

### Appendix 3: Glossary of Terms

#### **Additives**

Materials that are mixed with polymers to produce plastic and serve a specific purpose. Types of additives include antistatic agents, biocides, blowing agents, flame retardants, fillers, fragrances, pigments, and plasticizers, among others. More than 8,000 different additives are used in combination with polymers to produce plastics.

#### **“Advanced Recycling”**

Undefined industry phrase that covers a range of processes that turn plastic waste back into hydrocarbon feedstocks. Most of these feedstocks are consumed as fuel. May also be known as “chemical recycling,” “gasification,” “waste-to-fuel,” “waste-to-energy,” and “pyrolysis.”

#### **Butylene**

Chemical byproduct of ethane crackers. Most butylene is consumed in the production of polyethylene plastics.

#### **Carbon Dioxide**

Colorless, odorless greenhouse gas. It is a normal part of Earth’s atmosphere; however, concentrations of this gas are increasing due to releases from petrochemical production and combustion. The global warming potential (GWP) of other greenhouse gases is measured in relation to that of carbon dioxide.

#### **Carbon Dioxide Equivalent (CO<sub>2</sub>e)**

The weight of carbon dioxide emitted into the atmosphere that would produce the same estimated radiative forcing as a given weight of another radiatively active gas. Carbon dioxide equivalents are the weights of gases multiplied by their estimated global warming potential.

#### **Catalyst**

A substance that causes or accelerates a chemical reaction.

#### **“Chemical Recycling”**

As with “advanced recycling,” there is no standard definition for “chemical recycling.” The industry-led American Chemistry Council (ACC) projects major growth in so-called “chemical recycling” and “advanced recycling.” The ACC’s vision is to produce 30 million barrels of fossil fuels per year from plastic waste. Fuels are burned, not recycled. See also “Advanced Recycling” and “Pyrolysis”.

#### **Chlor-Alkali Electrolysis**

An energy-intensive process that extracts chlorine and caustic soda from salt.

#### **Coal-To-Plastics Gasification**

A process in which coal is superheated and blown with oxygen and steam, producing methanol and acetic acid, both of which are used in the production of plastics. The largest coal-to-plastics manufacturer in the U.S. mixes some plastic wastes in its gasification process.

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### **Cracker**

Term as used in this report is shorthand for cracking units in which heat and pressure break down, rearrange, or combine hydrocarbon molecules.

### **Ethane**

Colorless hydrocarbon extracted from the natural gas stream. Ethane is gaseous at standard temperature and pressure.

### **Ethylene**

Hydrocarbon recovered from crackers and other petrochemical processes, used as feedstock for many plastics and other consumer goods. Ethylene is polymerized into polypropylene, the most commonly used polymer in plastics.

### **Feedstock**

Raw materials used in industrial production. Most plastics feedstocks are produced through the cracking or refining of gas, oil, or coal.

### **Fluorochemicals**

Any chemical containing the element fluorine.

### **Fracking (Hydraulic Fracturing)**

A technique for stimulating the extraction of oil and gas from shale by injecting high-pressure streams of “fracking fluids.” Water is the most common fluid and is mixed with sand or similar material such as small ceramic balls suspended with chemicals.

### **Fractionator**

Apparatus that separates gases by boiling them off from the rest of the hydrocarbon stream.

### **Gas Processing Unit**

Facility that recovers hydrocarbon gas liquids from the stream of natural gas.

### **Global Warming Potential (GWP)**

An index that compares the relative radiative forcing of different greenhouse gases (see Carbon Dioxide) over a fixed period of time. The most common GWP comparisons use a 100-year timeframe. The State of New York uses a 20-year comparison. For consistency with EPA and global reporting, this report uses the 100-year timeframe for CO<sub>2</sub>e equivalence.

### **Greenhouse Gases (GHG)**

Gases such as carbon dioxide, methane, and hydrofluorocarbons (HFCs) that are transparent to solar radiation but opaque to infrared radiation and thus trap heat in the Earth’s atmosphere.

### **Hydrocarbons**

Chemicals containing hydrogen and carbon, such as gas, coal, or oil.

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### **Incinerator**

A facility that burns waste. A related term, “waste-to-energy,” refers to incinerators that also generate some electricity.

### **Methane**

A colorless, odorless greenhouse gas. Methane is the major component of natural gas. It is an important source of hydrogen used in the production of plastics. Often used as a synonym for natural gas although it is not a perfect substitute.

### **Methanol**

Colorless, volatile, flammable liquid alcohol made by oxidizing methane. The largest use for methanol is as a feedstock for the plastics industry.

### **Municipal Solid Waste**

Residential and commercial waste. Does not include industrial waste.

### **Naphtha**

A generic term for various flammable, hydrocarbon liquids with a boiling range between 122 and 400 degrees Fahrenheit.

### **Natural Gas / Natural Gas Liquids (NGL)**

A group of hydrocarbons (primarily methane, as well as ethane, propane, and others). Natural gas liquids NGLs are extracted as byproducts in the production of natural gas and oil. More than 90% of NGLs are processed from natural gas

### **Off-Gassing**

The release of harmful chemicals from plastics into air.

### **Petrochemicals**

Chemical feedstocks derived from gas, oil, or coal. Petrochemicals are used in the manufacture of plastics and other materials.

### **Plastics**

Materials consisting of additives and polymers, typically derived from petrochemicals. Microplastics are plastics smaller than 5 millimeters in size.

### **Polymers**

A substance composed of long chains of molecules made from repeating parts, for example: polyethylene from ethylene.

### **Propane**

A hydrocarbon extracted from natural gas or refinery gas streams. Consumed as polypropylene in plastic production, by way of cracking or dehydrogenation.

### **Propane Dehydrogenation (PDH)**

*Beyond Plastics at Bennington College, October 2021*

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A petrochemical process in which propane is converted into propene (propylene) and hydrogen. The propylene is subsequently consumed by polymerization to polypropylene, which is the second most common polymer in plastics.

### **Pyrolysis**

The thermal decomposition of waste or other matter, in the absence of air, at temperatures above 400 degrees Fahrenheit. In the pyrolysis process (essentially a furnace), molecules are cracked from large to small. End products are solids (called char), oils, and gases including methane and carbon dioxide. Pyrolysis of plastics generates toxic air pollutants including polycyclic aromatic hydrocarbons (PAHs) and greenhouse gases. In its first year of operation, a plastic waste pyrolysis plant in Oregon released 3.2 kg of carbon dioxide for every kilogram of plastic it processed. A [2020 report](#) on “chemical recycling” by GAIA notes that this operation “shipped over 49,000 tons of styrene, a highly toxic chemical to burn in cement kilns located in low-income and people of color communities across the country in 2018.”

### **Resin**

A solid polymer used as the basis of plastics and other products.

### **Siding**

An exterior wall covering material.

### **Very Large Ethane Carriers (VLEC)**

Vessels, typically longer than 750-feet, that deliver ethane from the United States to crackers around the world.

### **Vinyl**

As used in this report, vinyl refers specifically to polyvinyl chloride (PVC), a polymer of vinyl chloride.

### **Waste-To-Energy**

Incinerators that burn garbage to create a modest amount of electricity. Waste-to-energy practices create pollution, including toxic ash that is landfilled, and gases that contaminate air.