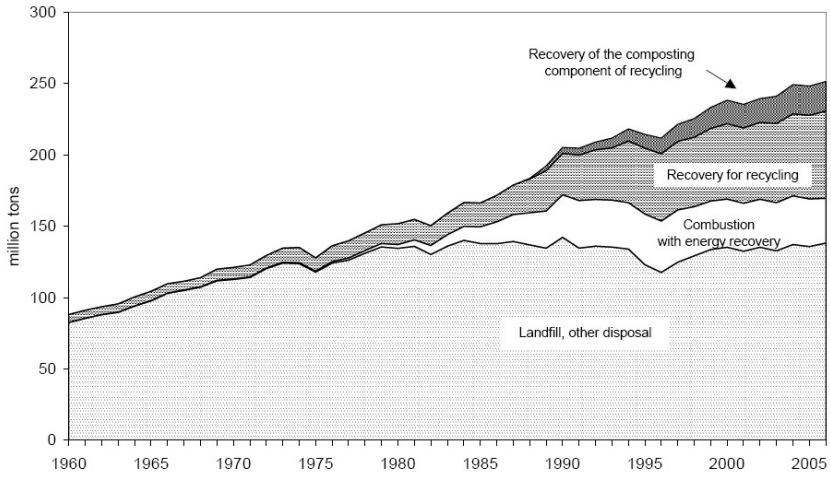
MODERN SOLID WASTE COMBUSTION

Each year the total amount of solid waste landfilled in America increases, despite larger and larger recycling rate claims all across America. Most Americans don't know this to be true, but you can check this phenomenon at the USEPA website http://www.epa.gov/epaoswer/non-hw/muncpl/pubs/06data.pdf.

Figure 26. Municipal solid waste management, 1960 to 2006



While it appears that there was a slight drop in landfilling tonnage from 1994 to 1997, that can be explained away quite simply as an "accounting change." Landfills had charged their customers based on incoming truck volumes until the USEPA encouraged (required) them to install truck scales. Since incoming trucks were not always completely full, the previously converted landfilling weights (based on volumes converted to tons) made it appear that the loading had been higher than it was.

I got into this solid waste business 30 years ago, when I was hired to fix or shut down the two 8-year-old incineration plants in Dayton, Ohio. I took them from being "high-profile government air polluters" (we were actually under indictment when I took over) to models of clean waste combustion with energy recovery by 1988, ten years later. Few people in Dayton even knew that the plants were operating 24 hours per day, 365 days per year, because there was no visible "smoke."

AUTHOR'S OPERATING SOUTH DAYTON PLANT IN 1988. TIRES IN FOREGROUND HEADED FOR RECYCLING.

I have seen the waste combustion industry go from an EPA-touted panacea in the 70s to nearly out-of-business in the 90s. Now we are poised at the beginning of an era of expansion, with modern waste combustion finally being recognized as the successful and environmentally sound technology that it is. Of all the waste disposal options available, modern waste combustion is the cleanest.

USEPA and the Clean Air Act Amendments of 1992 (CAAA92) established emission limits for modern incineration that are second to no others in the world. Perhaps the coal industry should have stepped up to help our waste combustion industry establish emission limits that were both healthy and reasonable, but they did not. Noisy people claiming that they represented the environment demanded and got stringent waste combustion emission limits from Congress in 1992. The coal industry remained silent when these extreme

limits were set on incinerators and waste-to-energy (WTE) facilities. Now, the coal industry is painfully aware that these same environmental pretenders are demanding that the coal industry meet similar emission standards. The playing field should be level for combustion facilities of all kinds; if it makes sense to have stringent emission limits for burning trash, then it also makes equal sense for those same stringent limits to be applied to all other combustors. This is especially true for Mother Nature's own refuse, compacted over eons into coal. Coal is just prehistoric garbage; it contains the same heavy metals and other trace elements that cause concern with solid waste combustion.

Modern incineration with energy recovery has become the choice for solid waste management throughout the modern world, except for America, where misconceptions still predominate. Americans seem to believe that any burning is un-natural and dirty, that any incineration is bad, that incineration is "banned" in Denmark and Sweden, that incineration is incompatible with recycling, and that there are no negatives to recycling, trucking, or landfilling. None of these beliefs are true.

MODERN WTE PLANT ON THE HUDSON, NORTH OF NY CITY

Incineration was "banned" for a short time in Denmark and Sweden in the '80s, until their university studies were completed; then modern incineration with energy recovery was declared the only good choice for solid waste management. Now, the European Union has adopted statutes that encourage WTE and ban the burial of any waste containing more than 2% combustible materials.

Since the CAAA of 1992, 87 modern WTE plants have survived and continued to operate in America. As required in their permits they have continuously reported their stack emissions, and demonstrated excellent compliance within their extreme limits.

Burning of almost any material can be done with modern technology so that the emissions are as clean as the burners on a gas stove. A burn barrel is not an incinerator; in fact, a burn barrel (so common in rural areas) is one of the dirtiest methods of waste management. An old apartment "incinerator" with its trash chute into a burn box in the basement is little better than a burn barrel; in fact it is worse, due to the high density of population close to the stack. They should all be banned for obvious health and environmental reasons. But the emissions from a modern central waste combustion plant are as clean as a natural gas-fired home furnace, based on a comparison of published emission factors for sources of equivalent energy input.

As is also required by their operating permits, the 87 American WTE plants have also demonstrated that recycling is very compatible with modern WTE or central incineration plants. The 87 cities that have waste combustors, have documented nearly the highest recycling rates in the nation, far above the average rates in the rest of America. Solid waste combustion programs are happy to take what's left after thorough curb side and drop off recycling has been accomplished. Studies show that the waste left over after very thorough recycling has a very similar energy content to trash without recycling, roughly half the energy pound-for-pound as does coal.

SAN FRANCISCO POST-RECYCLING SOLID WASTE AT TRANSFER STATION. NOTE THE LARGE LOADING CRANE AT THE FAR END OF THIS PIT.

Further, computer modeling of modern solid waste management choices by the USEPA, and recent studies in Hawaii have shown that recycling is not always the best choice for the environment, or for human health. Trucking causes accidents. Trucking and shipping have environmental costs which must be considered, if we are to truly minimize our human impact on the environment. State and federal departments of transportation and the insurance industry thoroughly document highway accidents and the millions of miles driven by trucks. Trucking solid waste long distances to landfills causes accidents and burns up immense quantities of diesel fuel. Semis hauling solid waste average about 2 MPG.

After the best efforts to recycle in San Francisco, for example, all the waste not recycled is transferred into semi trucks and driven over 70 miles to a landfill. The result is more costly fuel for the rest of us, gross diesel exhaust emissions, and increased accidents on more crowded highways. What about the health effects of driving all that waste and its germs hundreds of miles? Think about that the next time you notice that you are following one of those poorly sealed loads of trash with its dust and bits of tissue blowing out onto the highway.

In Honolulu, recent studies show that it would be more environmentally sound to use waste paper as fuel for electric generation, than it is to continue their paper recycling effort. This is due to the obviously long distances to market for the recycled paper, and to the obviously long distances that alternative fuels must be shipped to the islands. This finding is also due to the extremely clean combustion that the modern WTE plant produces vs the relatively dirty combustion emissions from shipping, trucking, and regular power plants burning fossil fuels.

The modern incineration industry now has several factual assets that it did not have in the early 90s. These assets will help the public to understand that WTE is very clean and that it is likely to be a viable solution to the inexorably growing problem of solid waste management across America. First, it has a very good record of operations at 87 WTE plants during the 15 years since the CAAA of 1992 took effect, all recorded religiously by the EPA. Second, it has a widely respected and tested operator certification process that ensures that each plant has been and will be operated by a person that understands the science of waste combustion. Third, it has the well established Waste to Energy Research and Technology Center (WTERT), part of Columbia University's widely respected Earth Science Center that studies ways to sustain human life and the environment on our ever more crowded Earth. WTERT is leading the way for the academics to recognize the facts of the solid waste situation. Fourth, there has been a new Supreme Court ruling (known as the 2007 United Haulers Case) which provides for public control of the waste stream into clean

disposal facilities when it is deemed to be in the best interest of public health. Such waste control is called “flow control” in the industry, and it is essential to financing these relatively expensive, high technology solutions for both solid waste management and the energy crisis. Frankly, the dump has always been far less expensive than the high tech solution, but the public, to my knowledge, has always preferred the cleaner, more expensive route for disposal when given the facts and the choice.

Today, the world is facing an unprecedented energy crisis brought about by economic growth in China, India, Africa, and the Phillippines. As these nations grow, they require more energy and they begin to generate more trash. Barring some worldwide disaster, this growth will continue and energy will become more and more expensive. No clean energy source should be excluded from the total mix of energy available in America. USEPA has stated, in writing, that modern incineration with energy recovery, WTE, is one of the cleanest sources of new electricity, second only perhaps, to wind turbines.