

# Why the Oil Industry Benefits from Bottled Water Sales

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Most people know of Royal Dutch Shell, Exxon, ConocoPhillips and British Petroleum as some of the world's biggest oil companies. These corporations are synonymous with gasoline, motor oil and environmental degradation.

Regardless of their ubiquity in our everyday lives, many people are not conscious of how these names are intimately linked to the bottled water industry through the production of PET (Polyethylene terephthalate) plastic bottles.

Given that 80 percent of the PET produced in the United States ends up in a Coca-Cola, Pepsi or Nestlé beverage container, people should know the connection that these bottled water producers have with the largest oil, chemical and plastic corporations on the planet. Let's see who is profiting from supplying oil-based plastic to the bottled water industry and how the players in this supply chain are some of the worst environmental polluters of our time.

The process of producing PET plastic bottles involves a number of different stages using multiple producers in the supply chain. Some of the corporations are widely recognizable, while others are more obscure. The important point in this analysis, however, is that the bottled water manufacturers are the end point of a supply chain that contains some of the biggest polluters on the planet.

## Step one: the production of PET's main raw materials

The supply chain for PET plastic bottles begins with two streams which produce PET's primary raw materials, terephthalic acid (PTA) and monoethylene glycol (MEG). These two streams come together when PET is actually produced in a factory through the chemical reaction between PTA and MEG.

These raw materials account for approximately 75 to 80 percent of the total manufacturing cost of PET.

**PTA.** Terephthalic acid, one of PET's two primary raw materials, is produced using paraxylene. Paraxylene, which is very similar to gasoline, is derived from crude oil through a refining process at oil and petrochemical refineries.

A number of oil companies in the US produce paraxylene including British Petroleum, Chalmette Refining (50/50 joint venture between ExxonMobil and Petróleos de Venezuela S.A.), Chevron Phillips Chemical (50/50 joint venture between Chevron and ConocoPhillips), ExxonMobil, Flint Hills (owned by private conglomerate Koch Enterprises), and Lyondell. These facilities are all located in

the gulf region of the United States.

At this point, the PET plastic bottle supply chain divides into two categories of PTA producers:

1. Companies that make both paraxylene and PTA -- In the United States this category is occupied by British Petroleum's Chemical division, BP Chemicals, and the private conglomerate Koch Industries. In BP's case its refineries in Decatur, Alabama and Texas City, Texas produce paraxylene which is then turned into PTA at the company's operations in Decatur, Alabama and Cooper River, South Carolina.

In the case of Koch Industries, its refining division, Flint Hills Resources, manufactures paraxylene at its operations in Corpus Christi Texas while its fiber and polymer company Invista turns paraxylene into PTA. While BP sells its PTA to PET manufacturers, Invista (Koch Industries) uses the PTA it manufactures for its own PET production.

2. Companies that purchase paraxylene and then produce PTA for their own PET production -- In this category chemical companies purchase paraxylene directly from the refinery, transport it to their production facility where they will produce PTA either for sale on the market or for their own PET production. This category is occupied by two major players, DAK Americas (subsidiary of private Mexican conglomerate Alfa, 2006 revenue \$6.8 billion), and Eastman Chemical Company (2006 annual revenue of \$7.5 billion).

**MEG.** Monoethylene glycol (MEG), PET's other primary raw material, is also derived from crude oil. In addition to being used by PET manufacturers, MEG is used to produce antifreeze and coolants for the automotive industry.

MEG's main raw material is ethylene, which is produced in refineries by steam cracking hydrocarbons. Natural gas is also used to make ethylene.

Ethylene is more widely produced than paraxylene and is manufactured by a large number of oil and chemical companies in the United States. The leading ethylene producers in the United States include, ChevronPhillips Chemical Company, Equistar Chemical Co., Exxon, Shell and Dow Chemical.

Once ethylene has been produced, MEG manufacturers will purchase it as a feedstock. Some of the large MEG producers in the United States include Eastman, Equistar Chemical Co., Formosa Plastics Corp (Owned by Chinese company Nan Ya Plastics), Huntsman Corp, Old World Industries, PD Glycol, Shell and Dow Chemical.

These companies produce MEG at their facilities and then either use it as a

building block for various types of plastic, including PET, or sell down the supply chain to other manufacturers.

### **Step two: PTA and MEG into PET**

Once the PTA and MEG have been produced they are used by chemical companies and PET manufacturers to make polyethylene terephthalate (PET).

In the United States there are seven main PET manufacturers: DAK Americas (subsidiary of private Mexican conglomerate Alfa, 2006 revenue \$6.8 billion), Eastman Chemical Company (2006 annual revenue of \$7.5 billion), Invista (owned by private conglomerate Koch Enterprises, 2006 annual revenue of \$90 billion), M&G Polymers USA (Italian company, Gruppo Mossi & Ghisolfi), Nan Ya Plastics (Taiwanese based with a 2004 revenue of \$6.8 billion), Wellman Inc. (2006 revenue, \$1.3 billion) and StarPet Inc.

All of these companies produce varying grades of PET used to manufacture a number of different products including, polyester fiber used for clothing (brands such as Lycra, Coolmax are made from PET) and carpeting.

The bottle grade PET resin produced by these companies is then sold to companies that convert the resin into plastic bottles.

### **Step Three: PET resin into plastic bottles**

Companies that purchase PET resin and then turn it into bottles are known in the industry as converters. This category of companies includes some of the beverage companies themselves, as well as companies that make plastic bottles and then sell them to the bottlers.

At this point in the supply chain we will break down how each of the three largest users of PET resin in the United States -- Coke, Pepsi and Nestlé -- acquire, or produce themselves, the plastic bottles that they fill with their products. We focus on these three companies given that, according to PET industry executives, in 2004 these three companies were responsible for purchasing eighty percent of the PET resin sold in the United States.

#### **Coca Cola**

The Coca Cola Company's largest bottler in North America, Coca-Cola Enterprises, owns two giant PET bottle manufacturers that are responsible for producing 90 percent of the PET plastic containers for all of the company's beverage products in North America.

The two companies, Western Container and Southeastern Container, buy PET

resin from the plastic and chemical companies and then convert it themselves into bottles. Only a small percentage of Coca Cola's bottles are purchased by outside bottle producers.

One of Western and Southeastern Container's suppliers of PET is Wellman Inc. Wellman states in its 2006 annual report that it purchases its PTA from British Petroleum and its MEG from Lyondell and MEGlobal Americas, which is 50 percent owned by Dow Chemical.

## **Nestlé**

Nestlé Waters North America produces about 50 percent of its bottles at Nestlé bottling plants. The other 50 percent of the company's bottles are produced by packaging companies like Amcor (2007 annual revenue 10.8 billion).

For the out of house bottle production, Nestlé actually buys the PET that AMCOR will use to produce the company's water bottles.

One of Nestlé's main suppliers of PET is Eastman Chemical Company. Eastman produces their own PTA and therefore purchases paraxylene from the major US producers mentioned above.

## **PepsiCo**

Pepsi is different from Coke and Nestlé because it purchases the majority of its bottles from the major plastic bottle manufacturers of which there are five in the United States: Amcor, Graham Packaging, Ball Corporation, PlastiPak and Constar International Inc.

Like Nestlé, Pepsi actually purchases the PET the bottle manufacturers will use to make Pepsi's bottles.

Constar, for example, buys PET from Eastman Chemical Company, Pepsi buys bottles from Constar.

## **Why is this information important?**

Few people realize that plastic bottles are composed of fossil fuels and chemicals, which are refined and manufactured by the companies mentioned above. Plastics are made from non-renewable resources and when they are produced substantial amounts of toxic chemicals are released into the air and the water supply.

The plastic used for bottled water containers come from players in a dirty industry. Major suppliers to PET plastic producers and the producers themselves

are regularly graded as the top polluters by various annual US polluter [ranking lists](#).

The intimate connections between the bottled water industry and the dirty oil, petrochemical and plastic industries fundamentally contradict the attempts by the water companies to paint their products as healthy and clean.

With this information we can add some context to the statement that bottled water contributes to global warming by actually linking Nestlé Pure Life, Dasani or Aquafina to the world's largest oil and chemical companies.

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