



Carbon Credit Opportunities

Western United Dairymen

March 10, 2010

Arbor Theatre – Modesto, California

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Welcome & Introduction

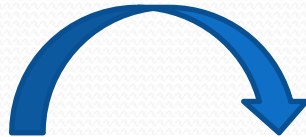
Getting a Carbon Credit To Market

- Have a qualifying manure management method “project”
- Register project with Carbon Credit Registry
- Have project verified to meet compliance with Carbon Credit Project “protocol”
- Operate project under “protocol” requirements and collect data
- Have project credits calculated/certified each year
- Market (sell or trade) your credits through reputable broker

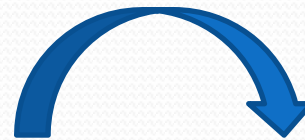
Getting A Carbon



Your Dairy



Collect Manure



Have a qualifying project



Register & Verify Project

Credit To Market

Getting A Carbon



Go about daily operations, collecting necessary data



Have your data and credits certified/verified



SELL or trade your credits

Credit To Market

Your Carbon Credit Options

Style Of Dairy	Project Options
Flush	Solid Separation Anaerobic Digester
Combination Flush/Scrape	Solid Separation Anaerobic Digester Composting
Scrape	Anaerobic Digester Composting

What Is A Carbon Credit?

- *Generic term assigning a value to a reduction or offset of "Greenhouse Gas" (GHG) emissions*
- *Equivalent to **one tonne of carbon dioxide equivalent** (CO₂e)*
- *Financial instrument that is transferrable/saleable providing economic benefits from CO₂e reductions*



GHG In California

- California's dairy industry represents approximately 2% (according to USDAIRY.COM) of the total greenhouse gas emissions for the state
- Utilizing "manure management" techniques can help reduce these emissions and produce additional revenue streams for the dairies!



How Will Carbon Credits Benefit Me?

- Financial
- Environmental
- Social


How Do I Get Carbon Credits?

- *Offset your dairy GHG emissions*
 - *Manure handling to capture/collect, divert, destroy and reduce methane*
 - *Anaerobic (complete mix, plug flow, covered lagoon)*
 - *Multi-stage mechanical separation yielding solids with a dry content of 20%*
 - *Composting (proposed CAR project protocol set for approval in June 2010)*



Register your Carbon Credits with Carbon Credit Registries

- *Organizations that register “projects” – set standards for projects (protocols) & determine how credits are authenticated*
- *Once authenticated, credits can be sold/traded through various “retailers” who specialize in carbon credit transactions*

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- **ACR** - American Carbon Registry - www.americancarbonregistry.org
 - **CAR** - Climate Action Reserve - <http://www.climateactionreserve.org/>
 - **CCX** - Chicago Climate Exchange - <http://www.chicagoclimatex.com/>
 - **VCS** - Voluntary Carbon Standard - <http://www.v-c-s.org/>
 - **RGGI** - Regional Greenhouse Gas Initiative - <http://www.rggi.org> (east coast only)
 - **Carbon Fund** - <http://www.carbonfund.org>
 - **CAR, CCX and VCS are the main registries**

Registering your credits...

- *Each registry has specific requirements for how credits are to be verified, calculated and certified*
- *Basic process is adherence to specific protocol as defined by registry*
- *Most registries do not transfer credits between them*



Collecting your credits

- *Operate your project*
- ***Collect data as required by your carbon credit registry***
- *Have your project certified/verified*
- *Once credits are calculated, verified and certified, your account will be updated*



Collecting Data

- Each registry has slightly different requirements, but be prepared to collect your yearly operational data for:
 - Herd (population, breed, average weight, feeding, milk production, veterinary)
 - Manure handling (method, gas production, testing)
 - Environmental (permitting, inspections, etc)

Trade/Sell Your Credits for \$\$\$\$

- *Sell your credits through retail brokers*
- *“Trade” your credits through Chicago Climate Exchange*



A yearly income example

- ***Rough example for sales***
 - *Average number of milking cows: 2497*
 - *Average number of heifers: 555*
 - *Project specifics are verified and input into protocol specific computational mechanism*
 - *13734 CRT (climate reserve tones) Total Emission Reductions (CH4 and CO2) for reporting period*
 - *Current retail market values per tonne (2/24/10) \$4.73 - \$7.90*
 - *Potential Revenue: \$64,962 - \$108,499.*

California Carbon Prices

- CAR National

LFGBid		Offer	Mid
<u>v09</u>	5.6	6.9	6.3
<u>v10</u>	5.9	7.3	6.6

- CAR California

Ag-Methane			
<u>v09</u>	5.00	8.50	7.00
<u>v10</u>	5.25	9.00	7.25

More Trading

- Offset projects
 - Carbon attributes
 - RECs
 - Gas
 - Power
 - Tertiary products
- Off-take
- Project participant
- Managing partner
- Company purchase
- Technology



What's the right price

- >\$1,500,000/tpy - SCAQMD PM10
- **\$300/tonne – CA Refinery & Carbon Capture & Sequestration**
- \$150 - \$200/ton tax by 2050**
- **\$80/tonne – modeling (coal to gas replace)**
- \$44/tonne EUAs (4/06)
- \$28/tonne –BK pressure relief
- \$15/tonne – Congressional Budget Office 2012
- \$14- 25/ton - ConocoPhillips
- \$13-\$39/tonne – Obama Staff
- \$10/tonne – WM/BK Floor Price
- **\$6.75 – \$7.75 v09 offer CAR CA Forestry (2/10)**
- **\$6 - \$7.25 – 09-13 CAR Landfill Gas (LFG) (2/10)**
- **\$6.0 - \$7.25– 09 CAR LFG (2/10)**
- **@ \$5.50 – Ozone Depleting Subs (2/10)**
- \$2.19/ton - RGGI Auction (9/09)
- \$0.35/ton – CCX Ag soil or forestry bid





In Review: Carbon Credit Opportunities

- *Benefits*
 - *Carbon Credits track GHG emission reductions*
 - *Sale/Trade of verified credits provides additional income*
 - *Implementation of qualified manure handling system benefits environment and industry regulatory issues that lead to demise of industry*
 - **“GREEN” IS GOOD PR**
- *Have a qualified manure handling project: Anaerobic Digesters, Multi-stage solids separation, Composting (June 2010)*
- *Register Your Project*
- *Operate Your Project*
- *Have Project Verified*
- *Collect Your Credits*
- *Sell/Trade Credits*



One Massive Challenge

- CA pop up 74% 2000 (34.1) – 2050 (59.5) (CA Dept Finance)
- 200 BMT global reduction by 2050 (Robert Socolow, Princeton)
- 14% - shut down everything that moves
- 68% - shut down all industrial, commercial, residential activity (David O'Reilly, Chevron)
- Emitted tonnes per person: (Union of Concerned Scientists)
 - China-4.58 and India-1.16 (Union of Concerned Scientists)
 - UK-9.66, US-19.78, CA-1/2 US
- Costs to control = 1% global domestic product (Sir Nicholas Stern)
- Costs of inaction = 5 – 20% (Sir Nicholas Stern)

QUESTIONS ???



Special Thanks

- Patrick Pfieffer – CantorC02e – current market perspectives
- Joel Levin – Climate Action Reserve
- Syd Partridge – Climate Action Reserve

