

**OVERVIEW OF CURRENT OPPORTUNITIES  
IN COMPLIANCE CARBON MARKETS &  
VOLUNTARY MARKETS  
FOR IDAHO AND UTAH DAIRY & LIVESTOCK INDUSTRY**



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# Presentation Overview

## Opportunities for ID & UT Dairy

### 1. Compliance Markets

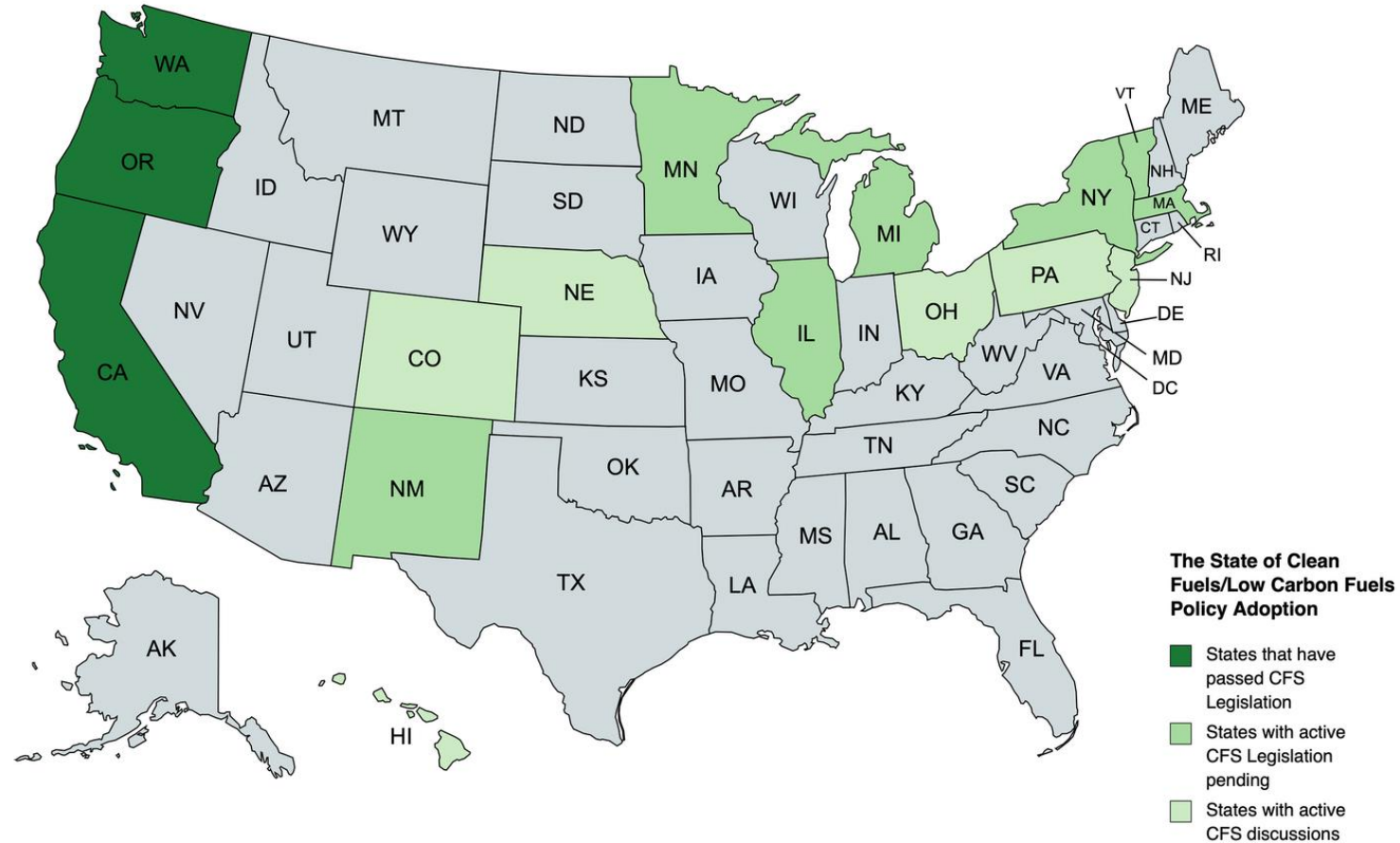
- State Clean Fuel Programs (in CA, OR, WA)
- Federal Renewable Fuel Standard Program
- State Cap-and-Trade Programs for “offset” projects (CA-Quebec, WA)

### 2. Voluntary Market Practices

- Alternative Manure Management (AMM) practices with established protocols for voluntary markets



# State Clean Fuel Standard Programs



Created with mapchart.net

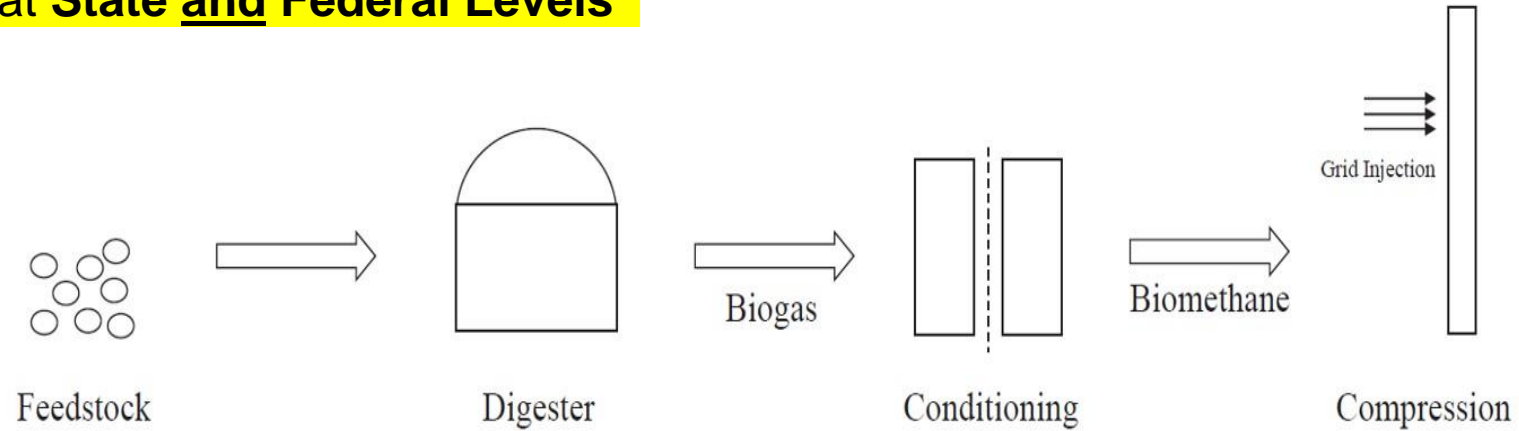
Image Source: Low Carbon Fuels Coalition

# NEEDED FOR PARTICIPATION IN COMPLIANCE MARKETS

## Biogas Control System (Anaerobic Digester)

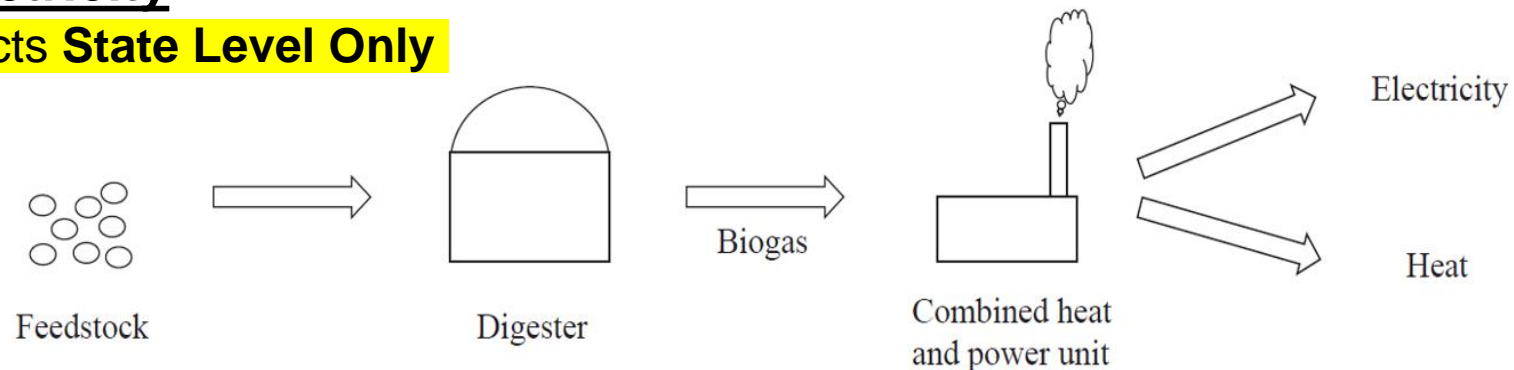
### Biogas to Biomethane (RNG)

Crediting for projects at **State and Federal Levels**



### Biogas to Electricity

Crediting for projects **State Level Only**



# Revenue Opportunities Associated with Biogas End-Uses for Compliance Fuel Markets

## Scenario A :

Biogas to Renewable Natural Gas (RNG)

1. State Low Carbon Fuel Program  
Credit (\$)

+

2. Federal RIN Credit (\$)

+

3. Commodity Gas Price (\$)

$(\$)\text{ Revenue} = 1 + 2 + 3$

## Scenario B :

Biogas to Electricity

1. State Low Carbon Fuel Program  
Credit (\$)

+

2. Power Purchase Agreement/Net  
Metering Price (\$)

$(\$)\text{ Revenue} = 1 + 2 + ?$



# State Clean Fuel Standard Programs

## States with Clean Fuel Programs:

- **California**
- **Oregon**
- **Washington**
- State compliance programs require fuel suppliers to reduce the Carbon Intensity (CI) of their fuels by a target date
- CI score determines crediting volume
- CI score for dairy RNG projects generally fall between -100 and -300

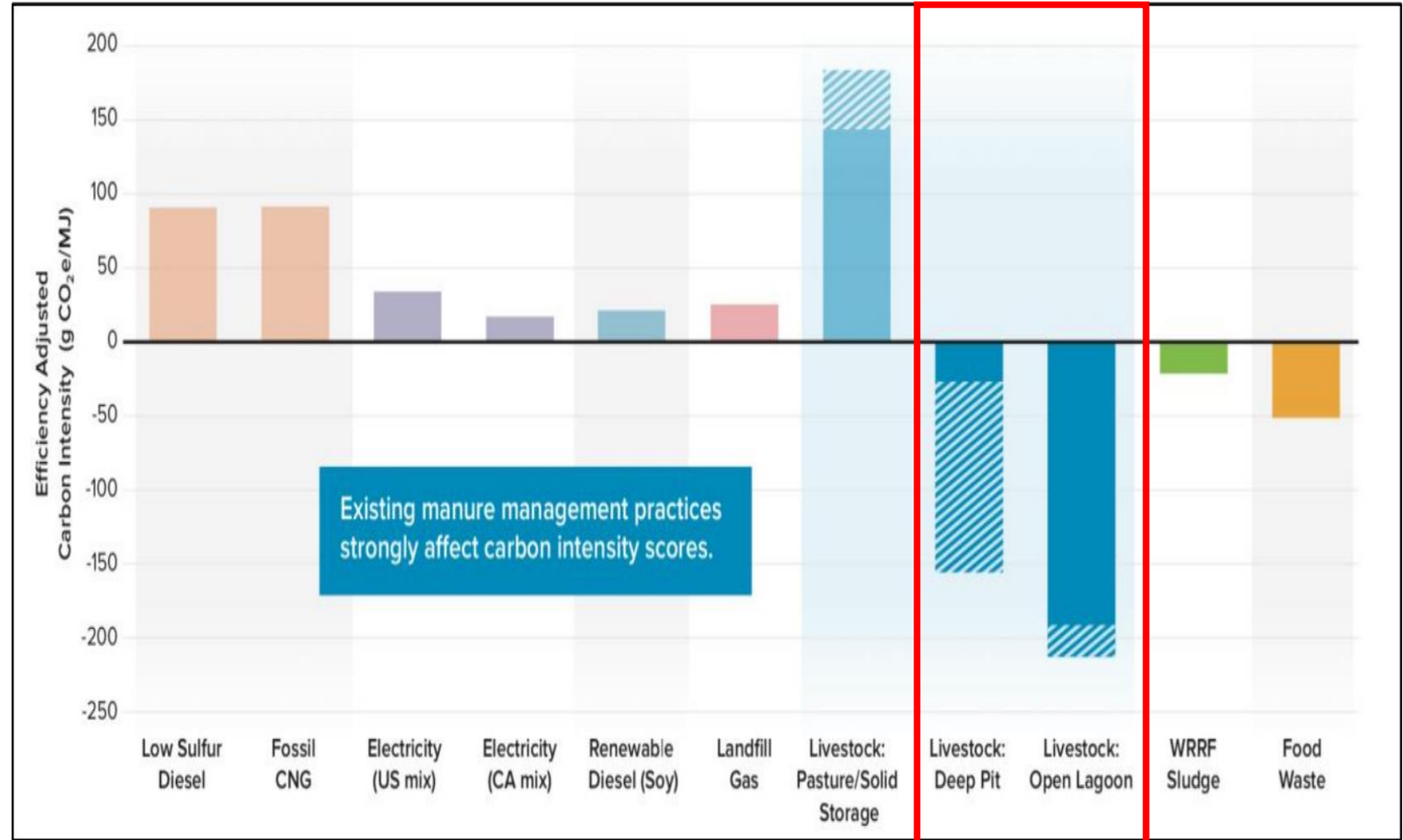
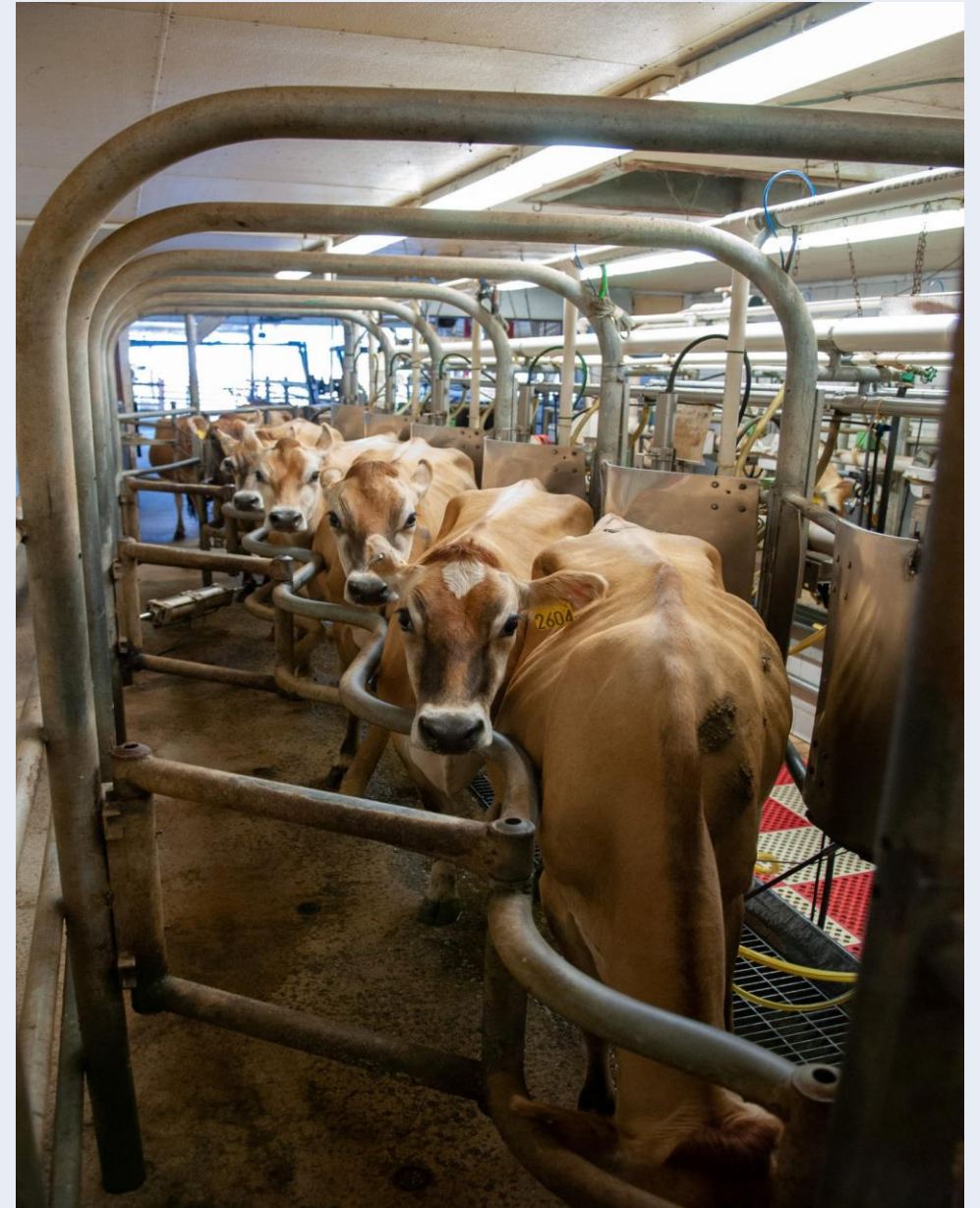


Image Source: American Biogas Council

# **State Cap-and-Trade Programs** **(CA & WA)**

- Separate from State and Federal low carbon fuel programs
- ID and UT dairies can be considered “offset” credit generators under cap-and-trade programs
- Only a few livestock offset projects in these programs – not very widespread
- Livestock Offset Protocols for Dairy and Swine projects, created by California Air Resources Board



**MANURE MANAGEMENT  
PRACTICES FOR  
VOLUNTARY MARKETS**





# VOLUNTARY MARKET PRACTICES

## 1) Advanced Solids Separation

- 2 known projects in Washington

## 2) Enteric Fermentation

- At least one underway in the U.S.

## 3) Nitrogen Management

- In process of establishing in U.S.



*Image Courtesy of The Dairy Farmers of Washington: Showing BioFiltro Technology (i.e., vermifiltration/worm beds) used as part of 'Advanced Solids Separation' practice at Royal Dairy in Washington state, and earns credits under voluntary market (Nestle).*

# Looking ahead...

- System costs; capital and ongoing operations and maintenance remain a challenge
- Price Uncertainty
- Risk
- Federal eRINs for biogas to electricity projects



*Image from Dairy Cares*

# Thank you!

Tune into the Carbon and Cow\$ Podcast with me,  
brought to you by Washington State University and University of Idaho!

*~More Details to Follow*

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