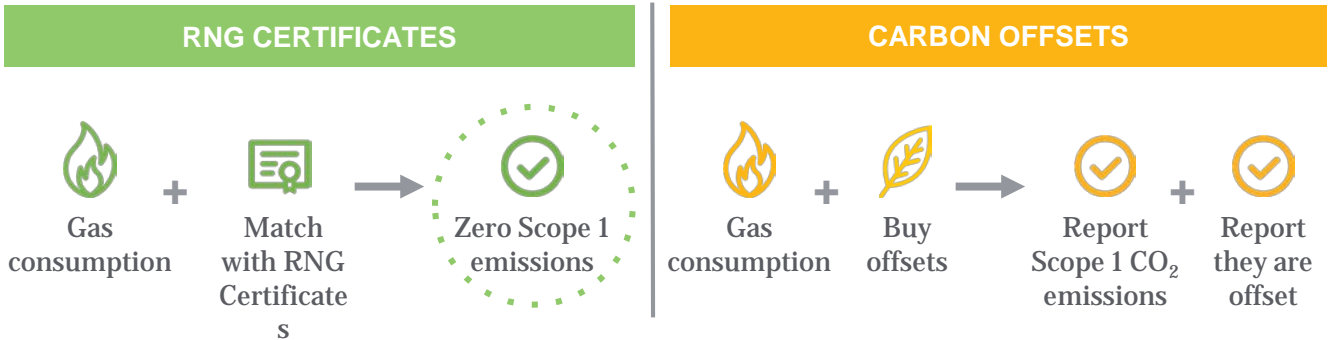
RNG CLAIMS

# RNG Certificates offer direct Scope 1 emissions mitigation



*CDP provides guidance that RNG Certificates eliminate the Scope 1 carbon emissions associated with natural gas.<sup>1</sup>*

<sup>1</sup> Climate Disclosure Project. CDP Technical Note: Accounting for Scope 2 Emissions Version 6. December 2019.



## RNG CLAIMS

# Following CDP while waiting on WRI...

<i>WRI Scope 2 Guidance (Previously referenced)</i>	<i>RNG application</i>
<p><b><i>Ownership</i></b>            Convey the direct GHG emission rate attribute (claim) associated with the unit of electricity produced. Be the only instruments that carry the GHG emission rate attribute claim associated with that quantity of electricity generation.</p>	Careful contracting
<p><b><i>Transparency</i></b>            Be tracked and redeemed, retired, or cancelled by or on behalf of the reporting entity.</p>	Tracking systems will help (Careful contracting until then.)
<p><b><i>Temporal</i></b>            Be issued and redeemed as close as possible to the period of energy consumption to which the instrument is applied.</p>	No current answer → track this as a buyer. <ul style="list-style-type: none"> <li>● LCFS - 3 quarters</li> <li>● RFS - 1 year</li> <li>● Oregon SB 98 - 3 years</li> </ul>
<p><b><i>Same market</i></b>            Be sourced from the same market in which the reporting entity's electricity-consuming operations are located and to which the instrument is applied.</p>	Common carrier pipeline injection