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Reports

Deception by the Numbers

American Chemistry Council claims about chemical recycling investments fail to hold up to scrutiny

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COVER PHOTO

An industrial flare burns off waste at a petrochemical refining plant in Baytown, Texas following Hurricane Harvey in 2017.

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1. Introduction

Despite decades of deceptive industry marketing, we know we can't recycle our way out of the plastic pollution crisis. But the companies making and selling plastic—and their trade association surrogate the American Chemistry Council—aren't giving up. Instead, they're doubling down to mislead investors, governments, and the public into believing we can. Here's how they're using the fantasy of chemical recycling to do it.

"Chemical recycling" is an intentionally vague term used by the chemical and plastics industries to refer to myriad technologies (many of which remain in the lab or pilot phases), all promising to convert plastic waste into its basic chemical building blocks and generate '"like new" plastic. There are two general categories: (1) plastic-to-fuel or waste-to-fuel,[1] which uses a variety of methods, generally involving heat and combustion, to turn plastic or mixed waste into hydrocarbons, such as gas or oil; and (2) plastic-to-plastic, which also uses various methods, including chemical solvents, to degrade plastic polymers into its basic building blocks. However, the engineering realities of these processes make this distinction rather fuzzy.

Without a widely accepted technical definition, the industry has often attempted to conflate waste-to-fuel/plastic-to-fuel and plastic-to-plastic under the respective umbrellas of "chemical recycling" and "advanced recycling." Waste-to-fuel/plastic-to-fuel conversion comprises existing technologies like pyrolysis and gasification, as well as still-theoretical methods. Since these processes produce fossil fuels, energy, or petrochemicals, they should not be considered recycling. Plastic-to-plastic methods would theoretically turn plastic waste directly into its chemical precursors, but these promises may never actually deliver.

The American Chemistry Council (ACC), a trade association that represents manufacturers of petrochemicals and plastics, promotes so-called chemical recycling technologies as a means to overcome the identified challenges to "traditional" mechanical recycling collection, sorting, and reprocessing (see *2. Criteria for Evaluation* for definitions). The ACC also often and overtly uses "advanced recycling" as a synonym for "chemical recycling,"[2] further confusing the issue, as "advanced" recycling can also refer to innovative elements of mechanical recycling, such as optical sorting.

The ACC often promotes the plastics industry's sizable investments in plastics recycling. In April 2020—just one day before the debut of the movie *The Story of Plastic*, which details the environmental and human impacts of the lifecycle of plastic—the ACC issued the statement "the private sector has invested $4.6 billion in advanced recycling technologies to complement and support existing recycling systems."[3] An infographic posted on the ACC's website had an even higher $4.8 billion in investment in 52 projects supposedly able to divert 3 million tons of waste from landfills, and then later updated this to $5.2 billion in investments in 62 projects supposedly able to divert 3.6 million tons of waste.[4]

While the ACC does not promote or publicize the list of these projects, we obtained the list of the projects used to generate this estimate. We found a range of technologies, including so-called "chemical recycling" and waste-to-fuel, as well as mechanical recycling improvements and upgrades, suggesting that the ACC may be trying to conflate unproven technologies and false solutions with mere additions and improvements to existing systems. We reviewed the various projects, technologies, and companies to assess whether these investments are actually plastics recycling and whether any of them might viably—and urgently—reduce plastic production and pollution. **We found that many of the investments are going into waste-to-fuel projects (which is not recycling), that one-third of the total projects or companies are likely to not be viable, and that none of the plastic-to-plastic projects on this list shows promise of becoming viable. This means that very little of this investment has a chance of reducing plastic production or pollution, and ensures years of fossil-based plastic production.**

Key Findings

- Less than 50% of the projects on the ACC's list of "advanced" recycling met our basic criteria to be deemed credible plastic recycling projects; the rest were either waste-to-fuel/plastic-to-fuel (which is not recycling), or other non-reprocessing projects.
- Of the recycling projects we determined to be valid mechanical or plastic-to-plastic recycling, we found these would have a total processing capacity of 0.2% of the plastic waste generated in 2017. This means that if even these projects are all successful and operate at full capacity, this would not address the overproduction of plastic in the U.S. market.
- About **one-third** of the total proposed recycling projects either is unlikely to be viable or is questionable as to whether they will be completed, and **all** of the plastic-to-plastic projects are considered to be of questionable viability or potentially unviable. **This means that the promises of plastic-to-plastic recycling show very little likelihood of recycling any plastic.**
- Taxpayer funding of at least $506 million was identified to be invested in these projects.
- Almost 90% of the taxpayer funds identified for projects on the ACC's list went to waste-to-fuel projects, meaning public money is being used to produce fuels, waxes, and chemicals for the petrochemical industry.

The Problem

To date, only 9% of the plastic ever produced has been recycled.[5] The Ellen MacArthur Foundation estimated in 2017 that, globally, 95% of plastic packaging material value was lost after a single use, and only 14% was even collected for recycling, with a much smaller percentage functionally recycled into new plastic packaging.[6] In the U.S., only 8% of all plastic generated was recycled in 2017.[7]

Recent research by Greenpeace revealed that many plastics used by food and beverage companies have such a low likelihood of being reprocessed in the U.S. by municipal collection and waste management systems that "recyclable" labels or symbols on packaging can be considered deceptive marketing.[8] At the same time, in an effort to address public concerns about plastic packaging, many large multinational food and beverage companies have made "circular economy" commitments to increase the use of recyclable and recycled content in their plastic packaging.[9] The petrochemical and plastics industries are at the ready to promote chemical recycling as a technical quick fix and silver bullet.

The False Solution

Many chemical recycling technologies co-opt "circular economy" language, but upon investigation, these circular claims fall flat. First, waste-to-fuel and plastic-to-fuel using heat processes (gasification or pyrolysis) to combust the waste or plastic into materials such as diesel jet fuel marketed to airlines, waxes, or lubricants, and the engineering nature of these processes, do not readily produce oil or gas able to be used as a drop-in solution for plastic manufacturing. Thus, these products are more likely to be combusted rather than recycled.[10]

This is a bait-and-switch, as **the world is already awash in oil and gas, and more of it is not needed.** In fact, virgin plastic is cheaper than recycled plastic *precisely because the fossil fuels used to produce it are so plentiful*. There is no evidence that the marketing of the fuels generated from the burning of waste actually reduces oil and gas exploration or production, or demand for virgin plastic resin. Plastic-to-fuel does not solve a plastic production problem, but instead aims to solve a waste management problem. It should be underscored that waste-to-fuel and plastic-to-fuel are not "recycling"; rather, they are material destruction.

ACC member Dow Chemical Company, a leading promoter of pyrolysis waste-to-fuel processes, initially called its process "recycling." However, after being pressed by the National Recycling Coalition in 2017, Dow leadership replied publicly: **"We agree. It is not recycling."**[11] Still, the ACC persists in using the term "advanced recycling" for chemical recycling, even noting on a current regulatory fact sheet that chemical recycling facilities, including pyrolysis and gasification, "should be regulated not as recycling but new manufacturing. These facilities receive plastic feedstock that is converted to valuable fuels and petrochemical products," and that these companies should be considered "producers of alternative energy not waste disposal companies."[12]

Plastic-to-plastic technologies, on the other hand, could *theoretically* produce plastic building blocks, like styrene or the monoethylene glycol used to make polyethylene terephthalate (PET) plastic, which would potentially classify it as recycling. However, many of these technologies remain proven only in laboratory conditions, which are vastly different from real-world conditions. As Global Initiative for Incinerator Alternatives (GAIA) has demonstrated in its recent investigation on U.S. chemical recycling, there are no plastic-to-plastic

facilities proven to be currently operational at commercial scale, according to publicly available regulatory data.[13] Only one company, Agilyx, claims to be commercially producing plastic monomers from waste plastic; however, investigations by GAIA reveals that Agilyx has not yet found an appropriate market for the styrene oil, leading to the incineration of the product.[14] And as with plastic-to-fuel, none of these technologies makes a credible case for actually reducing production of virgin plastic or exploration for and extraction of fossil fuels.

Finally, recent investigations and technical assessments have found that the chemical recycling industry at large is characterized by unresolved technical, economic, and environmental problems, noting that many methods can release toxic chemicals into the environment, as many plastics contain additives and chemicals like phthalates or bisphenol A (BPA), which are not destroyed in the depolymerization processes.[15] [16]

Evidence on mature technologies such as gasification and pyrolysis shows both that they are energy intensive, as is the polymerization process to make new plastic, and that the chemical conversion itself generates significant quantities of carbon dioxide.[17] [18] And despite industry promotional claims, there is no evidence that proposed solvent-based technologies (plastic-to-plastic) can deliver a net-positive energy balance. It is very difficult to find publicly available information to understand the final fate accountability of materials generated by these processes that would not end up as marketable fuel or plastic, including feedstock that can't be converted, co-products like char or chemicals removed from the process, or greenhouse gas and volatile organic compound emissions.

The Quest for Acceptance— and Taxpayer Dollars

The ACC also promotes robust growth and investment in the manufacturing of petrochemicals. It often promotes $204 billion in petrochemical projects,[19] a number that often appears as a stand-alone figure in news articles related to demand for plastic. Many of these projects would need additional financing and a complex series of environmental and land-use permits, and given the current economic downturn as well as the potential for a reduced demand for plastic, many likely will never be built. These projections are intended to drive investor confidence and create the impression that this money is already spent, suggesting that the buildout is "a done deal," ultimately serving the ACC's agenda of influencing state and local governments and decision-makers to approve fossil fuel, petrochemical, and plastic expansion projects; remove regulatory obstacles; and award public monies or tax breaks to pass some of this investment on to taxpayers under the guise of the public good.

"Chemical recycling" projects may be more likely than petrochemical projects to be approved for regulatory relief or public funding, as they carry an aura of "green" and "circular," precisely because they are considered recycling. In many ways, "chemical recycling" is similar to "clean coal" or carbon capture and storage: a vaguely defined false solution promoted by the industry.[20] Rather than pouring money into a declining oil and gas industry's self-imagined technological solution, money should be invested into a green and just recovery prioritizing a transition away from petro-based business models toward a climate-safe future with environmental justice.

In 2019, the U.S. Department of Energy (DOE) launched a "Plastics Innovation Challenge," which announced $25 million in grants to "position the U.S. as the world leader in advanced plastic recycling technologies."[21] [22] In April 2019, Haley Stevens (D-MI) convened a DOE hearing on chemical recycling. At the hearing Anthony Gonzalez (R-OH) said that "chemical recycling is probably ultimately how we get there,"[23] noting that Ohio is a center of polymer development and research, through the University of Akron's College of Polymer Science and Polymer Engineering.

Several current pieces of federal legislation include support for advanced and chemical recycling. The Realizing the Economic Opportunities and Values of Expanding Recycling (RECOVER) Act (H.R. 5115) would allocate $500 million in federal grants for states, municipalities, and tribal governments to expand recycling infrastructure. While the act does not specify advanced or chemical recycling, definitions of "recycling" in this bill include generation of feedstocks for manufacturing.[24] The ACC and other trade associations support this bill, and a coalition of plastic and petrochemical manufacturers—including packaging manufacturer and recycler Berry Global (which has a project on the ACC's list)—signed a letter to House Speaker Nancy Pelosi (D-CA) and others in April 2020, asking her to include the RECOVER Act in a coronavirus-related infrastructure package.[25] Co-sponsors of this bill are Tony Cárdenas (D-CA) and Larry Buchson (R-IN); four of the 52 projects on the ACC list are in Indiana (as well as another large PET recycling facility not on this list).

The Plastic Waste Reduction and Recycling Act (H.R. 7728), introduced by Reps. Stevens and Gonzalez, includes direction to the National Science Foundation, DOE, Environmental Protection Agency, and National Oceanic and Atmospheric Administration to support research and other activities on advanced recycling technologies.[26] This bill is endorsed by the ACC.[27] Haley Stevens also launched the Congressional Plastics Solutions Task Force in December 2019, which will, among other activities, look at "new technologies" and "facilitate investment in recycling technologies and promote education on plastics generation and recovery."[28]

Consumer Goods Companies: Wishcycling Their Recycling Commitments

Despite the fact that waste-to-fuel is not recycling, or that plastic-to-plastic is not technically or economically viable,[29] and that the plastics industry has yet to prove the environmental, climate, and health safety of these technologies, major food and beverage corporations are eagerly promoting them under the guise of "recycling" throughout their corporate responsibility materials and "circular economy" commitments.[30] Many fast-moving consumer goods companies have invested in or agreed to purchase material generated from these plastic-to-plastic and waste-to-fuel /plastic-to-fuel companies and technologies, including Nestlé, PepsiCo, and Unilever,[31] [32] [33] and others have publicly declared interest in so-called chemical recycling consortiums and partnerships with fossil fuel companies. Mars Inc., for example, sees pyrolysis as a part of its "circular economy" goals and has joined a consortium with petrochemical giant Total to develop and expand pyrolysis technologies.[34]

Companies appear to be relying on the promise of "chemically recycled" packaging to satisfy their recycled content commitments.[35] They face considerable risk of not meeting their commitments without significantly investing in innovations based on reuse that aim at total reduction of single-use plastics. Many fast-moving consumer goods companies and retailers —including Coca-Cola, Colgate-Palmolive, Keurig Dr Pepper, PepsiCo, Procter & Gamble, Unilever, and Walmart—are also investing in "chemical recycling" technologies indirectly via their funding of Closed Loop Partners' infrastructure investment fund.[36] Closed Loop Partners funds several chemical recycling companies, many of which appear on the ACC's list.

Three of the projects on the ACC's list are associated with major fast-moving consumer goods companies:

Loop Industries/Indorama: **Coca-Cola, Danone, PepsiCo**

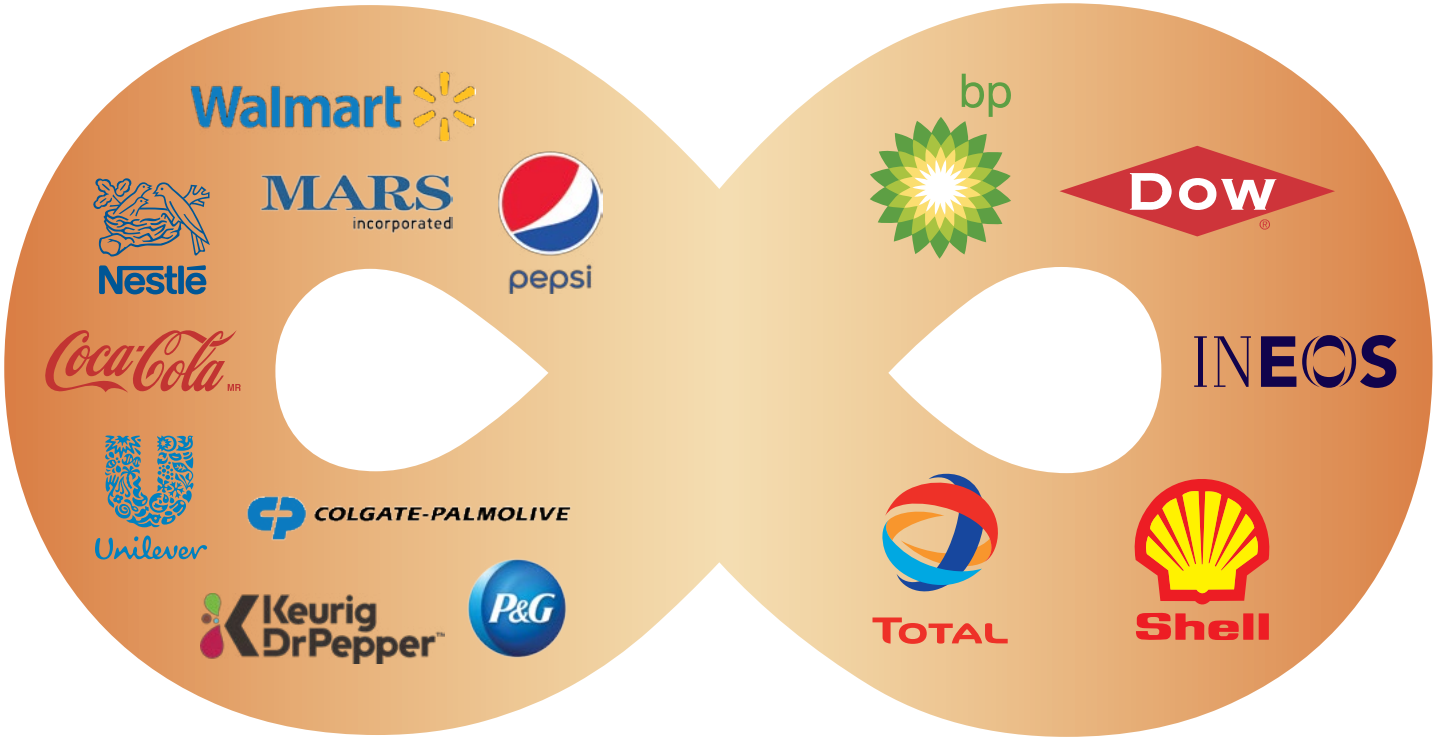
PureCycle: **Nestlé, L'Oréal, P&G**

BP Infinia: **Unilever**

These are the only three projects on the list that would be considered plastic-to-plastic, and we determined all three to be of questionable viability.

Petrochemical Companies: Fueling Climate Change

Many of these waste-to-fuel projects are either themselves owned by fossil fuel or petrochemical companies, or have petrochemical value chain partners and are currently supplying them with fossil fuels. Many petrochemical companies have announced investments in various "chemical recycling" start-ups in Europe and North America.[37] Several of these smaller companies position themselves as "green recycling" or "clean tech" companies, but in reality generate fuels and petrochemicals that are bought by companies like **BP**, **INEOS**, and **Shell**. At least two companies promise to produce jet fuel, which would be used not to make plastic, but would be combusted.



2. Criteria for Evaluation

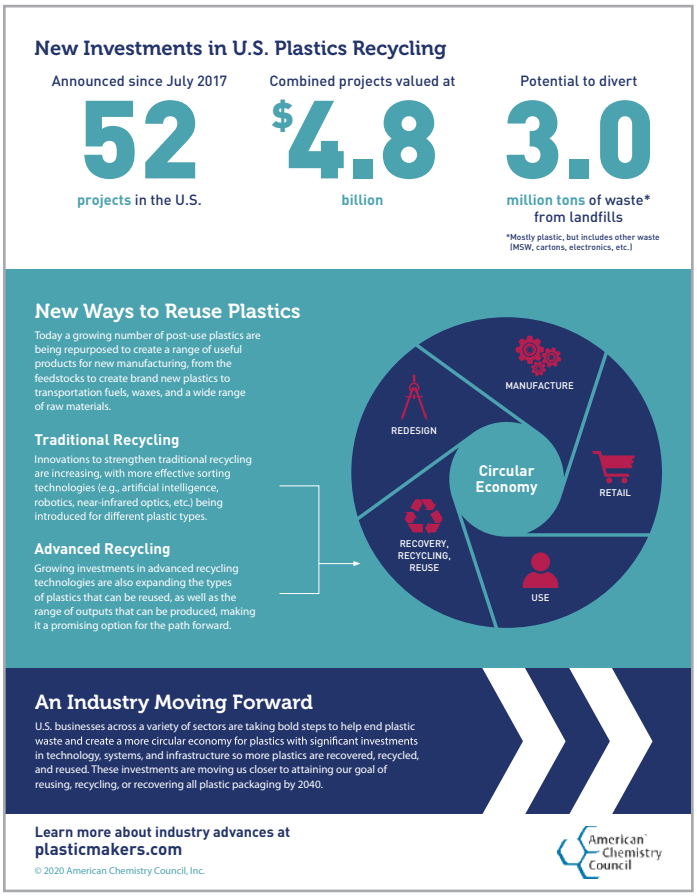


Figure 1: ACC Infographic on Investments in Plastics Recycling (2020).

Methodology

We obtained the list of projects the ACC used to generate its $4.6 billion estimate. This list, presented in section 3, included only the project name and cities. Using publicly available information, we analyzed these projects to determine if they can legitimately be considered plastics recycling, and whether the technologies are viable and likely to be built or successfully to recycle plastic waste to plastic. We also tabulated the known costs of these investments as well as any public funds spent. The list we obtained had 52 projects, and predated the ACC's updated infographic (Figure 1). It is not clear what criteria the ACC used to put this list together, though we noted that of the ACC's six technology provider members of its Advanced Recycling Alliance for Plastics,[38] five are represented on this list.

Between June and July 2020, we reviewed a range of company websites, news articles, state permitting databases (e.g., state environmental permits, air quality permits), the CalRecycle public database, corporate registration records, annual reports, and investor information. One of the projects was a duplicate, so we analyzed a total of 51 projects. Our review included two criteria for meeting the definition of plastics recycling, an investment breakdown of the projects, and their processing capacity.

Criterion 1: Does the Project Actually Recycle Plastic?

To meet the definition of "plastics recycling," the project must process plastic waste into plastic resin that can be used as feedstock for making a new plastic product. There is no standard definition of "advanced" or "chemical" recycling; the industry uses them interchangeably and liberally as greenwashing terms. We reviewed publicly available information about specific technologies and processes in use or proposed for each project to determine whether it is mechanical recycling, plastic-to-plastic, or waste-to-fuel.

Mechanical recycling: mehanical recycling is "standard" recycling that many of us are familiar with, where plastic is washed, chopped, and melted into plastic pellets, which are used to make new plastic products. Limitations in this process mean that most mechanically recycled plastic waste is transformed into material of lesser value, also known as downcycling.

Sorting: We found several examples of projects that were expansions of or upgrades to materials recovery facilities (MRFs). Projects that simply separate and bale mixed curbside materials are not necessarily "plastics recycling," though upgrades such as robotics and optical sorting may theoretically increase the reprocessing capacity.

Waste-to-fuel/plastic-to-fuel: Existing, pilot, or proposed projects and facilities that use any of a variety of methods, generally involving heat and combustion, to turn plastic or mixed waste into hydrocarbons, such as gas or oil. These should not be considered recycling, since those materials are ultimately combusted. Twelve of the ACC's 51 projects are waste-to-fuel or plastic-to-fuel. We found one company, Aemerge RedPak, that appears to be solely waste-to-energy, which we noted but included in this category.

Plastic-to-plastic: Pilot or proposed projects or facilities that would use any potential method to process plastic waste into the chemical precursors used to make plastic, or plastic monomers, are classified as plastic-to-plastic. This could theoretically be considered a chemical recycling

technology if proven to work at commercial scale. However, all plastic-to-plastic projects on this list remain unproven, and all were all found to be of questionable viability (see *Criterion 2: Are These Investments Viable?*), and those that are proven are only proven in labs. It is important to note our classification of the technology as plastic-to-plastic does not mean it will automatically end up becoming valid plastic recycling.

Most mechanical recycling is downcycling, where plastics are transformed into items of lesser value (e.g., plastic bottles reprocessed into carpet fibers). While some of the mechanical recycling investments on the ACC list appear to have some kind of innovative element (e.g., robotics, optical sorting), many of the projects on this list are a somewhat low bar for "advanced" innovation. We also found that, of the mechanical recycling/downcycling projects, many process or intend to process items like windshields, agricultural plastic, carpet, car seats and automotive plastic, or medical waste. Recycling these items does not address or improve the low recyclability of single-use packaging which remains the largest end use of plastic,[39] [40] [41] and which remains difficult to reprocess.

A few projects on the ACC list appeared to be in error (e.g., duplicate, one company that sold chemically recycled plastic but did not produce it). We raise this caution to ensure that the ACC is not inflating investment claims for "advanced" recycling by including any recycling upgrades. Seven of the 51 projects on the ACC's list were sorting or non-recycling.

Of the total 51[42] projects:

- Almost half are expansion of or upgrades to mechanical recycling facilities, including some that were sorting facilities or pilot projects.
- Almost one-quarter are waste-to-fuel/plastic-to-fuel, which is not plastics recycling. The ACC's inclusion of waste-to-fuel conflates generation of fuels from plastic waste with recycling.
- Seven were difficult to evaluate and define. We were unable to determine whether these could be classified as mechanical recycling, waste-to-fuel/plastic-to-fuel, or plastic-to-plastic, due to lack of available public data of the specific processes.
- We considered only four to be plastic-to-plastic chemical recycling. It is important to note that none of these four is considered viable (see Criterion 2) nor do we consider this an environmentally or economically sound solution to plastic waste, for reasons listed above.

Criterion 2: Are These Investments Viable?

Announcements about projects are free and easy to make, but obtaining the necessary financing or permits to complete those projects may be much more difficult. The ACC may be publicizing these numbers to lend credibility to these companies to gain more private investments, public funds, or tax breaks, or more favorable regulatory environments for "chemical recycling." We reviewed public information about each project to determine if the announced investments are viable—that is, the projects are likely to be built and successfully reprocess plastic—or whether they appear to be in the concept phase or otherwise stalled or likely to become stalled.

Operational: Many facilities appear to be operational, or seem likely to be operational by the end of this year. We found that 16 of the 51 projects are or appear to be already operational; however, this finding may not take into account COVID-19–related closures or idling.

Likely or potentially likely to progress: Facilities seem to be progressing through construction, and appear to have adequate funding and permits for completion.

Questionable: We identified many projects as "questionable" that may be an investment risk—for example, previous failed investments by the company, significant changes in the operating environment, or public opposition.

Unlikely to progress: Projects are unlikely to progress if they have had a number of delays, or if completion was necessary on permits or additional funding that may be difficult to obtain.

Difficult to evaluate—concept/announcement phase: Some projects on this list were difficult to evaluate, as they are currently in their concept or announcement phase.

For projects we determined "unlikely to progress" or "questionable," we do not believe they are guaranteed to fail. Rather, questions must be raised as to the viability of the investments, particularly for projects that received public funding, like tax abatements or state/county development funds. At least one company that appears on the ACC project list, Fulcrum Biofuels, has had a project in its announcement phase for almost 10 years.

Many "chemical recycling" companies (including those not featured on this list) are start-ups, often with proprietary, non-transparent technology. We note that many of these projects seem to be led by serial entrepreneurs who raise endless rounds of capital, while failing to deliver products to market. Pyrolysis and gasification in particular have been promoted as alternatives to waste incineration for decades; however,

they have a failed track record due to inefficiency, emissions pollution, and environmental impact.[43] [44]

Of the 12 waste-to-fuel/plastic-to-fuel projects on the ACC list, only 3 are operational, with 7 considered questionable or in the announcement/concept phase. Of the four projects we determined to be plastic-to-plastic—BP (Naperville, IL), Eastman (location TBD), Loop Industries/Indorama (Spartanburg, SC), and PureCycle (Ironton, OH)—we found that all were either announcement only, and thus difficult to evaluate, or questionable. **Thus, we determined that no plastic-to-plastic projects on this list are likely to actually recycle plastic.**

Investment Breakdown

To include project cost estimates, we looked at a range of public information. We did not find any financial or investment information for 15 of the 51 projects,[45] and where found, we reported the project cost, often without knowing if this money has already been spent, or is an estimated or actual project price tag. This would be particularly concerning for projects with high price tags that have not demonstrated viability.

The 36 projects for which we found announced costs totaled $2.176 billion.[46] Of this amount, we found that $1.25 billion (57%) was associated with waste-to-fuel/plastic-to-fuel projects, and $145 million was associated with plastic-to-plastic; the remainder ($542 million) was associated with mechanical recycling or sorting. Of the waste-to-fuel/plastic-to-fuel projects, $600 million was announced for projects we determined to be unlikely to be built and viably recycle plastic.

We also searched for publicly available information on the amount of public funds spent on these projects; however, note that this information is incomplete and the amount may be higher. Among the 51 projects, we found that at least $506 million had been awarded via public funds since 2017, including bonds, loans, grants, tax credits, and other incentives; this number is likely much higher. The ACC typically refers to the wave of investments as private-sector investments, meaning that these funds are likely to be **in addition to** the $4.6 billion of announced investments.

Of the identified $506 million of taxpayer funds spent on projects on this list, **89% was spent on waste-to-fuel/plastic-to-fuel projects, meaning that taxpayer money was directed toward generating fuels for the petrochemical industry, not toward recycling plastic**. We acknowledge that not all of this money is to ultimately be derived from taxpayers, as it includes bonds or loans; however, given the track record of some companies on this project list, and the questionable viability of many of these projects, there is a risk that these companies could fail to or struggle to repay their financial obligations. At least one company, Aemerge RedPak, has already defaulted on some of those funds; this company appears to only produce energy from its combusted waste (see findings in *4. Project and Company Profiles*).

We also note that several companies that received taxpayer dollars are owned by large waste management companies with existing revenue streams. For example, North Gateway Transfer Station in Phoenix, Arizona, is a subsidiary of Republic Services, one of the largest waste management companies in the country; with approximately $10 billion in revenue in 2019, it is not clear why this company needed to seek taxpayer funds.[47]

Overall, we found that $270,312,564 in taxpayer funds was spent on projects considered questionable or unlikely to be built.

Processing Capacity

To include processing capacity, we reviewed a range of publicly available information, mainly through announced projects as well as databases, such as CalRecycle grants. We are unable to verify whether this processing capacity is accurate for the projects now open, or whether the stated projects will achieve announced projections. For most of the projects, we were able to use stated processing capacity; we made a few estimates where we felt we had enough information to do so (e.g., size of facility, similar facility/technology announced by company).[48]

We found these 51 projects would add a total of 1,391,937 tons per year of additional processing capacity, which would be 4.02% of 2017's generation of plastic waste (34.5 million tons).[49] However, the waste-to-fuel projects—461,750 tons per year of announced additional processing capacity, or 0.1% of the plastic waste generated in 2017—are not recycling at all, so while this amount may be theoretically diverted from a landfill, it is transformed into inefficient fuels or (typically combusted) or petrochemicals. It is also difficult to ascertain how much new fuel and chemical inputs these projects would "offset" from existing petrochemical and plastic production.

It should also be noted that at least two companies—Roy Tech Environ and Yunnan Zintongi Plastics Engineering—are Chinese-owned and exporting reprocessed plastic to China, as a workaround to the legal limitations on the export of plastic waste. It is not clear how much, *if any*, of these companies' recycled plastic is being used in domestic U.S. manufacturing, as opposed to being sent to China. We did not find evidence of exporting of reprocessed plastic from the remaining 49 companies on this list, though it could be possible.

3. Evaluation of the ACC's Projects List

The following table describes our findings. Details and references for these findings follow in *4: Project and Company Profiles*.

Name/ Location	Technology Type	Likelihood of Progressing (Viability) 1 bar: difficult to evaluate/announcement phase 2 bars: unlikely 3 bars: questionable 4 bars: potentially likely 5 bars: likely to progress 6 bars: operational	Financial Information	Plastic reprocessing capacity (tons/year)
Agilyx / Ineos Styrolution Channahon, IL	Questionable. Agilyx plans to do plastic-to-plastic styrene processing, but issues at its Tigard, OR, plant raise questions as to whether this is actually plastic-to-fuel. ?	Difficult to evaluate: announcement phase. Partnership with INEOS announced in Dec. 2019. A June 2020 update notes that the facility (to be added onto INEOS'' existing facility) is still in the design phase. ▮	None found	3,650
Aemerge RedPak Hesperia, CA	Waste-to-energy. Facility performs thermal destruction of medical waste, generating syngas and char for energy. 	Operational. ▮▮▮▮▮▮	$55 million	None found
Agilyx Trainer, PA	Plastic-to-fuel. This facility as announced would convert plastic waste to synthetic crude oil to be used by Delta's jet fuel subsidiary, Monroe Energy. 	Questionable. It is not clear if there has been any progress on the Agilyx facility at Monroe Energy's refinery since the Nov. 2018 announcement, and several analysts have raised questions about this refinery's profitability, including the recent COVID-19–related economic downturn. ▮▮▮	None found	None found
Aquafil Carpet Recycling Phoenix, AZ	Plastic-to-fuel. This facility collects and prepares plastic for global export to a plastic-to-fuel facility. 	Operational, since late Dec. 2017. ▮▮▮▮▮▮	$10 million	None found
Avangard Innovative TBD, NV	Mechanical recycling /downcycling 	Potentially likely. Announcements as of Sept. 2019 indicated that the Nevada plant was planned for a 4th-quarter 2020 opening. However, there is no information as to the site's location or if the project has progressed. ▮▮▮▮	$30 million	50,000
Avangard Innovative Houston, TX	Mechanical recycling /downcycling 	Likely to progress. A Feb. 2020 report noted that this facility was set to open in Apr. 2020, though no reports of the opening have been found. ▮▮▮▮▮	$30 million	50,000
AZEK Wilmington, OH	Mechanical recycling /downcycling 	Operational. TimberTech mechanical recycling plant opened in April 2019. ▮▮▮▮▮▮	$25 million	50,000

Name/ Location	Technology Type	Likelihood of Progressing (Viability) 1 bar: difficult to evaluate/announcement phase 2 bars: unlikely 3 bars: questionable 4 bars: potentially likely 5 bars: likely to progress 6 bars: operational	Financial Information	Plastic reprocessing capacity (tons/year)
Balcones Dallas, TX	Sorting. This materials recovery facility (MRF) performs separation and baling of collected curbside materials, including paper, metal, glass, and plastic. 	Operational. 	$6 million	None found
Berry Global and Georgia-Pacific Recycling TBD	Mechanical recycling /downcycling 	Potentially likely. Partnership announced in Jan. 2020. 	None found	None found
BP Infinia Naperville, IL	Plastic-to-plastic 	Difficult to evaluate: announcement phase. In Oct. 2019, BP announced development of a pilot project at its research center, to be completed by mid-year 2020. 	$25 million	Pilot project capacity assumed to be 365 tons/yr (10 tons/day).
Brightmark TBD	Questionable. Specific details have not been fully announced. However, Brightmark's plant in Ashley, IN, is waste-to-fuel. 	Questionable. The company announced in Nov. 2019 that it would invest $500 million to $1 billion to build each of potentially up to 10 new facilities. However, this is a very early announcement, with no further news as to cities, sites, agreements, etc. 	$500 million to $1 billion	None found
Brightmark Energy/ ResPolyflow Ashley, IN	Waste-to-fuel 	Likely. Project was announced to have begun operation in late May 2020. 	$262 million, including $187.5 million in taxpayer funding	None found
CarbonLite Reading, PA	Mechanical recycling /downcycling 	Likely. The facility was wrapping up construction in Jan. 2020. 	$80 million	42,500 to 75,000.
CarbonLite Dallas, TX	Mechanical recycling /downcycling 	Operational since late 2017. 	$62 million	50,000
East-Terra Plastics Connorsville, IN	Mechanical recycling /downcycling 	Operational. Moved to expanded facility in 2018. 	$5 million	1,000
Eastman TBD	Plastic-to-plastic (methanolysis) 	Difficult to evaluate at time of writing/ announcement phase. Eastman estimates this would be at scale by 2021 or 2022. 	None found	None found
Eastman Kingsport, TN	Plastic-to-fuel. Eastman's "carbon renewal" technology is gasification, which produces syngas. 	Questionable. Eastman claims to have reached a commercially operational stage, but no publicly available data substantiate such claims. 	None found	None found
Ecomelida Orangeburg, SC	Mechanical recycling /downcycling 	Questionable. Project appears delayed. 	$52 million	None found

Name/ Location	Technology Type	Likelihood of Progressing (Viability) 1 bar: difficult to evaluate/announcement phase 2 bars: unlikely 3 bars: questionable 4 bars: potentially likely 5 bars: likely to progress 6 bars: operational	Financial Information	Plastic reprocessing capacity (tons/year)
EFS Plastics Hazleton, PA	Mechanical recycling /downcycling 	Operational since 2018. Current expansion underway. EFS notes that it lost orders in Spring 2020. 	None found	Estimated 15,000
EFS Plastics TBD, West Coast	Mechanical recycling /downcycling 	Difficult to evaluate /announcement phase only. 	None found	2,000
Envision Plastics Chino, CA	Mechanical recycling /downcycling 	Likely. Expansion of an existing project. 	$2.94 million	3,480
Far West Recycling Portland, Oregon	Sorting. This was a temporary 60-day demonstration project of sorting and collection, run by Titus MRF. 	No—pilot completed. 	None found	None found
FCC Houston, TX	Sorting. This MRF performs separation and baling of collected curbside materials (paper, metal, glass, and plastic), but does not recycle/reprocess them. 	Operational. 	$23 million	None found
FDS Manufacturing Pomona, CA	Questionable. Project received a Cal Recycle grant for mechanical recycling of /downcycling of plastic—however, at a different location. At least one outlet describes the Pomona project as processing of agricultural waste (nut shells, etc.) into plastic. 	Difficult to evaluate, as the exact project is not clear. 	$2.96 million	2,000
Fulcrum BioEnergy Gary, IN	Waste-to-fuels. The facility would turn municipal solid waste into jet fuel. 	Unlikely. Project was announced in Dec. 2018, and does not appear to have progressed past announcements. 	$600 million	None found
Fulcrum BioEnergy Reno, NV	Waste-to-fuels plant. The facility would turn household waste (MSW) into synthetic crude oil. 	Unlikely. This facility was originally announced as early as 2011, and though some constructions appear to have been initiated, this project seems stalled. 	None found	None found
GBD International New Brunswick, NJ	Mechanical recycling /downcycling; expansion of existing facilities 	Likely. At least one report suggests this expansion may have been completed in 2019. 	$1 million	13,200

Name/ Location	Technology Type	Likelihood of Progressing (Viability) 1 bar: difficult to evaluate/announcement phase 2 bars: unlikely 3 bars: questionable 4 bars: potentially likely 5 bars: likely to progress 6 bars: operational	Financial Information	Plastic reprocessing capacity (tons/year)
Green Tech Solution Inc. Blacksburg, SC	Questionable. While initial PR announcements about this facility mention plastics recycling, the company's website currently indicates it only accepts electronics and ferrous metals for recycling. ?	Unlikely: The project was expected to come online by 2019, but the property is currently listed as available for lease, and no further announcements have been made.	$75 million	None found
GreenMantra TBD	Questionable. We did not find a specific project. The company states: "Synthetic waxes are GreenMantra's primary commercial product." ?	Difficult to evaluate: announcement phase. No information found for development of a plant in the U.S., though the existing facility in Canada has been under expansion.	$300 million	None found
Inline Plastics Shelton, CT	Not recycling. Inline purchases chemically recycled plastic and touts the recycled packaging it sells but does not actually perform recycling	Did not evaluate: not recycling.	None found	None found
J.P. Mascaro & Sons/ TotalRecycle Exeter Township, PA	Sorting. This municipal waste MRF separates plastic, but does not recycle it. 	Questionable. This MRF invested in a pilot project to evaluate film separation, but the pilot did not meet its goals, suggesting that the improvements may not be successful.	$2.6 million	None found
Loop Industries/ Indorama Spartanburg, SC	Plastic-to-plastic 	Questionable. There is a site, but facility construction has been delayed past expected 2020 opening and has not yet started. The company says it needs additional investment to complete the project.	None found	44,000
Millville Plastics Millville, NJ	Questionable. Project announcements indicate the proposed facility would mechanically process various plastic scrap. However, Millville Plastics investor Green EnviroTech Holdings appears to only license pyrolysis (waste-to-fuel) technology for processing rubber tires. ?	Unlikely. Construction of this project is contingent upon a number of permits and resolution of ownership and tax history of the site, which has been ongoing for several years.	Potentially $150 million	None found
Netafim Fresno, CA	Mechanical/ downcycling. Expansion of existing facility. 	Likely. Netafim affirmed its profitability in a May 2020 investor call.	$2.0 million	Additional 9,612
New Hope Energy Tyler, TX	Plastic-to-fuel (pyrolysis) 	Questionable. Operational as of 2019; however, there was a fire at the facility in May 2020. Current status is not known.	$150 million	340,000

Name/ Location	Technology Type	Likelihood of Progressing (Viability) 1 bar: difficult to evaluate/announcement phase 2 bars: unlikely 3 bars: questionable 4 bars: potentially likely 5 bars: likely to progress 6 bars: operational	Financial Information	Plastic reprocessing capacity (tons/year)
Nexus Fuels TBD, GA	Plastic-to-fuel (pyrolysis) 	Questionable. The prototype is operational at small scale, but no further information has been found as to further commercial-scale operations. 	None found	18,250
North Gateway Transfer Station Phoenix, AZ	Sorting. Project is a municipal waste transfer station for preliminary separation of collected curbside recyclable materials, including paper, metal, glass, and plastic. 	Operational. 	$4.5 million	None found
Peninsula Plastics Recycling Turlock, CA	Mechanical recycling /downcycling 	Operational as of 2019. 	$4 million	Additional 17,000
PreZero US Riverside, CA	Mechanical recycling /downcycling 	Operational. 	$90 million	Additional 13,000
PreZero US Westminster, SC	Mechanical recycling /downcycling 	Operational. 	$13 million	30,000
PureCycle Technologies Ironton, OH	Plastic-to-plastic 	Questionable. Feedstock evaluation unit completed in 2015. Construction was planned later in 2020, but has been postponed again to 2022. 	$120 million	50,000
Quad City Innovations Livonia, MI	Waste-to-fuel 	Difficult to evaluate: announcement/concept phase. 	$60 million	100,000
Refined Plastics Berks County, PA	Waste-to-fuel (pyrolysis) 	Difficult to evaluate. Project appears to be still in announcement/concept phase. 	$120 million	None found
Regenyx, LLC TBD, West Coast	Questionable. Regenyx is a joint venture that controls an Agilyx plant (plastic-to-plastic), though current plant outputs have thus far been incinerated). It is not clear what technology the company proposes for future locations. ?	Difficult to evaluate. Project appears to be in concept phase only. 	None found	None found
Renewlogy Phoenix, AZ	Waste-to-fuel 	Questionable. Renewlogy's other project has been shut down due to process issues. 	$5 million	3,000 to 4,000
Roplast Oroville, CA	Mechanical recycling /downcycling. Equipment upgrade to existing facility. 	Potentially likely 	$2.5 million	Additional 2,500/year

Name/ Location	Technology Type	Likelihood of Progressing (Viability) 1 bar: difficult to evaluate/announcement phase 2 bars: unlikely 3 bars: questionable 4 bars: potentially likely 5 bars: likely to progress 6 bars: operational	Financial Information	Plastic reprocessing capacity (tons/year)
Roy Tech Environ Grant, AL	Mechanical recycling /downcycling 	Operational as of 2018	$1.6 million	22,000
rPlanet Earth Vernon, CA	Mechanical recycling /downcycling 	Operational as of 2018	$100 million, with $37.5 million in taxpayer funds	40,000
Shark Glass Recycling West Victorville, CA	Mechanical recycling /downcycling 	Likely	$1.3 million	Estimated 430
Sirmax SA Anderson, IN	Mechanical recycling /downcycling 	Potentially likely. Addition to existing facility, announced in 2019. The site has been purchased and construction appears to be progressing; start-up planned by end of 2022.	$18 million	20,000
Titus MRF Portland, OR	Not recycling. This MRF is likely a duplicate of the entry for Far West Recycling.	Duplicate of now-completed pilot (Far West Recycling).	None found	None found
Yunnan Zintongi Plastics Engineering (UPT Group) Montezuma, GA	Mechanical recycling /downcycling 	Operational.	None found	None found

4. Project and Company Profiles

Aemerge RedPak, Hesperia, CA

This waste-to-energy facility performs thermal destruction of medical waste, generating syngas and char for energy. There is no actual on-site plastic reprocessing, though the facility processes metal and glass waste, which can then be recycled. The company recently undertook a $50 million investment in 2017.[50] It appears to have received $40 million in various taxpayer bonds, and to have defaulted on these in 2019 due to regulatory issues with the procurement of medical waste.[51] The company applied for funding from CalRecycle in 2019 for components of its waste-to-gas system, but did not receive the funding.[52]

Agilyx

Agilyx is a thermal conversion technology provider that has developed a mixed plastic-to-crude thermal process, and is attempting to prove a plastic-to-plastic method.[53] Its proprietary pyrolysis technology is billed as a "plastic-to-plastic," producing styrene oil from plastic waste. However, a recent investigation by GAIA reveals that styrene oil produced at Agiylx's Tigard, Oregon, facility was later burned, rather than converted into new polystyrene.[54] This raises questions as to whether Agilyx's other facilities would be considered plastic-to-fuel. Either way, pyrolysis is problematic. Agilyx is a member of the ACC's Advanced Recycling Alliance for Plastics.[55]

Two Agilyx projects are on the ACC list. The ACC list also includes, Regenyx, a joint venture between Agilyx and Americas Styrenics (AmSty) that includes Agilyx's flagship Tigard plant; we included this third project as a separate entry.

Channahon, IL

This project was announced between INEOS and Agilyx in December 2019.[56] INEOS has since purchased the petrochemical business of BP, including Infinia. The INEOS Styrolution site in Channahon is directly adjacent to a facility operated by Americas Styrenics, the company whose St. James facility accepted styrene oil from Agilyx's Tigard plant.[57] A June 2020 update notes that the facility (to be added onto INEOS' existing facility) is still in the design phase.[58] No financial investment cost has been found. Expected capacity is 36,500 tons/year.[59]

Trainer, PA

This facility as announced would be waste-to-fuel, converting plastic waste to synthetic crude oil to be used by Delta's jet fuel subsidiary, Monroe Energy.[60]

It is not clear if there has been any progress at the Agilyx facility at Monroe Energy's refinery since the November 2018 announcement, and several analysts have raised questions about Delta's ability to make a profit with its refinery, including the recent COVID-19–related economic downturn.[61] We did not find an investment or project cost, or the expected capacity at this facility.

Aquafil Carpet Recycling, Phoenix, AZ

Aquafil is an Italian nylon manufacturer that recently incorporated a chemical recycling process to turn nylon into its monomer (caprolactam), which it then uses it to make nylon and yarn for the textile and carpet industries,[62] for customers including Adidas and Volcom.[63] Aquafil opened its Phoenix location in late December 2017.[64] This facility recovers and pelletizes carpet, and sends the pellets to Aquafil's Slovenia facility for the depolymerization.[65] [66] [67] Closed Loop Partners classifies this as plastic-to-fuel technology, not plastic-to-plastic.[68]

This Phoenix facility benefits from incentives related to California's carpet recycling regulations. Aquafil announced $10 million in investment for its Phoenix location.[69] The company notes a "favorable" business environment and support of the city, but we did not find evidence of public funds put toward this project. [70]

Avangard Innovative

This recycling company is planning to build three facilities—estimated at $30 million each—in the next few years to mechanically process commercial plastic film waste, including linear low-density polyethylene (LLDPE) and low-density polyethylene (LDPE) bags, shrink-wrap. and protective films.[71] It is not clear why the ACC list only includes two facilities.

TBD, NV

Announcements as of September 2019 indicated that the Nevada plant was planned for a fourth-quarter 2020 opening. In 2020, **Dow** has recently signed an agreement to purchase post-consumer recycled LDPE from Avangard Innovative; this announcement noted that the Nevada plant is now planned for 2021.[72] However, no announcement of site selection or construction progress has been found, or progress on the project. Another article indicates further progress on Avangard Innovative's Mexico plant.[73] The project's cost is $30 million,[74] and its expected processing capacity is 50,000 tons/year[75] [76]

Houston, TX

A February 2020 article noted that this facility was set to open in April 2020,[77] but we have found no news reports about that opening. Like the Nevada plant, this plant is expected to cost $30 million,[78] and its expected annual capacity is 50,000 tons.[79] [80] Unlike the Nevada plant, a facility exists.[81]

AZEK, Wilmington, OH

This recycling company's Wilmington facility processes post-consumer plastic waste like high-density polyethylene (HDPE) jugs into outdoor decking and lumber, sold under the brand name TimberTech. The TimberTech mechanical recycling plant opened in April 2019,[82] and AZEK went public in June 2020.[83] The project was a $25 million investment,[84] with a 50,000-ton/year production goal.[85]

Balcones, Dallas, TX

This MRF separates and bails collected curbside materials, including paper, metal, glass, and plastic.[86] It completed $6 million in expansion in 2019,[87] and was acquired by Closed Loop Partners in late 2019, with $2 million in improvements planned.[88] Closed Loop Partners notes that Balcones is the largest privately held recycler in Texas.[89] Its current processing capacity is 200,000 tons of material annually, 4% of which is plastic (the vast majority is paper).[90]

Berry Global and Georgia-Pacific Recycling, Location TBD

Berry Global is a large plastic packaging manufacturer and recycler. Berry announced in January 2020[91] that it would be adding capacity at its existing facility in Victoria, TX;[92] however, the ACC list partnership may have another (or several locations).[93] Georgia-Pacific intends to procure the post-consumer material (apparently polyethylene films), and Berry will reprocess it into recycled polyethylene. Costs were not disclosed in the partnership announcement.[94] No production capacity was found.

BP Infinia, Naperville, IL

British oil major BP has developed a chemical recycling technology called Infinia. In October 2019, BP announced development of a $25 million pilot project at its research center and development hub[95] in Naperville, which is scheduled to be completed in 2020.[96] The process appears to be depolymerization that will break down PET into its precursors terephthalic acid (TPA) and monoethylene glycol (MEG).[97]

In June 2020, BP announced the sale of its petrochemical business, including the Infinia chemical recycling technology, to gas and plastic giant **INEOS**. There is no indication yet that this sale will impact the development of the Infinia facility. The company did not announce planned capacity; we estimated pilot project capacity of 3,650 tons/year (10 tons/day).[98]

A recently announced consortium led by BP involving Infinia technology includes consumer goods producers **Danone** and **Unilever**, and packaging manufacturer ALPLA,[99] who has supplied Unilever with plastic packaging for products such as Dove body wash containers.[100] Unilever's chairman of the board is also on the board of BP.[101]

Brightmark

Formerly RESPolyFlow, Brightmark is a plastic-to-fuel company headquartered in San Francisco. Brightmark is a member of the ACC's Advanced Recycling Alliance for Plastics.[102]

Ashley, IN

This facility is waste-to-fuel. The pyrolysis process will turn plastic waste into diesel naphtha and waxes,[103] with no on-site plastics reprocessing. The company has received a number of public funds. The initial project as announced referred to a $260 million investment, including $185 million in Indiana green bonds;[104] [105] a recent investigation by GAIA showed the total investment now at $262 million, with $187.5 million in total taxpayer funds.[106] In April 2020, the town of Ashley received a grant from the U.S. Department of Commerce's Economic Development Administration for $1.2 million to extend water and sewer access for "a major plastics recycling company and to provide opportunities for further industrial and commercial development" (assumed to be Brightmark).[107] BP has agreed to purchase fuel products from Brightmark Energy's Ashley plastics-to-fuel plant, and AmWax will purchase waxes produced at the Ashley plant. This plant is now operational, though many delays were noted.[108]

Location TBD

The company announced in November that it would invest $500 million to $1 billion to build each of up to 10 new facilities;[109] however, this is a very early announcement with no further news as to the cities, sites, agreements, etc. The specific projects have not been fully announced, but it is assumed that they would be waste-to-fuel, like Brightmark's Ashley plant.

CarbonLite

This mechanical recycling PET company lists **Nestlé** among its customers.[110] Two expansion facilities are planned.

Reading, PA

This PET recycling project was wrapping up construction in January 2020.[111] This was a $80 million investment,[112] and will add processing capacity of 42,500–75,000 tons/year.[113]

Dallas, TX

This PET recycling facility opened in late 2017.[114] CarbonLite's $62 million investment[115] added 50,000[116] tons/year of processing capacity.

East-Terra Plastics, Connorsville, IN

This project is an expansion of a post-industrial plastic mechanical recycling plant, which opened in 2018.[117] [118] The company recycles used child car seats collected from retailer take-back programs, like Walmart's incentive-based program, and Walmart in turn uses the plastic from the seats to make shipping pallets.[119] A $5 million investment appears to have been made by East-Terra in 2016.[120]

Ecomelida, Orangeburg, SC

Plans for a $52 million investment in a carton recycling facility were announced by Ecomelida, the U.S. subsidiary of Chinese company Zhangzhou Sanlida Environmental Technology Corporation.[121] [122] The process described in initial announcements was mechanical recycling of food and beverage cartons; later documents suggest this is to be LDPE film reprocessing as well.[123]

Though it appears that the project may start reprocessing plastic by the fourth quarter of 2020,[124] [125] it is not clear why it has been delayed; the governor's office had announced in early 2018 that the project would be operational by the fourth quarter of 2018, though U.S.–China tariffs may weigh on business decisions.[126] [127] It is also not clear if Ecomelida has the necessary permits,[128] and it does not have a U.S.-facing web or business presence. The company received a $750,000 Rural Infrastructure Fund grant from the state.[129]

Eastman

Chemical manufacturer Eastman has two projects on the ACC list.

Kingsport,TN

Eastman's "carbon renewal" technology is gasification, a plastic-to-fuel process that produces syngas.[130] In November 2019, Eastman announced modifications to the front end of the existing large-scale system to allow it to accept mixed plastics. Eastman signed a deal to receive carpet waste fibers processed in California by Circular Polymer, which are then shipped to Tennessee.[131] It is not known if the process is operational or productive yet. It is possible that plans to expand production in 2020 may be threatened by the end of California's carpet recycling subsidy.[132]

Location TBD

Eastman has announced it is looking into a plastic-to-plastic technique called methanolysis, which uses methanol to depolymerize plastic into plastic precursors dimethyl terephthalate (DMT) and ethyl glycol. The company would then use those precursors in the production of its plastic.[133] The likelihood that this project will progress is difficult to evaluate at the time of writing. Eastman estimates its methanolysis will be "at scale" by 2021 or 2022.[134] No investment announcement or other information is currently available.

EFS Plastic

EFS is a mechanical recycling company with one recent expansion and another potentially planned.

Hazelton, PA

This facility features mechanical recycling of post-consumer plastics, including rigid packaging and film. The facility opened in 2018, with current expansion underway.[135] EFS notes that it lost orders in the spring of 2020.[136] No investment announcement was found.

Location TBD, West Coast

In February 2019, EFS announced a new facility for mechanical recycling of post-consumer plastics, including rigid packaging and film.[137] Though a January 2020 report from the Northeast Recycling Council does mention Pomona, there are no announcements about site placement or progress.[138] EFS Plastics' existing facilities suffered a loss of orders in April 2020 when the California requirement for recycled content in bags was paused by Governor Newsom,[139] though that pause has expired.[140] No investment announcement was found. The two facilities have an estimated capacity of 30,000 tons/year.[141] [142]

Envision Plastics, Chino, CA

This mechanical recycling company is expanding its existing facility in Chino, California. Envision Plastics uses a patented technology it obtained from The Dow Chemical Company subsidiary Union Carbide. This facility will mechanically recycle HDPE containers collected curbside, as well as agricultural film.[143] The project was funded by a $2.94 million CalRecycle state grant in 2018/2019.[144] Expected additional capacity is 3,480 tons/year.[145]

Far West Recycling, Portland, OR

Far West was a temporary 60-day demonstration project of sorting and collection, run by Titus MRF. It was funded by plastics trade industry associations (the ACC, PLASTICS), and manufacturers (AmSty, Berry Global, the Carton Council, LyondellBasell, Millikin), as well as Metro (Portland Metro Regional Government).[146]

FCC, Houston, TX

FCC is a municipal waste material recovery facility (MRF in Houston that separates and bales collected curbside materials (paper, metal, glass, and plastic), but does not recycle/reprocess them.[147] The $23 million facility was financed by FCC (a waste hauling company) in 2018, and began operations in 2019.[148] Houston residents pay for the recycling services.[149]

FDS Manufacturing, Pomona, CA

FDS manufactures industrial and agricultural packaging. The recycling techniques of this project are not fully clear. One article mentions a grant from CalRecycle in 2018/2019 to develop the process to turn agricultural waste (nut shells, etc.) into plastic at FDS's Pomona location; however, the CalRecycle grant only mentions recycling polypropylene (PP) and polyethylene (PE) plastic waste at FDS's Fresno and Riverside locations.[150] FDS received a U.S. Department of Agriculture grant (amount undisclosed) to research the pelletization process, as well as a $2.96 million grant from the state of California.[151] The CalRecyle grant lists a capacity of 2,000 tons/year[152]

Fulcrum Biofuels

This thermal waste-to-energy company had originally made an initial public offering (IPO) in 2011 to build a municipal solid waste (MSW)-to-ethanol plant in Nevada (see below). The company cancelled the IPO in 2012, citing "market conditions." A cursory review of the company's history reveals many municipal bonds for biofuels projects over the years. In 2016, BP (which has an 8% interest in Fulcrum) invested $30 million in Fulcrum,[153] as did United Airlines and Cathay Pacific Airways, and in October 2018, BP and chemicals firm Johnson Matthey signed an agreement with Fulcrum BioEnergy to license Fulcrum's Fischer-Tropsch technology.[154]

Two projects are on the ACC list for Fulcrum.

Gary, IN

This project as proposed is a waste-to-fuel plant, not a recycling plant. The facility would turn household waste (MSW) into jet fuel. Announced in December 2018,[155] the project does not appear to have progressed past announcements,[156] though the company's major investors include United Airlines, BP, Waste Management (WM), and the U.S. military.[157] Fulcrum promised to invest $600 million in this plant.[158] The company has received at least $2.1 million from the Indiana Economic Development Corp. for this project [159]

Reno, NV

Fulcrum Biofuels had originally made an IPO in 2011 to build an MSW-to-ethanol plant in Nevada, but shifting market conditions appear to have stalled this project. In 2017, Fulcrum announced it had secured financing for the Nevada plant and construction had started again, though a company representative noted the plant would need to be operational for the company to receive cellulosic biofuels credits from the U.S. government.[160] The company secured at least $200 municipal green bonds from the state of Nevada in 2019.[161]

The plant appears to now be intended to convert MSW to synthetic crude oil ("syncrude"), which would be purchased by Marathon Petroleum for its refinery in Martinez, California;[162] the Martinez refinery, idled since April 2020, is now set to be decommissioned.[163]WM and Waste Connections have long-term agreements to provide MSW to Fulcrum. Waste Dive notes this is an opportunity to "extend the life of the Lockwood Regional Landfill" and "could be a business opportunity for additional waste industry partners,"[164] suggesting that Fulcrum is not in the recycling business but is rather a manufacturer for the petroleum industry, as well as a company that resolves the issues of the waste management industry.

The plant appears to still be under the initial construction stages. Announcements that it could be operational by 2020 have not been substantiated, and given Fulcrum's track record, it would not be surprising if challenging market conditions again disrupt necessary financing.

GBD International, New Brunswick, NJ

A 2018 announcement indicated the New Jersey company was undertaking a $1 million expansion of post-industrial film recycling in 2018;[165] [166] at least one report suggests this expansion may have been completed in 2019.[167] This was reported as an increase in capacity of 13,200 tons/year.[168] This recycler had been threatened by the pause in California's recycled content law,[169] which has since expired. Shipments of various scrap and some reprocessed plastic pellets have been observed in export records from the U.S. overseas.

Green Tech Solution Inc., Blacksburg, SC

Green Tech Solution is a U.S. subsidiary of Chinese investment firm Tianjin Sheng Xin Non-Financing Guarantee Co.[170] Headed by the chairman of the Carolinas Chinese Chamber of Commerce,[171] Green Tech announced a $75 million project investment in 2018, with appreciation from local and state government officials.[172] However, since then, there have been no further announcements on progress, and the proposed site is currently listed for lease.[173]

While initial PR announcements about this project mention plastics recycling,[174] Green Tech Solution's website currently indicates the company only accepts electronics and ferrous metals for recycling.[175] It is possible that this project was intended to accept mixed plastic waste but has not progressed. As scrap from Green Tech Solutions' other sites are sent to Malaysia for processing, it is likely that any pellets or scrap that would be generated from this site would be intended solely for export, not retained for domestic reprocessing or manufacturing.[176]

GreenMantra Technologies, Brantford, Ontario

GreenMantra is a Canadian chemical recycling company. Closed Loop Partners classifies this work as both plastic-to-plastic and plastic-to-fuel. However, GreenMantra's technology appears to primarily produce polymers that can be added to other polymers for applications like roofing or asphalt: "Synthetic waxes are GreenMantra's primary commercial product."[177] One of GreenMantra's offtake partners is Sun Chemical;[178] INEOS Styrolution is also evaluating whether it will offtake GreenMantra's sytrene liquid.[179] GreenMantra is a member of the ACC's Advanced Recycling Alliance for Plastics.[180]

It is not clear if this project is the expansion of the Ontario plant, or a new facility within the U.S. Closed Loop Fund invested $3 million for expansion of the company's Bradford plant.[181] The ACC list seems to indicate a different plant, as it is listed as TBD; however, we used the $3 million to estimate the investment.

Inline Plastics, Shelton, CT

This packaging producer manufactures Safe-T-Fresh brand food containers for the food service/retail sector. It purchases "chemically recycled" plastic from Octal Extrusion Corp., an Oman-based PET sheet supplier.[182] Inline advertises the recycled packaging it sells,[183] but does not actually recycle plastic. The method that Octal uses to chemically recycle its plastic is also not disclosed.[184] There is no indication of Inline Plastics' investment in Octal Extrusion or other facilities.

J.P. Mascaro & Sons/Total Recycle, Exeter Township, PA

This facility was a year-long project to assess the viability of flexible plastic packaging. The facility itself was a sorting facility with no site processing capacity.[185] Upon completion of the initial yearlong pilot, the project did not ultimately demonstrate the intended 99% capture rate (74% at the end of the project).[186] This project received a $2.6 million grant from Materials

Recovery for the Future, an ACC project that also includes consumer goods companies, and other trade associations. [187]

Loop Industries/Indorama, Spartanburg, SC

This Canadian thermal decomposition company has formed a joint venture with global PET and polyester producer Indorama, using carpet as feedstock[188] for its depolymerization chemical recycling. Announcements dating back to 2018 indicated that the Spartanburg facility would be up and running by the second half of 2020;[189] however, the project is still in the engineering phases, with the company still trying to finalize a fixed-price construction contract.[190]

Initial capacity was announced to be fully subscribed by fast-moving consumer goods company customers **PepsiCo**, **Nestlé**, **Danone**, and **Coca-Cola**, but interest from other customers led the company to decide to expand the facility.[191] The company is also looking for other joint venture partners and financing for the Spartanburg location. Indorama remains committed, but the project clearly needs additional investors to continue, which could be challenging amidst COVID-19–related economic downturns.[192]

In a 2018 press release, **PepsiCo** touted its intentions to incorporate Loop's PET into its packaging by 2020.[193] Delays put PepsiCo's self-imposed 2025 deadline of increasing recycled content at risk—a point that is beside the fact that chemical recycling is a false solution that companies should not be using to meet their plastic reduction commitments.

The total cost of the facility retrofit and expansion is not clear; however, Loop and Indorama jointly invested $1 million in 2018.[194] A 2019 investment infusion into Loop totaled $45 million, intended to cover the costs of construction as well as other costs.[195]

Millville Plastics, Millville, NJ

Millville Plastics is a project formed by several investors, attempting to retrofit an old glass factory in Millville into a plastics recycling plant. While initial descriptions of the project suggest this would be mechanical recycling of plastic, Millville Plastics' principal investor, Green EnviroTech Holdings,[196] appears to only license pyrolysis technology for processing a singular feedstock, rubber tires.[197] In its 2019 filings to the U.S. Securities and Exchange Commission, Green EnviroTech notes that it is "currently not profitable and may never become profitable."[198]

Construction of the Millville Plastics project is contingent upon a number of permits and resolution of the ownership and tax history of the site. There is local opposition to the project, and a solar company has also made a bid to develop the site.[199] The project cost was estimated to be $150 million, and moving ahead is contingent on getting Grow New Jersey program tax credits to complete its financing. To date, it has not gotten those credits.[200] This project seems unlikely to move forward. No processing capacity has been announced.

Netafim, Fresno, CA

This irrigation company is a subsidiary of Orbia, formerly Mexichem chemical company, which has a partnership with Occidental Chemical (Oxy). Orbia appears to source Oxy's raw materials, including ethylene and polyvinyl chloride (PVC) materials.[201] The company launched a recycling company, and received a $2 million grant from CalRecycle to install new equipment at an existing facility to process agricultural plastic irrigation tubing into new plastic tubing.[202] The project seems likely to proceed or be operational,[203] and the company affirmed Netafim's profitability in a May 2020 investor call.[204]

New Hope Energy, Tyler, TX

New Hope Energy, is a provider of pyrolysis technology. In 2019, it opened a $150 million commercial-scale plastic-to-fuel facility in Tyler, Texas.[205] The company accepts mostly bulk post-industrial and post-consumer plastic, which it converts to fuels, naphtha, asphalt, and paraffin. New Hope Energy does not make new plastic; rather, it produces and markets petrochemical products, particularly marine fuel.[206] The company also sells the patented technology to bolt onto existing MRFs, which it describes as "micro-refineries."[207]

At full capacity, New Hope Energy estimates 340,000 tons/year,[208] but it is not clear how the company will collect feedstock. At least one load of plastic waste was shipped from the Omaha recycling center initially responsible for "recycling" the "difficult to process" waste from the Hefty Energy Bag pyrolysis program.[209] A Hawaiian beach cleanup nonprofit sent New Hope Energy a donated shipping container full of plastic bottle caps gathered and cleaned by children.[210] There was a fire at the facility in May 2020.[211]

New Hope Energy is a member of the ACC's Advanced Recycling Alliance for Plastics,[212] and the ACC's Plastics-to-Fuel and Petrochemistry Alliance.

Nexus Fuels, Atlanta, GA

Nexus Fuels is a "waste management and energy production company"[213] operating a recently opened plastic-to-fuel plant in Atlanta. The 50-ton/day pyrolysis plant (18,250 tons/year) began commercial production in 2019, using thermal decomposition to turn polyethylene (PE) into produce diesel and other fuels. Nexus said in January 2020 that it *only* takes post-industrial waste due to "contamination levels" of post-consumer waste.[214]

Shell has received and used Nexus Fuels' liquid fuel in its Norco, Louisiana, refinery, where it manufactures a range of fuel products as well as ethylene and propylene.[215] Nexus Fuels says it has other customers who use its products either as repurposed fuel or as feedstock to make plastic;[216] however, it does not disclose those customers. ACC director Kieth Christman pointed to Nexus Fuels as one of a few plastic-to-fuel companies mentioned in a March 2020 Congressional hearing on recycling, noting that it sells its fuel to Shell.[217]

North Gateway Transfer Station, Phoenix, AZ

North Gateway Transfer Station is owned by the City of Phoenix, and it houses an MRF where recyclables are sorted and baled, though not reprocessed on-site. The total cost of this was $4.5 million; $3 million was invested by Closed Loop Partners, and the City of Phoenix and the City of Peoria invested $1.5 million.[218] The MRF is operated by a subsidiary, Republic Services (ReCommunity).[219] Republic is one of the largest waste management companies in the country, controlling about 20% of landfill capacity,[220] with approximately $10 billion in revenue in 2019.[221]

Peninsula Plastics Recycling, Turlock, CA

A subsidiary of Merlin Plastics of Canada, Peninsula Plastics Recycling added a 17,000-ton/year expansion to its existing PET reprocessing facility, intended to process plastics #1-7 and improve the existing PET recycling system.[222]

PreZero US

PreZero US is a recycling company which has just opened two mechanical recycling facilities in the US in 2020 - in California and South Carolina. They are a subsidiary of German supermarket chain Schwarz Group. Schwarz owns Lidl grocery store which has been expanding in the US, and Schwarz acquired California's Resource Management Group (RMG) recycler.[223] PreZero US has an operational partnership with ACI plastics

The ACC has two PreZero projects on its list.

Riverside, CA

This new $90 million facility will process plastic film to meet California's SB270 plastic bag recycled content requirement. It began operation in June 2020 with commissioning, and is likely to be fully operational at the time of writing.[224] The company will mainly process film from retail distribution centers and other large-volume suppliers, though not store drop-off.[225]

Westminster, SC

PreZero is expanding onto an existing ACI Plastics facility to reprocess mixed rigid plastics.[226] Initial announcements said the facility would be open by mid-year 2020, but the company says progress has been delayed by COVID-19–related issues.[227]

PureCycle, Ironton, OH

PureCycle is constructing a gas solvent chemical recycling plant in Ohio. The technology was invented and licensed to PureCycle by **Procter & Gamble**, and is intended to use polypropylene (PP) material to make PP polymer. PureCycle's Ohio plant has an expected investment total of $120 million;[228] Closed Loop Partners provided a $3 million loan for the plant.[229]

PureCycle has received state bond money for the facility. For example, the Lawrence County Economic Development Corporation and the Southern Ohio Port Authority coordinated on $300 million bonds for construction of PureCycle, though the Lawrence County Commissioners suggest that bonds will be paid by the company, not the taxpayers.[230]

Several news reports state that this plant is at "the old" or "former" Dow site, suggesting perhaps that a former chemical plant is being retrofitted into a "recycling" facility; however the PureCycle facility appears to be adjacent to or located at an existing Americas Styrenics (AmSty) Sty polystyrene (PS) plant.[231] AmSty is a 50–50 joint venture between ChevronPhillips and Trinseo (a former Dow subsidiary, now its own company). When the joint venture was formed in 2007, Dow allotted the PS plant to AmSty;[232] The Dow facility was announced as decommissioned in 2016,[233] at which time Dow gave a 101,000-square-foot building to the Lawrence County Economic Development Corporation.[234] AmSty identifies this as an existing (not closed) plant,[235] so it appears that Dow may have closed part of this parcel, while the existing AmSty PS plant continues producing virgin PS. No promotional or business materials identify a link between AmSty and PureCycle. AmSty does have a chemical recycling joint venture with Agilyx, called Regenyx (see below).

Fast-moving consumer goods companies that have already signed offtake agreements for PureCycle PP include **Nestlé** and **L'Oréal**, as well as packaging company Aptar, which supplies major FMCGs, and petrochemical giant **Total**. [236] [237] [238]

The facility is estimated to produce 50,000 tons/year of PP.[239] Pilot production produced the first PP in September 2019, and PureCycle estimates commercial scale phase-up will start in mid-2021.[240] [241] PureCycle could expand into Europe with agreements from Total and L'Oréal.[242] A May 2020 announcement from investment firm Graf Industrial suggested that it may be aiming to acquire PureCycle.[243]

Quad City Innovations, Livonia, MI

Quad City Innovations (QCI) has proposed a waste-to-fuel facility in Livonia, Michigan. The QCI website markets a range of fuels, and a replacement for carbon black.[244] In late 2019, the Michigan Strategic Fund board gave $60 million in state-funded bonds to finance the project—apparently the entire amount needed for the project.[245] While a site appears to have been selected,[246] it is not known how far construction has progressed or how successful the technology may be. QCI has also entered into negotiations for other locations.[247]

ReFined Plastics, Berks County, PA

ReFined Plastics was formed in 2015. In 2020, the company announced its intention to buy and develop the former Titus coal-fired power plant facility to open a pyrolysis plant, potentially using waste from an adjacent landfill.[248] The president and chief technology officer of ReFined Plastics has estimated the project will cost $120 million and is seeking investors.[249] The company received a U.S. Department of Commerce grant, with Secretary Wilbur Ross noting that this would "invigorate" the area following the 2013 closure of the coal-fired power plant.[250] ReFined Plastics notes that revenues would at least initially come from leasing parcels on the facility to industrial tenants.[251] It is not clear if the company has relevant permits for the project.[252] This project seems to be in the concept phase only for now, despite public funds; however, "pre-order" of processed pellets are available on the ReFined Plastics website.[253]

Regenyx, Location TBD

Regenyx is the joint venture between Agilyx and Americas Styrenics (AmSty), itself a JV between AmySty plastic manufacturer Trinseo (a former Dow subsidiary) and ChevronPhillips. Regnyx controls the Tigard, Oregon, facility (Agilyx's only operational plant), though this is often referred to in industry news as simply Agilyx's plant, rather than Regenyx. A "west coast" project was mentioned in the initial announcement, but this specific project appears to be in the concept/announcement stage only.

Agilyx's proprietary pyrolysis technology is billed as "plastic-to-plastic," producing styrene oil from plastic waste. However, recent investigation by GAIA reveals that styrene oil produced at Agiylx's Tigard facility was later burned, rather than converted to new polystyrene.[254] This raises questions as to whether Agiklx's other facilities would be considered plastic-to-fuel. Either way, pyrolysis is problematic.

This project is referenced in the initial October 2019 announcement about the formation of the joint venture.[255] With no project cost or specific site, this JV appears to be still in the concept stage only.

Renewlogy, Phoenix, AZ

Renew Phoenix is a joint venture between Generated Materials Recovery and Renewlogy, the Salt Lake City waste-to-fuel company that used pyrolysis to process mixed plastic waste collected through the Hefty Energy Bag program.[256] Renewlogy's own website states that its thermal depolymerization process produces fuel, including naptha, noting that the infrastructure (reformer and recracker) emits non-condensate gas (10–25%) and char (5%). This facility is assumed to be plastic-to-fuel.

The Phoenix project was announced in April 2019, and there have been no further announcements. However, the Renewlogy facility in Salt Lake City has been shut down since January 2019 due to process issues.[257]

The initial project announcement in early 2019 specified a cost of $5 million, and a city-estimated capacity of 3,000–4,000 tons/year.[258] Renewlogy received a grant from the Arizona Commerce Authority in 2017 to study the Phoenix project, and is part of a venture partnership with the City of Phoenix. [259] Renewlogy is a member of the ACC's Advanced Recycling Alliance for Plastics.[260] It also has projects in Asia with the Alliance to End Plastic Waste,[261] an organization promoted by the ACC and composed of ACC petrochemical and plastic company members.[262] [263]

Roplast Industries, Oroville, CA

Roplast Industries manufactures plastic bags. An equipment upgrade and expansion (including de-inking) at its existing facility will provide an additional 2,500 tons/year of LDPE.[264] The company received a $2.5 million grant from CalRecycle in 2018/2019.[265]

Roy Tech Environ, Grant, AL

Roy Tech Environ is a U.S. subsidiary of Chinese firm Shanghai Roylai Metal Products Co. The company was formed in 2015, but had previously bought scrap in the U.S. for reprocessing in China. Roy Tech announced it would open a $1.6 million facility in Grant, Alabama. The U.S. recycling facility appears to have begun operations at least as early as 2019. Exports of plastic to Singapore and Hong Kong regularly have been observed through 2020.[266]

rPlanet Earth, Vernon, CA

This new PET bottle mechanical recycling facility began operation in 2018. The facility and its equipment had a $100 million price tag, and the company received at least $37.5 million in government tax breaks, grants, and loans: $20.5 million in low-cost debt financing through the U.S. Treasury Department's New Market Tax Credit program, $10 million in sales tax breaks via the California Alternative Energy and Advanced Transportation Financing Authority, $4 million in loans, a $3 million grant from CalRecycle, and a $1.5 million loan from Closed Loop Fund.[267] The announced capacity is 40,000 tons/year.[268]

Sirmax North America, Anderson, IN

This Italian company, with U.S. headquarters in Indiana, produces primarily automotive plastic. This project involves a mechanical process to pelletize and process plastic scrap and make some recycled-content resin.[269] The new facility for processing industrial plastic scrap was announced in 2019. The site has been purchased, with a start-up planned by the end of 2022.[270] Construction appeared to be progressing as of February 2020.[271]

The company will spend approximately $18 million, and will receive $2 million in public funding, including $1.5 million for development of a brownfield site and $650,000 for infrastructure, such as a rail spur and utility expansion.[272]

Shark Glass Recycling, Victorville, CA

This Danish-owned company recovers both plastic and glass from windshields, sending the polyvinyl butyral (PVB) film from the windshields to a facility in Georgia to be used as a PVC replacement in carpets and other applications. The company (which has existing facilities in Los Angeles and Georgia), received a $1.28 million grant from CalRecycle in 2018/2019 to build a new facility in Victorville, California. The facility is estimated to process 5,329 tons/year.[273] About 8% of an average windshield consists of PVB, yielding approximately 430 tons of recycled plastic.[274]

Titus MRF, Portland, OR

This is a duplicate from the Far West entry (the ACC appears to have counted this twice).

Yunnan Zintongi Plastics Engineering (UPT Group)

Yunnan Zintongi Plastics Engineering is a subsidiary of Chinese UPT Group. This project was announced in September 2018[275] to reprocess plastic waste for export to Chinese manufacturing firms.[276] Since then, there have been no further news articles, and the company does not appear to have a U.S.-facing web presence. U.S.–China tariffs have also cancelled other planned investments by Chinese firms in the southeastern United States.[277]

A search for state air permits yielded none obtained by Yunnan Zintongi.[278] The site was previously a frozen foods canning plant. However, between October 2019 and June 2020, as observed in customs records, there have been three shipments from UPT Group in Montezuma, Georgia, to Mexico (via truck), and three maritime exports of PET pellets to Malaysia. This project also appears on a Northeast Recycling Council list of recycling projects as of February 2020, with a "projected" open date of 2019.[279]

Dow Chemical facility in Freeport, Texas, Dow's largest integrated site.

5. Recommendations

We believe that mechanical recycling is environmentally preferable to any of the "chemical recycling" methods. However, current U.S. reprocessing capability is so low that only PET and HDPE are functionally recyclable, so the role of mechanical recycling for plastic waste is very limited.[280] Investments in mechanical recycling should not substitute or outpace investments into infrastructure, innovations, and alternative business models that ultimately reduce plastic production.

American Chemistry Council

The ACC should cease using "advanced recycling" as a synonym for "chemical recycling," and stop promoting "chemical" recycling as a solution to the plastic pollution issue. The ACC and its plastics and packaging manufacturer members should cease distracting and confusing legislators and the public with false solutions and bait-and-switch PR tactics, and should instead focus on fostering investments in reducing the harmful impacts of plastic on Americans' health and environment.

Elected Officials

Elected officials, such as state and federal legislators, who take policy action to respond to plastic pollution issues should not get distracted by the promises of "advanced" or "chemical recycling" technologies. Particularly amidst the need for a green and just recovery, federal, state, and local governments should not spend limited resources funding these technologies without thorough environmental, safety, and economic reviews.

Public officials should not consider waste-to-energy, waste-to-fuel or plastic-to-fuel projects as energy recycling, and instead clarify that this is petrochemical manufacturing (and subject to appropriate manufacturing permitting and classification), and should consider this part of the fossil fuel industry. They should seriously examine the viability of the companies and their ability to develop the requisite technology before approving taxpayer funds under the guise of "recycling," "sustainability," or "job creation."

Public officials should reject demands from petrochemical trade associations such as the ACC, or companies associated with it or its various umbrella groups, for public subsidies, relaxed regulatory consideration, or other special privileges. Regulatory clarity should be developed and enforced regarding safety and economic considerations for the storage, marketing, and disposal of feedstock, marketable products, and by-products of these processes, and "closed loop" claims by companies promoting their technology should not be accepted in lieu of regulation and disclosure.

Local Decision-makers

Public officials responsible for permitting chemical recycling projects or allocating economic development funds for chemical recycling projects should interrogate "advanced" or "chemical recycling" technologies vigorously to determine their methods, their environmental impacts, and whether they are proven to *reduce plastic production* (not just divert plastic from landfills). Officials should require transparency on these technologies' processes and emissions, and the chemicals used and stored for projects seeking public financing, tax abatements, or relevant permits, and they must make this information available to other decision-makers and the public at large. Local decision-makers, like all public officials, should require companies seeking public funds or a relaxed permitting process to provide evidence of the viability of these projects, and the potential for these technologies to reduce plastic pollution.

Investors

Investors should support due diligence in ensuring that new technologies and facilities do not pose health and environmental risks, by driving disclosures and transparency of these technologies. Investors should not fund waste-to-energy, waste-to-fuel or plastic-to-fuel projects, particularly not if portraying them as investments in plastics recycling. Investors in the fast-moving consumer goods sector could consider giving preference to investment opportunities for companies that avoid false solutions in their commitments to reduce plastic and instead urgently reduce their use of plastic packaging in favor of reuse and refill.

Fast-Moving Consumer Goods Companies

Fast-moving consumer goods companies adopting and aiming to meet goals related to reducing plastic packaging should not consider “chemical recycling”—and especially not waste-to-energy, waste-to-fuel or plastic-to-fuel—as valid pathways to meet commitments to plastic reduction. FMCGs should not invest in, agree to offtake plastic from, or join development consortiums with “chemical recycling” and petrochemical companies. Companies like Coca-Cola, Danone, Mars, Mondeléz, PepsiCo, Procter & Gamble, Nestlé, and Unilever need to drop these false solutions entirely and focus their investments and efforts on reducing plastic and urgently accelerating innovation into reuse. Stakeholders such as the Ellen MacArthur Foundation could help to clarify how companies should be considered validly meeting voluntary agreements like the New Plastics Economy to deter use of “chemical recycling” to meet any virgin plastic reduction commitments.

Activists hold up letters spelling out the words Break Free From Plastic near the US Capitol in Washington, D.C. U.S. Senator Tom Udall (D-N.M.) and U.S. Representative Alan Lowenthal (D-Calif.), have introduced their landmark legislation, the Break Free from Plastic Pollution Act.

Endnotes

1 In this report, we attempt to be as specific as possible when describing the technologies. "Waste-to-energy" refers to mixed waste treated with a variety of methods of energy recovery (e.g., biomass incineration, co-incineration in cement kilns, landfill gas recovery). "Waste-to-fuel" or "plastic-to-fuel" primarily generates hydrocarbons, with "plastic-to-fuel" describing methods where the feedstock is exclusively plastic. However, given the lack of publicly available information on many of the technologies associated with specific projects, we at times either use the terms together or, when referring to specific projects, use the broader "waste-to-fuel" inclusive of all potential feedstocks. Some waste-to-fuel or plastic-to-fuel projects may have energy recovery associated with them.

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DECEPTION BY THE NUMBERS

SEPTEMBER 9, 2020