

Acute	Chronic	Legal and policy	Market	Technology	Reputational
Physical risk		Transition risk			

## Formosa Penalized Over Plastic Pellets, But Real Risk Is in Shift to New Materials

Formosa Plastics, a vertically-integrated supplier of plastic resins and petrochemicals, agreed to a \$50 million settlement with local environmental groups in October 2019 to redress damage caused by the discharge of plastic pellets from its Texas facility. This incident, and penalties imposed by the US Environmental Protection Agency, inspired further citizen-led lawsuits against the company in Louisiana, culminating in the court's suspension of permits for a proposed \$9.4 billion complex in the state.

Formosa's case is emblematic of the transition risk facing the materials sector. Regulators are becoming more attuned to the environmental impacts, and governments, consumer packaged goods companies and supranational organizations are developing plans to transition away from consumer plastics.

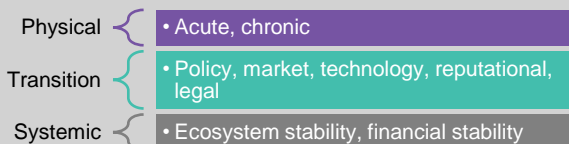
**50%** Share of gross value added in the direct operations of the materials sector that is moderately or highly nature-dependent

**\$50 million** Settlement paid by Formosa Plastics to clean up plastic-pellet pollution

**\$9.4 billion** Value of Formosa manufacturing facility suspended by citizen lawsuit

### Nature risk explained

Nature-related risks are the **physical**, **transition** and **systemic** threats posed to an organization as a result of its dependencies and impacts on the natural world. Each comprises specific risk types:



### Manifestation of nature risk

Established in Taiwan in 1954, Formosa Plastics Corporation (TPE: 1301) is one of the largest polyvinyl chloride (PVC) resin manufacturers globally, operating a large facility in Point Comfort, Texas since 1983. By 2016, residents of the surrounding area had grown concerned about the number of small plastic resin pellets in the nearby San Antonio Estuary.

Known as 'nurdles', these pellets are the building blocks of almost all plastic products. They are produced by refining oil and natural gas, then transported by truck, rail and ship to plastics manufacturers who melt and mold them into myriad consumer items. The pellets are persistent pollutants, degrading into microplastics. Animals mistake them for prey, and ingestion can result in stomach ulcerations and bioaccumulation of the toxic substances and pathogens that can be carried by microplastics.

It takes 600 nurdles to make one small plastic bottle. Over 11 trillion are estimated to enter oceans each year. In Formosa's case, from 2016 (or before) until the time of writing, nurdles have flowed out of the wastepipes of its Texas plant, entering adjacent Cox Creek and Lavaca Bay to the detriment of various marine and coastal species.

In April 2017, a group of San Antonio volunteers sued Formosa under the US Clean Water Act. Evidence in the 2019 trial included 2,428 samples of over 46 million nurdles collected from the estuary over a three-year period and alleged to have originated from the Formosa facility. While the Clean Water Act made allowances permitting Formosa Plastics to discharge "trace amounts" of plastics into US waterways, this

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evidence indicated the company's impact on the environment was significantly larger. The court found Formosa guilty of violating its permit conditions, largely based on the evidence presented by activists.

The penalties were not the first time Formosa had come under fire for mishandling its environmental impacts. The company had previously been fined for a number of infringements including improper disposal of wastewater, leaks of air pollutants, hazardous waste, and poor risk management. Other facilities – notably a comparable plant in Louisiana – similarly failed to manage their nature impact. The [EPA's Enforcement and Compliance History](#) database houses details of past cases - access by searching "Formosa".

### Selected penalties issued to Formosa by the EPA for violations at its Texas Point Comfort plant

Date	Alleged violations	Penalty
<u>Feb 1991</u>	Land disposal and treatment, permit violation, container requirements	\$3.375 million
<u>Jan 2022</u>	Multiple pollution releases and inadequate risk management plan, discovered in 2015 audit	\$2.85 million
<u>Feb 2010</u>	Failure to regulate leaks of air pollutants, hazardous waste, and wastewater discharge	\$600,000
<u>May 1997</u>	Failure to meet standards for hazardous air pollutants	\$150,000

Source: BloombergNEF, US EPA. Note: Date refers to the "final order entered" date from EPA records.

### Financial and reputational impacts on Formosa Plastics

Formosa agreed to mitigation payments totaling \$50 million over five years to support rehabilitation projects and undo damage to waterways, public beaches, and local marine life. It also committed to reach "zero discharge" of plastic pellets from the Point Comfort facility by 2024, requiring deployment of technology costing up to another \$50 million, on top of monitoring and other enforcement costs. While the direct impact of the settlement was negligible relative to the firm's

\$6.7 billion revenue in 2019, the incident signaled the onset of a more difficult period for Formosa.

Analyses from [Bloomberg Intelligence](#) and the [Institute for Energy Economics and Financial Analysis](#) project slow growth for Formosa Plastics revenues to 2025. While this is a trend across the broader plastics sector due to higher input costs squeezing margins, the fallout from Texas has spotlighted the company's exposure to nature-related risks.

A \$9.4 billion industrial complex announced in 2018 in St. Louis Parish, Louisiana, was intended to be a key part of Formosa's North America growth plans. Comprising 14 plastic manufacturing plants over 2,300 acres, it immediately attracted strong local opposition over potential pollution. Despite these concerns, the Louisiana Department of Environmental Quality (LDEQ) granted the project permits under the Clean Air Act. Inspired by the lawsuit brought against Formosa in Texas, local citizen activist groups appealed the issuance of permits. In 2021, President Biden cited the area in an executive order directing federal agencies to prevent disproportionate harm to communities resulting from climate change and pollution, leading to the revocation of the permits by a Louisiana district court in September 2022.

### Nature risk across the materials industry

The plastics value chain is complex, entailing interactions with nature at each stage, from extraction of raw materials to processing and waste disposal, and exposing manufacturers to significant risks. These risks can be physical (such as limited access to water sources), transitional (regulation that hampers production), or systemic (global trade flows collapsing due to a breakdown in ecosystem services, for example). These risks stem from companies' impacts and dependencies on nature.

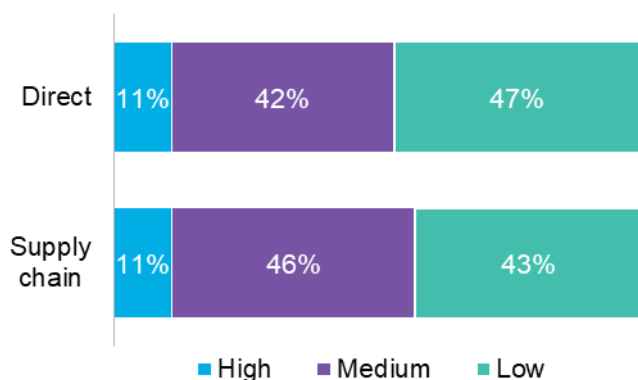
The ENCORE nature tool describes the production of specialty chemicals as having significant impacts on nature. It identifies seven impact drivers of nature loss in the industry, with water use, terrestrial ecosystem use, emissions, waste, and water and soil pollutants

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classified as highly or very highly material, as evidenced by the Formosa Plastics case.

Likewise, the materiality matrix finds seven nature dependencies in the industry, though only groundwater and surface water are classed as highly material. Additionally, over 50% of direct and supply chain gross value added in the materials industry is moderately or highly dependent on nature, according to the World Economic Forum.

### Nature dependency of gross value added across the chemicals and materials sector



Source: World Economic Forum, BloombergNEF.

Numerous examples of companies impacted by nature risk exist across the plastics value chain. Staying within plastic pellet production, the cases of Frontier Logistics, Ducor, Styropek and ExxonMobil highlight the legal and reputational risks that companies face and demonstrate that the challenges faced by Formosa are not an outlier in the industry.

A study published by the Minderoo Foundation, supported by the UN Environment Programme's Finance Initiative, found pollution litigation against petrochemical companies in the US may cost petrochemical companies, consumer goods producers, and their insurers in excess of \$20 billion by 2030.

Regulation in the plastics sector presents a major source of risk to companies as governments and supranational organizations seek to rein in harmful practices. The European Commission has proposed

regulation to prevent plastic pellet losses during manufacture, including proposals for mandatory measurement and reporting. The Plastic Pellet Free Waters Act was introduced in the US Senate for the third time in July 2023. If passed, this would require the EPA to prohibit the discharge of plastic pellets into waterways. The UK, Canada and the EU have all set minimum targets for post-consumer recycled content for plastics that will come into force by 2030.

### Similar cases of nature risk from nurdle pollution

Company	Risk type	Description
<b>Frontier Logistics</b>	Legal and reputational	\$1.2 million settlement to clear up plastic pellet pollution from a facility in Charleston, South Carolina, in 2021. The company also agreed to allow an independent auditor to assess nurdle pollution at the plant and follow its recommendations.
<b>Ducor</b>	Legal and reputational	Found to be contributing to plastic pellet pollution in Rotterdam harbor in 2020, Ducor must now prevent pellet loss or face a €15,000 (\$16,000) fine per infringement.
<b>Styropek</b>	Legal and reputational	Received notice of intent to sue in October 2023 due to allegations of plastic pellet pollution violating Pennsylvania's Clean Water Act. The company said that it is evaluating the allegations.
<b>ExxonMobil</b>	Legal, criminal and reputational	Following activist pressure, ExxonMobil agreed to report on plastic pellet spills in 2019. California's Department of Justice is taking legal action against the company, alleging they deceived the public about the harmful effects of plastic pollution.

Source: BloombergNEF.

A legally binding agreement on plastic pollution is expected by 2024, with the backing of 175 UN members. In 2022, the UN announced a \$2.6 trillion plastic pollution plan, which laid out a scenario in which "mismanaged plastic waste" could be reduced by 80% by 2040. Notably for plastics manufacturers, this suggests cutting investment in virgin plastic production

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by a total of \$2.2 trillion by 2040. The UN claims this scenario would avoid \$3.3 trillion of externalities such as ocean clean-up and air pollution, suggesting \$1.7 trillion should be invested in developing sustainable plastic substitutes. For more information on the UN's plastic proposal, see *UN's \$2.6 Trillion Plastic Pollution Plan Still Not Enough* ([web](#) | [terminal](#)).

Companies are also facing downstream pressure. Brand owners such as Nestle, Danone, Mondelez and Unilever have committed to reducing the amount of virgin plastic in their supply chain and ensuring that 100% of their packaging will be recyclable, reusable or compostable by 2025.

### Managing nature risk

With growing awareness of the harmful impacts of plastic production spurring market and regulatory change, companies are beginning to respond, though slowly. BNEF has assessed how 20 of the largest plastic producers have integrated nature and biodiversity into their strategies; a sample of the findings is compiled in the adjacent table. A comprehensive scoring of plastics manufactures based on sustainability and emissions indicators can be found in the *Circular Economy Company Ranking Tool* ([web](#)).













Policies are in their infancy. While Borealis and INEOS have set ambitious targets for 100% recyclable, reusable, compostable or recoverable packaging by 2025, only TotalEnergies has set a tangible biodiversity protection target – net-zero deforestation at its new sites – and only Lotte Chemical has committed to zero water pollution. Neither has provided a date by which these targets will be reached.

Lyondell Basell, INEOS, Dow and Borealis have committed to zero plastic pellet discharge targets, but none have provided a date for achieving this target. Formosa Plastics did not mention its commitment to zero plastic pellet discharge in Texas in its 2022 annual report. It is unclear whether they intend to achieve this by 2024, as promised in the settlement.

The slow progress of companies in the sector suggests that not enough is being done to mitigate risk. Better

identification, assessment and disclosure of nature-related impacts and dependencies will inform business and investor understanding of nature-related risks in the industry and increase the likelihood of preventative actions being taken.

### Water pollution, waste and nature targets of selected large plastics manufacturers by revenue

Company	Water pollution reduction target	Zero plastic pellet discharge target	Nature protection target
 TotalEnergies			Blue
 SINOPEC			
 سابك sabic			
 Lyondellbasell		Blue	
 ExxonMobil			
 INEOS		Blue	
 Braskem			
 Dow		Blue	
 LOTTE CHEMICAL	Blue		
 BOREALIS		Blue	
 Formosa Plastics			
 Hanwha			

Source: BloombergNEF. Note: Blue indicates target in place. Applies to company-wide commitments, not individual projects.

### More from BNEF:

Theme: *Decarbonizing Petrochemicals* ([web](#))

Research Series: *Circular Economy* ([web](#))

*Sustainable Materials Market Outlook 4Q 2023* ([web](#) | [terminal](#))

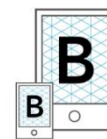
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