

Renewable Energy
Revs Up

THE RIGHT FORCES

PRODUCING POWER FROM RECYCLED ORGANICS

FOR the more than 200 persons attending the BioCycle "Renewable Energy from Organics Recycling" Conference held October 29-31 in Des Moines, Iowa, there was a sense they were part of "a profound revolution that is developing in our entire energy system." The sessions revealed how timing, commercial systems, our nation's priorities and research knowledge have coalesced. Recovery of biomass — everything from woody materials and MSW to crop residuals, manure and food processing wastes — must be made now more than ever before in these critical times. Yes, said presenters from all over the world, we can create fuels like biogas and ethanol — along with healthy, high quality soils — from biomass through anaerobic digestion, fermentation, gasification and composting.

"In addition to technologies, this Conference covers economics, environmental impacts, marketing and public policy," declared Floyd Barwig, executive director of the Iowa Energy Center, in the opening plenary session. "These are pieces of a radical change whose nature, pace and eventual scope will only be understood with the benefit from hindsight. This is not a centrally planned change, but a messy chaotic process that can take a long time, and then all of a sudden, seem to appear overnight. And behind it all, research will drive this process."

Barwig cited several examples of how major technological breakthroughs have occurred in bits and pieces: The railroads' transition from steam locomotives to diesel locomotives for propulsion in the 1950s, some 50 years after "a lot of flops and disappointments along the way that included a Depression and World War II; The transition to personal computers from mainframe that was littered with start-up failures; The current widespread use of photovoltaics in offshore applications is also evidence that the pace of change in our world continues to pick up.

"At this Conference, we are talking about organic residuals and biomass conversion. We can look at composting, about making methane and other chemicals," continued Barwig. "But what I challenge you to do is to step back and look at some other things going on in our world and see if what we are about here today fits into the pattern of the bits and pieces that will eventually form a dramatic revolution in our whole energy system. We have an improved understanding of the materials in organic residuals that we want to recycle and better processing technologies. We may not need some of the large mechanical systems we've relied on in the past; there may be other ways of getting things done."

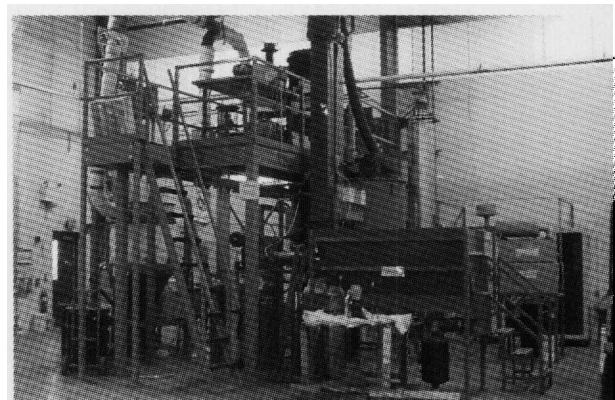
Floyd Barwig concluded his observations as follows:

"We have a whole new perspective on national security after September 11. The possibility of disentangling ourselves from the politics of oil takes on a much greater meaning. The thought of fuel cells that can

The gasifier at the Biomass Energy Conversion Facility operated by the Iowa Energy Center illustrates the technology now available to utilize renewable power sources.

*Waste managers,
policy makers,
system creators,
innovative
investors and
bioresearchers
make critical
connections at
last month's
BioCycle
Renewable
Energy
Conference.*

Jerome Goldstein



run directly on ethanol from here and that our relationships in other parts of the world might not be dominated by oil takes on new meaning.

The United States has about two percent of the world's proven reserves. The Middle East has 67 percent. If we stay on this course, we will become increasingly dependent on part of the world where there are great questions. The work discussed here may become a significant portion of a new form of security, of personal and economic well-being, of our nation's safety and health. ... I'd like to challenge you to look beyond the details presented at this Conference and think about the possibility that right now in Des Moines, Iowa, we may be witnessing the early to middle stages of a vast revolution. A revolution that will take years to build momentum, but then may change our whole world in the blink of an eye."

EUROPEAN POLICIES AND THE RENEWABLE ENERGY INDUSTRY

According to Luc de Baere of Organic Waste Systems in Gent, Belgium, anaerobic digestion makes "Euro sense" in Europe where there will be almost 70 operating plants by the end of 2002. New plants have an average capacity of 40,000 tons per year. Explains de Baere:

"The difference with the United States is that the landfill crisis in Europe is real. We are so densely populated especially in areas like Belgium and Holland that there is not any space left to site a landfill in the next town or the next state. There is much opposition to landfills, and landfilling cost is about \$60 to \$80/ton. That is very expensive, and also many countries have a landfill tax — as much as \$40/ton. All this really changes the playing field and drives opportunities for anaerobic digestion. There is also strong opposition to incineration; which must meet high air emission standards and costs between \$80-\$100/ton. All this means that in Europe, composting, digestion and biological treatment can compete. (In contrast, in the U.S., there are still landfills charging as little as \$10/ton.)"

De Baere points out that regulatory measures in Europe play a significant role. As noted above, European countries such as the United Kingdom, Holland, Belgium and several others are taxing what goes into a landfill. Some countries are experimenting with outright bans of landfilling organics.

The European Union landfill directive has been accepted. "This is a law that specifies that the amount of biodegradable waste going to the landfill by 2006 has to be reduced by 25 percent compared to the 1995 level, by 50 percent in 2009, and 65 percent in 2016," explains de Baere. "This directive will also have a big impact on biological treatment opportunities."

In addition, European countries have also instituted a "renewable energy bonus" — \$0.02 to \$0.03 per kilowatt hours as an additional bonus when green power is generated from biomass. The goal is to increase the average in 2000 of three percent renewable electrical energy to 12 percent by 2010. If power companies do not have sufficient "Green Certificates" to verify that figure, they will have to pay an \$0.11/kw/hr fine. (That fine represents a further incentive to produce energy from MSW — about \$10 to \$20/ton.)

"A most important factor favoring composting and anaerobic digestion in Europe is the implementation of 'source separated collection' of garbage," continues de Baere. "We tend to have more fresh food in Europe, therefore more food waste. We don't have the kitchen sink grinder, so all the food waste ends up in our garbage bags. Yard trimmings (mostly grass clippings with some leaves), food waste and other 'compostable trash' are collected together, and there is a steady tonnage throughout the year. (Only December through March is there a decrease.) This represents a sizable fraction of the waste stream, and that's why these source separated collection programs have spread all over Europe."

In the coming years, de Baere believes that more such policies will be implemented in the United States — such as dealing with greenhouse gases being emitted from landfills, enforcing diversion goals that states have mandated, introducing landfill taxes

as they have in Europe. "I hope that in the next few years, we could finally be successful in introducing anaerobic digestion in the United States," de Baere concludes.

LOCAL INPUTS TO THE NEXT INDUSTRIAL REVOLUTION

Kay Martin is a solid waste manager with the Ventura County, California — population 700,000 — which is adjacent to Los Angeles County, has a very strong agricultural economy and open space policy. In her presentation at the Renewable Energy Conference, she focused on how local solid waste managers can "help us step up to the next industrial revolution and advance the national bioenergy initiative. In other words, how can we become a change agent at the local level and make things happen in our communities." In Kay Martin's opinion, the energy value of our biomass in the waste stream is being lost and treated principally as a management problem rather than as a product that we want to put back into the marketplace.

Her main point to solid waste professionals and energy analysts: Anything you can make out of petroleum, you can make out of renewable biomass.

BUILDING FOR THE FUTURE

Since we have returned to our Pennsylvania editorial offices from the Des Moines Renewable Energy Conference, we have spoken with a number of persons who attended. One representative of the banking and investment sector gave us this message: "It was a great opportunity for us to think about what technologies exist and how they might develop as businesses. In order for this industry to blossom, we're going to need to analyze successes and failures, both in terms of technologies and business/financial strategies. This conference gave us the chance to build for the future."

Each day since our return, we are in contact with a company involved with a project to utilize biomass and get us further away from what one Conference speaker calls the "fossil fuel happy hour." Our staff here is preparing to hold a similar event in 2002 — so we all can continue to build a truly renewable energy future more rapidly and more effectively. ■

Cosponsors of the "Renewable Energy From Organics Recycling" Conference joining BioCycle were the following: Iowa Biotechnology Byproducts Consortium; Public Power Institute/Tennessee Valley Authority; Environmental & Energy Study Institute; Iowa Department Of Natural Resources; Center For Sustainable Environment Technologies, Iowa State University; CalRecovery, Inc; Compost Science & Utilization; Bluestem Solid Waste Agency (Cedar Rapids, Iowa); U.S. Department Of Energy - Office of BioPower Technologies; U.S. Department Of Energy - National Energy Technology Laboratory; Office of Systems & Policy Support; Office of Strategic Center for Natural Gas; and the Iowa Energy Center.

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