COMMENTS ON SB- 11: AN ACT CONCERNING THE RELIABILITY, SUSTAINABILITY AND ECONOMIC VITALITY OF THE STATE'S WASTE MANAGEMENT SYSTEM

My name is Thomas Swarr. I am a resident of Hartford and currently serve as an ad hoc member of the board for the Materials Innovation and Recycling Authority (MIRA) and on the City of Hartford Solid Waste Task Force (SWTF). These comments reflect my personal opinions and do not represent the views of the MIRA board or SWTF. I joined both of those groups to advocate for a solid waste management system that was more environmentally sustainable for the state of CT and socially just for Hartford.

I support this proposed legislation as a positive step. My primary concern is that we have delayed action on the CT Solid Waste System (CSWS), aka trash incinerator in Hartford's South Meadows, so long that time is critical. I have concerns that we can keep the plant operating long enough to buy time for a preferred solution. Achieving the goals of this proposed legislation will depend on defining a feasible roadmap for moving from our current system to a desired future state. I believe this can be accomplished with a strong focus on waste reduction and transitioning to advanced thermal technologies currently in use in Europe and Southeast Asia that are modular, more efficient, cleaner, and can produce more valuable end products, such as transportation fuels or chemical feedstocks.

Section 1

The switch to goals based on per capita final disposal rather than waste diversion is a positive step. Diversion or recycle rate metrics are subject to numerous methodological issues and too easy to game. Final disposal dictates the capacity requirements and ultimately generates the harms to public health and the natural environment. I would offer the following comments:

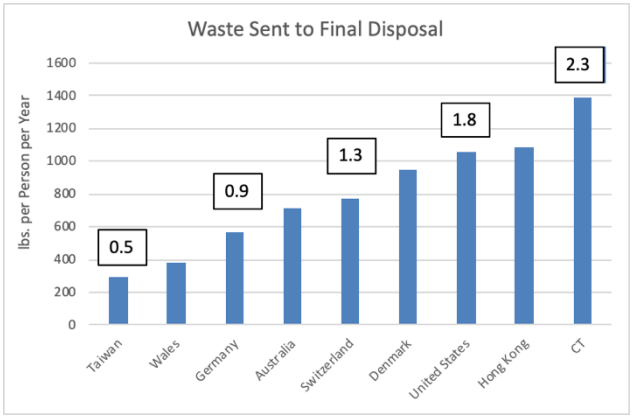
- Section 22a-228 subsection(e) provides a notwithstanding free pass that the "commissioner shall not prohibit the disposal of solid waste at any out-of-state land disposal…" providing the municipality "made an effort to utilize a waste-to-energy facility." Development of more environmentally responsible waste management technologies, which tend to be capital-intensive, and to achieve self- sufficiency will require public policies to make out- of- state landfill disposal more difficult and expensive. I would prefer language that prohibits out- of- state landfill so long as there is available capacity at CT waste treatment facilities. Outright prohibition may face legal challenges, but we could at least impose a fee on out- of- state landfill disposal to reduce the financial incentive for cheaper disposal.
- The goal to reduce annual residential waste disposal to no more than 500 pounds per person is reasonable, but does present some difficulties for data systems to monitor progress. In Hartford, the Department of Public Works (DPW) services residences with six or less units. Larger apartment buildings are considered commercial and required to contract for their waste services. Private haulers may have difficulty tracking residential data, because their routes will be determined by geographic proximity rather than building type and residential and commercial waste will be mixed in the same truck. The data could probably be adjusted based on contracted dumpster sizes, but customer privacy issues would need to be respected. The waste collected by DPW is only about one- third of the "Hartford waste" currently delivered to the MIRA facility.
- Waste reduction programs will critically depend on changing consumer behaviors. It can be anticipated that these efforts will need to be carefully tailored to the special needs of CT's 169 towns. In particular, urban areas and rural agricultural areas will have very different concerns. Thus, it will be important to have robust engagement processes to include towns in the revision of the statewide solid waste management plan.

Section 2

There were two fundamental requirements of the Phase II request for proposals to modernize the CSWS that must be dropped from any future solicitations under subsections (b) and (c). The requirement for sufficient capacity to treat 700,000 tons per year (TPY) essentially constrained the responses to traditional combustion waste- to- energy plants. The requirement that proposed projects be compatible with current practices for source separation and collection of designated recyclables is obviously in conflict with waste reduction/ diversion goals and again would favor traditional combustion technologies.

The state should promote a more distributed system of smaller facilities using advanced gasification and pyrolysis technologies that have been successfully deployed in many other countries. A distributed system would reduce the amount of truck transport (and associated diesel emissions) of waste to centralized facilities, providing further health benefits. In addition to lower air emissions associated with gasification and pyrolysis, these technologies[1] can yield more valuable end products, such as diesel or jet fuels or various chemical feedstocks. For example, a ton of municipal solid waste (MSW) can produce ~500 kWh, worth about $20 at current wholesale rates. That same ton of MSW can produce about 30 gallons of diesel, worth ~$100.

Any solicitation(s) should be limited to an aggregate capacity of no more than 250,000 TPY. A "back- of- the- envelope" calculation can justify the 250,000 TPY limit. Using data from the state's 2015 waste characterization study[2], residential waste disposal was ~760 lbs./ person, and we can assume 500 lbs./person goal (34% reduction) in doable. Assuming the commercial/industrial customers that essentially pay based on amount disposed were more proactive and have less room for further waste reduction, and arbitrarily select a 10% waste reduction goal. Based on these assumptions, the total waste disposed by a state population of 3,575,000 would drop to ~1,767,000 tons from the 2,322,598 recorded in 2015. The trash facilities at Bridgeport, Bristol, Lisbon and Preston have a permitted capacity of 1,505,625 tons. Thus, the necessary replacement for the MIRA facility is roughly 250,000 tons. This of course, begs the question of whether the 500 lbs./person goal is doable.



A study[3] comparing the recycling rates for various countries shows that the waste reduction goals are not only feasible, they are not all that aggressive. The boxed numbers on the chart show the required waste disposal capacity in millions of TPY. The axis is total waste disposed per person, including residential and commercial/ industrial. Future waste reduction efforts could help reduce the cost of replacing the other trash plants as they reach end of life. These data also illustrate some of the tracking and reporting challenges presented by goals that cover only residential waste. The corresponding numbers for total waste disposed for the example discussed above are ~1,300 lbs./person in 2015, dropping to ~990 lbs./person. That is essentially bringing CT performance in line with the US average.

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[1] Gasification of Municipal Solid Waste, Ceo, Y-C et. al., DOI: 10.5772/intechopen.73685, Available at https://www.intechopen.com/books/gasification-for-low-grade-feedstock/gasification-of-municipal-solid-waste

[2] CT DEEP, 2015 Statewide Waste Characterization Study, Final Report, Available at https://www.ct.gov/deep/lib/deep/waste_management_and_disposal/Solid_Waste_Management_Plan/CMMS_Final_2015_MSW_Characterization_Study.pdf

[3] Recycling – Who Really Leads the World? 11 December 2017. Robert Gillies, Peter Jones, Joe Papineschi, & Dr. Dominic Hogg. Available at https://www.eunomia.co.uk/reports-tools/recycling-who-really-leads-the-world-issue-2/

Some will argue that these advanced thermal technologies are simply not ready for commercial application and will not work with the mixed MSW typical of "current practices for source separation and collection." A couple illustrative examples can demonstrate that these plants are in fact in service, but admittedly at sizes consistent with a need to add no more than 250,000 TPY.

Energos[4] is a Norwegian company specializing in small scale plants. The Sarpsborg, NO plant shown in the photo to the left processes 78,000 TPY, providing heat and heat electricity. A study[5] of small- scale waste- to- energy indicated that the capital costs were $525/ ton of waste treatment capacity. This compares to ~$300 million to revamp the CSWS to maintain 700,000 TPY, or ~$425/ ton of capacity. This seems to me an acceptable premium for smaller plants that would impose significantly reduced impacts on the host community. The photo at right shows facility at Devon County, UK that handles 60,000 TPY. Fulcrum Bioenergy[6] is building a facility to process ~175,000 tons of MSW feedstock annually, creating 11 million gallons per year of renewable synthetic crude oil. A survey[7] of small- scale facilities acknowledged higher costs, but noted several offsetting advantages; treatment of waste close to source, creation of jobs in local community, less public resistance to smaller plants, and easier integration of facilities into existing industrial areas.

The need for modified source separation and collection practices previously considered a barrier to adoption of advanced gasification/ pyrolysis is an essential success factor for achieving goals to reduce waste sent for final disposal. Solicitations should encourage partnerships between municipalities and organizations proposing waste facilities to develop coordinated systems that provide feedstocks tailored to the proposed technologies to optimize efficiency and minimize environmental impacts.

Subsection (c) seeks proposals to achieve measurable source reduction and increases in recycling, including through volumetric pricing. It is important to send a clear price signal to consumers for the actual cost of waste disposal. While some towns require residents to contract for their waste disposal, for many the costs are buried in property taxes and perceived as free. Even those paying for disposal have enjoyed rates previously subsidized by the sale of electricity and recovered materials. Wholesale electric rates have dropped dramatically and the current turmoil in recycle markets has turned a revenue stream into another expense[8]. Developing systems for more effective separation and collection will likely impose upfront costs, such as additional bins or multi- compartment collection trucks. It will be extremely difficult to fund these investments solely through tipping fees. Making waste disposal costs more visible at the same time as the industry is facing pressure for greater tip fee revenues will not endear town leaders to their constituencies. However, the CSWS project demonstrated that public- private partnerships without any public investment have limited chance of success.

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[4] http://www.energos.com

[5] Small Scale Waste- to- Energy Technologies, Ellyin, C., (2012) Department of Earth and Environmental Engineering, Columbia University, Available at http://www.seas.columbia.edu/earth/wtert/sofos/Ellyin_Thesis.pdf

[6] http://fulcrum-bioenergy.com/facilities/

[7] Small Scale Energy- from- Waste, IEA Bioenergy, Johansson, I. & Warren, K. (2015) Available at http://task36.ieabioenergy.com/wp-content/uploads/2016/06/IEA-Bioenergy-Small-scale-EfW-Final.pdf

[8] Dramatic upheaval in the market for recyclables may cause Connecticut communities to lose hundreds of thousands of dollars. Stacom, D. & Gerike, L. Hartford Courant, July 9, 2019.

Subsection (e) proposed a nonrefundable fee to cover costs of preparing and reviewing solicitations. This would seem to me an unnecessary barrier that could discourage responses, particularly following a multiyear, expensive effort to redevelop the CSWS. CT may be viewed as a less than welcoming environment for these kinds of projects.

Section 3

I support efforts to develop markets for recovered materials. This will provide additional revenue for the waste management system and can promote economic development by attracting companies that process recovered materials into products, or at least higher value materials for export. The state purchasing power can be a valuable tool to help open up markets for saleable products. This approach could be expanded to include state guarantees to purchase products produced from disposed MSW, such as transportation fuels or road aggregate and/or building materials recovered from incinerator bottom ash.

Section 4

MIRA has contractual obligations to serve member towns for another seven years. It will be important to maintain that capacity long enough to enable construction of some replacement capacity. The amount of replacement capacity can be reduced significantly with meaningful, but uncertain waste reduction efforts. The modular advanced technologies I am advocating do have shorter construction times, but will face the same NIMBY public resistance and regulatory hurdles that can delay construction of any waste disposal facility. Given these uncertainties and the potential for a catastrophic failure of the MIRA facility, it would be advisable for the MIRA plan to include development of a multimodal transfer station as a risk mitigation measure.

I do have concern that once such a transfer station is constructed that cheap out-of- state landfill disposal will be used to save costs rather than serve only as an emergency relief. Public policy reform will be necessary to achieve the goals of self- sufficiency and state- of- the art technology to minimize potential harms to public health and the environment.

General Comments

There have been claims that PAYT can achieve immediate 40% reductions in residential waste disposal. Using data from the 2015 waste characterization study, the 760 pounds of residential waste disposed per person included 120 pounds of targeted recyclables (dry fiber and plastic, metal, and glass containers) and 228 pounds of food and yard waste. Only 75% of this material need be recovered to achieve the goal of no more than 500 pounds per person. But the 500- pound goal cannot be achieved without recovering the compostable organics. An MIT[9] study observed that 80% of the municipalities with successful programs also had PAYT programs. The report also identified two other critical success factors; a nearby processing facility and preexisting infrastructure for handling yard waste. One alternative for urban areas might be to investigate use of wastewater treatment plants to process the compostable organics. Collection in the northeast faced additional challenges due to seasonal variations. While providing clear environmental benefits, compostable collection will add cost.

[9] Municipal Curbside Collection: What Works and Why, Layzer, J.A., (2014) MIT-Department of Urban Studies and Planning. Available at https://dusp.mit.edu/sites/dusp.mit.edu/files/attachments/project/Municipal%20Curbside%20Compostables%20Collection%20%20What%20Works%20and%20Why.pdf

Given the financial condition of the state and a reluctance to invest in infrastructure, I do have concerns that we lack the political will to make the necessary investments in a sustainable waste management system. Thus, I reluctantly suggest one further risk mitigation strategy. When issuing solicitations for waste facilities, we might consider a pilot of a facility that can process mixed MSW with no source separation or source- separated materials rejected for unacceptable levels of contamination. There are some advanced mechanical biological treatment technologies[10] designed to treat residual waste to recover recyclables (though of admittedly lower quality) and optimize energy recovery. If separation and collection of multiple streams proves too costly or unable to achieve acceptable quality levels, this type of system could provide an option that would at least be more responsible than relying on out- of- state landfills and could provide more uniform feedstock for gasification/ pyrolysis.

I will end with one final point to put the current cost escalation in perspective. Tipping fees in the $150 / ton range can trigger much resistance to a proposed solution. But the cost to a family of 4, assuming our 760 pounds per capita, amounts to ~$20/ month. At 500 pounds per capita that would drop to $12.50 / month. We have an ethical responsibility to make "strategic materials management" or "materials innovation" more than titles on a report or quasi- public organization. This bill deserves public financial support to make true public- private partnerships possible.

Respectfully submitted,
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[10] Herhoff GmbH, Waste Treatment Technologies, http://www.herhof.com/fileadmin/media/unternehmen/Herhof_brochure_ENG_0102010_for_sending_lq.pdf