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September 8, 2020

To whom it may concern,

The City of Omaha is busy deploying two [new 96-gallon carts](#) to all residences in anticipation of the new waste/recycling collection contract on November 30, 2020. Included in those bins is a Hefty EnergyBag starter kit.

When the EnergyBag program started in 2016, we analyzed the program and wrote this [white paper](#), wherein we expressed cautious optimism about the program. In short, we were disappointed with the fact that EnergyBag materials were being sent to a cement kiln in Kansas City, but we were optimistic about the program longer term because it keeps ubiquitous, pervasive materials out of the landfill, and we were confident that a better end-use would eventually be found once the volume of materials reached critical mass.

Since 2017, we've been helping clients set up their own EnergyBag collection systems while monitoring the EnergyBag program.

We are excited to report that Firststar Fiber, the materials recovery facility that collects and sells all of Omaha's residential recycling, will soon be investing in a facility that will turn EnergyBag materials into plastic lumber. The program is headed in the right direction. We will continue to encourage people to participate and will help our clients incorporate the collection of EnergyBag materials into their waste management systems.

The cover letter and white paper below are unchanged from when they were published in September 2017.

Sincerely,

Craig Moody  
Managing Partner



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September 20, 2017

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To whom it may concern,

Omaha is in a unique position. We are currently the only city participating in the [Hefty EnergyBag Program](#). Several business partners have come together to deploy the effort, which collects plastic materials that aren't currently accepted as part of our normal mixed recycling stream. These "soft" plastics are often in the form of food packaging - bread bags, wrappers, etc.

On several occasions the firm has had friends and clients ask us whether the program is something they should use. So, like any good boss does, I delegated the research to our intern, David Rice. We asked him to answer the question, should we be recommending to our clients that they participate.

David went on an impressive journey of researching the program. He talked to nearly every business involved. He spoke with experts in the field of waste-to-energy. He sifted through several academic papers. And perhaps most importantly, he fielded question after question from our team. We poked holes in everything he did. We pushed back. We really wrestled with his findings. In short, he really dug in, and we took this seriously.

Before I go any further, I need to declare that my family implemented the program at home, and it's been amazing just how many materials we've been able to divert from the landfill and send to a cement kiln near Kansas City, MO. Our family of four now sends 1 - 2 small bags of trash to the landfill each week. Most of our outgoing materials end up composted, recycled or in an Energy Bag. It's been an eye-opening experience, but I dove in without doing much homework on the environmental implications, which is likely the same course of action nearly every other participant took. Read a few materials, talk to a neighbor that's participating, order the bags, and – voila – you're off and running. But the environmental story is a little murky.

Most environmental issues aren't clear-cut. There's not an obvious answer. What I like about our team's approach is that we're pretty practical about many of these vexing issues. We certainly have a long view toward where we want our world to transition, but we're also pragmatic about what can get done in the short term. The Energy Bag program is a perfect microcosm of how these issues aren't straightforward and require some serious deliberation about whether short-term consequences are worth long-term benefits.

So let's get to it. In this paper, we summarize several concerns with the current program. Here are a few of the larger issues:



1. At present, Energy Bag materials are destined to be burned as fuel at a cement kiln near Kansas City, MO, which will create harmful emissions (primarily greenhouse gasses and dioxins). While the emissions are likely lower or at least on par with the emissions from the main fuel sources at the kiln (waste to energy materials that include but are not limited to plastics), they are still emissions, which we're not fans of. It's important to note that we weren't able to identify any studies that solely measured emissions associated with incinerating materials that will be typically found in Energy Bags, but we believe that those emissions are likely to be similar to if not lower than those in typical waste to energy materials.

2. Authorities in the zero waste field do not consider waste-to-energy to be part of a zero waste strategy. In other words, if an organization's goal is to be zero waste, the Energy Bags program doesn't currently help you achieve that goal. Incineration essentially equals landfilling from the zero waste perspective.

3. We are concerned about unintentionally growing the waste-to-energy (WTE) industry. In at least one case, a state classified WTE as a clean or renewable energy source, which then allows it to inappropriately compete against other truly renewable energy sources like wind and solar for tax subsidies or to meet a state's clean energy mandates.

4. Program sponsors often use misleading language when describing the program, such as calling it an "innovative recycling program". It's not recycling. At least not currently.

5. There is legitimate concern that capturing and diverting these materials from the landfill will reduce the likelihood of and voracity with which organizations will pursue source reduction strategies for these materials.

6. The cement kiln has multiple EPA clean air and two clean water violations. These such violations are unfortunately not uncommon in the cement kiln industry. Plus, Dow has a spotty environmental record.

7. Speaking of the EPA, their [waste management hierarchy](#) ranks the various waste management strategies from most to least environmentally preferred. The ranking is as follows (best to worst)

1. Source reduction & reuse
2. Recycling/composting
3. Energy recovery
4. Treatment & disposal

There are other issues illuminated in our white paper, but the aforementioned are those that we feel are most concerning.

However, in our conversations with Dow Chemical, the business behind the program, we learned their long-term goal is to transition away from channeling the material as feedstock for cement kiln operations and instead chemically recycle these soft plastics via the process of pyrolysis. Doing so is a much better outcome.



Ideally there is no end state for materials (e.g., landfill or incineration). Rather, they continue to exist through a circular process where they are used over and over again. It's a process that more closely mimics nature, where there is no true waste. Every material has a purpose. So, the long-term goal for the Energy Bag program is good.

You may be asking why not just skip over the incineration and go right to recycling these materials? Good question. The challenge in the short-term is building a large and reliable materials stream. Dow (or another third party) isn't likely to invest in the equipment, processes, infrastructure, manpower, etc. until they reach a certain, steady threshold for the flow of these materials. The last thing they want is an expensive recycling machine and its operators to sit idle.

The question then becomes, are we comfortable with the short-term negative consequences under the assumption that the long-term vision will be achieved? In our view, we are, but we're not going to be very patient with the organizations involved as they work toward an incineration-to-recycling transition.

We recently led a waste characterization study for one of our larger clients, and we were struck by how prevalent soft plastics are. They are everywhere, and for some of our clients they are unavoidable. For this reason, we do feel that it's worthwhile to invest in the Energy Bag program, which is really a statement of trust in the program's sponsors. But we will continue to push our clients to focus on source reduction first and foremost.

We believe there are some important, short-term steps that should be taken by program sponsors. They include 1) a third party conducting a scientifically sound study to more accurately measure the environmental impacts of incinerating these materials, 2) for Dow and other program sponsors to more explicitly state their plans for transitioning from cement kiln incineration to chemical recycling, and 3) for program sponsors to tighten up the inaccurate language around the program (refrain from calling it recycling).

Finally, we are committed to staying up to date on the Energy Bag program. There is promise, and we are assuming positive intent on the part of the sponsors. We will keep a close eye on the program as it unfolds and develops. If we don't see meaningful progress, we'll likely rescind our recommendation and begin to unravel the steps made to participate in and support the program.

Sincerely,

A handwritten signature in black ink, appearing to read "CM", is positioned above the name of the sender.

Craig Moody, Managing Principal

# Hefty EnergyBag: Cautionary Support



Contributors:  
David Rice, Intern  
Craig Moody, Managing Partner

# Hefty EnergyBag: Cautionary Support

We are taking a deeper look at the Hefty EnergyBag Program because multiple current or previous clients asked whether they should employ the program at their organizations. As sustainability consultants, we wanted to learn if this program is something we should recommend to our clients.

## What is the Hefty EnergyBag Program?

The Hefty EnergyBag Program (HEBP) is an initiative designed to recover non-recyclable plastics (plastics which cannot currently be mechanically recycled). The materials will be collected across Omaha in orange Hefty brand plastic bags. Visit Hefty's [site](#) to learn about which materials can be placed in the bags. According to the sponsors of the program, the bags will be transported to a cement plant in Sugar Creek Missouri (outside Kansas City). At the plant, the bags will be added to the materials mix used as combustion fuel.

The program launched its first phase in September of 2016 by distributing bags to RecycleBank members in Papillion, Elkhorn, and parts of Omaha<sup>1</sup>. Participation in the EnergyBag program is now open to anyone in the Omaha area, residential or commercial<sup>2</sup>. To partake in Omaha's program, participants purchase EnergyBags in rolls of 20 bags sold for \$6 online. The bags are also available through Papillion Sanitation, and according to Firstar Fiber, the bags will be available at select stores in the Omaha area including Hy-Vee locations in October 2017. Prior to the program launch in Omaha, there was a similar program piloted in Citrus Heights, CA during the summer of 2014. In that program, the materials were converted using chemical and pyrolysis processes into synthetic diesel fuel instead of being incinerated<sup>3 4</sup>.

Once filled, the orange bags are placed with normal recyclables in a curbside bin for collection (residential program only). Recyclables are then taken to Firstar Fiber, which sorts the orange bags from the other recycling materials. The orange bags are collected until there is enough volume to make hauling them to Missouri feasible. Dale Gubbels, president of Firstar Fiber, reports that there have been no hauls as of August 30, 2017; however, materials have been sent to pyrolysis testing facilities to see whether they can be turned into synthetic diesel fuel. According to a study published in the journal, Fuel, synthetic diesel fuel can reduce GHG emissions up to 14% compared to conventional diesel fuel<sup>5</sup>.

## Who are the sponsors?

- **The Dow Chemical Company (Dow)** — Dow is a chemical company involved in the creation of plastics, plastic resins, specialty chemicals, and agro-sciences, among other operations. Dow originated the program and is the leading sponsor.
- **Reynolds Consumer Products** — Reynolds is the owner of the Hefty brand. They make other products such as tin foil, plastic wrap, and other household goods. Reynolds has little involvement besides having their brand as the face of the program.

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<sup>1</sup> <http://www.dow.com/en-us/news/press-releases/dow-hefty-energy-bag-omaha>

<sup>2</sup> <http://www.hefty.com/whats-new/articles/hefty-energy-bag-program/>

<sup>3</sup> <https://www.environmentalleader.com/2015/02/dow-helps-divert-6000-pounds-of-waste-from-landfill/>

<sup>4</sup> <http://www.dow.com/en-us/news/press-releases/Dow%20Co%20Sponsors%20Energy%20Bag%20Pilot%20Program%20for%20Plastic%20Waste>

<sup>5</sup> <http://www.sciencedirect.com/science/article/pii/S0016236117304775>

- **Conagra Foods** — Conagra produces packaged food products. Conagra is the sponsor responsible for bringing the program to Omaha.
- **Systech Environmental Corporation (Systech)** — Systech is a provider of by-product co-processing materials and alternative raw materials. In other words, most of Systech’s operations involve taking waste materials to cement plants to be incinerated for energy<sup>6</sup>. They also arrange the procurement of waste products that can be used as raw material in cement manufacturing. Systech is owned by LaFarge, the largest cement manufacturer in the world. Systech will be accepting the HEBP materials as a fuel source for the Sugar Creek Cement plant in addition to the waste materials they already supply the plant with.
- **Firstar Fiber** — Firstar Fiber is the contracted recycling facility for the City of Omaha where the contracted haulers, Waste Management and others, drop off collected materials. They qualify as a Materials Recovery Facility meaning they receive, sort, and prepare recyclable materials for end users.
- **RecycleBank** — RecycleBank is an organization that partners with cities and brands to reward residents and RecycleBank members for helping to make their communities greener. RecycleBank was brought on as a program sponsor to have their Omaha members be the first to test the program.
- **Keep America Beautiful (KAB)** — A nonprofit community improvement organization formed by canning and bottling companies including Coca-Cola. KAB was added as a sponsor to the HEBP in the summer of 2017, and they are now offering Dow-funded grants to expand the program to other cities.

## Using Our Vision as a Guide

Before we discuss strengths and weaknesses of the Hefty EnergyBag Program, let us first establish our vision for the future. Let’s start with the end in mind. To do so we must ask ourselves what we want for our community and the environment. Often environmental issues are doom and gloom, and we forget that we have a say in what the future looks like. Instead of running away from what is bad, which does not guarantee a desirable direction, let’s work towards a common vision.

Verdis Group’s vision is that of ‘true.green’ – a state where people and the planet flourish in harmony. That’s some high-level stuff, so we should dive a bit deeper on what it means. We envision the following:

- Communities modeled after nature, where the concept of waste is absent – everything has value.
- Companies which design truly sustainable products and which practice Extended Producer Responsibility (EPR)<sup>7</sup>, a strategy that places a shared product end-of-life responsibility on producers and entities in the supply chain.
- A world free from fossil fuel reliance, which includes a future of 100% renewable energy.
- An economy that values nature, not one that continuously takes from it and pollutes it.

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<sup>6</sup> <http://www.go2systech.com/about-systech/>

<sup>7</sup> <http://www.calrecycle.ca.gov/epr/>

- Societies that create an abundance of fundamental values for people like community, safety, and health & wellness, to name a few.
- A planet with clean air and clean water for all.

## Summary of Concerns with the Hefty EnergyBag Program

### Misleading Statements about Recycling

The Hefty EnergyBag literature refers to the program as “an innovative plastic recycling program”<sup>8</sup>, but incinerating these materials is not recycling. The same literature makes it clear that the materials are indeed going to be burned, or, as they say, “turned into valuable energy resources”, but it’s very misleading to refer to this program as recycling.

The program has some environmental benefits compared to burning coal but it should not be promoted as a sustainable, renewable, or recycling practice. The HEBP still pollutes (not sustainable), relies on incineration of fossil fuel derived materials (not renewable), and incineration in any form is not considered to be recycling by the National Recycling Coalition (not recycling)<sup>9</sup>.

### The Priority Should be Source Reduction & Similar Efforts

The materials - non-recyclable plastics - are not inherently environmentally friendly. They are, after all, made from fossil fuels. These products are not currently designed with their end in mind; they are designed only to be convenient. Indeed, these materials have led to major waste management problems across the globe and account for a third of all trash in the U.S. today<sup>10</sup>.

When it comes to efforts to reduce waste, the top priority should be minimizing demand for these products in the first place (source reduction). This includes taking aggressive action to reduce the amount of materials being purchased, but it’s much more than simply reducing. It also includes but is not limited to: product redesign, minimizing packaging, avoiding single-use disposable products, purchasing better materials (biodegradable, compostable, etc.) and more.

These efforts should be the start of an organization’s approach to achieving zero waste, but there is a real risk that the HEBP may temper an organization’s desire to meaningfully pursue such efforts. For most people, diverting materials to material recovery via incineration feels a bit better than sending them to the landfill. So when it comes time to work on source reduction efforts, there’s a bit less motivation than there would be otherwise. The pain point isn’t quite as painful, which means organizations are less likely to make meaningful progress on source reduction.

### Altering the Destination

The HEBP is currently effective only at changing the final destination (end-use) of the materials. The change of destination changes the set of environmental concerns, and it can appropriately be debated which set of concerns is worse (landfill vs. incinerate). If the materials were originally altered in ways that significantly eliminated environmental problems (such as making them

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<sup>8</sup> <https://www.kab.org/hefty-energy-bag-program/program-overview>

<sup>9</sup> [nrcrecycles.org/nrc-policies/](https://nrcrecycles.org/nrc-policies/)

<sup>10</sup> <http://www.motherjones.com/politics/2006/05/origins-anti-litter-campaigns/>



compostable and making sure they are routed to commercial composting operations), it would better align with our vision.

Advocates claim that implementing the program will keep trash from being littered in places where it affects wildlife. This is a weak argument because the program does not prevent litter; it only changes the destination of plastics that were already going to be put in the trash.

## Emissions Implications

Since the materials are going to incineration, concerns with emissions need to be addressed. Burning plastics and waste materials for disposal and energy recovery is known to release high volumes of persistent organic pollutants (POPs) as well as greenhouse gases (GHG)<sup>11</sup>. The POPs released from incinerating plastic include compounds such as dioxins and furans, some of the most toxic and carcinogenic compounds known to science<sup>12</sup>. To summarize the International Programme on Chemical Safety's (World Health Organization Branch) report titled "Persistent Organic Pollutants", persistent organic pollutants are organic compounds resistant to natural processes that would otherwise break POPs down. POPs tend towards bioaccumulation, meaning they concentrate in the fatty tissues of other organisms, increasing the likelihood they enter our food chain. POPs also have the ability to move long distances in the atmosphere before settling. These traits make POPs extremely difficult to remove from the environment (bad news considering their toxicity)<sup>13</sup>.

There is debate as to whether incineration of plastics as part of waste-to-energy (WTE) schemes emit more greenhouse gasses (GHGs) than burning coal. (Note WTE includes many types of waste, not just plastics.) Most studies report that WTE schemes emit less GHG than coal<sup>14</sup> <sup>15</sup>, while other reports say WTE has GHG emissions that exceed coal-powered plants on a per megawatt basis<sup>16</sup> <sup>17</sup>. In addition to GHG disputes, there are varied results of dioxin and furan emission comparisons between WTE and coal<sup>18</sup> <sup>19</sup>. According to a Columbia University Study, "With regard to dioxin/furans, the emission factors of WTE are considerably higher than for coal-fired utilities"<sup>20</sup>.

We uncovered information pertaining to the emissions associated with WTE schemes (albeit some of it was conflicting); however, it's important to note that we are not aware of a study specifically examining only the emissions associated with incinerating the materials being collected as part of the HEBP. Nevertheless, we think it's valuable to at least consider some of the studies examining the incineration of WTE materials, which include the materials in the HEBP but not exclusively, results of which are highlighted below. In the following tables, Municipal Waste Combustion is equivalent to WTE.

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<sup>11</sup> [http://ac.els-cdn.com/S187802961630158X/1-s2.0-S187802961630158X-main.pdf?\\_tid=e676b762-7ba1-11e7-9f22-00000aab0f27&acdnat=1502132274\\_30ed44142a7fb340d404ceb5db749fcb](http://ac.els-cdn.com/S187802961630158X/1-s2.0-S187802961630158X-main.pdf?_tid=e676b762-7ba1-11e7-9f22-00000aab0f27&acdnat=1502132274_30ed44142a7fb340d404ceb5db749fcb)

<sup>12</sup> <https://www.epa.gov/dioxin/learn-about-dioxin>

<sup>13</sup> <http://www.pops.int/documents/background/assessreport/en/ritterren.pdf>

<sup>14</sup> <https://plastics.americanchemistry.com/Sustainability-Recycling/Energy-Recovery/Residue-Derived-Solid-Recovered-Fuel-for-Use-in-Cement-Kilns.pdf>

<sup>15</sup> [https://www.researchgate.net/publication/242108296\\_Emissions\\_from\\_Waste-to-Energy\\_A\\_Comparison\\_with\\_Coal-fired\\_Power\\_Plants](https://www.researchgate.net/publication/242108296_Emissions_from_Waste-to-Energy_A_Comparison_with_Coal-fired_Power_Plants)

<sup>16</sup> <http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={DEEA097E-A9A6-4E53-898C-0BC2F4C60CC4}>

<sup>17</sup> <https://web.archive.org/web/20131217055632/http://www.environmentalintegrity.org/documents/FINALWTEINCINERATORREPORT-101111.pdf>

<sup>18</sup> <http://www.energyjustice.net/incineration/worsethancoal>

<sup>19</sup> <https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=159286>

<sup>20</sup> [https://www.researchgate.net/publication/242108296\\_Emissions\\_from\\_Waste-to-Energy\\_A\\_Comparison\\_with\\_Coal-fired\\_Power\\_Plants](https://www.researchgate.net/publication/242108296_Emissions_from_Waste-to-Energy_A_Comparison_with_Coal-fired_Power_Plants)

Table 1—GHG comparison—EPA data<sup>21</sup>, some via Columbia University Study<sup>22</sup>. EPA does not count the biogenic fraction (natural wastes like food) of emissions from WTE. However, the EPA does factor in the methane emissions avoided from landfilling even though the materials generating methane are the same biogenic materials whose emissions they do not count during combustion, making the calculations controversial. The Columbia study mentions the \*emissions if biogenic (food, paper, wood, etc.) emissions are counted.

Fuel	CO <sub>2</sub> (lbs/MWh)	SO <sub>2</sub> (lbs/MWh)	NO <sub>x</sub> (lbs/MWh)
WTE	1016 (*2988 counting biogenic waste emissions)	0.8	5.4
Coal	2249	13.0	6.0
Oil	1672	12.0	4.0
Natural Gas	1135	0.1	1.7

Table 2 - EPA Inventory of Sources and Environmental Release of Dioxin-Like Compounds 2013 Update<sup>23</sup>. The chart shows air releases of dioxins and furans for the year 2000. The left column shows the quantity of dioxins released per kilogram of material in Nanograms. The rate of emissions for Municipal Waste Combustion (i.e., WTE) is roughly ten times higher than that of coal fired utility boilers.

Source	Dioxins and Furans Emissions Factor (ng WHO <sub>98</sub> -TEQ/kg)	Total Releases (g WHO <sub>98</sub> -TEQ)
Municipal Waste Combustion	105	77
Coal Fired Utility Boilers	11	70
Cement Kilns Not Burning Hazardous Waste	13	17

<sup>21</sup> <https://archive.epa.gov/epawaste/nonhaz/municipal/web/html/airem.html#4>

<sup>22</sup> <http://www.seas.columbia.edu/earth/wtert/sofos/nawtec/nawtec14/nawtec14-3187.pdf>

<sup>23</sup> <https://cfpub.epa.gov/ncea/dioxin/recordisplay.cfm?deid=235432>

Table 3 - EPA Top 10 Sources of Dioxin-Like Compound Releases (2006 Update to original (2000) study)

Source: <https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=159286>

Rank	2000 (1,422 g total)		1995 (3,444 g total)		1987 (13,965 g total)	
1	Backyard barrel burning of refuse (air)	498.5	Municipal waste combustion (incineration of refuse) (air)	1393.5	Municipal waste combustion (incineration of refuse) (air)	8905.1
2	Medical waste/pathological incineration (air)	378.0	Backyard barrel burning of refuse (air)	628.0	Medical waste/pathological incineration (air)	2570.0
3	Municipal wastewater treatment sludge (applied to land and incinerated) (land and air)	89.7	Medical waste/pathological incineration (air)	487.0	Secondary copper smelting (air)	983.0
4	Municipal waste combustion (incineration of refuse) (air)	83.8	Secondary copper smelting (air)	271.0	Backyard barrel burning of refuse (air)	604.0
5	Coal-fired utility boilers (electric generating plants) (air)	69.5	Cement kilns (hazardous waste burning) (air)	156.1	Bleached chemical wood pulp and paper mills (land, water)	370.1
6	Diesel heavy-duty trucks (air)	65.4	Municipal wastewater treatment sludge (applied to land and incinerated) (land and air)	133.3	Cement kilns (hazardous waste burning) (air)	117.8

Since 1987, U.S. WTE facilities have lowered their overall emissions, including POP emissions, with better technology and regulations such as EPA maximum achievable control technology (MACT) standards<sup>24</sup>. Yet, we should keep in mind that WTE facilities are converting the material's energy into electricity and abide by more stringent regulations than cement plants<sup>25</sup>.

In summary, we are confident that emissions of CO<sub>2</sub> are lower for HEBP plastic incineration than they are for most other fuel types. Levels of dioxin and furan emissions are less clear and need to be studied further. Ultimately even if a reduction in emissions is less bad than present activities, it still ends in emissions, which we would prefer to eliminate altogether.

<sup>24</sup> <http://www.seas.columbia.edu/earth/wtert/sofos/nawtec/nawtec14/nawtec14-3187.pdf>

<sup>25</sup> <https://www.epa.gov/rcra/identification-non-hazardous-secondary-materials-are-solid-waste>

## **Sugar Creek Cement Plant**

Of further concern is the Sugar Creek Cement Plant in Sugar Creek, Missouri where the HEBP materials are being sent. According to the plant's president, Jarrod Huntley, the plant includes three materials in its current fuel mix: petroleum coke, methane gas, and WTE materials provided by Systech. Systech is owned by LaFarge (the world's largest cement company) and has been supplying the plant with WTE materials, or what it refers to as alternate solid fuels (ASF), since 2007 when LaFarge owned the plant.

The Sugar Creek Cement Plant has a history of environmental violations at state and national levels. The EPA's Enforcement and Compliance History Online (ECHO) website displays that up to the current date, the Sugar Creek Cement Plant has had at least 12 consecutive quarters of high priority violation (HPV) of the Clean Air Act<sup>26</sup>. We spoke with Joe Terriquez, an EPA Region 7 Air and Waste Management officer about the violation history of the plant. Joe told us that the HPV at the plant has been resolved but it is likely that EPA data systems are not updated so the system continues presenting the plant as HPV.

The original HPV was the result of a 2010 Clean Air Act settlement against LaFarge. The Sugar Creek plant and all 12 other LaFarge-owned cement plant sites in the US were found to be emitting too many pollutants. The volume and type of pollutants varied from site to site. The Sugar Creek plant was required by the settlement to implement a year-round selective non-catalytic reduction system (SNCR) to control the levels of nitrogen oxides they were emitting<sup>27</sup>. According to the EPA, "Nitrogen oxides can cause ground-level ozone, acid rain, particulate matter, global warming, water quality deterioration, and visual impairment. Nitrogen oxides play a major role, with volatile organic chemicals, in the atmospheric reactions that produce ozone. Children, people with lung diseases such as asthma, and people who work or exercise outside are susceptible to adverse effects such as damage to lung tissue and reduction in lung function"<sup>24</sup>.

In July 2015, the Sugar Creek Cement Plant was found to be violating the Clean Water Act (CWA) under its newest owner, Central Plains Cement Company (Eagle Materials)<sup>28</sup>. The plant was in violation of its industrial stormwater permit and was required to pay a penalty and complete a conservation supplemental environmental project. The plant was most recently in violation of the CWA in the first quarter of 2017<sup>29</sup>. The officer at the EPA told us that the air and water violations seen on the EPA's ECHO website for Sugar Creek are not as bad as they seem, and that the cement industry involves messy operations and it is not uncommon for kilns to have many violations.

## **WTE is not Clean Energy**

We should practice caution with the HEBP because of the implications WTE projects have for taking funding from truly renewable energy resources. While the Hefty EnergyBags may not be going to produce electricity in Omaha's case, they certainly could if the program expands to other municipalities. It is important that energy from incineration not be classified as "clean", "sustainable", "renewable", or any related terminology even though there are lower GHG emissions than traditional fossil fuels. Burning waste is not "clean" energy because it emits GHGs and toxins into the atmosphere.

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<sup>26</sup> <https://echo.epa.gov/detailed-facility-report?fid=110012704136>

<sup>27</sup> <https://www.epa.gov/enforcement/lafarge-north-america-inc-clean-air-act-settlement>

<sup>28</sup> <https://www.epa.gov/mo/audubon-materials-llc-dba-central-plains-cement-company-llc-sugar-creek-missouri>

<sup>29</sup> <https://echo.epa.gov/detailed-facility-report?fid=110012704136>

If we allow waste burning to be technically classified as renewable energy, it stands to reason that it could qualify for climate subsidies designed for truly renewable energy sources like solar, hydro, and wind. This is exactly what happened in the state of Maryland. In 2011, Maryland classified WTE incineration as a Tier 1 renewable energy source. Increased competition for renewable energy subsidies led to plans to construct the nation's largest trash incinerator in Maryland<sup>30 31</sup>(which was defeated by community activism and is now being replaced by a solar farm and recycling center).

Nationwide, many organizations are under pressure to achieve renewable energy targets and may unknowingly sign “renewable” electrical energy purchasing agreements that include WTE schemes, which still have considerable GHG emissions. While we may see more of a push for WTE plants in the future, we must remember that these plants do still emit toxic chemicals, greenhouse gases, and produce potentially hazardous ash<sup>32</sup>. WTE likely reduces GHG emissions compared to traditional fossil fuels, but WTE is not without pollution.

### Concerns with EPA Standards for WTE

There are EPA loopholes that have lowered the emissions standards for waste incineration. Before February of 2013, facilities burning waste were classified as incinerators and subject to more stringent emissions standards than other combustion facilities. In 2013, the EPA approved a policy to allow processing facilities to take solid waste streams (including plastics, tires, solvents, chemical wastes, chemically-treated wood, paper sludge, and coal byproducts) and reclassify them as *non-hazardous secondary materials*<sup>33</sup>. This ruling opened the door for cement kilns like Sugar Creek and other industrial plants to burn waste without having to meet the standards of existing waste incinerators that are burning the same materials<sup>34 35</sup>.

### Incineration Does Not Assist with Zero Waste Goals

Incineration, in any form, does not currently count towards zero waste goals for organizations/communities. The zero waste standard is set by the Zero Waste International Alliance (ZWIA). The National Recycling Coalition has also dismissed incineration as a form of reuse or recycling and does not consider it part of their zero-waste resolution policy<sup>36</sup>. Both organizations stand by the following definition of Zero Waste:

*“Zero Waste is a goal that is ethical, economical, efficient and visionary, to guide people in changing their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use. Zero Waste means designing and managing products and processes to systematically avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them. Implementing Zero Waste will eliminate all discharges to land, water or air that are a threat to planetary, human, animal or plant health”.*<sup>37</sup>

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<sup>30</sup> <http://www.unitedworkers.org/end>

<sup>31</sup> [https://d3n8a8pro7vnm.cloudfront.net/unitedworkers/pages/129/attachments/original/1432159756/StopThe\\_Incinerator\\_Powerpoint.pdf?1432159756](https://d3n8a8pro7vnm.cloudfront.net/unitedworkers/pages/129/attachments/original/1432159756/StopThe_Incinerator_Powerpoint.pdf?1432159756)

<sup>32</sup> <https://web.archive.org/web/20131217055632/http://www.environmentalintegrity.org/documents/FINALWTEINCINERATORREPORT-101111.pdf>

<sup>33</sup> <https://www.federalregister.gov/documents/2013/02/07/2012-31632/commercial-and-industrial-solid-waste-incineration-units-reconsideration-and-final-amendments>

<sup>34</sup> <https://www.epa.gov/rcra/identification-non-hazardous-secondary-materials-are-solid-waste>

<sup>35</sup> [http://earthjustice.org/sites/default/files/files/200\\_Enviro\\_Final%20Opening%20Brief\\_11-12-2014.pdf](http://earthjustice.org/sites/default/files/files/200_Enviro_Final%20Opening%20Brief_11-12-2014.pdf)

<sup>36</sup> <http://nrcrecycles.org/nrc-policies/>

<sup>37</sup> <http://zwia.org/standards/>

Furthermore, the ZWIA states that to be recognized as a zero waste community, the community must “oppose any kind of incineration, both those already operating and those in planning or development in their jurisdiction or region. Communities with existing incinerators must commit in writing to phase out of all burning in next contract with service providers or when alternative facilities are available”<sup>38</sup>. The HEBP, in its current form, is in conflict with Omaha (or any organization, for that matter) becoming a true zero waste community.

### **The Economic Model of the HEBP Places Responsibility on Individuals Instead of Producers**

According to the principle of Extended Producer Responsibility, businesses have the responsibility to create products and packaging that minimize waste generation. They should manage systems of delivery to avoid disposable packaging and as a final resort, make sure products and packaging is recyclable or compostable.

The HEBP places the responsibility on the consumer to purchase the orange bags, and while the producers of these materials (Dow) are taking steps to minimize the amount of material to achieve a particular outcome (i.e., plastics used for packaging are dramatically thinner than they were in years past), the weight of responsibility in the current HEBP system is heaviest on consumers taking responsibility. Additionally, buying the bags is voluntary and consumers get no substantial benefit (other than feeling nominally better). The voluntary nature prevents the spread of the HEBP beyond those who are environmentally concerned and decide the environmental pros outweigh the cons.

We acknowledge that consumers are not completely free of guilt in the current transaction. Consumers, especially in the US, demand extreme convenience. We are a grab-and-go society, which drives the demand for many of the materials the HEBP is established to collect. Consumers should also take more responsibility for and take meaningful actions to move away from soft plastics.

### **Recyclable Materials Have Been Wrongly Placed in the Bags**

Table 4 displays the results from audits of the Hefty EnergyBags in Omaha posted on KAB’s website. Based on these results we are concerned that mechanically recyclable materials are improperly being placed into the bags. In Omaha, residents can recycle #1, #2, #3 and #5 plastics and most commercial organizations can recycle #1–#7 plastics. The HEBP is aimed to catch non-recyclable plastics such as soft or flexible plastics; however, if we combine the categories in the table that are mechanically recyclable, approximately 18% of the materials are recyclable (10% (#3–#7 plastics) +2% (PET/HDPE Bottles) +6% (Paper) = 18% recyclable materials). Overall, only 76% of the materials captured in the EnergyBags were targeted by the program and should actually be in the bags.

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<sup>38</sup> <http://zwia.org/standards/zero-is-zero/>

Table 4 – Composition of Non-Recycled Plastics in EnergyBag Bright Orange Bags<sup>39</sup>

Type of Packaging	Weighted Average from Omaha Audits
<b>Flexible Plastics:</b>	<b>65%</b>
PE Bags/Wraps	43%
Other Flexibles	21%
<b>Rigid Plastics:</b>	<b>23%</b>
#3-#7	10%
PET/HDPE Bottles (#1-#2)	2%
Scrap Rigids, Food Service, EPS	11%
<b>Others:</b>	<b>13%</b>
Paper	6%
Other Waste	7%
<b>Total</b>	<b>100%</b>

Hopefully the program better its capture rate over time. Not only because valuable recyclables might be incorrectly incinerated but also due to concern people might put highly toxic materials like PVC and metals into the bags. Ultimately a much larger, more sophisticated education campaign would likely reduce contamination.

## Where the Hefty EnergyBag Program gets Credit

### Excellent Long-Term Goal

Rarely do new efforts to recycle materials go smoothly and quickly from waste stream programs to successful recycling programs that are cost-effective and require less energy than extracting and refining virgin materials. For example, the newspaper that we recycle today was once burned until value was found turning it back into newspaper again. Another example is plastic bags which until recently were added to the trash. Now, there is value collecting them at grocery stores to be made into bags again. Often the challenge in dealing with these materials is developing an economic system which creates value for materials previously considered waste.

We had the opportunity to speak with Dr. Han Zhang, Sustainability and Advocacy Manager for Packaging & Specialty Plastics at Dow. Dr. Zhang explained to us that Dow is exploring circular economy concepts with the HEBP. He told us that Dow wants to keep molecules at their highest level of value whenever possible. According to Dr. Zhang, Dow believes there is an opportunity to advance chemical recycling of non-recyclable plastics via the process of pyrolysis, which creates more value than WTE. Dow is leading the HEBP to test whether they can get enough material volume to make chemical recycling a feasible option in the future. Chemical recycling would make it possible to transform discarded non-recyclable plastic materials back into new plastics. This concept is much closer to resembling the vision we established above for our communities.

<sup>39</sup> <https://www.kab.org/hefty-energy-bag-program/grant-application>

However, we must be cautious. While Dow has been taking on sustainability initiatives of late<sup>40</sup>, they have a questionable reputation when it comes to environmental activities<sup>41 42 43 44 45 46 47</sup>. The present solution must not turn into a method to ramp up incineration, pass it off as “sustainable”, and never fulfill the circular economy vision.

Ultimately, the long-term vision as articulated to us is sound, but we have not seen a clear glide path for transitioning the program from incineration to recycling.

### **Increased Recycling Rates**

The HEBP has the potential to bolster recycling rates of mechanically recyclable materials by filtering out non-recyclable plastics contaminating the recycling stream headed to Firstar Fiber. Non-recyclable plastics frequently contaminate recycling streams at Material Recovery Facilities like Firstar Fiber. This leads to fewer materials being recycled, and it can cause equipment problems at their facility. While the leading solution is having less of these materials in the first place (source reduction), the HEBP could assist in growing recycling rates.

Contamination rates are continuing to rise across the country with the continued transition to mixed/single-stream recycling, and the main contaminant tends to be non-recyclable (soft) plastics. The EnergyBag program does have the potential to counteract the contamination trends<sup>48</sup>.

### **An Indicator for Increased Interest in Material Recovery**

Furthermore, the HEBP is an acknowledgement that people and companies are looking at current waste streams as an opportunity. These materials have value. They are a resource, and if we can get people thinking in those terms, it will be better for all of us in the long run.

The EPA’s Waste Management Hierarchy<sup>49</sup> places materials recovery in the following prioritized order:

1. Source Reduction & Reuse
2. Recycling/Composting
3. Energy Recovery
4. Treatment & Disposal

As such, diverting these materials from the landfill (disposal) to energy recovery is a step in the right direction. The next step up the hierarchy (recycling) is where we hope the program ultimately heads.

### **Accounting for Environmental Costs**

Finally, the HEBP gets credit because it is a step towards accounting for the inherent environmental cost of products. Dale Gubbels told us that the price of the bags is designed to cover, at least in part, Firstar Fiber’s costs to collect and sort them. In this model, consumers end up

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<sup>40</sup> <http://www.dow.com/en-us/science-and-sustainability/2025-sustainability-goals>

<sup>41</sup> <http://www.corp-research.org/dowchemical>

<sup>42</sup> <http://violationtracker.goodjobsfirst.org/prog.php?parent=dow-chemical>

<sup>43</sup> <http://www.businessinsider.com/another-leak-at-dow-chemical-2012-11>

<sup>44</sup> <https://www.epa.gov/enforcement/dow-chemical-company-settlement>

<sup>45</sup> <http://america.aljazeera.com/opinions/2014/12/dow-chemical-mustfinallyhelpthehopaldisastervictims.html>

<sup>46</sup> <http://www.nytimes.com/1983/03/17/us/dow-has-refused-to-give-epa-data.html>

<sup>47</sup> <http://www.latimes.com/business/la-fi-epa-pesticide-dow-20170627-story.html>

<sup>48</sup> <http://www.waste360.com/source-separation/contamination-continues-hurt-recycling-efforts>

<sup>49</sup> <https://www.epa.gov/smm/sustainable-materials-management-non-hazardous-materials-and-waste-management-hierarchy>



voluntarily paying to deal with the inherent external costs of the products they buy involving non-recyclable plastic materials. However, as detailed in the concerns section, this model places no responsibility on the producers of non-recyclable materials, a major flaw according to our EPR vision.

## Conclusion: Cautionary Support

After countless hours of both internal and external deliberation, we are cautiously supporting the Hefty EnergyBag Program. While the HEBP in its current form is less than ideal, we do believe it is a potential step in the right direction.

We think the chemical recycling direction it is headed would be a big win for closing the circular economy loop if it could successfully turn non-recyclable plastics back into new products with little to no waste. We support efforts to close production loops or create materials that cause fewer (and eventually no) end-of-life environmental problems.

There are, however, serious concerns about the program in its current form. The major worries are

- There's no clearly articulated plan for transitioning from WTE to recycling.
- It does not help an organization achieve zero waste
- If implemented, it could decrease the likelihood that meaningful source reduction would occur
- It takes WTE schemes a step closer to classification as renewable
- Dow and the Sugar Creek Cement Plant have questionable environmental records
- WTE still produces dioxins

We already have clients that have implemented the HEBP in certain settings, and we will spend adequate time with them and other interested clients discussing the pros and cons of the program before they move forward with implementation or expansion. There are, however, some key steps that we would like to see in the short term in order for us to more forcefully recommend the HEBP. We would like to see

- A third party environmental and economic study comparing landfilling HEBP materials and incinerating them at cement kilns
- A formalization of and associated plan for Dow's intention to transition the program from incineration to chemical recycling
- More responsibility on the part of producers of non-recyclable plastics to capture and recycle these materials
- The program and its sponsors change the marketing language and remove messaging presenting the HEBP as recycling, renewable, sustainable, or zero waste.
- More clarity from the EPA about the clean air act violations at the Sugar Creek Cement Plant.