

# The EU's Methane Regulation Must Include Supply Chain Emissions and the Petrochemical Sector

The transatlantic trade in petrochemicals — the fossil fuel-derived building blocks of plastic pollution — is booming. In the midst of a mounting climate emergency, this is not the kind of economic cooperation the world needs. As the European Union (EU) claims to step up its climate commitments, its pivot to fracked gas produced in the United States as a source of feedstocks for its plastic industry threatens to undermine emissions reductions objectives and exacerbate plastic pollution.

*Outsourcing* the production of plastic feedstocks beyond Europe's borders cannot mean putting the impacts of that feedstock production *out of sight* or *out of mind*. Neither regulators nor plastics producers in Europe should be allowed to hide behind the anonymity of imported feedstocks while banning fracking within their own borders.

This document summarizes some key facts and features of the flows of natural gas liquids (NGLs) from the United States to Europe (including to Norway and the United Kingdom) and the broader context of such flows both in the United States and in Europe. It puts this developing trade in the context of the EU Methane Regulation and clarifies why the regulation must be designed to include petrochemicals and full supply chain emissions.

## Key Messages

- **Plastics production in Europe fueled by fossil feedstocks from the United States is jeopardizing European climate and plastic reduction goals.** The EU has set out ambitious goals for curbing carbon dioxide emissions to mitigate the climate crisis, in addition to its goals to protect human and environmental health through limits on pollutants and regulation of single-use plastics. Regulations in the US are nowhere near as protective. A handful of companies have been using US gas liquids to make plastics in Europe, threatening to undermine the EU's climate and health policies.
- **The upcoming EU methane regulation must cover the full supply chain, including fossil fuel imports, and must apply fully to petrochemicals:** The regulation should account for petrochemicals both as feedstock and energy source in accordance with the recently adopted resolution of the European Parliament to reduce methane emissions.

## Background and Context

Almost all plastic is made from fossil fuels, primarily from byproducts of oil and gas production. Most plastics made in Europe are derived from an oil refining byproduct called naphtha. In the United States, plastic is made primarily from natural gas liquids (NGLs), molecules lighter than most oil but heavier than methane. The primary NGL used for plastics production is ethane, followed by propane — commonly referred to as “liquid petroleum gas” or LPG in Europe.<sup>1</sup> Ethane has few uses other than as a petrochemical feedstock, whereas propane is used as a combustible fuel for heating, transportation, and other non-petrochemical applications in addition to its growing role as a feedstock for plastics production.

The shale and fracking boom in the United States produced a corresponding boom in gas liquids, especially ethane. Ethane did not have a large preexisting market, but the supply glut of ethane led to a massive investment in and construction of new facilities to turn ethane into ethylene, and ultimately plastic. With the construction of new crackers in 14 locations, US steam cracking capacity increased from 26 million tons per year (tpy) in 2005 to 45 million tpy in 2021.<sup>2</sup> As of October 2021, plans are underway to build another five crackers, adding an additional 9.1 million tpy of capacity, a further increase in US ethane cracking capacity by at least 20%. Still, the ethane glut remains, and producers have turned to export markets. In 2014, producers in the United States began exporting ethane by pipeline to Canada and began shipping across oceans in 2016. With the exception of 2020, exports from the US have increased every year, spiking sharply to a new maximum in August 2021, the most recent month for which data are available.<sup>3</sup>

Prior to 2016, European plastics production had been either stagnant or declining for at least a decade.<sup>4</sup> Since then, however, European plastics producers have increasingly imported fracked NGLs from the US to increase plastics production. One company, INEOS, is seeking to build the first new plastics plant in Europe in 20 years<sup>5</sup> — although those plans may still be stopped.<sup>6</sup> Notably, since the US shale gas boom began, seven European countries have banned or placed moratoria on fracking, namely France, Bulgaria, The Netherlands, Germany, Ireland, the United Kingdom, and Spain.<sup>7</sup> As will be explained below, many of the facilities

<sup>1</sup> See Center for International Environmental Law, [Fueling Plastics: How Fracked Gas, Cheap Oil, and Unburnable Coal are Driving the Plastics Boom](#) (2017).

<sup>2</sup> Beyond Plastics, [The New Coal: Plastics & Climate Change](#) 12 (2021).

<sup>3</sup> See [U.S. Exports of Ethane](#), U.S. Energy Information Administration, (last visited Nov. 9, 2021).

<sup>4</sup> See [European Market Overview](#), Petrochemicals Europe (last visited Nov. 9, 2021).

<sup>5</sup> Press Release, INEOS, [INEOS, Europe's largest petrochemicals company, announces Antwerp as the location for its new ground breaking 3 billion Euro petrochemical investment](#) (Jan. 14, 2019).

<sup>6</sup> See Press Release, ClientEarth, [€3bn Ineos plastics project in doubt as company drops inadequate permit](#) (Mar. 29, 2021).

<sup>7</sup> AFP, [France bans fracking and oil extraction in all of its territories](#), The Guardian (Dec. 20, 2017); AFP, [Bulgaria bans shale gas drilling with 'fracking' method](#), BBC (Jan. 19, 2012); [Dutch minister confirms ban on drilling, shale gas 'not an option'](#), DutchNews.nl (Feb. 16, 2018); AFP, [Germany largely bans fracking with new laws](#), DW (Feb. 11, 2017); Marie O'Halloran, [Ireland joins France, Germany, and Bulgaria in banning fracking](#), The Irish Times (June 28, 2017); Jillian

using US ethane and propane to make plastic are in countries with some form of fracking restriction.

The fracking, plastic, and petrochemical industries are extremely opaque. They provide little public disclosure of production volumes and corporate customers, and the diversity of resins, chemical precursors, and product names makes it even more difficult to draw industry-wide comparisons and conclusions with limited data. The lack of transparency from the US wellhead to the European warehouse is further evidence of the need for strong regulation, applied across the petrochemical and plastics supply chain.

## Tracing Flows from the US to Europe

To turn US fracked gas into European plastic pellets, molecules of ethane and propane go through a long supply chain. First, oil and gas are produced at fracking wells. Gas liquids are then separated from the heavier oil and the lighter methane, as well as cleaned of impurities, and transported via pipeline to fractionators. Fractionators further separate the gas liquids into their individual components — ethane, propane, butane, pentane, etc. While some are inland, many fractionators are located at ports, where separated NGLs are directly loaded onto ships for international transport. Once at European ports, the NGLs are offloaded and either used at cracker plants located near the port or transported again by pipeline to other petrochemical facilities.

### Overview

#### EXTRACTION

Most US NGLs going to Europe come from wells drilled in the Permian (Texas and New Mexico), Eagle Ford (Texas), and Appalachian (Pennsylvania, Ohio, West Virginia) basins. *These fracking wells are the major, but not only, source of methane emissions in the transatlantic petrochemical supply chain.*

#### TRANSPORTATION

NGLs move to ports primarily by pipeline. There are several NGL pipelines feeding the Texas ports of Houston-Galveston, Port Arthur, and Freeport — ATEX Express, Chaparral System, Shin Oak System, Seminole System, TE Products, and South Texas System pipelines. The Mariner East pipeline is the main source feeding the Pennsylvania port, Marcus Hook.

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Ambrose, [Fracking halted in England in major government U-turn](#), The Guardian (Nov. 1, 2019) (noting that Scotland, Northern Ireland, and Wales had already halted fracking); Cristina Brooks, [Spain becomes fourth EU country slapping ban on new fossil fuel production](#), IHS Markit (May 21, 2021).

## SHIPPING

Ethane and propane are transported on ships. Large-scale ethane shipping is new and requires specialized ships for cooling and pressurization, while propane is easier to transport. The primary companies shipping ethane from the US to Europe are Ineos and Enterprise Products Partners. Propane is shipped by a wider variety of companies.

## IMPORT

Both ethane and propane are imported into several European ports. Antwerp is the only port identified that accepts both ethane and propane.

## PRODUCTION

The primary known users of US ethane in Europe are INEOS and Borealis; SABIC imported ethane for a few years but the facility is currently non-operational. The primary known petrochemical users of US propane in Europe are INEOS and Dow Chemical.

## EU Methane Regulation

In October 2020, the European Commission presented a strategy to address methane emissions in the EU.<sup>8</sup> The strategy covers the energy, waste, and agricultural sectors, with specific proposals for legislation addressing each sector to be developed separately.<sup>9</sup> The legislative proposal for the energy sector is expected in December 2021.<sup>10</sup>

The primary components of the original strategy for the energy sector included five pillars, three required and two optional.

Required:

- Measurement, reporting, and verification (MRV) of methane emissions
- Leak detection and repair (LDAR)
- A ban on routine venting and flaring

Optional:

- Extension to the petrochemical sector
- Full supply chain coverage

<sup>8</sup> Press Release, European Commission, [Reducing greenhouse gas emissions: Commission adopts EU Methane Strategy as part of European Green Deal](#) (Oct. 14, 2020).

<sup>9</sup> See [Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on an EU strategy to reduce methane emissions](#), COM (2020) 663 final (Oct. 14, 2020).

<sup>10</sup> See *id.* at 11.

In October 2021, the European Parliament voted overwhelmingly to approve a resolution asking the Commission to propose strong legislation.<sup>11</sup> Among several other elements, the European Parliament:

“[W]elcomes the consideration of rules covering the whole supply chain to ban routine venting and flaring in the energy sector up until the point of production ... considers that feedstock uses of fossil gas and oil, including for non-energy purposes such as to produce petrochemicals, should be included in such a proposal[.]”<sup>12</sup>

The European Parliament also:

“Notes that fossil gas and oil are used in the energy and petrochemical sectors and that both sectors therefore contribute to the methane emitted at fossil gas and oil well pads and processing plants; notes that according to the International Energy Agency, petrochemicals account for 8% and 14% of total primary demand for fossil gas and oil and that these shares are bound to increase; calls on the Commission to ensure that MRV and LDAR obligations and routine venting and flaring rules apply equally to fossil gas and oil used in the petrochemical sector[.]”<sup>13</sup>

These potential differences in coverage — whether or not petrochemicals are included in the regulation and whether those requirements apply to the full supply chain — will determine whether the Methane Strategy comprehensively deals with a dangerous source of greenhouse gases or whether it excludes some of the most rapidly growing sources of methane emissions. As the research summarized in this document makes clear, excluding the emissions from the petrochemical and plastics supply chain would create an enormous loophole in Europe’s climate policy.<sup>14</sup>

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<sup>11</sup> See [Resolution on an EU strategy to reduce methane emissions](#), Parl. Eur. Doc. P9\_TA(2021)0436.

<sup>12</sup> *Id.* at para. 20.

<sup>13</sup> *Id.* at para. 21.

<sup>14</sup> For more analysis of the ongoing developments around the Methane Strategy, see Andy Gheorghiu, [Exploring innovative ways to bring down methane emissions in the energy sector](#), Energy Transition (Oct. 26, 2021).

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Rethink Plastic, part of the Break Free From Plastic movement, is an alliance of leading European NGOs working towards ambitious EU policies on plastics. It brings together the Center for International Environmental Law (CIEL), ClientEarth, Environmental Investigation Agency (EIA), European Environmental Bureau (EEB), European Environmental Citizen's Organisation for Standardisation (ECOS), Greenpeace, Seas At Risk, Surfrider Foundation Europe, and Zero Waste Europe. Together they represent thousands of active groups, supporters and citizens in every EU Member State working towards a future free from plastic pollution.