

## Green waste is key in high tech compost

by MIKE BRESLIN

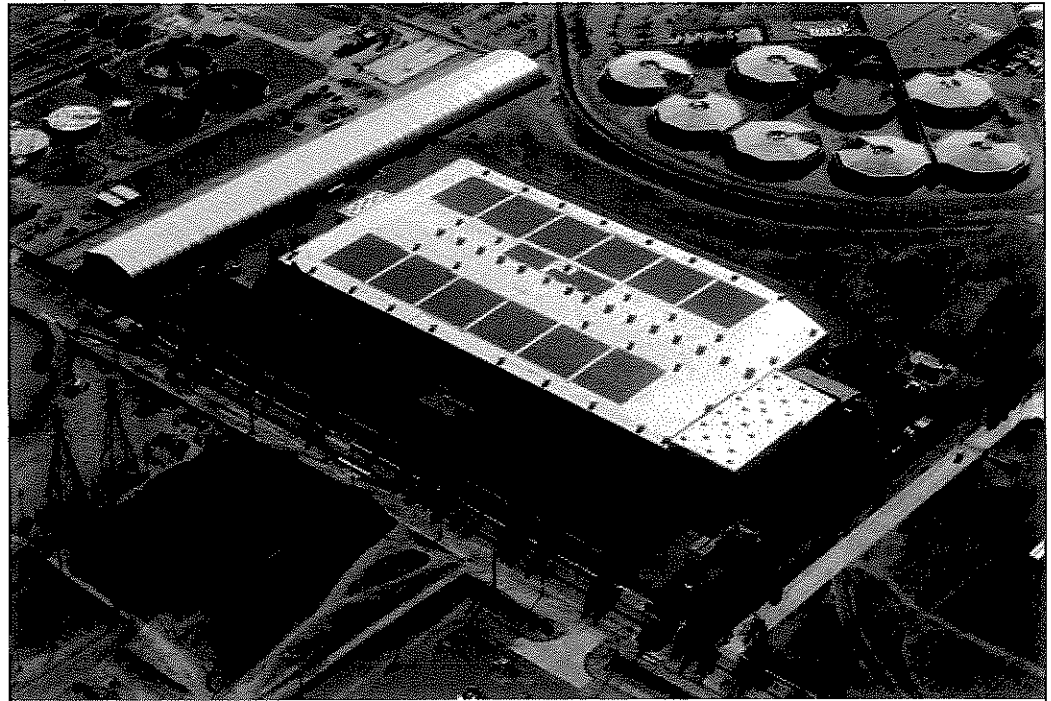
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According to the United States Environmental Protection Agency (EPA) and various large municipal solid waste agencies, green waste such as yard trimmings, arborist cuttings and food residuals constitute from 25 to 30 percent of the American municipal solid waste stream. That's a lot of biomass going to landfills that could otherwise become useful, environmentally beneficial compost, or feedstock for ethanol production.

Green waste is widely used at landfills as alternative daily cover (ADC) as a substitute for dirt and other material. But there are many options for ADC. For example, besides green waste and compost, California's Integrated Waste Management Board (CIWMB) approves ash and cement kiln dust, treated auto shredder waste, construction and demolition waste, contaminated sediment sludge and shredded tires for ADC.

There are no current CIWMB restrictions on landfilling with green waste or using it as ADC, but regulations are in place to reduce landfill organics by 50 percent by 2020. Landfill operators in California are only supposed to apply an appropriate amount of green waste at the end of the day to cover garbage on the working face of the landfill. Thickness requirements are aimed at reducing the abuse of green waste as ADC.

Because green waste has high carbon value, the last place it should go is into landfills. Composting green waste offers the benefits of resource efficiency



The Inland Empire Regional Composting Facility (IERCF) in Rancho Cucamonga, California is the nation's largest indoor composting operation. IERCF processes approximately 60,000 tons of green waste and 150,000 tons of biosolids annually to produce 90,000 tons of compost.

by creating useful, natural fertilizers and soil improvement characteristics. High quality compost is in high demand by farmers because of growing consumer demand for organic foods – people who want to avoid ingesting foods treated with chemical fertilizers and prevent the

runoff of destructive chemicals from farmlands into the water supply.

But there are emerging national problems associated with large-scale municipal composting. In California, the apparent worldwide leader in implementing environmental regulations, we

may be seeing the forerunners of composting regulations to come in other states. "Composting is starting to be regulated by our Air Resources Board because of the smell and by the Water Board due to concerns over ground

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## Biomass plays big role in California green energy policies

by IRWIN RAPOPORT

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The State of California has mandated that the annual percentage of renewable power generated in-state be bolstered by the conversion of a coal-fired power plant in Bakersfield to one that uses local agricultural and urban wood waste to generate clean, renewable electricity.

Millennium Energy, LLC, is converting the Mt. Poso Cogeneration

facility, built in 1989, to process biomass. The conversion is estimated to cost \$30 million.

"The conversion process of the combustor is minor; Mt. Poso facility's combustor is a circulating fluidized bed type which, by design, is capable of utilizing several varying types of fuel," explained Wayne Terry, Millennium's vice president. He also mentioned, "Some shielding of the super heater sections to minimize erosion

and increasing the capacity of the bed classification system are the areas of major concern. The additional ash loading as a result of the use of agricultural wood waste increases the potential erosion.

"Those changes are going to be accomplished in a 30 day outage window as part of the overall conversion," he added. "Because we do not have a fuel staging area for biomass, the largest portion of the investment is

developing 22 acres of the facility's property to accommodate the biomass."

Millennium plans to break ground in September 2009 and be ready to utilize 100 percent biomass in July 2010.

The plant currently uses a mix of 80 percent coal and 20 percent biomass.

"We had an opportunity to start the conversion early by adding bio-

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## Green compost

■Continued from Page 1

water contamination," said compost information specialist Charlene Graham at CIWMB. In addition, air quality regulators such as the South Coast Air Quality Management District and the San Joaquin air district have rules that require the reduction of volatile organic compounds and ammonia which are typically emitted from composting operations.

Besides these concerns, even the best managed outdoor composting operation is challenged to achieve and maintain temperatures over 131 degrees Fahrenheit throughout the pile to ensure that all seeds and pathogens are killed. High quality compost has value, while lower quality compost has lower value.

That's why the Inland Empire Regional Composting Facility (IERCF) in Rancho Cucamonga, California may be a prototype for the future of municipal green waste and biosolids composting. It's all indoors and produces consistent, high quality compost which is in high demand within its marketplace. And because emissions are tightly controlled with the use of a biofilter, a plant of this type can be located in an urban area, thereby reducing trucking expenses to remote sites.

IERCF's 454,000 square-foot facility (a former IKEA warehouse) is fully enclosed and equipped with a high tech air filtration system. Its roof has a one megawatt photovoltaic installation that provides about half of the plant's electricity. Water used for the composting process is supplied by the adjacent Inland Empire Utilities Agency's recycled water program. After water is used for composting it is piped back for re-treatment and re-use. Thus, air and water problems are solved and the solar system significantly reduces its carbon footprint, making it a synergistically green recycling solution.

The plant is located in San Bernardino County in a heavy industrial section, just west of Los Angeles County, and draws its green and wood waste feedstock from a 60-mile radius.

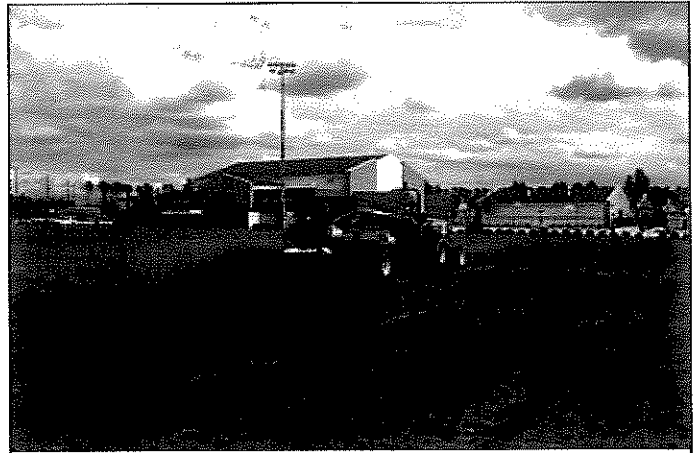
Biosolids come from the Inland Empire Utilities Agency and the LA County Sanitation District, the partners that operate the facility. Green waste consists of brush, trees and yard trimmings, bedding straw supplied by horse stables and from municipal material recovery facilities, as well as tree and lawn services.

Annually, IERCF is now processing approximately 60,000 tons of green waste and 150,000 tons of biosolids to produce 90,000 tons of high quality compost. Biosolids consist of treated wastewater, essentially water and nutrients. "Green waste is critical to our composting process. To have a balanced compost heap you have to have carbon, nitrogen and oxygen. The wood provides the porosity for the oxygen to move into the pile and the carbon makes for a good carbon-to-nitrogen ratio for the compost," said Jeff Ziegenbein, deputy manager of Operations for IERCF.

To avoid smelling up the neighborhood, biosolids, wood and green wastes are delivered by tarp-covered trucks that are unloaded indoors after the loading dock doors are sealed. Composting is done through the EPA-approved Aerated Static Pile (ASP) composting method that mixes materials in large piles, rather than in traditional windrows that places material in long piles where they decompose naturally over a period of several weeks.

With ASP, air is pulled through the composting material during a four-step process of mixing, active composting, screening and curing. Air is constantly circulated through a massive biofilter to remove odors and regulated compounds before it is exhausted to the atmosphere. Up to 12 air changes per hour occur within the facility. Exhaust fans are automatically controlled by temperature sensors in the piles.

The IERCA plant also incorporates recycled wood in its biofilter system. This consists of 50,000 cubic yards of a special blend of wood chips covering a 3 acre area, approximately 8 feet deep. The wood chips are placed on a perforated, ground level floor. Air is piped into the perforated floor where it slowly passes through the media before exhausting to the atmosphere. Every two



The compost can be used in a variety of applications to provide benefits such as improved soil quality and plant growth, control of sediment runoff and erosion and revitalization of compacted or sandy soil.

to four years the wood chips in the biofilter are replaced. The wood blend is a combination of fruit and nut tree woods and recycled wood from trees destroyed by bark beetles. A sprinkler system above the filter keeps the wood chips wet. Air handling pipes constantly suck air from the facility into a giant header, 12 feet in diameter and 1,000 feet long located under the biofilter. "Inside of the composting building it smells like compost, but you can walk by the biofilter and there is no perception of odor," Ziegenbein commented. The air is then pushed through the eight-foot layer of damp wood chips where it is treated before being exhausted into the atmosphere. Air emissions are monitored by the South Coast Air Quality Management District, which has some of the most stringent air quality standards in the country. Plant operations are also inspected by Cal EPA and the California Integrated Waste Management Board.

Active composting takes approximately 22 days before the pile is screened and moved into curing. Larger pieces screened from the compost are recycled back to the mixing operation and processed again. During curing, which takes between 30 to 38 days, the material stabilizes and is ready for distribution. Load out of finished compost is also done indoors in a sealed environment.

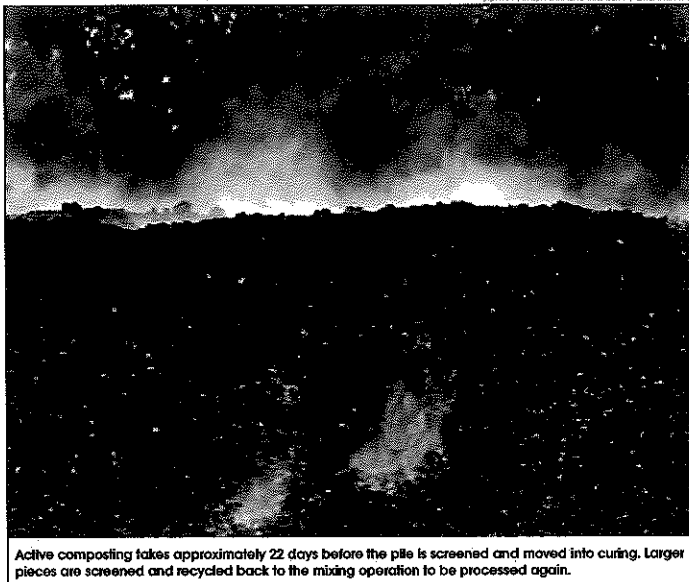
"Our high quality compost is wholesaled out in bulk to about 75 local customers who use the product as a soil conditioner, a top dressing or bag it," said Ziegenbein. The product is sold under the name SoilPro Premium Compost (a brand name registered by IERCA) in retail outlets such as Home Depot. It also has many commercial turf applications, such as for golf courses and soccer fields. According to Ziegenbein, SoilPro is a well decomposed, stable and weed-free source of organic matter containing a full spectrum of micro-nutrients necessary for healthy plant growth, and has a pleasant earthy odor. Unlike many composting operations, SoilPro appears to be supported by a well designed marketing plan with distinctive logotype, detailed product information for resellers, including a guaranteed minimum nutrient analysis, a list of product benefits and application coverage data.

"The good news about our operation is we use all recycled water, a significant portion of renewable energy and the compost has a high value that's helping our rate payers," Ziegenbein said. Before IERCA opened this plant, it trucked biosolids from Southern California to Arizona where it was applied on farms raising non-food crops such as cotton. Besides reducing high trucking expenses and related transport pollution, IERCA now has a value-added product that has had all weed seeds and pathogens destroyed in the composting process. SoilPro can be used for non-food as well as food crop applications. By using high quality compost, growers can reduce or eliminate the use of chemical fertilizers that have high solubility that tend to leach into groundwater and contaminate it with phosphates, nitrates and other harmful chemicals.

Since SoilPro compost is a wood-based, nutrient-rich soil conditioner it can be used in a variety of applications to provide many benefits. While its primary mission is to improve soil quality and plant growth, it helps controlling sediment runoff and erosion and revitalizes compacted or sandy soil. Compost also benefits water conservation by acting like a sponge, holding water until plants need it.

The real cost driver for IERCA is treating biosolids, but the plant needs the appropriate amount of green waste to do it properly. IERCA can work with MRFs if they can separate out a clean, green stream that works in its operation. More operations like IERCA can allow MRFs to have another reliable recycling outlet that helps keeps green waste out of landfills.

"We are a test case. We believe this type of operation can be located in many urban areas. Right next to us we have a very large correctional center. That's rather challenging because you have a lot of people who don't want to be there in the first place. If we had odors or complaints about health concerns, they could become a tough neighbor. But we have had zero issues because we have a very good biofilter with a team monitoring it to ensure that it functions properly with no odor issues. We've had no complaints. Something like this could be sited almost anywhere," Ziegenbein concluded.



Active composting takes approximately 22 days before the pile is screened and moved into curing. Larger pieces are screened and recycled back to the mixing operation to be processed again.