

# COLUMBIA UNIVERSITY

IN THE CITY OF NEW YORK

## EARTH ENGINEERING CENTER

April 6, 2009

Ms. Mary D. Nichols, Chair  
California Air Resources Board  
1001 I Street  
Sacramento, CA 95814

**RE: Sustainable Waste Management and the Low Carbon Fuel Standard**

Dear Ms. Nichols,

Energy recovery from solid wastes, either in the form of electricity or methane, has been accepted as a source of renewable energy in most developed nations and in many of the states of the Union. In its web page, US-DOE and EIA show it to be the major source of renewable energy in the U.S., next to hydropower. However, NRDC, Sierra and some other well-meaning environmental organizations, are opposing combustion with energy recovery (waste-to-energy or WTE) and landfill gas (LFG) recovery on the grounds that such support will impede recycling or composting. Yet, the Columbia/BioCycle national survey has shown time and again that states that are doing a good job in collecting and using LFG are also leading in recycling; California is a prime example of this. Similarly, states that, years ago, made the commitment to build WTE facilities are recycling more than the national average.

NRDC and the other organizations that have signed the March 27 letter to CARB claim that there is a flaw in the proposed Low Carbon Fuel Standard because it will encourage the collection of landfill gas without providing alternatives to landfiling, specifically "dedicated digesters". The Earth Engineering Center of Columbia University has studied extensively all means for sustainable waste management for more than a decade. The results of two theses on composting can be found on the web (Verma; Ostrem; [www.wtert.org](http://www.wtert.org), Publications, Theses) and two more are being conducted this year. The conclusions can be summarized as follows:

- a) Once organics are **mixed** with the rest of the garbage, they can either be landfilled with LFG recovery or combusted with energy recovery (WTE). Facilities that have been built in other countries to treat mixed wastes (i.e., wet and dry solids) have been unsuccessful. A prime example is the only large scale "sorting" and anaerobic digestion facility in North America, at Newmarket, Ontario. This plant was built in 2002 to process 115,000 tons per year of mixed wastes. Seven years

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later it processes less than 20,000 tons annually, produces only 6,000 tons of compost product and the natural gas it recovers generates enough electricity just to power the plant itself.

- b) Sorting and aerobic composting of **mixed** wet and dry wastes has also been spectacularly unsuccessful. For example, a plant built in 2003 for \$100 million in Athens Greece for treating 1,200 tons of mixed wastes currently processes 700 tons per day and its "compost product" is not marketable and ends up in a landfill.
- c) In contrast, food wastes that are source-separated at households or businesses can be digested anaerobically with methane recovery. The only large scale operation in North America is the Dufferin, Ontario, facility that processes about 40,000 tons/year of food and green wastes that are **source-separated** by the citizens of Toronto. This prototype operation is successful and Toronto now plans to build two 50,000 ton/year plants. These plants will be as costly as a new WTE facility of the same capacity.
- d) There are no anaerobic digestion plants in the U.S. The U.S. source-separated organic wastes are either composted or used beneficially as Alternative Daily Cover in landfills.
- e) The U.S. is the world's largest landfiller: It landfills about 25% of the global total. On the plus side, through the concerted action of EPA and the waste management industry, the U.S. collects and uses about 60% of the LFG that is captured globally.
- f) As is recognized by the USEPA and E.U. hierarchies of waste management, recycling is preferable to WTE and WTE is preferable to landfilling. However, our studies have shown that after all the possible recycling/composting has been done there remains a large fraction of municipal solid wastes that can either be landfilled or combusted in a WTE facility. California is a good example of this because, despite major efforts by CIWMB to promote recycling and composting, over 50% of the California MSW is being landfilled (Columbia/BioCycle State of Garbage in America, BioCycle, December 2008). Therefore, landfilling will continue to be with us for several decades and beyond, especially in places that have a lot of land to spare.

In consideration of the above factors, the Earth Engineering Center of Columbia University applauds CARB's efforts to increase LFG recovery in California, as well as any other state or federal measure that will help reduce the environmental impacts of waste disposal. Opposition to such measures on ideological grounds is counterproductive.

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