SB 1383 Dairy & Livestock

Greenhouse Gas Reduction Working Group Meeting

January 5, 2018
CalEPA Building
Byron Sher Auditorium

Dairy Subgroup #1:
Fostering Markets for Non-Digester Projects

Committee Membership Breakdown

CO-CHAIRS
- J.P. Cativiela (Dairy Cares)
- Ryan Flaherty (Sustainable Conservation)

11 Subgroup committee members represent:

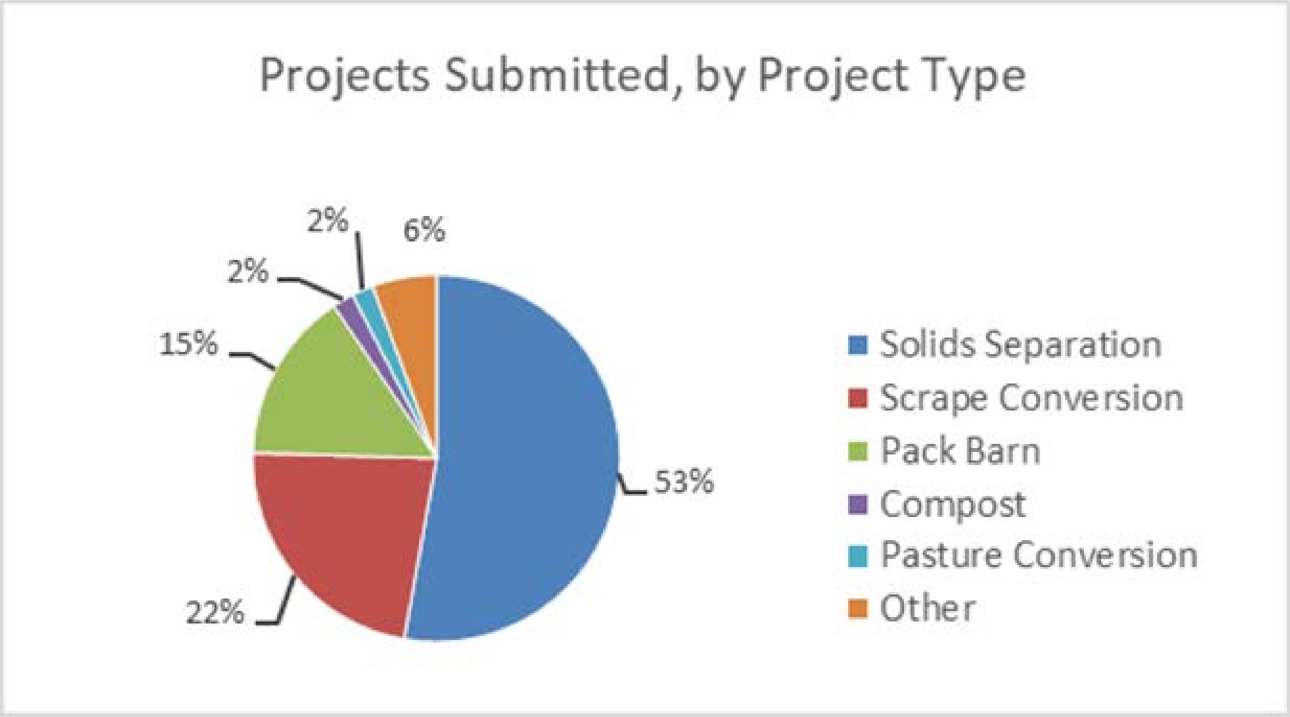
- dairy farmers (pasture and non-pasture)
- academic expertise on livestock waste management
- environmental justice groups
- environmental/conservation groups
- private sector dairy design engineering
- private sector environmental crediting
- dairy industry organizations

Industry Update: Development of Non-Digester Projects in California

- Significant progress has been made in identifying and implementing non-digester projects in California
- CARB quantification methodology (QM) recognizes manure solids-liquids separation (SLS) combined with drying manure as effective in reducing methane emissions
- QM also recognizes other manure collection and "dry" storage methods as effective
- Ongoing UC Davis research on California dairies will further refine knowledge of SLS to inform refinement of QM

Industry Update: Development of Non-Digester Projects in California

- First-round of Alternative Manure Management Program funding showed <u>*high level of interest*</u> – 53 applications for \$29.5 million total (of \$9-\$16 million available)
  - Total about 1.95MM CO_2e reductions over 10 years (applicant's estimates, not verified)



Summary of Dairy Subgroup #1 Activities

- 5 public meetings (July, August, September, October and December)
- 4 key practices discussed (flush, scrape, solids-liquids separation, and compost)
- 9 expert presentations covering a variety of topics:
  - Context of problem and potential solutions
  - Scientific understanding of environmental impacts and potential for tradeoffs
  - Current practices and technologies
  - Barriers and opportunities
  - Environmental justice concerns
- Interim findings discussed and documented during public meetings
- More work needed

June 2017 to December 2017

Findings: General

- U.S. dairy farms, including California dairies, are most efficient in world in terms of GHG emissions per unit of milk produced
- Methane emissions largely driven by how manure is stored, and not how it is collected (flush or scrape)
- In general, reducing the ***amount*** of volatile solids stored anaerobically, or the ***time*** they are stored anaerobically – ***or both*** – reduces methane produced
- Other promising non-digester technologies exist but are not yet commercially available and/or proven in the marketplace
- There are currently no CA credit schemes available for non-digester technologies

Subgroup #1: Non-Digesters

Findings: All practices discussed

- Reduce methane emissions, but exact quantification is unknown
- Very little known about impacts to other important GHG and non-GHG air emissions and water quality outcomes
- Performance varies based on system design, operation, other factors
- No methods have been defined to best determine effectiveness of practices

Subgroup #1: Non-Digesters

Findings: Solids-Liquids Separation

- In flush systems, mechanical SLS followed by dry storage of solids reduces methane compared to wet (anaerobic) storage
- SLS is fairly common but still only a minority of dairies (30%?)
- SLS solids removal performance depends on many factors
  - Ex: age of system, flow rates, manure composition, particle size, bedding use, design and maintenance
- Research suggests some SLS systems remove more volatile solids than in CARB's Quantification Methodology
- Unclear how SLS might impact non-methane emissions downstream, particularly nitrous oxide and ammonia from lagoons

Subgroup #1: Non-Digesters

Findings: Scrape Collection with Dry Storage

- Methane reduction can be achieved by:
  - Converting flush collection to scrape collection followed by dry/aerobic storage, or
  - Increasing amount of manure stored in dry/aerobic conditions on existing scrape collection systems
- Scrape collection systems currently rare in California and infrastructure to provide equipment and service limited
- SLS likely still needed to dry slurry, but will be different types than those used on flush systems
- Drying of slurry with SLS will still generate some portion of volatile solids in liquid form; CARB's QM does not account for this
- Compared to flush systems, scrape collection with drying of solids can make it easier to export nutrients to other farms, resulting in water quality benefits for dairies with excess nutrients
- Unclear how scrape might impact non-methane emissions downstream, particularly nitrous oxide, ammonia, and VOCs

Subgroup #1: Non-Digesters

Findings: Composting

- Composting manure solids reduces methane compared to other methods of dry storage and adds value to dried solids
- Ammonia emissions appear to increase
- Beneficial for water quality
- Significant regulatory and market barriers exist

Subgroup #1: Non-Digesters

Recommendations (so far)

- Develop crediting schemes (such as carbon credits) to further incentivize use of non-digester technologies, where data supports doing so
- Consider adjusting QM as SLS study data becomes available
- Develop a standard protocol for measuring solids removal in SLS
- Conduct investigation to determine best methods for measuring baseline emissions (methane and non-methane) as well as changes in these emissions resulting from implementation of practices and technologies intended to reduce methane
- Address regulatory and other barriers to composting
- Establish policies, programs and funding to evaluate and advance promising technologies that do not meet the AMMP's current definition of "off-the-shelf" technology

Subgroup #1: Non-Digesters

Environmental Justice Considerations

Subgroup #1: Non-Digesters

Environmental Justice Position

- Policies and programs must improve, rather than degrade, both the environment and surrounding communities
- In the San Joaquin valley, the contaminants emitted by dairy operations cause asthma, lung disease, are precursors to toxic pollutants while manure threatens drinking water sources
- Accordingly analysis should assess the potential GHG impacts, Air Quality Impacts, Water Impacts, Odor Impacts and Health Impacts of both manure and enteric emissions
- There must not be any new on-farm emissions of criteria air contaminants, toxic air pollutants, or increased water degradation, and accordingly there should be no negative environmental impacts from a project

Subgroup #1: Non-Digesters

Environmental Justice Position

- Community Benefit Agreements should be considered in all projects as they provide a substantial framework for ensuring mitigation methods and benefits are supported by local residents.
- Community outreach and engagement should be required to ensure meaningful & inclusive participation.
- Technical Assistance and resources should support community engagement to support both community based organizations and costs associated with outreach, workshops meetings, etc (i.e. childcare, food, meetings held in evening to accommodate working schedules, travel reimbursement)

Subgroup #1: Non-Digesters

2018 Roadmap For Developing Final Recommendations

- Additional meetings planned, probably through at least May 2018
- Future meeting topics:
  - Pasture systems and the opportunity to reduce methane and realize other benefits through broader adoption of pasturing where feasible
  - Additional input from environmental justice representatives regarding minimizing impacts to communities and ensuring community benefits
  - Promising emerging technologies
  - Specific recommendations toward reducing barriers to composting
  - Potential crediting schemes and market enhancements for non-digester methane-reducing technologies

Subgroup #1: Non-Digesters