

# **The CIWMB's Life Cycle Assessment for Organic Materials Management**

## **Los Angeles Solid Waste Management Local Task Force Meeting**

**March 19, 2009**

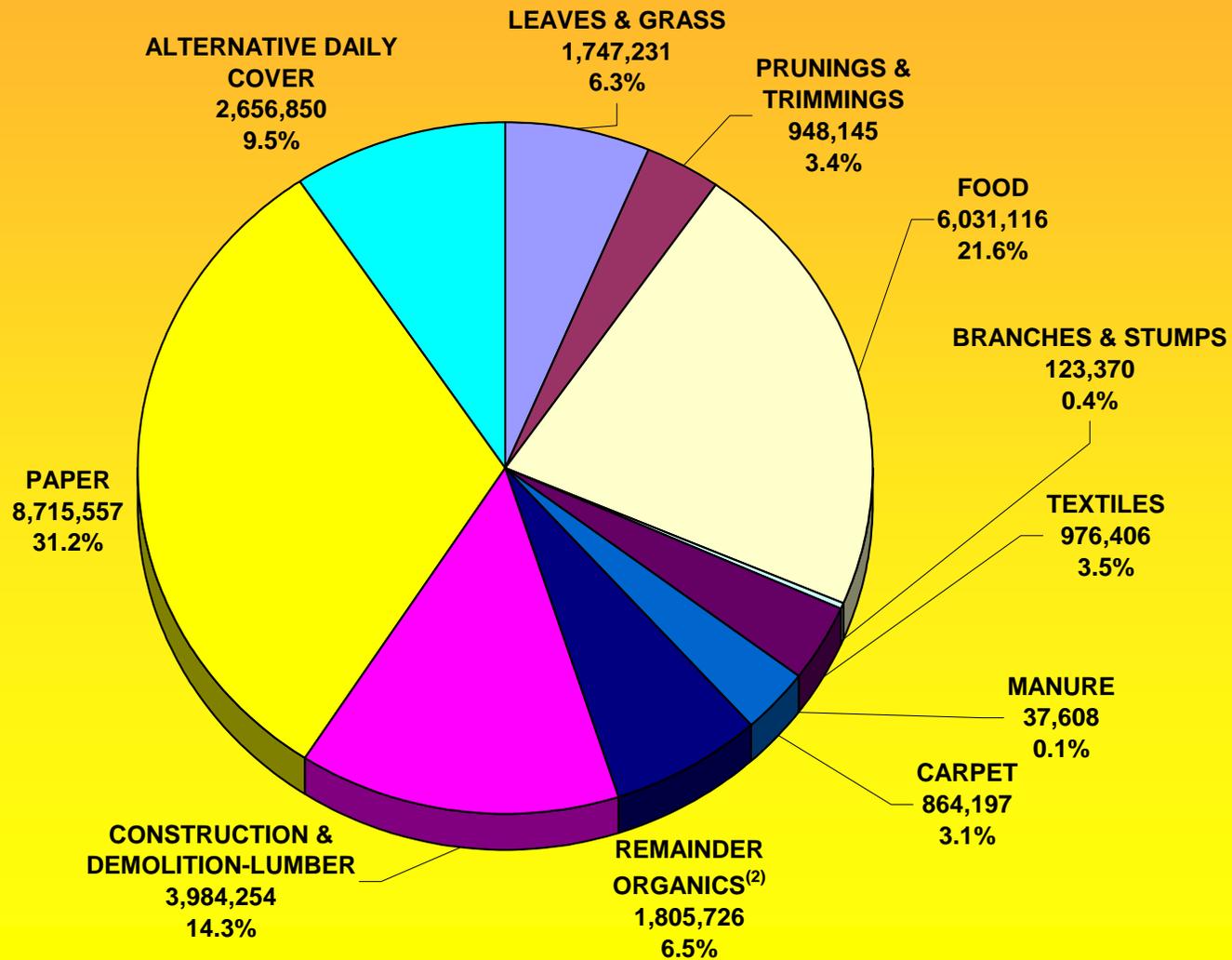
Steve Uselton & Danielle Aslam  
[www.ciwmb.ca.gov](http://www.ciwmb.ca.gov)

# **CIWMB Strategic Directive 6.1 (Market Development)**

**The Board will assist in the development of viable, sustainable markets to divert materials from landfills in accordance with the waste management hierarchy and California Global Warming Solutions Act of 2006**

***Reduce organics sent to the landfill by 50% by 2020***

# 2006 TOTAL TONS OF ORGANICS DISPOSED<sup>(1)</sup> (27,890,461 TONS)



# CIWMB Organics Policy Roadmap

- 2007 Organics Summit & BioFuels Forum
- Organics Roadmap Developed
  - 6 Key Area Issues:
    - Alternative Daily Cover Policy
    - Economic Incentives and Disincentives
    - Siting and Capacity Development
    - Regulatory and Permitting Constraints
    - **Research, Product Standards & Technology Evaluation**
    - Education and Procurement



# Research, Product Development & Technology Evaluation

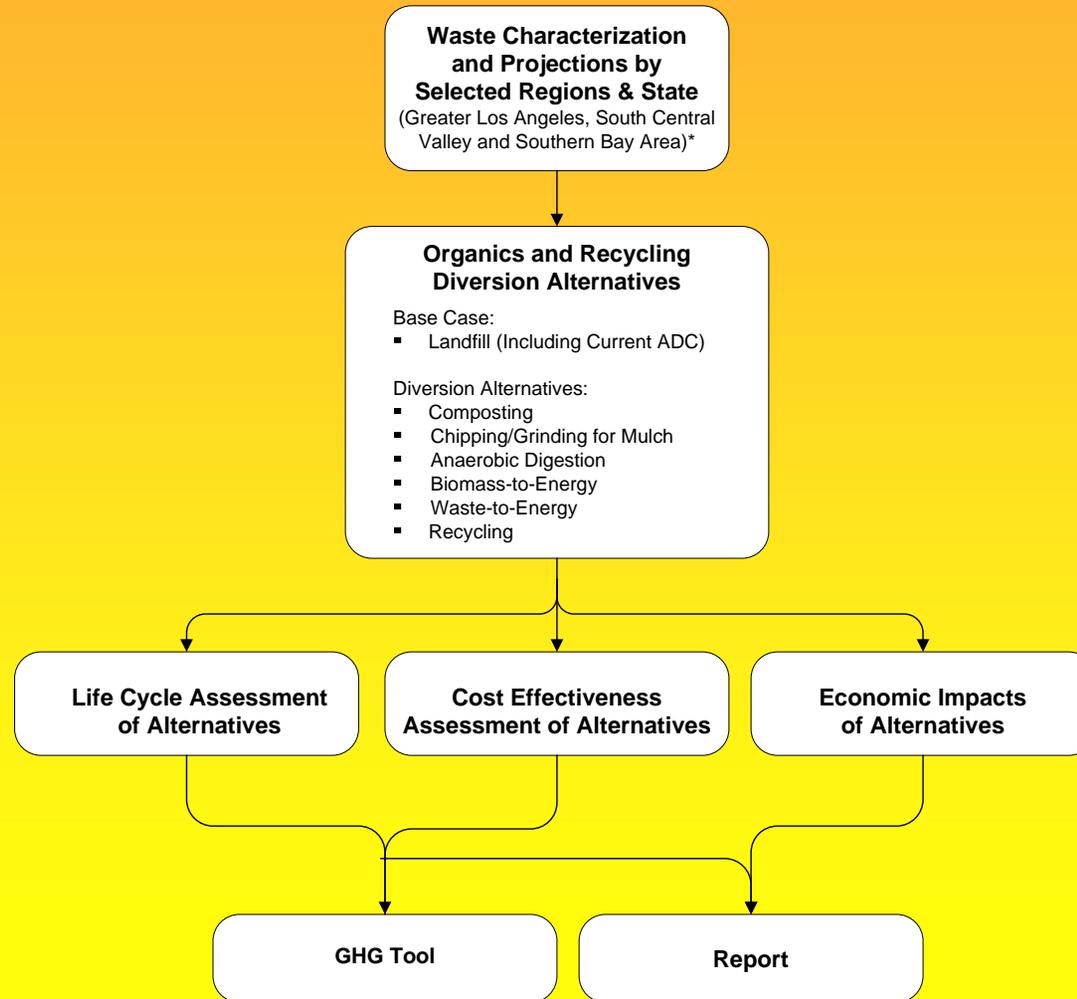
- BioEnergy & BioFuels Contract
- Compost BMPs & Benefits Contract
- LifeCycle Assessment for Organics Materials Management
- Agricultural Specifications Contract
- Compost Cover Methane Reduction at Landfills Contract
- Compost Emissions Report
- Landfill Based Anaerobic Digestion Project

# **Life Cycle Assessment (LCA) for Organics Materials Management**

## **Goal:**

**Develop data, methods, and tools to  
analyze the cost and life cycle GHG  
aspects for organic waste diversion**

# Scope of Work



# Project Outcomes

- A report that characterizes organic diversion alternatives in terms of average design and operating characteristics, such as:
  - Equipment
  - Efficiencies for energy and materials recovery
  - Products and end-use applications
- Develop cost, energy, and emission coefficients:
  - Cost/ton
  - Energy consumption/ton
  - CO<sub>2</sub>/ton
  - CH<sub>4</sub>/ton
  - N<sub>2</sub>O/ton
- Develop tool for hypothetical yet realistic scenarios to estimate cost and Life cycle GHG aspects

# Feb 09 Stakeholder Workshop

## List of Presentations:

- The CIWMB's Life Cycle Assessment for Organic Materials Management, Clark Williams – CIWMB
- Life Cycle Assessment of Organic Diversion Alternatives and Economic Analysis for Greenhouse Gas Reduction Options, Keith Weitzn - RTI International
- Economic Data Collection Status Report, Keith Weitzn - RTI International
- Quantifying the GHG Benefits of Compost: Sampling Results in CA, Sally Brown – Univ. of Washington & Matt Cotton, Integrated Waste Management Consulting, LLC.
- Available Online at:  
[www.ciwmb.ca.gov/Climate/Events/LifeCycle/2009/default.htm](http://www.ciwmb.ca.gov/Climate/Events/LifeCycle/2009/default.htm)

# Additional Feedback Wanted



- Draft final data memoranda to stakeholders for review
- Draft final scenario design, methods, and assumptions to stakeholders for review
- Draft final compost sampling and analysis report to stakeholders for review
- Draft LCA and economic analysis report to Board for review
- Prototype GHG tool to Board for review



- Final compost sampling and analysis report
- Draft final LCA and economic analysis to stakeholders for review
- Prototype GHG tool to stakeholders for review
- Stakeholders workshop



- Final LCA and economic analysis report
- Final GHG tool

# Project website:

[www.ciwmb.ca.gov/Climate/Organics/LifeCycle](http://www.ciwmb.ca.gov/Climate/Organics/LifeCycle)

# Subscribe to listserv:

[www.ciwmb.ca.gov/Listservs](http://www.ciwmb.ca.gov/Listservs)

# Contact:

**Clark Williams**

**[clarkw@ciwmb.ca.gov](mailto:clarkw@ciwmb.ca.gov)**

**(916) 341-6488**





# COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY

1955 Workman Mill Road, Whittier, CA 90601-1400  
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998  
Telephone: (562) 699-7411, FAX: (562) 699-5422  
www.lacsd.org

STEPHEN R. MAGUIN  
*Chief Engineer and General Manager*

February 9, 2009

Mr. Clark Williams, Supervisor  
Statewide Technical and Analytical Resources Division  
California Integrated Waste Management Board  
1001 I Street  
P.O. Box 4025  
Sacramento, CA 95812

Dear Mr. Williams:

## **Comments on Technical Approach for the Life Cycle Assessment and Economic Analysis of Organic Waste Management and Greenhouse Gas Reduction Options**

Thank you for holding the stakeholder meeting on February 2, 2009, on the subject project. The Sanitation Districts of Los Angeles County is supportive of the project and would like to be involved throughout the process, as we believe science should be the basis for policy decisions. At the stakeholder meeting, the contractor provided an overview of the technical approach for the project. We would like to indicate our concerns with this approach:

### **INCOMPLETE DATA**

In order to draw meaningful conclusions there needs to be complete and meaningful data. As indicated by the contractor at the stakeholder meeting, the data received from most public agencies that participated in the survey is incomplete due to the short deadline given and non-existent for private operators due to confidentiality concerns. This leaves hardly any meaningful data from which to draw conclusions. The contractor is apparently proceeding forward with these major information gaps, which will call into question any conclusions or findings. Filling the information gaps with general information not pertaining to the specific site may not be useful or may misrepresent that site.

### **NEED FOR TECHNICAL ADVISORY GROUP**

Stakeholder input should be early and throughout the process, not towards the end when it will be too late to make any corrections or adjustments. A technical advisory group would provide an opportunity for stakeholders with expertise in landfill operations and energy recovery, composting processes, conversion technologies, local government perspective, and knowledge of regional solid waste management infrastructure to review technical information and have input into the project deliverables. As you are aware, we have requested that a technical advisory working group be formed for this project.

### UNBIASED AND TRANSPARENT ANALYSIS

The goal of the project should be to conduct an unbiased, robust, and scientifically sound life cycle assessment of organics diversion options. This can only be achieved by making all assumptions, models, and calculations transparent and accessible for peer review. The process should also be deliberate and properly vetted, not rushed with artificially short deadlines.

The study should also recognize the investments made in landfill gas-to-energy facilities and their significant greenhouse gas (GHG) reduction benefits as a result of less fossil fuel being burned to produce the same power and the effective management (destruction) of methane.

It is also important to acknowledge that composting is very difficult to site and permit, thereby resulting in facilities being located far away from metropolitan areas. Transportation to these facilities needs to be included as an emissions source. If a new collection infrastructure is needed for organics, then emissions from these collection vehicles must be accounted for in the analysis. Additionally, any proposed composting facility within the South Coast Air Quality Management District would likely require full enclosure with air ventilated to an odor control system in order to meet stringent air quality requirements. The significant capital required to fully enclose such a facility also needs to be included in the study.

### ACCURACY OF BASE CASE LANDFILL

Since no two landfills are the same, there needs to be an accommodation or input field for collection efficiency, methane destruction (flaring), and energy recovery (which has GHG reduction benefits). The basic assumptions indicated by the contractor for landfills are erroneous, particularly for those landfills located within the South Coast Air Quality Management District (SCAQMD). The contractor intends to use a default landfill gas collection efficiency of 75%. The landfills operated by the Sanitation Districts of Los Angeles County have much higher collection efficiencies (90+%) and technical papers have been published substantiating this. Additionally, a low collection efficiency of 75% would likely be insufficient to meet the stringent SCAQMD landfill surface emissions monitoring requirements or the impending statewide version of this requirement being adopted by the California Air Resources Board.

The contractor also indicated that the base case assumes no landfill gas collection for the initial three years of operation. This is contrary to actual practice in Southern California. For landfills within the SCAQMD jurisdiction, gas collection systems are installed from the beginning of the operation and throughout landfill's development. SCAQMD inspectors and the local enforcement agency visit the landfills regularly to ensure that adequate landfill gas systems are in place to control surface emissions.

### GREENWASTE AS ALTERNATIVE DAILY COVER IS DIVERSION

Greenwaste used as alternative daily cover (ADC) is diversion according to state law. Consequently, the CIWMB study should portray it as such and classify it as a diversion alternative. The technical approach erroneously includes greenwaste as ADC in the landfill base case, which could artificially skew the results and GHG benefits towards composting.

FUGITIVE GHG EMISSIONS FROM COMPOSTING

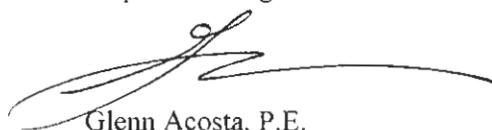
There is an increasing awareness in the scientific community of fugitive GHG emissions from composting operations. In fact, scientific studies (e.g., Czepiel, et al, 1996; Schenk, et al, 1997; Stredwick, 2001, and Amlinger, et al, 2008) have shown that methane and nitrous oxide are generated from composting and these fugitive GHG emissions are comparable to surface GHG emissions of a well-controlled landfill. The LCA should include these fugitive methane and nitrous oxide emissions as part of composting.

CONSIDERATION OF MARKET OR PRODUCT DEMAND

It is important to sustain the existing markets for alternative organics management, such as composting, and not negatively impact them. Flooding the marketplace with a new, unplanned supply of finished products could negatively impact pricing and the financial viability of these operations. A careful evaluation and strategic management of potential markets also needs to be considered in this study, so that supply does not exceed demand and cause an accumulation of product such as the existing situation in the recyclable commodities market.

Thank you for your consideration of our concerns. Should you have any questions, please contact me at (562) 908-4288, extension 2723, or Mr. Dung Kong at extension 2475.

Very truly yours,  
Stephen R. Maguin



Glenn Acosta, P.E.  
Senior Engineer  
Facilities Planning Section

SRM:GA:mh

cc: Brenda Smyth, CIWMB  
Howard Levenson, CIWMB



LINDA S. ADAMS  
SECRETARY FOR ENVIRONMENTAL  
PROTECTION

# CALIFORNIA INTEGRATED WASTE MANAGEMENT BOARD



ARNOLD SCHWARZENEGGER  
GOVERNOR

1001 I STREET, SACRAMENTO, CALIFORNIA 95814 • P.O. BOX 4025, SACRAMENTO, CALIFORNIA 95812-4025  
(916) 341-6000 • WWW.CIWMB.CA.GOV

MARGO REID BROWN  
CHAIR  
MBROWN@CIWMB.CA.GOV  
(916) 341-6051

August 28, 2008

WESLEY CHESBRO  
WCHESBRO@CIWMB.CA.GOV  
(916) 341-6039

Margaret Clark, Vice-Chair  
Los Angeles County Solid Waste Management Committee/  
Integrated Waste Management Task Force  
P.O. Box 1460  
Alhambra, CA 91802-1460

ROSALIE MULÉ  
RMULE@CIWMB.CA.GOV  
(916) 341-6016

Dear Ms. Clark:

CHERYL PEACE  
CPEACE@CIWMB.CA.GOV  
(916) 341-6010

Thank you for your August 13, 2008 letter regarding potential options for the Organic Diversion Facilities Siting Project. In your letter, you indicated the need for the California Integrated Waste Management Board (Board) to define the terms "Organics" and "Compostable Organics" in order to avoid confusion among the legislature, regulated communities, and local governments that ultimately bear the cost of implementing programs. Also, you indicated that that the Board needs to consider the findings of State and local efforts with regards to conversion technology. The Board recognizes the importance of these issues to local jurisdictions and hopes the following addresses your concerns.

GARY PETERSEN  
GPETERSEN@CIWMB.CA.GOV  
(916) 341-6035

In February 2007, the Board adopted a set of Strategic Directives to establish the Board's purpose, vision, and core values in pursuit of reducing the amount of resources being wasted. Strategic Directive 6.1 calls for a reduction of the amount of organics in the waste stream of 50% by 2020. The Board broadly interpreted "organics" as all carbon-based materials, including paper, plastic, carpet, and textiles, which can add up to as much as 70 percent of the waste stream. The term "compostable organics" is a subset of the broader category of carbon-based organics and refers to only those materials that could be handled by a composting facility. "Compostable organics" include materials such as grass, leaves, branches, woody waste, and food waste, which currently amount to roughly 25 percent of the waste stream. These definitions and the Board's Strategic Directive do not translate into any mandatory diversion requirement. Rather, this is an expression of the Board's recognition that



INTEGRATED  
WASTE  
MANAGEMENT  
BOARD

(Over)



Ms. Margaret Clark, Vice-Chair  
August 28, 2008  
Page 2

organics can be used as a valuable resource for many products (compost, fuel, and energy) and its desire to stimulate additional diversion from landfills and minimize the generation of waste.

The Board remains committed to working in partnership with local government and other stakeholders to develop a future modeled on resource conservation and waste minimization. Increasing demand and markets for compost is certainly a part of that commitment. The use of conversion technologies to process organic materials may also play a vital role in diverting materials from landfills. To that end, the Board continues to carry out the Organics Roadmap and work with the State Bioenergy Working Group and other stakeholders to resolve issues surrounding conversion technologies. The Board has developed a guidance document that provides a basic outline of how current Board statutes and regulations apply to conversion technology facilities. The Board also is sponsoring anaerobic digestion projects and a gasification-to-ethanol pilot project.

I thank you for your interest in furthering the diversion of organic materials and hope this response addresses your comments. As always, the Board welcomes all stakeholder input on critical issues related to composting and conversion technology.

Sincerely,

A handwritten signature in cursive script that reads "Margo Reid Brown". The signature is written in black ink and is positioned above the printed name and title.

Margo Reid Brown  
Chair

cc: Board Members, CIWMB  
Mark Leary, Executive Director, CIWMB