

DIRTY THIRTY

CAN THE TOP 30 PUBLICLY TRADED SINGLE-USE PLASTIC COMPANIES CLEAN UP THEIR MESS?

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Key Takeaways

- In 2019, 30 publicly traded companies - **the Dirty Thirty** - produced 58% of single-use plastic (SUP)ⁱ. The top 10 - *ExxonMobil, Dow, Indorama, Sinopec, LyondellBasell, PetroChina, Alpek, Aramco, Reliance and Braskem* - were responsible for 39%.
- The Dirty Thirty footprint is highly concentrated in a few clusters, including the US Plastic Production Corridor and the EU Trilateral Chemical Region.
- The top ten equity and top ten fixed income investors own 76% and 43% of the Dirty Thirty's equity and debt respectively. BlackRock, Vanguard and Capital Group are on both lists.
- The Dirty Thirty's SUP supply chain encompasses multiple risk factors ranging from carbon and other emissions, end-product waste and operational spills. The industry poses threats to society and human health, with amplified effects often felt by more marginalised or vulnerable communities.
- As a result of its wide-ranging impact, the industry is more exposed than others to regulation, policy change and legal challenges. The Dirty Thirty in particular are experiencing increasing pressure from business clients to meet 2025 SUP reduction commitments, increasingly viewed as accountable for combatting plastic pollution.
- Plastic pollution is forecast to triple by 2040,ⁱ with 80% expected to come from SUP. Without serious change, by 2050, in a 1.5°C scenario, plastic lifecycle emissions are forecast to make up roughly 13% of carbon budgets.ⁱⁱ
- Solving the plastic pollution crisis, including the pollution from plastic production itself - for example, GhG emissions and toxic chemical releases - will play a key role in addressing the climate crisis and achieving goals outlined in the Paris Agreement.
- Both solutions and green financing are available for companies looking to retool towards sustainable plastic production, but uptake is slow among the Dirty Thirty, many of whom appear to be adopting a wait-and-see approach.





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¹ An unrealised gain is a potential profit that exists on paper, resulting from an investment. It is an increase in the value of an asset as SUP are defined by the American Chemistry Council as Packaging applications and single-use Consumer and Institutional Products.



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Executive summary

Single-use plastics (SUP) pose a triple threat to our earth, harming the natural environment, animal and human health. And while COVID-19 saw cleaner air and lower fuel consumption, single-use plastic consumption soared with the demand for personal protective equipment and hygiene measures surrounding food packaging.

While SUP inputs and outputs are expansive, making it difficult for consumers to gain meaningful insight into the supply chain, production and financing are highly concentrated.

Production is concentrated in four key regional clusters around the globe - the US Plastic Production Corridor on the Louisiana Gulf Coast; the EU Trilateral Chemical Region covering Belgium, The Netherlands and North West Germany; the Eastern Province in the Kingdom of Saudi Arabia; and Jiangsu Province, China. A small number of equity and fixed income investors own 76% and 43% of the Dirty Thirty's equity and debt respectively. BlackRock, Vanguard and Capital Group are on both lists. The Dirty Thirty themselves - the 30 largest publicly traded SUP companies - accounted for 58% of global SUP production and 57% of total SUP revenue globally in 2019.

While in some circumstances this concentration allows for economies of scale, thus improving efficiency of resource usage, it also poses a risk to companies, production facility clusters and investors by creating an over-dependency on SUP production. This could lead to heightened economic risk if this were to be affected by severe weather events or reduced consumer demand as anti-plastic sentiment spreads.

Momentum for a global plastics treaty to regulate plastic pollution is growing. To meet the expectation of consumers, regulators, key world leaders and influencers, the Dirty Thirty must pivot the plastics industry away from SUP to zero-waste plastic.

regulate





With such a daunting task at hand, many in the Dirty Thirty may be uncertain how to make the first move. Environmental justice issues are complex and involve change from the ground up. Industry, trade associations, brands, civil society and governments have produced exhaustive analysis and developed clear, accessible and well-analysed roadmaps that would decrease the climate, natural environment and health impacts of SUP production while improving the sector's investment outlook. More than half of these roadmaps are ready for implementation at scale in the near-term.

Solutions include pre-, during and post-production options, ranging from employing sustainability-by-design, to eliminating shedding of micro- and nano-particles, to increasing sustainable recycling and improving post-processing.

commitment

Without the commitment of the Dirty Thirty, meaningful SUP reduction is unlikely. Clients and global stakeholders are now calling on them to implement a transparent, step-by-step programme to reduce the harm and prevalence of SUP while simultaneously improving investment outlook. They must **develop and implement a whole-of-business strategy to decrease SUP waste to zero tonnes** by fully embracing their engineering and innovation roots.

At the same time, the investment community has a vested interest in facilitating the industry's transition to more sustainable production processes. Investors should **engage the Dirty Thirty to immediately reduce their SUP and climate risk** to mitigate valuation decline, **require the companies they invest in to publish time-bound, stepwise plans** to decrease their absolute SUP production and **lead by example** to decrease environmental impacts from SUP waste production, use and material management.

lead by example



Uncovering the Dirty Thirty

Who are the Dirty Thirty?

Out of 291 public and private companies producing SUP assessed by Planet Tracker in 2021 (based on 2019 data), we selected 30 publicly traded companies - **The Dirty Thirty** - which accounted for 58% of global SUP revenue (almost USD 69 billion) and 57% of global SUP volume (almost 60 million tonnes) - see Figure 1 and Table 1.

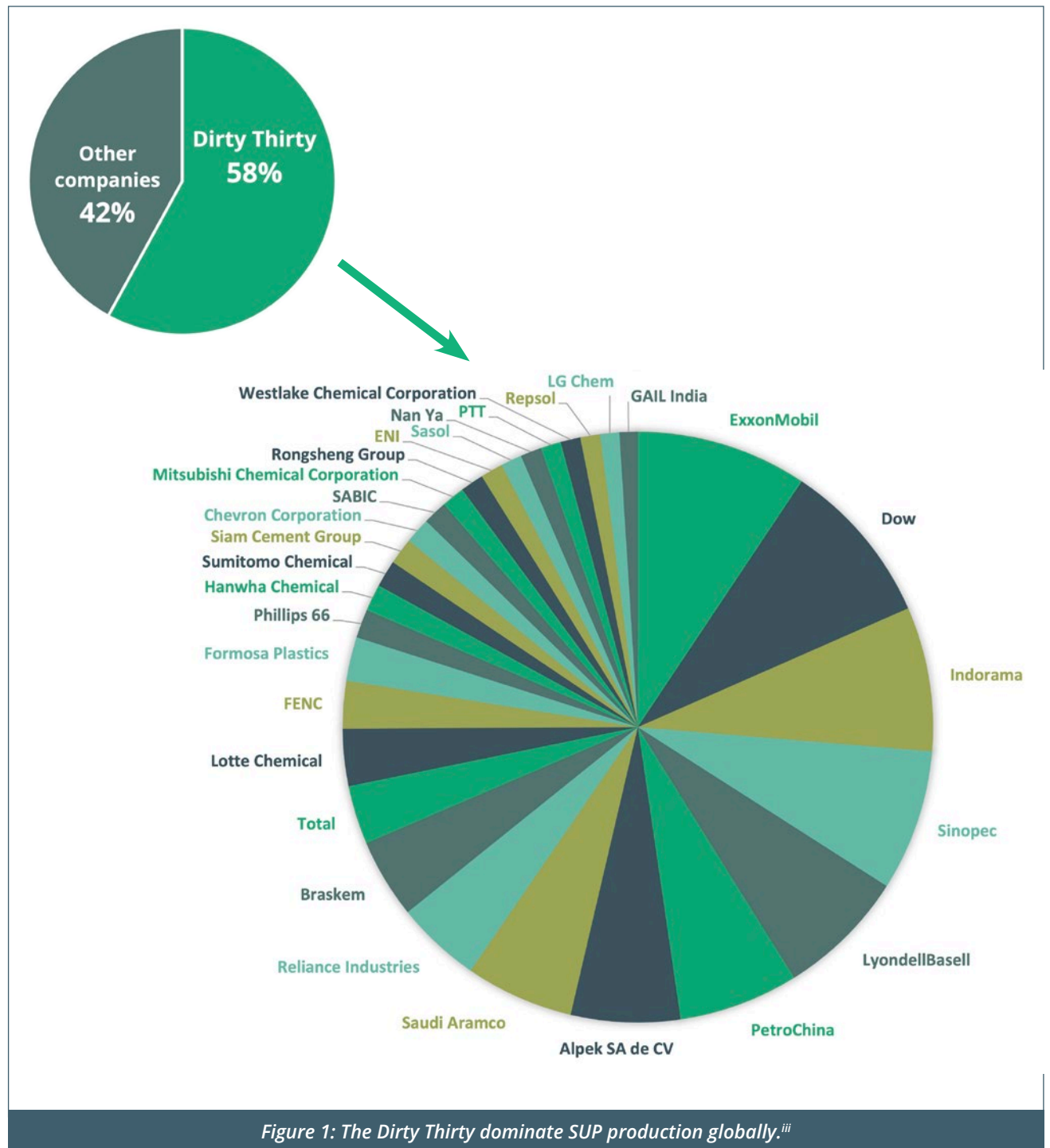


Figure 1: The Dirty Thirty dominate SUP production globally.ⁱⁱⁱ



Table 1: The Dirty Thirty responsible for 58% of global SUP production and 57% of global SUP revenue, 2019.^{iv}

Rank	Company	2019 SUP Revenue		2019 SUP Production		% Plastic Revenue / Total Revenue 2019	Bloomberg Ticker
		USD millions	% of industry	kt	% of industry		
1	ExxonMobil	6,451	5.4%	5,894	5.6%	3%	XOM US Equity
2	Dow	6,223	5.2%	5,555	5.3%	14%	DOW US Equity
3	Indorama	5,437	4.6%	4,249	4.1%	48%	IVL TB Equity
4	Sinopec	5,320	4.5%	4,776	4.6%	1%	386 HK Equity
5	LyondellBasell	4,866	4.1%	3,913	3.7%	14%	LYB US Equity
6	PetroChina	4,524	3.8%	3,988	3.8%	1%	601857 CH Equity
7	Alpek	4,110	3.5%	2,743	2.6%	66%	ALPEKA MM Equity
8	Aramco	4,078	3.4%	3,450	3.3%	1%	ARAMCO AB Equity
9	Reliance	3,197	2.7%	3,117	3.0%	4%	RIL IN Equity
10	Braskem	2,989	2.5%	2,843	2.7%	22%	BRKM5 BZ Equity
11	Total	2,220	1.9%	1,827	1.7%	1%	FP Equity
12	Lotte Chemical	2,150	1.8%	2,056	2.0%	17%	011170 KS Equity
13	FENC	1,789	1.5%	1,580	1.5%	22%	1402 TT Equity
14	Formosa Plastics	1,653	1.4%	1,561	1.5%	25%	1301 TT Equity
15	Phillips 66	1,074	0.9%	1,023	1.0%	1%	PSX US Equity
16	Hanwha Chemical	1,018	0.9%	934	0.9%	2%	000880 KS Equity
17	Sumitomo Chemical	1,010	0.9%	957	0.9%	5%	4005 JT Equity
18	Siam Cement	995	0.8%	993	0.9%	7%	SCC TB Equity
19	Chevron	970	0.8%	934	0.9%	1%	CVX US Equity
20	SABIC	902	0.8%	806	0.8%	8%	SABIC AB Equity
21	Mitsubishi Chemical	881	0.7%	831	0.8%	3%	4188 JT Equity
22	Rongsheng	872	0.7%	834	0.8%	7%	002493 CS Equity
23	ENI	849	0.7%	585	0.6%	1%	ENI IM Equity
24	Sasol	791	0.7%	635	0.6%	6%	SOL SJ Equity
25	Nan Ya	791	0.7%	576	0.6%	9%	1303 TT Equity
26	PTT	773	0.7%	766	0.7%	1%	PTT TB Equity
27	Westlake	745	0.6%	649	0.6%	9%	WLK US Equity
28	Repsol	745	0.6%	517	0.5%	1%	REP SM Equity
29	LG Chem	720	0.6%	679	0.6%	3%	051910 KS Equity
30	GAIL	687	0.6%	706	0.7%	7%	GAIL IN Equity
Total Top 30 Publicly Traded		68,830	58.0%	59,977	57.3%		
Global Total All Companies		118,702	100.0%	714	100.0%		



The Dirty Thirty are well-known companies. They are the gatekeepers of the SUP production supply chain and hold ultimate responsibility for reducing the prevalence and impact of SUP.

Yet they are not known collectively as the group responsible for the majority of SUP production - see Figure 2. This is the first time they have appeared together on a list of this kind. This list was arrived at via the methodology outlined in Appendix 1.



Figure 2: The Dirty Thirty - the 30 listed companies responsible for 58% of global SUP production and 57% of global SUP revenue. Companies are ranked horizontally from left to right by SUP revenue, meaning highest revenue is ExxonMobil at #1 and lowest is GAIL at #30.^{iv}

Mapping the Dirty Thirty to empower investors

The Dirty Thirty footprint is highly concentrated in a few clusters, including the US Plastic Production Corridor and the EU Trilateral Chemical Region. While, in some circumstances, this allows for economies of scale, thus improving efficiency of resource usage, it also creates an over-dependency on SUP production and heightened economic risk if this were to be curtailed.

Table 2: SUP revenue (USD millions) and SUP production (kt), 2019.^{vi}

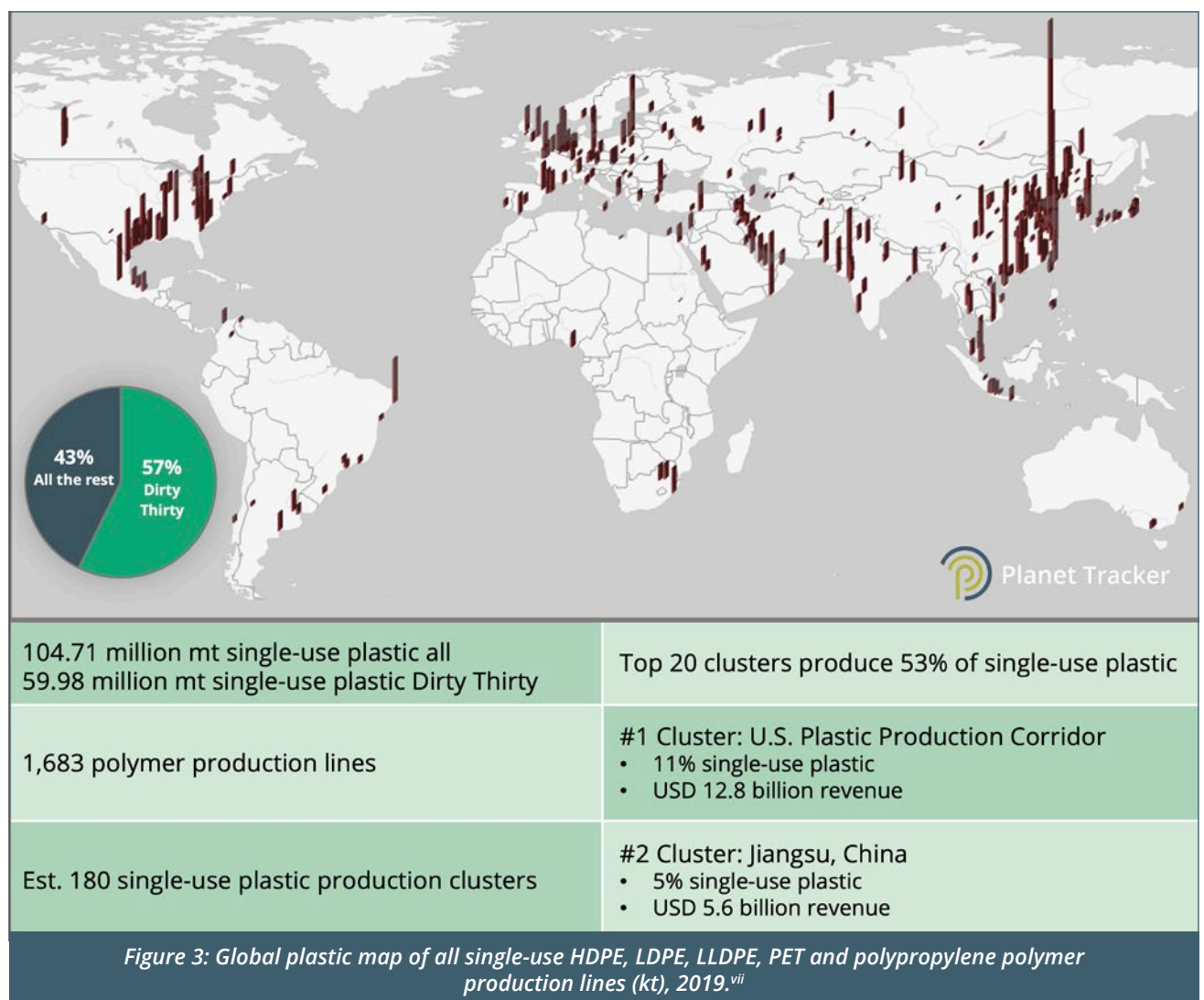
Sector Assessment	2019 SUP Revenue		2019 SUP Production	
	USD millions	% of industry	kt	% of industry
Global	118,702	100.0%	104,714	100.0%
Top 100	106,007	89.3%	93,196	89.0%
Top 30 Publicly Traded	68,829	58.0%	59,977	57.3%
Top 20 Publicly Traded	60,975	51.4%	53,199	50.8%
Top 10 Publicly Traded	47,193	39.8%	40,528	38.7%



In the US Plastic Production Corridor cluster, which runs along the US Gulf Coast in Texas and Louisiana, capacity and production is forecast to continue growing until 2035, despite increasing climate risks from storms, sea-level rise and storm surges, causing the growing possibility of stranded assets of USD 16 billion in the short-term (by 2021) and USD 45 billion over the mid-term (by 2025) (see Stormy Outlook).

Mapping SUP production by location empowers investors to better measure, monitor and manage their risks and opportunities. Knowing where their investments are means they can then manage them for location-based physical risks, such as climate change, chemical pollutants in the environment and health risks facing workers and surrounding communities. For example, companies may face increasing costs associated with litigation, remediation projects and tighter regulations, all of which are better understood when illustrated and mapped.

Planet Tracker found that, for each of the five polymers responsible for SUP production, production is clustered within a few regions dominated by the Dirty Thirty - see Figure 3.





Globally, out of an estimated 180 different SUP production clusters,² just 20 are responsible for 53% of global SUP production. This is led by the US Gulf Plastic Production Corridor at 11% with 11.8 million tonnes and USD 12.8 billion in revenue in 2019, followed by Jiangsu, China; Eastern Province, Kingdom of Saudi Arabia and the EU Trilateral Chemical Region³.

In summary, the Dirty Thirty have the controlling market share across all five single-use plastic polymers – see Figure 4.

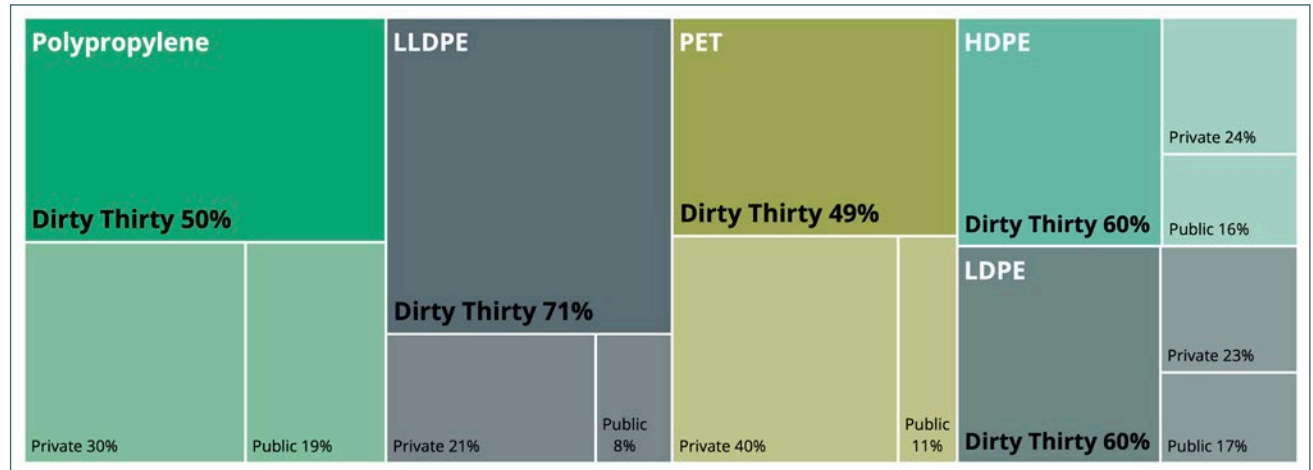


Figure 4: The Dirty Thirty's market share across all global SUP production (%), 2019.^{viii}

Understanding the Dirty Thirty's supply chains to help align plastic commitments

The Dirty Thirty's primary clients consist of those in the Plastic Containers & Packaging (PC&P) sector, in which 83 companies are responsible for 93% of revenue by publicly traded companies (see Unwrapping Investor Risk). These PC&P companies sell plastic products to the majority of the world's fast-moving consumer goods companies.^{ix}

Plastic commitments must be aligned across commercial relationships between buyers' cost of goods sold and sellers' revenue to mitigate risks of non-performance. Being able to map the Dirty Thirty's supply chains in detail will help achieve this.



² Defined as a loose association of chemical production facilities connected via shared transport infrastructure by which they share chemicals, energy and other resources.

³ With a turnover of EUR 180 billion and more than 350,000 persons employed in the chemical industry (2015), the trilateral region of North Rhine Westphalia, Germany, Flanders, Belgium and the Netherlands is home to one of the world's largest plastics production clusters.



Case study: assessing supply chain commitments across business relationships - Unilever

Unilever buys directly from both PC&P companies and from the Dirty Thirty. Unilever also sells its products, containing PC&P materials, directly downstream to, for example, store groups such as Walmart - which provides Unilever with 6.8% of its revenue and represents 1.0% of Walmart's cost of goods sold.^x

Unilever's costs of goods from buying from the PC&P companies Amcor and AptarGroup and from the Dirty Thirty Company LyondellBasell are 1.0%, 0.5% and 1.1% respectively - see Figure 5.^{xi}

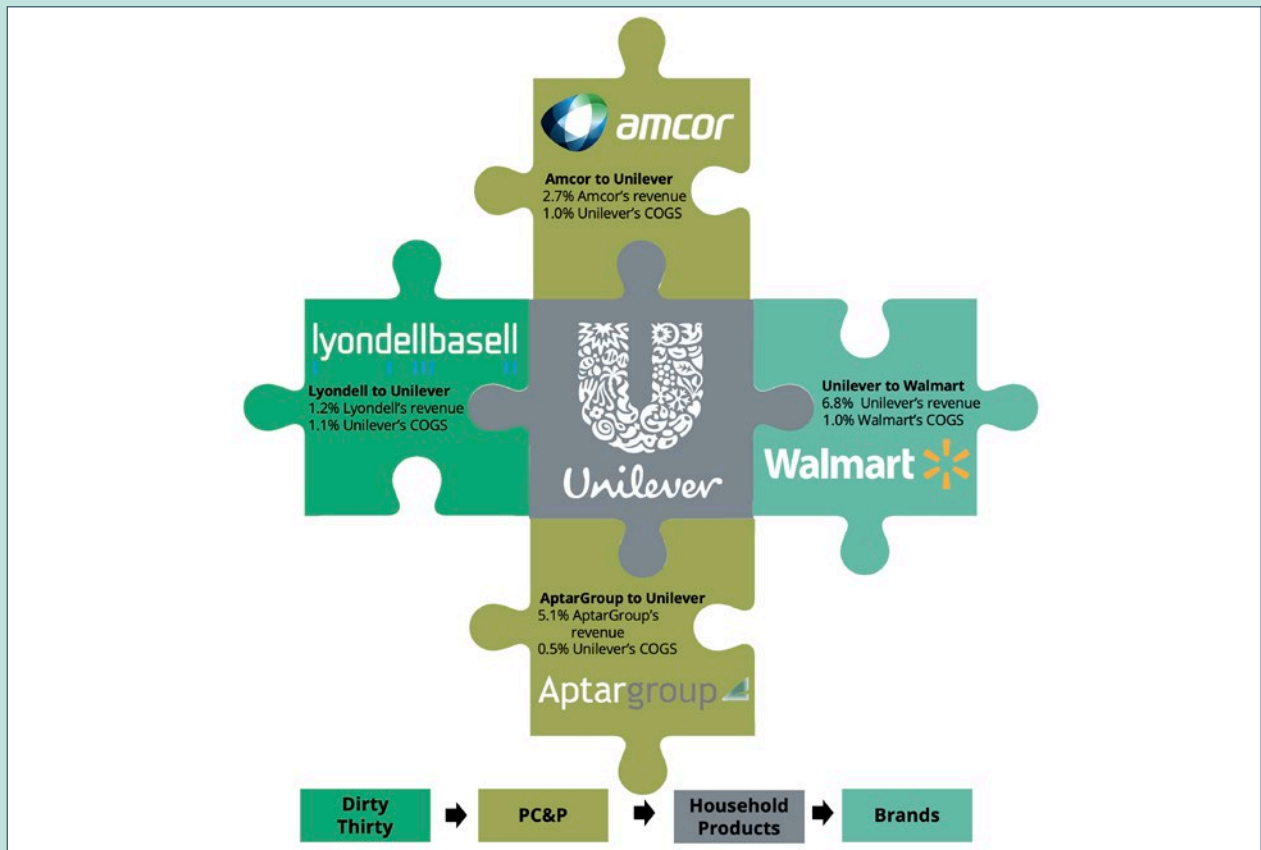


Figure 5: The Dirty Thirty's interconnected supply chains.^{xii}

By 2025, Unilever's plastic commitment is to:^{xiii}

- halve the use of virgin plastic, by reducing the company's plastic packaging by more than 100,000 tonnes;
- help collect and process more plastic packaging than Unilever sells – accomplished by investing in recycling, collecting waste directly or via offsets potentially, funding waste collection jobs and others' strategies;
- ensure that 100% of Unilever's plastic packaging is designed to be fully reusable, recyclable or compostable; and
- increase the use of post-consumer recycled plastic material in its packaging to at least 25%.

As Unilever's plastic commitment is material to 1.2%, 2.7% and 5.1% respectively of LyondellBasell's, Amcor's and AptarGroup's revenue,^{xiv} all three companies should ensure they can support Unilever's plastic commitment to maintain and grow their commercial relationship.



Case study: matching customer reduction commitments - Indorama & Nestlé

Indorama reports 0.7% of its revenue from sales to Nestlé, equal to 0.2% of Nestlé's cost of goods sold.

^{xv} If Indorama wishes to maintain its client relationship with Nestlé, it should therefore match or exceed Nestlé's SUP reduction commitments which include "commitment is that 100% of our packaging is recyclable or reusable by 2025"^{xvi} along with "up to CHF 2 billion (USD 2.2 billion) to lead the shift from virgin plastic to food-grade recycled plastic, and to accelerate the development of innovative packaging solutions".^{xvii}

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SUP: a triple-threat for climate, environment and health

The vast majority of plastic discarded into municipal waste streams and littered globally is SUP, with over 115 million metric tonnes discarded in 2019.^{xviii, xix} From five to 13 million tonnes enter the oceans annually.^{xx}

To solve the climate crisis, solve the plastic crisis

The plastic sector is a huge, often unacknowledged contributor to carbon emissions on several different fronts.

- Plastics production makes up approximately 9% of global oil production and rising (measured in million barrels per day).^{xxi} This is similar to all emissions associated with global commercial real estate and greater than aviation and shipping combined.^{xxii, 4}
- Carbon typically amounts to 50% to 80% of the weight of plastics.^{xxiii}
- The EU plastic supply chain for chemicals production and converting polymers to plastics resulted in emissions of approximately 178 million mtCO₂e in 2018.^{xxiv}

By 2050, plastic's lifecycle emissions, from production to incineration, could be 2.75 gigatons of CO₂e annually, or 56 gigatons in total, equalling 10% to 13% of the entire remaining carbon budget within the 1.5°C scenario.^{xxv}

If rising SUP production is allowed to continue, the plastics industry will prevent nations globally from decarbonizing their economies and meeting their Paris Agreement commitments in order to decrease their absolute GhG emissions within predetermined timeframes.

Unfortunately, there is already significant global investment committed to further expand plastic infrastructure, with USD 56 billion planned from 2021-2025 in the US alone (see Stormy Outlook).

In China, from 2020 to 2023, Bloomberg Finance L.P. forecasts that ethylene, a key basic chemical feedstock for SUP, may increase production by 82% or 21 million tonnes as 18 new production facilities are scheduled to become operational.^{xxvi}

Toxic chemicals and public health

From ingested microplastics to toxic chemical releases, current plastic production is bad for our environment and our bodies. Plastic can enter our systems via inhalation, ingestion or skin contact, it can have a range of effects on our body, from infertility to illnesses like diabetes, asthma and endocrine disruption. It can even prove fatal in the worst cases.^{xxvii}

Beyond immediate impact, SUP is also problem for the wider environment in the long-term. The single use nature necessitates either burial, dumping, burning, or the rare down-cycling into lower-value, lower quality products, all of which involve carbon emissions and other toxic releases.^{xxviii}

At the same time, the fossil fuel extraction process to create plastic spews many dangerous pollutants into our environment, including sulphur oxides, nitrogen oxides, volatile organic compounds, chlorinated and other toxic organic chemicals.^{xxix} More are then released during the plastic production process, including benzene,^{xxx} a known human carcinogen.

⁴ Benchmark year is 2016. Commercial real estate sector is 6.6%, aviation sector is 1.9%, and shipping sector is 1.7%.



In the US, the Plastic Production Corridor in Louisiana and Texas is associated with much higher cancer rates than the national baseline. As a result, this industry-intensive area is locally known as Cancer Alley.^{xxxix}

Louisiana is also uniquely vulnerable to climate change, which induces sea-level rise and storm surges. Of the 20 parishes in Louisiana's eroding Coastal Zone, 19 are home to plastics' plants which were responsible for a total 42,096 lbs of toxic releases in 2019 alone.^{xxxix} For residents of the state of Louisiana, the chemical releases and natural disasters are intertwined and leave communities under constant threat.

Example: European toxic chemicals analysis

In 2017, according to the European Industrial Emissions Portal, the EU27 plastic sector (sector 4(a) and its sub-sectors) had up to 2,167 toxic chemical releases that exceeded legal and regulatory limits across all pollutant categories: chlorinated organic substances, heavy metals, inorganic substances, other gases and substances and related categories. This was equal to 53% of all toxic chemical sectors from the overall chemical sector. Most EU plastic production toxic chemical releases occurred either via air (58.2%) or water (41.3%) - see Table 3.^{xxxix}

Table 3: EU27 toxic chemical releases from plastic production, 2017.^{xxxix}

Where Toxic Chemical Releases Occur	Total toxic chemical release events	Percent of total
Air	1,261	58.2%
Water	895	41.3%
Land	8	0.4%
Confidential	3	0.1%
Total	2,167	100.0%



Embedded in our environment

Currently, 11 million tonnes of plastic waste pollutes the ocean each year.^{xxxv} The rate of plastic pollution is forecast to triple by 2040, with 80% from flexible and multilayer plastic, which are often transported as nurdles.^{xxxvi}

Nurdles are lentil-sized pellets (1 mm) which are the foundation of most everyday plastic products.^{xxxvii} Nurdles are heated and formed into the plastic products we use - and throw away - each day: bottles, wrap, film, plastic in clothes, and many other items. Nurdles are frequently spilled, entering the environment and the food chain, often via seafood like mussels, oysters and anchovies.^{xxxviii, xxxix}

Because plastic pollution is so prevalent globally, the European Space Agency (ESA) Sentinel-2 satellites are now being used to actively track plastic pollution in the high seas.^{xl} Analysis by Australia's national science agency - Commonwealth Scientific and Industrial Research Organisation (CSIRO) - demonstrates that there are more than 14.4 million tonnes of microplastics embedded in the floor of the Earth's oceans^{xli} - see Figure 6.

The environmental impacts of plastic pollution are also having knock-on effects on global economies. Each tonne of plastic in our marine environments has an estimated USD 33,000 annual cost to marine natural capital.^{xlii}

Investors and companies must act now to address these material climate, environmental and health costs associated with plastic production by focusing on producing sustainable, zero-waste plastic that downstream businesses are demanding to meet consumer sentiment.

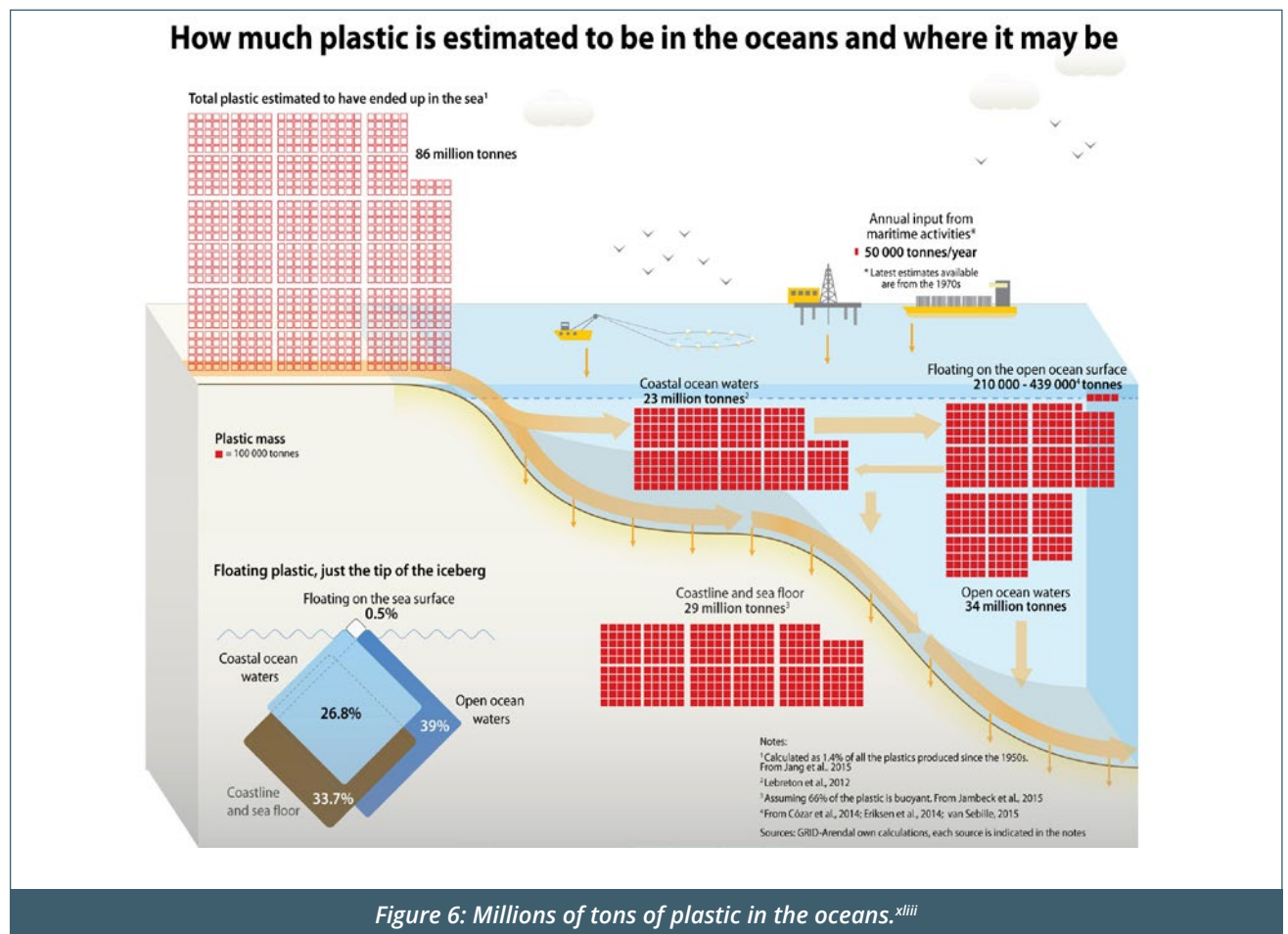


Figure 6: Millions of tons of plastic in the oceans.^{xliii}



Case study: 750 million plastic pellets spill into the Mississippi River

On 2 August 2020, in New Orleans, the container ship CMA CGM Bianca^{xliv}, spilled 750 million nurdles produced by Dow Chemical when a 40-ft container fell off the vessel's deck after it became adrift from Napoleon Avenue Wharf.^{xlv}

CMA CGM is the 3rd largest container shipping company globally, with 557 ships and more than 3 million 20-ft equivalent units (TEU).^{xlvi}

"I cried. It was that bad," said Liz Marchio, National Parks Service science educator. "They were like snowdrifts piled up. Inches deep with the river sloshing around."^{xlvii}

For clean-up, CMA CGM, who reported USD 31.4 billion in revenue in 2020,^{xlviii} hired two men to use leaf blowers to blow the nurdles into the Mississippi River and then try to scoop them out - see Figure 8. Volunteers used 1-ft by 1-ft frames to collect and sample nurdles.^{xlix}

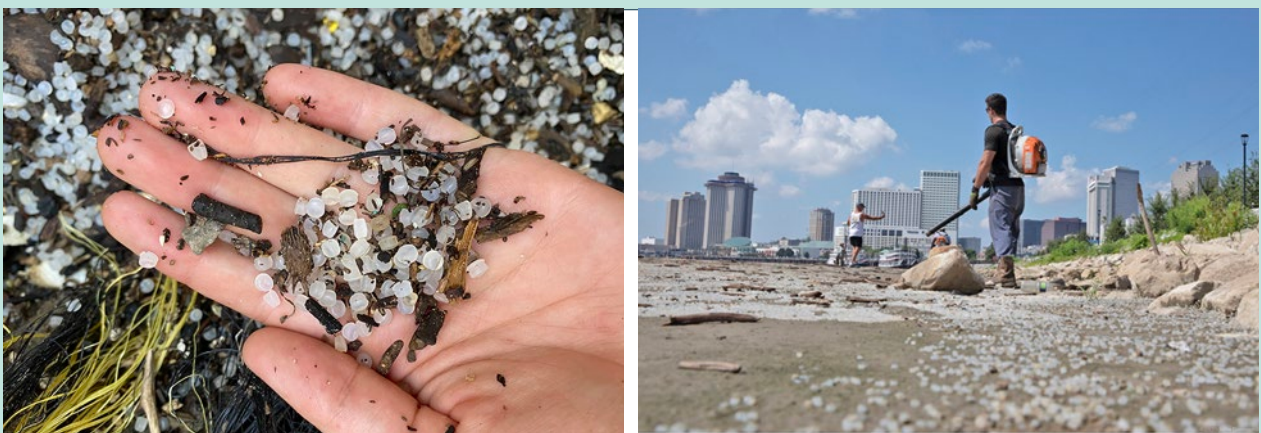


Figure 7: Six weeks after the 2 August 2020 spill, nurdles under Piety Street Wharf, New Orleans (left).ⁱ Using a leaf blower to clean up nurdles, New Orleans, August 2020 (right).ⁱⁱ

The US Coast Guard and other US regulatory agencies refused to penalize or fine CMA CMG or Dow as they do not consider this form of plastic pollution a "hazardous material" under the US Clean Water Act.^{lii}

Some of the spilled nurdles were produced by Dow's Plaquemine Parish, Louisiana facility, which currently enjoys a significant property tax exemption under Louisiana's Industrial Tax Exemption Program - see Figure 8^{liii}



Figure 8: A 55-pound (25-kg) bag of Dow Chemical polyethylene washed up under a wharf in New Orleans' French Quarter on 22 August 2020 (left). The same bag full of nurdles produced by Dow Chemical notes: "Do not dump into ... any body of water" (right).^{liv}



Case study: North Sea plastic pellet pollution

In the EU27, almost all of the plastic production facilities assessed are within three kilometres or less from a Natura 2000 protected area – the largest coordinated network of protected areas globally, stretching over 18% of the EU’s land area and encompassing more than 8% of its marine territory. When these facilities spill plastic during production, the plastic pollution can enter protected areas, harming the biodiversity of Europe’s most valuable and threatened species and habitats.^{lv}

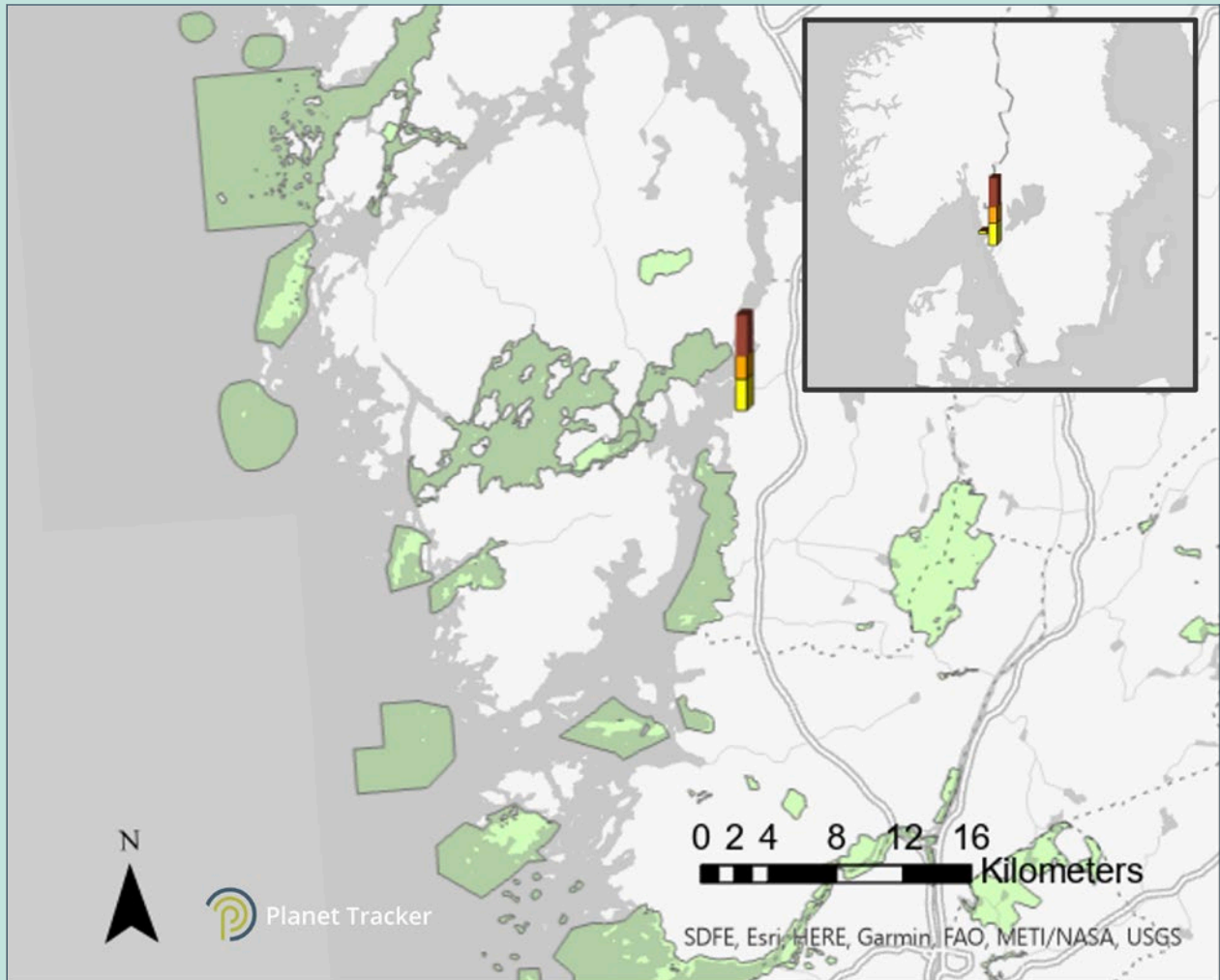


Figure 9: Stenungsund, Sweden chemical cluster. Yellow is basic chemicals capacity (kt), range is intermediates chemicals capacity (kt) and red is plastic resins capacity (kt).^{lvi}

In Stenungsund, Sweden, a small chemical cluster - see Figure 9, has plastic facilities owned by INEOS, Akzo Nobel and Borealis – a 75% OMV and 25% Mudabala⁵ joint venture.^{lvii} In 2016, the cluster was found to be spilling up to 36 million plastic nurdles into the environment^{lviii} and nearby waterways - see Figure 10.

⁵ Mubadala Development Company is a sovereign wealth fund established in 2002 as a public joint-stock company by the government of Abu Dhabi, United Arab Emirates, which remains its sole shareholder.



Figure 10: (A) and (B) 300 µm mesh nets collecting nurdles in the Orust-Tjörn Fjord system, Stenungsund, Sweden chemical cluster. February 2016.^{lix}

As this small cluster has 0.8% and 1.3% of HDPE and LDPE global capacity respectively, one can calculate the impact from hundreds of other facilities globally to understand the potential magnitude of plastic spills happening during production.^{lxvi}

On top of the plastic pollution, the European Environment Agency reported in 2017 that the same facilities in Stenungsund also released dangerous chemicals exceeding EU27 regulatory levels, including:^{lx}

- Arsenic and compounds
- Benzene
- 1,2-dichloroethane
- Halogenated organic compounds
- Hydrofluorocarbons
- Mercury and compounds
- Non-methane volatile organic compounds
- Nitrogen oxides
- Phenols
- Trichloromethane
- Vinyl chloride
- Zinc and compounds

Across the EU, in 2017, the plastic industry recorded 2,167 different events where plastic production resulted in toxic chemical releases that exceeded EU regulatory levels.



Dirty Thirty and investor considerations

Plastic and climate risk are both contributing to increased portfolio risk for institutional investors, both directly via stranded assets and indirectly via regulatory and infrastructure pressures that endanger the value of investor capital.

It is imperative for investors to actively manage their investments before these risks negatively impact their investment performance. This is especially true where producers are facing short-term and mid-term climate and oversupply pressure as is the case in the US Plastic Production Corridor.

Current global demand

Overall, global plastic consumption of the five SUP polymers increased by 42% from 141 million tonnes in 2010 to 201 million tonnes in 2019 - see Table 4.^{lxii}

Table 4: Global plastic consumption, 2010–2019 (rounded).^{lxii}

Plastic	2019 (kt)	2010 (kt)	% 2010–2019	Absolute Change (kt)
HDPE	46,635	33,602	39%	13,033
LDPE	22,618	19,036	19%	3,582
LLDPE	34,205	22,523	52%	11,682
PET Bottle Grade	24,896	17,033	46%	7,863
Polypropylene	72,341	49,235	47%	23,106
Grand Total	200,696	141,431	42%	59,265

Over the same period, all plastic resin consumption grew, led by China at 85%, equalling 29,602 million tonnes - see Table 5.^{lxiii} That said, consumption growth was weakest in Western Europe and East Asia, where demand grew close to inflation rates as restrictive SUP policies came into effect coupled with changing corporate behaviour and consumer demand preferences.

Developed countries in general have been more likely to see demand for plastics align with inflation, while developing nations have yet to reach similar plastic demand saturation points, thus leading to capacity expansion for some types of resins.



Table 5: Regional plastic consumption, 2010–2019 (rounded).^{lxiv}

Region	2019 (kt)	2010 (kt)	% 2010–2019	Absolute Change (kt)
China	64,242	34,640	85%	29,602
Other Asia Pacific	30,564	16,818	82%	13,745
Middle East & Africa	20,307	13,924	46%	6,384
Central & Eastern Europe	11,170	7,791	43%	3,379
South America	9,686	8,575	13%	1,111
North America	28,971	25,987	11%	2,984
Western Europe	24,054	22,187	8%	1,867
East Asia	11,703	11,509	2%	194
Grand Total	200,697	141,431	42%	59,265

Whilst plastic demand has often been forecast as a function of global GDP, JP Morgan Cazenove is now suggesting that global plastic demand may decrease from 1.5x GDP to 0.5x GDP by 2050.^{lxv} Even this forecast decline might be too conservative, with pressure increasing on local regulators to decrease SUP waste in the absence of global industry leadership.

These potential changes and weakening in demand for SUP in some markets should be ringing alarm bells for institutional investors with stakes in, or otherwise affected by, SUP production. The time has come to shift portfolios away from SUP.

Investor risk is highly concentrated

Institutional investors need to understand their exposure to SUP production and revenue risk. The top 50 institutional equity investors in the Dirty Thirty have USD 9.8 billion in total invested.^{lxvi} This concentrated position is equal to 96% of overall investment assessed for six key institutional investor categories: banks, brokerages, insurance companies, investment advisors, pension funds and sovereign wealth funds - see Table 6.⁶



⁶ Equity ownership for facilities was cross-checked via two databases – Bloomberg Finance, L.P. and Moody's Bureau van Dijk Orbis. This cross-checked list was then screened manually via relevant corporate filings to confirm estimated corporate structures and ownership. Ownership was analysed up to the level of the operator's name for each facility, but not beyond operator name. Equity ownership value was then calculated using currency spot and share prices in local currency from 23 April 2021 multiplied by shares outstanding. Shares outstanding were downloaded via Bloomberg Finance, L.P., 23 April 2021 yet reporting cycles lag current markets, thus, data is an estimate only.



Table 6: The Dirty Thirty's top 50 institutional equity investors. Reviewed below are the 13,339 investor positions associated with six institutional investor classes: banks, brokerages, insurance companies, investment advisors, pension funds and sovereign wealth funds.

All positions were priced into USD using current share prices as of 23 April 2021.^{lxiv}

Name	USD millions	%	Cumulative
Vanguard Group Inc	1,927	18.9%	18.9%
Capital Group Cos Inc	1,779	17.4%	36.3%
BlackRock Inc	1,607	15.8%	52.1%
State Street Corp	921	9.0%	61.1%
FMR LLC	439	4.3%	65.4%
Kieppe Patrimonial SA	322	3.2%	68.6%
Geode Capital Management LLC	247	2.4%	71.0%
Northern Trust Corp	223	2.2%	73.2%
Dimensional Fund Advisors LP	214	2.1%	75.3%
Invesco Ltd	152	1.5%	76.7%
TIAA Board of Overseers	148	1.4%	78.2%
Legal & General Group PLC	111	1.1%	79.3%
Wellington Management Group LLP	104	1.0%	80.3%
Franklin Resources Inc	97	0.9%	81.2%
T Rowe Price Global Asset Management Ltd	96	0.9%	82.2%
Dodge & Cox	94	0.9%	83.1%
American International Group Inc	80	0.8%	83.9%
Prudential Financial Inc	71	0.7%	84.6%
Housing Development Finance Co	70	0.7%	85.3%
Eaton Vance Corp	69	0.7%	85.9%
SEI Investments Co	66	0.7%	86.6%
Equitable Holdings Inc	58	0.6%	87.2%
Public Investment Corp Ltd	53	0.5%	87.7%
Pzena Investment Management Inv	51	0.5%	88.2%
Lindsay Goldberg & Bessemer LL	47	0.5%	88.6%
AustralianSuper Pty Ltd	46	0.5%	89.1%
Eagle Capital Management LLC	46	0.4%	89.5%
Mirae Asset Dsewoo C0 Ltd	45	0.4%	90.0%
Fidelity Investments Canada Ltd	44	0.4%	90.4%
Ninety One PLC	41	0.4%	90.8%
Schroders PLC	40	0.4%	91.2%
Kasilornbank PCL	40	0.4%	91.6%



Name	USD	%	Cumulative
Ensign Peak Advisors Inc	37	0.4%	92.0%
Principal Fondos de Inversión SA de CV, Operadora de Fondos de Inversión Principal	36	0.3%	92.3%
Societe Generale SA	35	0.3%	92.7%
Stichting Pensioenfonds ABP	30	0.3%	93.0%
RhumbLine Advisers LP	30	0.3%	93.2%
First Eagle Holdings Inc	29	0.3%	93.5%
UTI Asset Management Co Ltd	28	0.3%	93.8%
Raymond James Financial Inc	27	0.3%	94.1%
Grace Partners of Dupage LP	27	0.3%	94.3%
WisdomTree Asset Management Inc	27	0.3%	94.6%
Kotak Mahindra Bank Ltd	26	0.3%	94.8%
Siam Commercial Bank PCL	25	0.2%	95.1%
Voya Financial Inc	23	0.2%	95.3%
PRIMECAP Management Co	23	0.2%	95.6%
Pictet & Cie Europe SA	23	0.2%	95.8%
Janus Capital Group Inc	21	0.2%	96.0%
PNC Financial Services Group Inc	20	0.2%	96.2%
Grasim Industries Ltd	20	0.2%	96.4%
Total	9,834	96.4%	
Grand Total	10,204	100.0%	

Led by Vanguard, Capital Group, BlackRock, State Street, FMR, Kieppe Patrimonial, Geode Capital, Northern Trust, Dimensional Fund Advisors and Invesco, the top ten institutional equity investors positions are even more concentrated, owning over 76% of the sector with a position valued at USD 7.8 billion.^{lxviii}

The top ten institutional fixed income investors are also highly concentrated, owning 43% of all bonds and loans assessed.^{lxix}

As demonstrated in Tables 6 and 7, there is overlap between the two top ten lists, with BlackRock, Vanguard and Capital Group included in both.

HSBC and the Republic of India have the highest concentrations with 10.9% and 8.0% of all securities surveyed and USD 210 million and USD 155 million invested in the sector - Table 7.⁷

⁷ Fixed income for corporate bonds and loans were calculated in USD using Bloomberg Finance, L.P. proprietary processes 23 April 2021. Over 7,000 fixed income investor positions were also priced, analysed and assessed by category of investors. Planet Tracker analysed 26.5% of all outstanding corporate bonds and loans for the Dirty Thirty, equal to USD 114.5 billion out of USD 431.65 billion. Total fixed income securities assessed were 496.



Table 7: The Dirty Thirty's top 30 fixed income investors. Includes review of corporate bonds and loans ownership. Total fixed income investments assessed are 7,573 positions.^{1xx}

Company	Amount Outstanding (USD millions)	% Tracked	Cumulative
HSBC Holdings PLC	210	10.9%	10.9%
Republic of India	155	8.0%	18.9%
UTI Asset Management Co Ltd	146	7.6%	26.5%
BlackRock Inc	88	4.6%	31.0%
Vanguard Group Inc	80	4.1%	35.2%
Franklin Resources Inc	41	2.1%	37.3%
Prudential Financial Inc	40	2.1%	39.4%
JPMORGAN CHASE & CO	32	1.6%	41.0%
TIAA Board of Overseers	28	1.4%	42.5%
Capital Group Co Inc	26	1.4%	43.8%
Goldman Sachs Group Inc	26	1.4%	45.2%
IDFC Ltd	25	1.3%	46.5%
Invesco Ltd	22	1.2%	47.6%
Neuberger Berman Group LLC	22	1.1%	48.8%
Allianz SE	21	1.1%	49.9%
Japan	20	1.0%	50.9%
Ninety One PLC	20	1.0%	51.9%
UBS Group AG	19	1.0%	52.9%
Manulife Financial Corp	19	1.0%	53.9%
Grasim Industries Ltd	18	0.9%	54.9%
Kasilornbank PCL	17	0.9%	55.8%
Credit Suisse Group	16	0.8%	56.6%
Husing Development Finance	16	0.8%	57.4%
AllianceBernstein Holding LP	16	0.8%	58.3%
ICICI Bank Ltd	16	0.8%	59.1%
Wellington Management Group	15	0.8%	59.8%
FMR LLC	14	0.7%	60.6%
State Farm Mutual Auto Insurance	14	0.7%	61.3%
Loews Corp	13	0.7%	62.0%
Principal Financial Group	13	0.7%	62.6%
Top 30 Asset Managers (Tracked)	1,208	62.6%	
All Asset Managers (Tracked)	1,929	100.0%	



While BlackRock^{lxxi} has recently begun to assess plastic via a natural capital lens and Norges Bank^{lxxii} has a longstanding policy on ocean risk relevant to plastic pollution, it is incumbent upon the leadership teams at these institutional investors to create SUP financial and lending policies.

Can sustainability tailwinds push the Dirty Thirty away from SUP?

With more and more demand from downstream businesses to help meet consumer preferences, SUP production may soon be forced to shift production towards sustainable, zero-waste plastic to avoid losing customers.

The EU is an example of a jurisdiction where demand for virgin plastics is cascading towards further decline by 2025, following significant policy levers that have been put in place by the EU and member states to improve plastics' sustainability profile while decreasing negative environmental, health and climate impacts that occur during plastics' production, use and material management - see Figure 11.

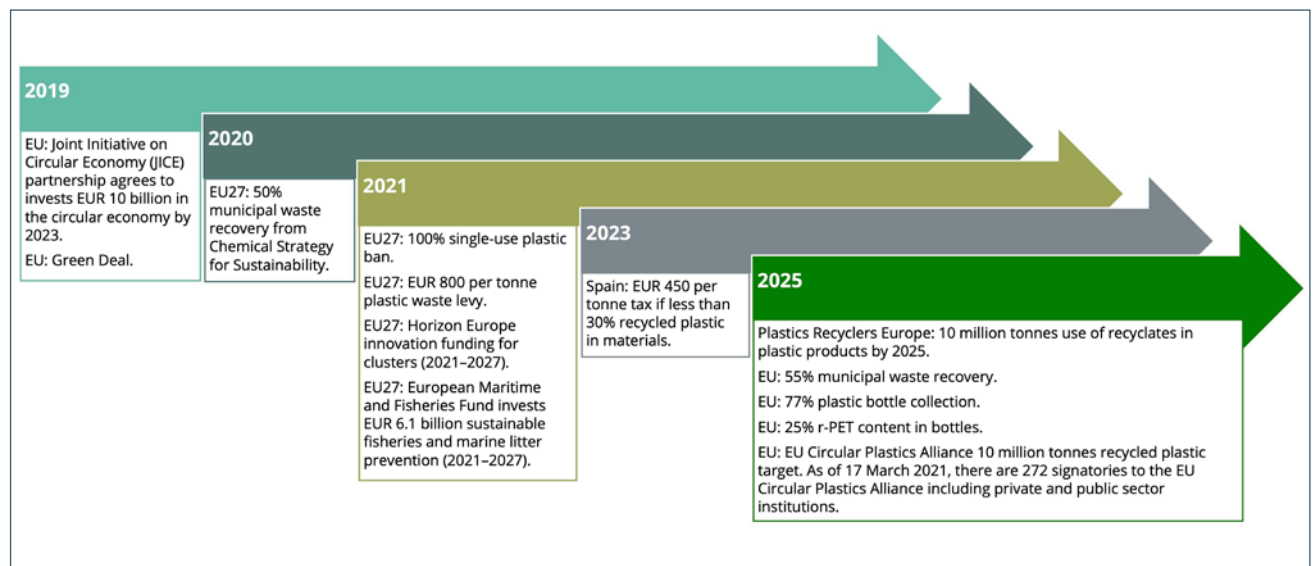


Figure 11: EU plastic policy development, 2019–2025.^{lxxiii}

Demand for sustainable materials is now accelerating in the EU, with many looking towards the voluntary target by Plastics Recyclers Europe in 2025 of 10 million tonnes recyclates.^{lxxiv}





The Dirty Thirty transition plan

Plastic is a useful material. It is durable, flexible and at times is useful to society – which is why a sector-wide evolution throughout the supply chain is necessary.

Civil society, governments and some investors are pushing industry to play its part in achieving net zero. Unfortunately, the Dirty Thirty are struggling to adopt and describe a strategic approach.

They are not commenting regularly in regulatory filings available in Bloomberg on the issues pertinent to this transition - see Table 8 - and there is a demonstrated lack of engagement with programmes such as the Ellen MacArthur Foundation’s New Plastics Economy initiative.⁸

Table 8: The Dirty Thirty’s regulatory filings: survey of 10,900 filings, 2015–2020.^{lxxv,9}

Topic	Mentions	Topic	Mentions
Circular Economy	278	Chemical Recycling	84
Plastic Waste	206	Trash	57
Plastic Pollution	130	New Plastics Economy	4
Pyrolysis	120	Gyre	0

Now is the time for investors and the business sector to collectively act and co-ordinate around a 2025 vision for zero plastic waste globally. Some technology solutions are immediately commercially viable with return on investment (ROI) less than five years.

Companies in the Dirty Thirty are beginning to take charge. Some examples are below.

- Dow Chemical (#2 in the Dirty Thirty) has a commitment to achieve carbon neutrality for Scope 1, 2 and 3 emissions plus product benefits by 2050.
- Lotte Chemical (#12 in the Dirty Thirty) has committed itself to carbon neutrality by 2040 and a green transition for its products with a focus on, amongst various strategies, plastics recycling.
- Mitsubishi Chemical (#21 in the Dirty Thirty) goal is net-zero GhG emissions by 2050.

At the sector level, the EU is supporting the plastic sector by partly funding related research and development costs to accelerate innovation to mature technologies, measured by using Technology Readiness Levels (TRL)^{10, lxxvi, lxxvii} This would improve the sector’s sustainable plastic strategy likelihood of success - see Figure 12.

⁸ <https://ellenmacarthurfoundation.org/topics/plastics/overview>

⁹ Planet Tracker reviewed 10,900 regulatory filings between 1 January 2015 and 31 December 2020. The aim was to assess if, within these regulatory filings, the Dirty Thirty were reporting on risks and opportunities the sector faces from SUP.

¹⁰ Technology Readiness Levels (TRL) are a type of measurement system used to assess the maturity level of a particular technology. Each technology project is evaluated against the parameters for each technology level and is then assigned a TRL rating based on the projects progress. In the EU, the formal categories are:

- TRL 1: Basic principles observed.
- TRL 2: Technology concept formulated.
- TRL 3: Experimental proof of concept.
- TRL 4: Technology validated in lab.
- TRL 5: Technology validated in relevant industrial environment.
- TRL 6: Technology demonstrated in relevant industrial environment (prototype).
- TRL 7: System prototype demonstration in operational environment (prototype operational).
- TRL 8: System ready.
- TRL 9: Actual system proven in operational environment (competitive).

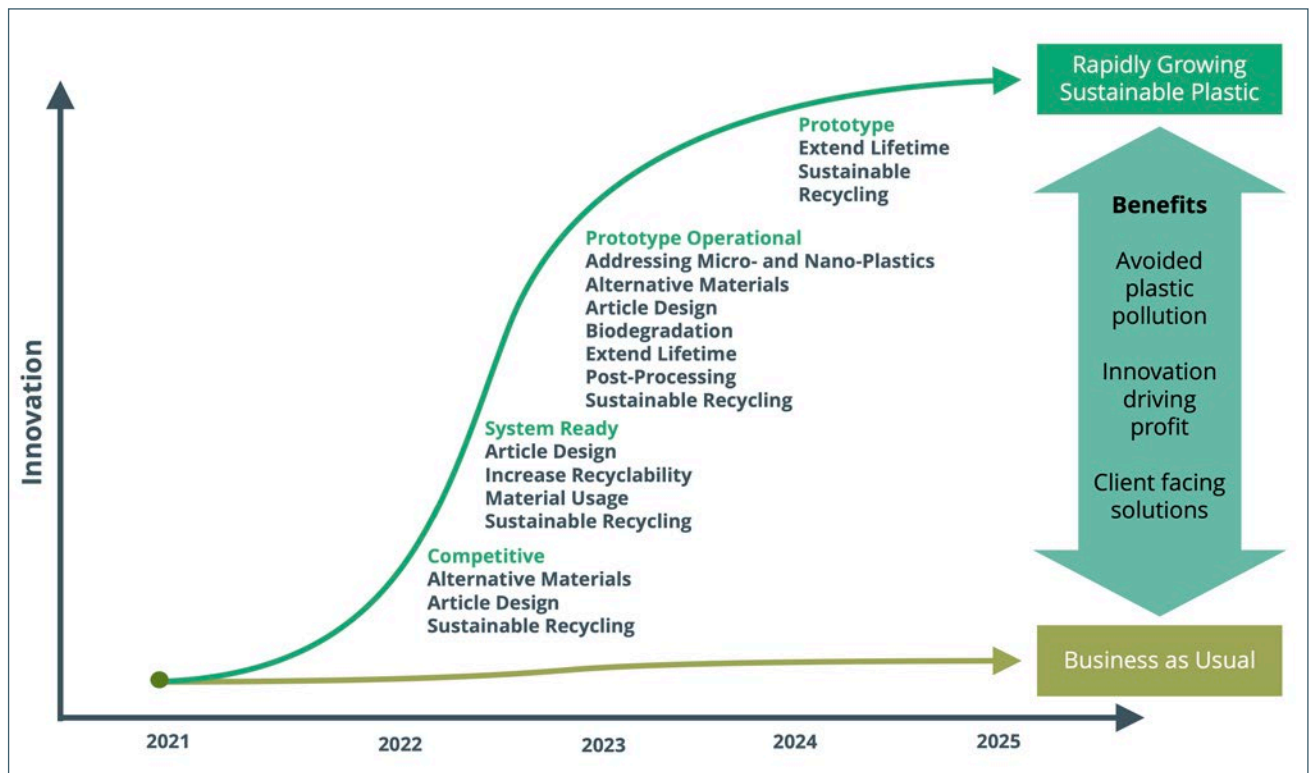


Figure 12: A possible roadmap for the Dirty Thirty to avoided plastic pollution, 2021–2025. Analysis based on work done by SusChem (European Technology Platform for Sustainable Chemistry), CEFIC (European Chemical Industry Council), DECHEMA (German Society for Chemical Engineering and Biotechnology), ESAB (European Society of Applied Biocatalysis), EuropaBio (European Association for Bioindustries), GDCh (the German Chemical Society), PlasticsEurope, EuPC, ECP4, RSC (Royal Society of Chemistry (UK)), and EU Circular Plastics Alliance, an alliance with over 400 industry signatories.^{lxxxviii, lxxxix, lxxx}

The key to transitioning away from SUP and decreasing plastic pollution is to make the plastic products we use and depend on daily using forward-looking approaches like ‘Safe and Sustainable-by-Design (SSbD)¹¹, sustainable recycling and ‘reuse, reduce and refill’.

Long-term sustainable plastic production requires low-impact feedstocks and energy sources, potentially such as “green hydrogen” derived from non-fossil fuel resources if this can achieve carbon neutrality, so that the sector can also decouple from fossil feedstocks in the production stage.

While many plastic products may be recyclable, most are not recycled due to a combination of factors – from design constraints to a lack of sustainable material management infrastructure.

According to The Ellen MacArthur Foundation, one-third of all plastic packaging leaks into the environment as pollution, hurting our air, land waterways and oceans.^{lxxxix}

Out of the remaining two-thirds, 14% is collected for recycling (of which much is not ultimately recycled), 14% is incinerated and 40% is disposed of in landfill.^{lxxxix} In other words, two-thirds of plastic waste becomes wasted financial capital – an inefficient use of economic and natural capital resources.

¹¹ The EU Green Deal includes the Chemical Strategy for Sustainability and the Safe and Sustainable-by-Design (SSbD) approach.



Figure 12 demonstrates near-term real-economy actions that the Dirty Thirty could implement which are competitive, system-ready and replicable. The pathways are then segmented by type:

- **Addressing micro- and nano-particles:** Leveraging sustainability-by-design and safe design concepts, making plastic free from hazardous chemicals, and eliminating shedding of plastic during production, use and material management.
- **Alternative materials:** Includes short-, mid- and long-term analysis supported by standardised use of life cycle analysis to understand zero-harm outcome.
- **Article design:** Designing for reuse and ease of re-manufacturing.
- **Extended lifetime:** Developing self-repairing and preserving polymers and improving ageing to eliminate SUP.
- **Increasing recyclability:** Designing all new plastic polymers for 100% recycling and reuse, in conjunction of moving products towards reuse and refillable.
- **Material usage:** Employing life cycle analysis to decrease absolute tonnes of SUP material usage while pivoting to long-lasting reuse and refillable models.
- **Post-processing:** Developing regulatory-approved technology to decontaminate polyolefins (which can contain contamination residues such as additives) to enable reuse with food-grade status.
- **Sustainable recycling:** Fund reverse logistics solutions (“many-to-one”) to improve recycling rates, sorting, and enhanced mechanical recycling. When appropriate and proven, support gasification, waste pre-treatment, and other technological solutions.

These product innovations are readily applicable globally. If co-ordinated across businesses and investors, in collaboration with other industries, the plastics sector can quickly evolve to achieve the following by 2025:

- **20% improvement** in industrial productivity, environmental and materials performance and reduction in life-cycle costs.
- **25% weight reduction** from monolayer and in-mould labelling.
- **Demonstrate biodegradable** polymers use-case.
- **Develop businesses enabling 100% recycled plastic.**
- **Decrease shedding** of nano- and micro-plastics and limit waste footprint.
- **Deploy refillables and reusables to 30%** of the market and improve reuse.
- **Deploy polyethylene (PE) for industrial and food-grade reuse.**
- **Explicitly design products to be dismantled as future feedstock.**
- **Improve recycling yield.**
- **Deploy reuse and recycling, insurance and lease/buy-back schemes for fishing gear** (e.g., nylon 6 fishing nets, ropes, fish aggregating devices (FADS), buoys, etc.)
- **Reduce the carbon footprint of products by > 30%** based on a full life cycle assessment) and decrease landfill waste volume by > 50%, thereby reducing landfill waste costs.
- **Never compromise on chemical safety for humans and the environment.**
- **Demonstrate zero-harm chemical recycling technologies** using a standardized and scientifically accepted and comparable full life cycle assessment approach: pyrolysis, gasification, depolymerization /solvolysis and dissolution of multi-polymer recycling.
- **Design and deploy “green hydrogen” energy and feedstocks sources**, agricultural and forest biomass waste-based raw materials, and reuse into materials.



Recommendations

Plastic has a climate problem, climate has a plastic problem, and these interlinked problems are compounded by serious health risks. The Dirty Thirty must lead the way in reducing the effects of both by pivoting their strategic direction towards embracing innovation to rapidly decrease their absolute production of SUP by 2025.

It is a goal that is highly achievable. Roadmaps, solutions, prototypes and research are available. It is up to the will of the Dirty Thirty. With business clients increasingly demanding sustainable plastics that do not heat up the climate, do not hurt the environment and do not cause harm to health, now is the time to act – both for the climate and their own pockets.

Planet Tracker recommends that the **Dirty Thirty** take the following actions:

- **Develop and implement a whole-of-business strategy to decrease SUP waste to zero tonnes** by fully embracing their engineering and innovation roots.
- **Describe how they will meet and exceed their buyer's supply chain commitments** to align products with SUP needs.
- **Design future business around zero-plastic waste and the circular economy** by focusing on engineering SUP pollution solutions that cause no harm the environment, the planet or to human health.
- **Publish a roadmap to zero-plastic waste and pollution.** Solutions do exist (see Figure 13) and they require leadership with capital to scale and expand rapidly so as to address the planetary plastic crisis. Much like wind and solar a decade ago, the companies that **fully embrace eliminating SUP waste and pollution** are likely to outperform competitors in both the near- and long-term.
- **Publish plans to clean up plastic production facilities to eliminate toxic chemicals.**
- **Commit to carbon neutrality.**
- **Never compromise on chemical safety for humans and the environment, and compliance with existing regulations is a must.**

All **investors** should:

- **Engage the Dirty Thirty** to immediately reduce their SUP and climate risk to mitigate continuing valuation decline.
- **Require the companies invested in to publish time-bound, stepwise plans** to decrease their absolute SUP production.
- **Lead by example** to decrease environmental impacts from SUP waste production, use and material management.



Equity investors specifically should:

- **Engage with stakeholders to develop and publish zero plastic pollution policies**, clearly describing expectations to decrease absolute tonnes of SUP and related wastes throughout the supply chain for the executives of portfolio companies.
- **Describe how they will meet and exceed their buy**

Policymakers and regulators should:

- **Integrate plastic risks into every relevant climate policy action.** We cannot solve climate change without solving the plastic crisis so every policy made must seek to integrate solutions for both the climate and the plastic crises where possible. Require reporting, such as under TCFD, to include absolute decrease in SUP waste and pollution.





Appendix 1: Methodology

Recognising the disconnect between sustainability needs, consumption forecasts and industry practices, Planet Tracker set out to determine which publicly traded companies are most responsible for SUP production. Using spatial finance analysis, Planet Tracker’s findings show how global SUP production is clustered in key areas, with just a handful of companies dominating production.

Analysis by Minderoo Foundation suggests that close to 85% of all single use plastics is produced from just five polymers: PP, PET, LLDPE, HDPE and LDPE.

This report focuses on the 85% of SUP produced in the Olefins/Polyolefins (HDPE, LDPE and LLDPE, and polypropylene) and the Aromatics (PET) supply chains. Planet Tracker assessed these and determined that there are 1,163 facilities globally, which can be further sorted into 1,753 polymer production lines when adjusted for joint ventures - see Table 9.^{lxxxiv}

*Table 9: Global SUP production and revenue by ownership category, 2019.
Light green are publicly traded companies and light grey are private institutions.^{lxxxv}*

Plastic	Operator Category	SUP (kt)	SUP Revenue (USD millions)	Total Revenue (USD millions)	Share of Total Revenue (%)	# Operators
HDPE	All	14,374	15,818	5,004,411	0.3%	429
	Private	3,401	3,738	1,154,950	0.3%	133
	Public	10,973	12,079	3,849,460	0.3%	296
LDPE	All	13,646	15,908	5,004,411	0.3%	267
	Private	3,206	3,657	1,154,950	0.3%	64
	Public	10,440	12,251	3,849,460	0.3%	203
LLDPE	All	23,516	25,225	5,004,411	0.5%	284
	Private	4,557	4,925	1,154,950	0.4%	70
	Public	18,959	20,300	3,849,460	0.5%	214
PET	All	23,430	27,631	5,004,411	0.6%	122
	Private	9,466	10,442	1,154,950	0.9%	44
	Public	13,964	17,189	3,849,460	0.4%	78
Polypropylene	All	29,748	34,121	5,004,411	0.7%	651
	Private	9,017	10,388	1,154,950	0.9%	212
	Public	20,730	23,732	3,849,460	0.6%	439
All	Total	104,714	118,702	5,004,411	2.4%	1,753
All	Private	29,647	33,150	1,154,950	2.9%	523
All	Public	75,067	85,551	3,849,460	2.2%	1,230



To understand global trends, each facility was then assessed, geolocated and manually cross-checked by employing spatial finance techniques and assigning a location to each facility based on the city it is in, thus simplifying data illustrations.

If a facility had more than one operator, each operator was allocated their percentage of SUP production volumes^{lxxxvi} and revenue according to ownership¹², thus becoming a separate production line.

All single-use polymer production lines used the same scale across the dataset of 1,753 separate polymer production lines, including both publicly traded and private institutions, which then allowed for the use of consistent, standardized stacked bar charts to describe kilotons of SUP by height across all maps.

Subsequently, to estimate SUP revenue, the SUP production volume in 2019 was multiplied by the four-quarter average contract price per standardized volume in USD for 120 different HDPE, LDPE, LLDPE, PET and polypropylene commodity contracts compared to each facilities location, country and region.^{lxxxvii, lxxxviii} Analysis used 38 different HDPE contracts, 19 different LDPE contracts, 20 different LLDPE contracts, 11 different PET contracts and 32 different polypropylene contracts.



¹² Equity ownership for facilities was cross-checked via two databases – Bloomberg Finance L.P. and Moody's Bureau van Dijk Orbis. This cross-checked list was then screened manually via relevant corporate filings to confirm estimated corporate structures and ownership. Ownership was analysed up to the level of the operator's name for each facility, but not beyond operator name. Equity ownership value was then calculated using currency spot and share prices in local currency from 23 April 2021 multiplied by shares outstanding. Shares outstanding were downloaded via Bloomberg Finance L.P., 23 April 2021 yet reporting cycles lag current markets, thus, data is an estimate only.



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- lxxxvi To estimate SUP volumes for the Dirty Thirty, Planet Tracker used the data from the Minderoo Foundation's *Plastic Waste Makers Index: Revealing the true source of the single-use plastics crisis*, that uses:
- Lifecycle analysis estimates of SUP content in the “municipal solid waste for plastics” category (Environmental Protection Agency, United States (2021), *National Overview: Facts and Figures on Materials, Wastes and Recycling*);
 - Country-level SUP production, conversion, consumption and disposal estimates;
 - Facility-level data on capacity, production and utilization rates for each of the five polymers (Wood Mackenzie, correspondence with Minderoo Foundation, 2020);
 - Trade data for polymers, packaging, finished goods and waste (International Trade Centre 2021, *Trade statistics for international business development*);
 - Conversion factors for the five polymers into rigid and flexible formats to determine SUP;
 - Intensity of finished goods use of the five polymers. (Lund, et al. McKinsey & Company (2019) *Globalization in transition: The future of trade and value chains*); and
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ABOUT PLANET TRACKER

Planet Tracker is an award-winning non-profit financial think tank aligning capital markets with planetary boundaries. Created with the vision of a financial system that is fully aligned with a net-zero, resilient, nature positive and just economy well before 2050, Planet Tracker generates breakthrough analytics that reveal both the role of capital markets in the degradation of our ecosystem and show the opportunities of transitioning to a zero-carbon, nature positive economy.

PLASTICS TRACKER

The goal of Plastics Tracker is to stem the flow of environmentally damaging plastics and related-products that are creating global waste and health issues by transparently mapping capital flows and influence in the sector, starting from resins production through to product-use. By illuminating risks related to natural capital degradation and depletion, investors, lenders and corporate interests across the economy will be enabled to create more sustainable plastics products.

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