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Ms. Lucille Van Ommering
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California Air Resources Board
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Via Email and Web: lvanomme@arb.ca.gov and
http://www.arb.ca.gov/lispub/comm2/bcsubform.php?listname=dec-14-pdr-ws&comm_period=1

Subject: Waste-to-Energy Considerations in Proposed CARB GHG Cap and Trade Regulations

Dear Ms. Van Ommering:

On behalf of the Energy Recovery Council (ERC), I appreciate the opportunity to submit the following comments on establishing a cap-and-trade program for greenhouse gases in California. As I will further explain in these comments, waste-to-energy is an important tool in helping to reduce greenhouse gas emissions through the generation of clean, renewable energy. ERC firmly believes that any future programs to control greenhouse gases, whether at the federal, regional, or state level, should recognize and capitalize on the net greenhouse gas reductions provided by waste-to-energy.

ERC is the national trade association representing the companies and municipalities that provide waste-to-energy services in the United States. Waste-to-energy facilities produce clean, renewable energy through the combustion of municipal solid waste in specially designed power plants equipped with the most modern pollution control equipment to clean emissions – fully capable of meeting California's strict emission standards. In addition, the Intergovernmental Panel on Climate Change recognizes waste-to-energy facilities as a commercially available key mitigation technology. Waste-to-energy facilities reduce trash volumes by 90% with the remaining residues safely reused or disposed in highly regulated secure landfills. There are 87 waste-to-energy plants operating in 26 states managing about eight percent of America's trash, or almost 29 million tons each year. Waste-to-energy produces electrical output necessary to meet the power needs of more than 1.5 million homes. Three facilities operate in California processing almost 1 million tons of trash per year and providing baseload electric generating capacity of 70 megawatts. Waste-to-energy is one of California's significant homegrown renewable energy sources and can be a vital tool to help meet the State's renewable power generation goals.

On December 14, 2009, the ARB held a public workshop on its recently released Preliminary Draft Regulation (PDR) for a California Greenhouse Gas Cap-and-Trade Program. Subsequent to this session, ARB representatives met with representatives of our industry to discuss whether it was appropriate to include municipal solid waste under a cap-and-trade program. At that meeting, our industry representatives presented Attachment 2 to you as an example of how waste-to-energy compares with fossil fuel power sources. Attachment 2 compares GHG emissions from a typical waste-to-energy plant to GHG emissions from various fossil fuel sources and the average California mix of energy sources. At first blush, it appears that the overall GHG

emissions from waste-to-energy are higher than the fossil fuel sources. However, as CARB recognizes, the bulk of these emissions (~65%) are from biogenic waste sources (green waste, paper, etc.) internationally recognized as being part of the "near-term" carbon cycle that are not counted as part of a GHG C&T program. The remaining ~35% of emissions are from anthropogenic (fossil) sources, but these are waste sources that would be generated in any event as a waste. These are waste materials that are destined for disposal and, without waste-to-energy, would require disposal in a landfill. The fossil emissions of a typical waste-to-energy plant are lower than coal or oil-fired emissions and are only slightly higher than that of a combined cycled natural gas generating facility. Also demonstrated in Attachment 2 are the approximate avoided emissions associated with a waste-to-energy facility using the life-cycle analyses documented in Attachment 1. This light green bar below the x-axis on Attachment 2 shows the avoided emissions associated with waste-to-energy facilities, including:

1. Avoided fossil fuel emissions from other energy sources,

2. Avoided landfill methane emissions, and

3. Avoided emissions associated with recycling and recovery of ferrous and non-ferrous metals that is achieved in a waste-to-energy plant.

These are avoided emissions that are unique to waste-to-energy and that cannot be achieved by any of the other fossil fuel (or renewable energy) sources. Indeed, if an overall life-cycle assessment of the fossil fuel energy source were used to include energy production and transportation emissions, the emissions associated with the other fossil energy sources would be even higher.

At the meeting with representatives of the waste-to-energy industry, CARB expressed reservations about using a life-cycle assessment to recognize avoided GHG emissions. **Yet CARB is already doing this in several areas**:

- *Low Carbon Fuel Standard*. Life-cycle analyses are already employed to estimate emissions associated with fuel sources that go far beyond the emissions from combusting the fuel.

- *Mandatory Commercial Recycling.* The CARB has included mandatory commercial recycling as one of the early action measures for which regulations will be developed in 2010 in conjunction with your "sister" agency – CalRecycle. The emissions reductions estimated to be achieved as part of increased commercial recycling do not occur at the point where the recycling and recovery activity takes place at the local government level. Rather, the GHG reductions are estimated GHG reductions that occur from the use of recycled commodities instead of virgin materials that result in estimated energy savings (e.g., by typically using the USEPA WARM model: http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.html).

As CARB is already recognizing in other GHG venues, it is entirely appropriate to consider life-cycle assessments when considering GHG impacts associated with waste management and material recycling and recovery practices.

ERC firmly believes that it is inappropriate to include waste-to-energy under California's proposed cap-and-trade program given the significant GHG reductions achieved by waste-to-energy. Regulation of stack carbon dioxide emissions as a point source ignores the energy and environmental benefits of waste-to-energy facilities that are more fully defined through a life cycle assessment. The significant savings in greenhouse gas emissions resulting from waste-to-energy is not theoretical, but proven by substantiated, peer-reviewed analysis of site-specific data. A complete explanation of the greenhouse gas mitigation capabilities of waste-to-energy facilities is provided in Attachment 1 to substantiate this claim.

The recognition of waste-to-energy as a GHG reduction technology is not without significant precedent. Other greenhouse gas regulatory programs, such as the European Union Emission Trading Scheme (EU-ETS), the Regional Greenhouse Gas Initiative (RGGI), and Congressional climate change legislation (sponsored by California's Congressman Waxman And Senator Boxer) under consideration should be viewed as potential models upon which to base a new California cap-and-trade program – at least with respect to waste-to-energy. Under the EU-ETS, by far the largest mandatory GHG cap-and-trade program, waste-to-energy facilities are specifically excluded due to their ability to reduce GHG emissions from waste management (just as CARB has already recognized for mandatory commercial recycling). In fact, the European Environment Agency (EEA) attributes considerable reductions in waste management GHG emissions to increased levels of recycling and waste-to-energy. Under RGGI, which regulates fossil fuel-fired utilities only, waste-to-energy facilities are specifically excluded because they burn municipal solid waste. Further, the U.S. House-passed Waxman-Markey federal cap and trade bill (H.R. 2454), while capping fossil-fuel fired utilities, among other sources, specifically excludes waste-to-energy plants which burn five percent or less of supplemental fossil fuel (e.g., natural gas or fuel oil as a supplemental fuel). The U.S. Senate Environment and Public Works Committee approved the same exclusion in the Boxer-Kerry (S. 1733) bill. The House bill and the Senate Energy and Natural Resources Committee's approved *American Clean Energy and Leadership Act* (S. 1462) also establish a federal Renewable Portfolio Standard that recognizes waste-to-energy as a renewable energy source. Finally, the net reductions achieved by waste-to-energy have been recognized internationally under the Clean Development Mechanism, as part of the Kyoto Protocol. Waste-to-energy projects can generate credits through the approved methodology AM0025, "Avoided emissions from organic waste through alternative waste treatment processes."

The goal of each of these programs is promotion of technologies and practices that lower the release of greenhouse gases into the atmosphere. Waste-to-energy helps to achieve that goal and therefore has been appropriately excluded from cap and trade regimes.

Any cap-and-trade program established by CARB should embrace the same goal as the international programs: to support technologies and methods that lower greenhouse gas emissions into our atmosphere. To some extent, CARB is heading in the correct direction with regard to solid waste management. CARB has recognized that the Climate Action Reserve (CAR) as a possible entity through which tradable GHG reduction credits may be generated. CAR has already adopted a GHG offset protocol for waste conversion technologies that recognizes the benefits of diverting organic waste from landfills to reduce methane emissions.

Indeed, the GHG reduction credits derived by the CAR protocol for conversion technologies is based on reduced landfill emissions – very similar to what is achieved by a waste-to-energy facility. However, to accurately evaluate waste-to-energy facilities, CARB should also recognize the additional GHG reductions achievable by waste-to-energy through metals recycling and the recovery of energy resulting from this alternative to fossil sources.

California is only beginning to fully embrace the benefits of waste-to-energy in managing solid waste and producing renewable electricity – although three such facilities already exist in California. California's AB 939 (Sher, 1989) recognizes the benefits of these three facilities by allowing landfill waste diversion credit for these operations. Additionally, the California Integrated Waste Management Board recently completed a solid waste GHG lifecycle analysis that documents the greatest future reductions in solid waste GHG emissions involve a framework that heavily emphasizes the recovery of energy from waste, including the increased use of waste-to-energy.

Subjecting waste-to-energy facilities to a California GHG Cap and Trade system without recognizing their overall lifecycle benefits will be inconsistent with other California integrated waste management policies and will jeopardize the continuing economic viability of these operations. Any program that places waste-to-energy under the cap would have the unintended consequence of increasing the release of greenhouse gases since communities may choose to close facilities or cease pursuing new capacity rather than pay the cost of compliance with a cap-and-trade program. The potential closure or reduced operation by these facilities could easily result in more waste being disposed of in California landfills and reduced metal recycling & recovery, effectively a form of emissions "leakage" that CARB is aggressively attempting to minimize. By recognizing the net reductions in greenhouse gases achieved by waste-to-energy and not regulating it under a cap, CARB can insure that waste-to-energy continues as a viable means to reduce landfill disposal and increase metal recycling and recovery – along with associated GHG emission reductions.

Indeed, CARB's sister agency, the CIWMB (now CalRecycle) recently completed a comprehensive life-cycle assessment of GHG reductions associated with waste management practices – by employing a life cycle assessment. For more information, go to: http://www.calrecycle.ca.gov/Temp/Climate/default.htm. The initial conclusions of the CIWMB life-cycle assessment is that the greatest degree of GHG reductions from the waste and recycling sector is achieved by maximizing energy recovery from waste.

Attachment 1 provides supplemental information on the GHG mitigation characteristic of solid waste combustion and both technical and international references. If California were to adopt a position that punishes the waste-to-energy industry, it would lose a key greenhouse gas mitigation technology, already embraced by much of the rest of the world. Given the magnitude of the challenge, no mitigation technology can go untapped. With 90% of the non-recycled portion of municipal solid waste sent to landfills, waste-to-energy has significant potential to help meet greenhouse gas reduction goals.

In conclusion, ERC strongly requests that waste-to-energy facilities be recognized for their avoided GHG emission benefits that are unique to this energy source. Rather than include waste-to-energy in the proposed cap and trade regulations or to impose a convoluted process to track and record avoided emissions associated with waste-to-energy, ERC recommends that CARB simply recognize the additional GHG reduction benefits associated with waste-to-energy by simply excluding waste-to-energy plants from the forthcoming cap and trade system.

ERC appreciates the opportunity to provide our views on greenhouse gas policies in California and is available to discuss this matter further at your convenience.

Sincerely,

Ted Michaels
President

Attachments:

1. Supplemental Information
2. Graph of GHG Emissions

cc: Sam Wade, CARB, swade@arb.ca.gov
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Attachment 1

SUPPLEMENTAL INFORMATION

Waste-to-Energy reduces greenhouse gas emissions

Waste-to-energy achieves the reduction of greenhouse gas emission through three separate mechanisms:

1) by generating electrical power or steam, waste-to-energy avoids carbon dioxide ($C0_2$) emissions from fossil fuel based electrical generation,

2) the waste-to-energy combustion process effectively avoids all potential methane emissions from landfills thereby avoiding any potential release of methane in the future, and

3) the recovery of ferrous and non-ferrous metals from MSW by waste-to-energy is more energy efficient than production from raw materials thereby avoiding CO_2 from fossil fuel combustion.

The three cited mechanisms provide a true accounting of the greenhouse gas emission reduction potential of waste-to-energy. A lifecycle analysis, such as the Municipal Solid Waste Decision Support Tool (MSW-DST) developed under an EPA contract, is the most accurate method for understanding and quantifying the complete accounting of any MSW management option. A life cycle approach should be used to allow decision makers to weigh all greenhouse gas impacts associated with various activities rather than targeting, limiting or reducing greenhouse gas emissions on a source-by-source basis. Indeed, the Organics Lifecycle Analysis recently completed by the California Integrated Waste Management Board (CIWMB) builds upon the MSW-DST and concludes that the California waste management scenario that results in the greatest reduction in GHG emissions is a scenario that relies heavily on future waste-to-energy projects.

ERC advocates use of the MSW-DST for policy decisions because this peer-reviewed tool, available through the U.S. Environmental Protection Agency and its contractor RTI International, enables the user to directly compare the energy and environmental consequences of various management options for a specific or general situation. Independent papers authored by EPA (such as *"Moving From Solid Waste Disposal to Management in the United States, " Thorneloe (EPA) and Weitz (RTI) October, 2005; and "Application of the us. Decision Support Tool for Materials and Waste Management, "Thorneloe (EPA), Weitz (RTI), Jam beck (UNH), 2006)* utilized the DST to study municipal solid waste management options.

These studies, and that of the one recently conducted by the CIWMB, used a life-cycle analysis to determine the environmental and energy impacts for various combinations of recycling, landfilling, and waste-to-energy. The comprehensive analysis examines collection and transportation, material recovery facilities, transfer stations, composting, remanufacturing, landfills, and combustion. The results of the studies show that waste-to-energy yielded the best results-maximum energy with the least environmental impact (emissions of greenhouse gas,

nitrogen oxide, fine particulate precursors, hazardous air pollutants and others). In brief, waste-to-energy was demonstrated to be the best waste management option for both energy and environmental parameters and specifically for greenhouse gas emissions.

The MSW-DST was also used by a recent paper published in *Environmental Science and Technology* titled "Is It Better to Burn or Bury Waste for Clean Electricity Generation," authored by US EPA and North Carolina State scientists (2009, v42, pages 1711-1717).

When the MSW-DST is applied to the nationwide scope of waste-to-energy facilities, on average, one ton of greenhouse gas emissions are avoided for every ton of waste processed. Based on this factor, U.S. waste-to-energy facilities, which process 30 million tons of trash, and prevent the release of approximately 30 million tons of carbon dioxide equivalents that would have been released into the atmosphere if waste-to-energy were not employed.

Recognition of Waste-to-Energy as a contributor to climate change solutions

International Acceptance. The ability of waste-to-energy to prevent greenhouse gas emissions on a lifecycle basis and mitigate climate change has been recognized in the actions taken by foreign nations trying to comply with Kyoto targets.

The Intergovernmental Panel on Climate Change (IPCC) has also recognized the greenhouse gas mitigation aspect of waste-to-energy. The IPCC acknowledges that "incineration reduces the mass of waste and can offset fossil-fuel use; in addition greenhouse gas emissions are avoided, except for the small contribution from fossil carbon." This acknowledgement by the IPCC is particularly relevant due to the IPCC being an independent panel of scientific and technical experts that shared the Nobel Peace Prize with Al Gore.

The German Ministry of the Environment published a report in 2005 entitled "Waste Sector's Contribution to Climate Protection," which states that "the disposal paths of waste incineration plants and co-incineration display the greatest potential for reducing emissions of greenhouse gases." The German report concluded that the use of waste combustion with energy recovery coupled with the reduction in landfilling of biodegradable waste will assist the European Union-15 to meet its obligations under the Kyoto Protocol.

Under the Kyoto Protocol, the Clean Development Mechanism (CDM) is a method of emissions trading that allows the generation of tradable credits (Certified Emission Reductions [CERs]) for greenhouse gas emissions reductions achieved in developing countries, which are then purchased by developed countries and applied toward their reduction targets. CERs are also accepted as a compliance tool in the European Union Emissions Trading Scheme.

Waste-to-energy projects in developing countries can be accorded carbon offsets under the CDM methodology (AM0025 v11) by displacing fossil fuel-fired electricity generation and eliminating methane production from landfills. The methodology, entitled "Avoided emissions from organic waste through alternative waste treatment processes," specifically includes the "incineration of fresh waste for energy generation, electricity and/or heat."

Domestic Recognition. The contribution of waste-to-energy to reduce greenhouse gas emissions has been embraced domestically as well. The U.S. Conference of Mayors adopted a resolution in 2004 recognizing the greenhouse gas reduction benefits of waste-to-energy. In addition, the U.S.

Mayors Climate Protection Agreement supports a 7 percent reduction in greenhouse gases from 1990 levels by 2012. By signing the agreement, mayors have pledged to take actions in their own communities to meet this target, and have recognized waste-to-energy technology as a means to achieve that goal. As of July 2, 2008, 850 mayors have signed the agreement.

Columbia University's Earth Institute convened the Global Roundtable on Climate Change (GROCC), which unveiled a joint statement on February 20, 2007 identifying waste-to-energy as a means to reduce CO_2 emissions from the electric generating sector and methane emissions from landfills. This important recognition from the GROCC, which brought together high-level, critical stakeholders from all regions of the world, lends further support that waste-to-energy plays an important role in reducing greenhouse gas emissions. The breadth of support for the GROCC position is evidenced by those that have signed the joint statement, including Dr. James Hansen of the NASA Goddard Institute for Space Studies, as well as entities as diverse as American Electric Power and Environmental Defense.

Finally, the final version of the US House of Representatives *American Clean Energy and Security Act of 2009* (H. R. 2454) excludes waste-to-energy from the proposed federal cap and trade program as does the Senate Environment Committee's approved companion bill, S. 1733. The House bill and the Senate Energy and Natural Resources Committee's approved bill S. 1462 also establish a federal Renewable Portfolio Standard that recognizes waste-to-energy as a renewable energy source.

It is widely recognized that practical cap and trade systems cannot and should not cover all sectors of the economy. In response, provisions are wisely made to encourage reductions in uncapped sectors, and to prevent leakage of emissions into uncapped areas of the economy. A robust offsets program is part of the solution.. Accurately identifying those sectors, such as waste-to-energy, that achieve net GHG reductions is another critical element. In choosing those sectors that should be subject to a cap, CARB should ensure consistency with other California state policies and avoid regulation of facilities that on a life cycle basis effectively reduce GHG emissions.

Policy Recommendations

ERC firmly believes that waste-to-energy facilities should be excluded from the Cap and Trade program. Any climate change policies should recognize the life cycle approach to greenhouse gas reductions so that any greenhouse accounting system accurately recognizes the impact of any source. We believe that this approach is technically sound and that it will demonstrate that the waste-to-energy industry can significantly assist in the reduction of greenhouse gas emissions and therefore should be exclude from the universe of potential targeted sources for greenhouse gas emission reductions or limits. Further, significant harm would be done to the nation's waste-to-energy facilities if they were treated as if they were fossil fuel fired electric generators, and would contradict nearly thirty years of renewable energy policies that have recognized the benefits of waste-to-energy.

If CARB believes that waste-to-energy must be included in the Cap and Trade program, ERC believes that waste-to-energy should be given credit for the avoided emissions achieved on a life cycle basis. Lifecycle analysis using the MSW-DST and national averages demonstrates that for

every ton of waste combusted at a waste-to-energy facility, approximately one ton of carbon dioxide equivalents are avoided. Even without credit for avoided fossil fuel-fired energy emissions, the LCA approach demonstrates that waste-to-energy provides a net avoidance of GHG.

Attachment 2