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November 30, 2018

California Air Resources Board
1001 I Street
P.O. Box 2815
Sacramento, California 95812

Re: November 15, 2018 Proposed Amendments to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms Regulation

The State needs a consistent and equitable approach to achieving GHG reductions from the solid waste management sector. Board Resolution 12-33 called for CARB to develop just such an approach, but one still has not been developed. We are hopeful that one will be developed soon, and we look forward to being part of that process. However, until such an equitable approach is developed, a rush to judgment on the inclusion of WTE facilities in the cap & trade program while landfills face no cap & trade costs risks irreparable harm of waste being diverted from WTE to landfills. Decisions on the continued operation of the two remaining WTE facilities in California are being made on the basis of how CARB proceeds with its allowance allocation. Closure of facilities precipitated by an allowance approach that renders these facilities unsustainable economically will be permanent. As revised, we estimate the overall financial impact to the two WTE facilities to be $52 M over the 12-year period from 2018 – 2030. This substantial additional cost borne solely by WTE facilities in a competitive waste market dominated by landfills is not sustainable.

We have outlined several approaches that we think that allow for the continued operation of these two facilities. We look forward to working with CARB on these options as well as the long-term plan for reducing GHG emissions from the waste management sector.

Discussion:

We appreciate CARB's efforts to adjust the allowance allocation formula originally proposed in its September 4th proposal. However, CARB's revised methodology still imposes a sizable financial penalty on the two WTE facilities in California, while landfills have absolutely no compliance obligation under the cap & trade program. As revised, we estimate the overall financial impact to the two WTE facilities to be $52 M over the 12-year period from 2018 – 2030, assuming that the state at least partially meets its organics diversion requirements under AB 1383. Even assuming that the state only minimally meets its diversion requirements, and the % of biogenic carbon reaching the State's WTE facilities is at 62% (the current level seen at the Stanislaus WTE facility), the financial impact is still $35 M on just two facilities. This substantial additional cost borne solely by WTE facilities in a competitive waste market dominated by landfills is not sustainable. We cannot continue to operate facilities that are not economically sustainable.[a]

The disparity of treatment is egregious in its delivery of a policy signal in direct contrast to CARB and CalRecycle's own recognition of WTE as a lower carbon option for waste management. CARB and CalRecycle have both recognized these facilities as having lower GHG emissions than landfills.[b] The undeniable goal of any cap & trade program is to explicitly encourage lower GHG emissions by providing a higher financial cost to more GHG intensive means of delivering a product or service. CARB's continued inclusion of the state's two WTE facilities in the cap whilst landfills are excluded defies logic, equity, and sound policy.

We firmly believe that the cap & trade program must be designed to ensure equitable treatment across all facilities and technologies operating within a given sector. Therefore, we oppose the proposed inclusion of WTE facilities in the program and the proposed allowance mechanism for WTE facilities as the current proposal fails to provide equitable treatment or the transition assistance needed to avoid an undue economic impact of the two remaining WTE facilities in CA.

The impacts of WTE's inclusion in the cap & trade program are fully known to CARB. In its 1st update to the Climate Change Scoping Plan, CARB explicitly recognized the risk of higher GHG emissions from uneven treatment in the waste management sector:

> "Another approach is to add MSW Thermal facilities to the Cap-and-Trade program in 2015, while leaving other Waste Sector sources out. Under this approach, MSW Thermal plants would have an incentive to reduce their GHG emissions over time through control of input feedstock and other techniques. However, a challenge with implementing this approach is that MSW Thermal plants have a modest potential to reduce their GHG emissions. Over time, they may have

[a] We also cannot raise prices to waste generators to meet costs; the result would be rapid re-diversion back to landfills.
[b] The well recognized GHG benefits of WTE facilities relative to landfilling, including by both CARB and CalRecycle, are presented in detail in our earlier comments dated October 22, 2018 and are included herein by reference.

> to purchase more emissions credits, making them increasingly less competitive compared to traditional landfills. ***This approach would likely result in more GHG emissions if it results in an increase in MSW going to landfills***."[c] [emphasis added]

CARB already understands how to provide equity within the waste management sector. In the same document, CARB noted two approaches that would provide a level playing field, both of which rely on treating the waste management sector the same way under the cap and trade program:

> "Remove MSW Thermal Facilities from Cap-and-Trade post-2015
> Under this option, MSW Thermal facilities would be removed from the Cap-and-Trade Regulation for the foreseeable future. This approach would put MSW Thermal facilities on a level playing field within the Waste Sector, where none of the methods of handling MSW would be subject to the Cap-and-Trade Regulation. …
>
> Add MSW Thermal Facilities and Other Waste Sector Sources to Cap-and-Trade in 2015
> Under this approach, MSW Thermal facilities and other options for handling waste (such as landfills) would be subject to the Cap-and-Trade Regulation. This would provide a level playing field for power generation and potentially avoid increases in waste disposal at landfills from a reduction in combustion of MSW."

Even without the requirement to purchase allowances, WTE facilities are under financial pressure. According to CalRecycle's 2015 report, WTE "is actually a more expensive alternative to landfilling in California when compared to the statewide median as well as the surrounding landfills."[d] The Commerce Refuse-to-Energy Facility permanently closed on June 26, 2018, citing the cost of continuing to operate. All of the waste is now going to landfills and generating addition GHG emissions.

By including WTE in the cap and not including landfills, CARB will create the perverse effect of incentivizing more waste to landfills resulting in increased GHG emissions. To resolve this issue, we ask for equitable treatment in the waste management sector, called for in board resolutions from 2011 and 2012, through the provision of transition allowances, as directed in Board Resolution 17-21.[e]

In move toward greater equity in the waste management sector, we are proposing several different options for transition assistance for consideration by CARB staff. Consistent with Board Resolution 17-21, the implementation of each option should expire in 2024 and replaced with an approach applied consistently across the entire waste management sector. Consistent

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[c] See California Air Resources Board (2014) *Proposed First Update to the Climate Change Scoping Plan: Building on the Framework, Appendix C – Focus Group Working Papers, Municipal Solid Waste Thermal Technologies*
[d] CalRecycle (2015) Landfill Tipping Fees in California https://www2.calrecycle.ca.gov/Publications/Download/1145
[e] Resolution 17-21 does not impose a limitation on the transition assistance provided. The provision of full allowances, until such time as the rest of the waste management sector incurs a compliance obligation, is consistent with the original stated goal of transition assistance to "avoid imparting undue initial economic gain or loss to covered entities through allocation." See CARB (2010) Initial Statement of Reasons, Appendix J: Allowance Allocation.

with Board Resolution 12-33, such an approach should be comprehensive and address "the most appropriate treatment under the Cap-and-Trade program for all end-of-life management options for Municipal Solid Waste, including but not limited to, landfills, waste-to-energy, composting, and recycling."

Option 1: Continuation of Existing Process Until Landfills are Capped

To date, the State's two remaining WTE facilities have not faced a compliance obligation through 2017 because CARB has allocated emissions allowances equal to their facility's reported, verified, and covered emissions from municipal solid waste. This approach has effectively resulted in consistent treatment within the waste management sector. We do not think this should be a permanent approach but will ensure equity until such time as a long-term approach for the entire waste management sector is developed.

Option 2: Energy – Based Allocation

For covered entities without a product benchmark, the existing regulation specifies the use of energy-based allocation calculation methodology specified in section 95891(c). Under this option, CARB would apply the exact same calculation to the two remaining WTE facilities in the State.

Possible regulatory language for Option 2 is included in Attachment A.

Option 3: Allocation based on Organics Diversion

As SB 1383 is implemented, organics will be diverted from the waste shed, potentially reducing the GHG benefits of WTE relative to landfilling currently recognized by both CARB and CalRecycle. As organics are diverted from the landfills, we proposed that WTE's exposure to the cap and trade program would increase based on the actual organics diversion achieved in practice, based on CalRecycle's regular statewide waste characterization studies. This approach was proposed to CARB in comments dated January 20, 2017, which we refined in subsequent discussions. This approach best matches the science, and the effects of organics diversion on the benefits of WTE relative to landfills. We understand that staff rejected this Option, but we put if forward here as part of the larger discussion of how to achieve ARB GHG reduction objectives.

Option 4: Direct Regulation

WTE facilities are obligated to manage the MSW that is delivered to them, and as a result, have minimal ability to reduce stack emissions of CO2. However, when viewed as part of a larger system, those communities that rely upon WTE could achieve GHG reductions from waste management more broadly. Mechanisms to reduce GHG emissions from the waste management sector could include adoption of AD and/or composting, increased recycling, additional metals recovery from WTE facilities, and reuse / recycling of ash. These mechanisms, or a combination thereof, could be implemented at the WTE facility, or as part of a broader approach.

These types of GHG reductions could be incentivized through direct regulation that provided the flexibility to implement waste management solutions that resulted in lower GHG emissions. As this regulatory approach were developed, CARB would need to temporarily implement one of the other options to preserve equity of treatment in the waste management sector.

Option 5: Inclusion of fossil-fuel combustion emissions in cap

WTE facilities combust fossil fuels both during start-up, shut-down, and, as needed, for control of the combustion process. WTE facilities also use fossil fuels in operating mobile equipment on-site. To incentivize GHG reductions from the combustion of fossil fuels, CARB could include the combustion of fossil fuels in the cap, while excluding those emissions associated with waste management, which would be managed by a comprehensive approach to be developed.

Thank you very much for the opportunity to comment. Please let us know if you have any additional questions and thank you for your work on this important issue.

Sincerely,

Michael E. Van Brunt, P.E.

Cc: Peter H. Weiner

Attachment A – Proposed Regulatory Changes

Option 2: Energy – Based Allocation

§95870

(j) Allocation to Waste-to-Energy Facilities. Vintage 2020 allowances available for allocation to waste-to-energy facilities shall be calculated as set forth in section 95891(f)(1). The Executive Officer will place vintage 2020 allowances in the annual allocation holding account of each eligible waste-to-energy facility by October 24, 2019. An amount of vintage 2020 true-up allowances will be placed in the annual allocation holding account of each eligible waste-to-energy facility by October 24, 2019 to account for 2018 and 2019 emissions.

§95871

(i) Allocation to Waste-to-Energy Facilities. Allowances available for allocation to waste-to-energy facilities each budget year shall only be calculated as set forth in section 95891(f). The Executive Officer will place an annual individual allocation in the annual allocation holding account of each eligible waste-to-energy facility, by October 24 of each calendar year beginning in 2020 for allocation from the 2021 annual allowance budget and ending in 2023 for allocation from the 2024 annual allowance budget.

§95891

(f) Allocation to Waste-to-Energy Facilities. The Executive Officer shall calculate the amount of allowances directly allocated to waste-to-energy facilities using the following methods.

(1) Allocation for Budget Year 2020. For budget year 2020, the Executive Officer shall calculate the amount of California GHG Allowances directly allocated to waste-to-energy covered facilities using the following equation:

$$A_{2020} = BaselineAllocation \times c_t + \sum_{t=2018}^{2019} TrueUp_t$$

Where:

"A_{2020}" is the amount of California GHG allowances directly allocated to a facility for budget year 2020;

"BaselineAllocation" is the GHG emissions from the historical arithmetic mean of the amount of energy produced due to fuel combustion at the facility based on the emissions efficiency benchmark per unit of energy from fuel combustion adjusted for the GHG emissions from the historical arithmetic mean of annual electricity sold or provided for off-site use that was generated from non-biogenic fuel. This value is calculated by the following equation:

$$BaselineAllocation = F_{consumed} * B_{Fuel} - e_{Sold,Non-Biogenic} \times B_{Electricity}$$

Where:

"$F_{Consumed}$" is the historical baseline annual arithmetic mean amount of energy produced due to fuel combustion at the facility, measured in MMBtu. The Executive Officer shall calculate this value based on the total mass of steam generated by the facility multiplied by the ratio "B" in units of MMBtu/lb steam, defined as the ratio of the boiler's maximum rated heat input capacity to its design rated steam output capacity by section 98.33 of subpart C, title 40, Code of Federal Regulations, Part 98 (December 9, 2016).

"B_{Fuel}" is the emissions efficiency benchmark per unit of energy from fuel combustion, 0.05307 California GHG Allowances/MMBtu;

"$e_{Sold,Non-Biogenic}$" is the historical arithmetic mean of annual electricity sold or provided for off-site use that is generated from non-biogenic fuel, measured in MWh. This equals the historical arithmetic mean of total annual electricity sold or provided for off-site use multiplied by the historical arithmetic mean of annual covered (non-biogenic) emissions divided by annual total emissions;

"$B_{Electricity}$" is the emissions efficiency benchmark per unit of electricity sold or provided to off-site end users, 0.431 California GHG Allowances/MWh;

~~"BaselineAllocation" is the historical arithmetic mean of annual covered emissions for the 2015-2017 data years, as defined in MRR, for the facility based on a positive or qualified positive emissions data verification statement and adjusted for the GHG emissions from the historical arithmetic mean of annual electricity sold or provided for off-site use that was generated from non-biogenic fuel. This value is calculated by the following equation:~~

~~$$BaselineAllocation = GHG - e_{Sold,Non-Biogenic} \times B_{Electricity}$$~~

~~$$BaselineAllocation = GHG$$~~

~~Where:~~

~~"GHG" is the historical arithmetic mean of annual covered emissions, as defined in MRR, for the facility based on a positive or qualified positive emissions data verification statement;~~

~~"$e_{Sold,Non-Biogenic}$" is the historical arithmetic mean of annual electricity sold or provided for off-site use that is generated from non-biogenic fuel, measured in MWh. This equals the historical arithmetic mean of total annual electricity sold or provided for off-site use multiplied by the historical arithmetic mean of annual covered (non-biogenic) emissions divided by annual total emissions;~~

~~"$B_{Electricity}$" is the emissions efficiency benchmark per unit of electricity sold or provided to off-site end users, 0.431 California GHG Allowances/MWh;~~

"ct" is the cap adjustment factor for budget year "t" to account for cap decline as specified in Table 9-2;

"t" is the budget year from which the direct allocation occurs; and

"$TrueUp_t$" is the amount of true-up allowances allocated to account for allocation not properly accounted for in prior allocations. This value of

allowances from budget year "t" shall be allowed to be used for compliance for budget year t-2 and subsequent years pursuant to sections 95856(h)(1)(D) and 95856(h)(2)(D). This value is calculated by the following equation:

$$Trueup_t = BaselineAllocation \times c_t$$

(2) Allocation for Budget Years 2021 and beyond. For budget years 2021 and beyond, the Executive Officer shall calculate the amount of California GHG Allowances directly allocated to eligible waste-to-energy covered entities using the following formula:

$$A_t = BaselineAllocation \times c_t$$

Where:
"A_t" is the amount of California GHG allowances directly allocated to a facility for budget year "t";

"t" is the budget year from which the direct allocation occurs;

"BaselineAllocation" is the GHG emissions from the historical arithmetic mean of the amount of energy produced due to fuel combustion at the facility based on the emissions efficiency benchmark per unit of energy from fuel combustion adjusted for the GHG emissions from the historical arithmetic mean of annual electricity sold or provided for off-site use that was generated from non-biogenic fuel. This value is calculated by the following equation:

$$BaselineAllocation = F_{consumed} * B_{Fuel} - e_{Sold,Non-Biogenic} \times B_{Electricity}$$

Where:
"$F_{Consumed}$" is the historical baseline annual arithmetic mean amount of energy produced due to fuel combustion at the facility, measured in MMBtu. The

Executive Officer shall calculate this value based on the total mass of steam generated by the facility multiplied by the ratio "B" in units of MMBtu/lb steam, defined as the ratio of the boiler's maximum rated heat input capacity to its design rated steam output capacity by section 98.33 of subpart C, title 40, Code of Federal Regulations, Part 98 (December 9, 2016).

"B_{Fuel}" is the emissions efficiency benchmark per unit of energy from fuel combustion, 0.05307 California GHG Allowances/MMBtu;

"$e_{Sold,Non\text{-}Biogenic}$" is the historical arithmetic mean of annual electricity sold or provided for off-site use that is generated from non-biogenic fuel, measured in MWh. This equals the historical arithmetic mean of total annual electricity sold or provided for off-site use multiplied by the historical arithmetic mean of annual covered (non-biogenic) emissions divided by annual total emissions;

"$B_{Electricity}$" is the emissions efficiency benchmark per unit of electricity sold or provided to off-site end users, 0.431 California GHG Allowances/MWh;

~~"BaselineAllocation" is the historical arithmetic mean of annual covered emissions for the 2015-2017 data years, as defined in MRR, for the facility based on a positive or qualified positive emissions data verification statement and adjusted for the GHG emissions from the historical arithmetic mean of annual electricity sold or provided for off-site use that was generated from non-biogenic fuel. This value is calculated by the following equation:~~

~~$BaselineAllocation = GHG - e_{Sold,Non\text{-}Biogenic} \times B_{electricity}$~~

~~$BaselineAllocation = GHG$~~

~~"GHG" is the historical arithmetic mean of annual covered emissions for the data years 2015-2017, as defined in MRR, for the facility based on a positive or qualified positive emissions data verification statement;~~

~~"$e_{Sold,Non-Biogenic}$" is the historical arithmetic mean of annual electricity sold or provided for off-site use that is generated from non-biogenic fuel, measured in MWh. This equals the historical arithmetic mean of total annual electricity sold or provided for off-site use multiplied by the historical arithmetic mean of annual covered (non-biogenic) emissions divided by annual total emissions;~~

~~"$B_{Electricity}$" is the emissions efficiency benchmark per unit of electricity sold or provided to off-site end users, 0.431 California GHG Allowances/MWh; and~~

"c_t" is the cap adjustment factor for budget year "t" to account for cap decline as specified in Table 9-2.

(3) Data Sources. To determine the appropriate baseline values, the Executive Officer employed data reported to ARB pursuant to MRR for the data years 201~~5~~1-2017. The Executive Officer may solicit additional data as needed.

Attachment B – Discussion of WTE's GHG Benefits Relative to Landfilling

WTE facilities were initially exempted on the basis of science and to ensure parity of treatment across the waste management sector. With CalRecycle's recognition of the GHG benefits of WTE relative to landfilling (see excerpt below), it was clear that including WTE in the cap and trade program while landfills were excluded would result in unequal treatment within the waste sector, and potentially result in leakage of GHG emissions from a capped source, WTE, to an uncapped source, landfilling.

> "Published LCA studies and best available published direct measurement data support CalRecycle staff's general conclusions. CalRecycle staff concludes that the three existing California WtE facilities provide net avoided methane emissions over waste otherwise disposed in a California landfill. The net avoided emissions exceed non-biogenic emissions from burning of the fossil fuel-based components such as plastic in the WtE facility."[f]

Since the initial exemption of the existing WTE facilities in 2012, the recognition of WTE as a source of GHG mitigation has grown. In 2014, CARB itself, concluded that WTE offers GHG reductions relative to landfilling:

> "Preliminary staff estimates … indicate that combusting waste in the three MSW Thermal facilities in California results in net negative GHG emissions, ranging from -0.16 to -0.45 MT CO2e per ton of waste disposed, when considering that the waste would otherwise be deposited in landfills resulting in higher emissions."[g]

In 2013 and 2014, the Center for American Progress and Third Way have both reviewed WTE and validated its GHG benefits.[h,i] In addition, the Joint Institute for Strategic Energy Analysis (JISEA) operated on behalf of the U.S. Department of Energy's National Renewable Energy Laboratory, the University of Colorado-Boulder, the Colorado School of Mines, the Colorado State University, the Massachusetts Institute of Technology, and Stanford University published a report in 2013 after a review of solid waste management options for Boulder's municipal solid waste concluded WTE was a better option than landfilling:

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[f] CalRecycle. 2012. CalRecycle Review of Waste-to-Energy and Avoided Landfill Methane Emissions. Available at: http://www.calrecycle.ca.gov/Actions/PublicNoticeDetail.aspx?id=735&aiid=689

[g] See Table 5 of California Air Resources Board (2014) *Proposed First Update to the Climate Change Scoping Plan: Building on the Framework, Appendix C – Focus Group Working Papers, Municipal Solid Waste Thermal Technologies*

[h] Center for American Progress (2013) Energy from Waste Can Help Curb Greenhouse Gas Emissions http://www.americanprogress.org/wp-content/uploads/2013/04/EnergyFromWaste-PDF1.pdf

[i] Third Way (2014) *Power Book*: *Energy from Waste*, http://powerbook.thirdway.org/filter-web-app/energy-from-waste, accessed November 26, 2014.

> "We find that MSW combustion is a better alternative than landfill disposal in terms of net energy impacts and carbon dioxide (CO2)-equivalent GHG emissions.
>
> "Life cycle assessment studies published in the literature have generally been consistent in suggesting that MSW combustion is a better alternative to landfill disposal in terms of net energy impacts and CO2-equivalent GHG emissions. The results from this study match that expectation. In this report, WTE leads to a higher reduction in emissions compared to landfill-to-energy disposal per kWh production."[j]

Then in 2016, Berkeley Law released a report earlier this year in response to a request from the Governor's office, looking at the merits and demerits of energy recovery options for wastes remaining after reaching the state's 75% recycling goal. The authors conclude that:

> "Harvesting these leftover materials as solid waste energy sources could provide multiple environmental benefits:
> – complementing intermittent renewable energy, such as wind and solar, to offset fossil fuel-based energy sources and associated greenhouse gas emissions; [and]
> – avoiding landfill emissions of methane (a potent greenhouse gas that is 28-34 times as strong as carbon dioxide over 100 years) by diverting wastes to energy, particularly organic wastes;"[k]

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[j] Joint Institute for Strategic Energy Analysis (2013) *Waste Not, Want Not: Analyzing the Economic and Environmental Viability of Waste-to-Energy (WTE) Technology for Site-Specific Optimization of Renewable Energy Options*.
http://www.nrel.gov/docs/fy13osti/52829.pdf

[k] Berkeley Law Center for Law, Energy & the Environment (2016) *Wasting Opportunities: How to Secure Environmental & Clean Energy Benefits from Municipal Solid Waste Energy Recovery*.
https://www.law.berkeley.edu/research/clee/research/climate/waste-to-energy/