

The Chemical Coast: Financing Facilities and Property Taxes Avoidance

The Chemical Coast, along the Gulf Coast of Texas and Louisiana, is where 84% of U.S. plastics production, across the sector's supply chain, is located (*Appendix: Table 4*).ⁱ Each state has policies that both support using industrial revenue bonds and limit property taxes on petrochemical facilities, which produce the chemicals used in plastics manufacturing, that use fossil fuel energy with fossil fuel feedstocks to make the plastics we use, despite significant risks to local communities' health (*Appendix: Table 5*).

In fact, nine publicly traded petrochemical companies in the S&P 500 own 37% of the U.S. plastics production capacity in the Chemical Coast, while, according to Bloomberg, only three of these nine companies have net-zero targets to mitigate climate change and not one of has sustainable plastics policies.ⁱⁱ This is despite plastics, and their related risks, being discussed more than 80 times during these companies' quarterly earning calls since 2015.ⁱⁱⁱ

Texas and Louisiana have two key property tax exemption pathways used by these petrochemical companies that they employ in the 22 out of 3,220 counties^{iv} that make up the Chemical Coast.

First, by the end of 2021, Texas and Louisiana municipalities^v have issued more than 40 municipal bonds valued at \$2.7 billion to support plastics production infrastructure with petrochemical corporations as the global ultimate obligor. As these municipalities are issuing these industrial revenue bonds, this may limit property taxes that otherwise would have been paid by these corporations on their infrastructure. The result is that this decreases funding for schools.

For example, ExxonMobil's East Baton Rouge petrochemical and plastics resins facility is partially financed via \$523 million in municipal bond issuance.^{vi} The facility is responsible for 13% and 5% of U.S. low-density polyethylene plastic and polypropylene plastic capacity.

Second, each state limits property tax collection that otherwise would fund schools, libraries, and municipal services.

Louisiana's Industrial Tax Exemption Program (ITEP) exempts 100% of property taxes over three years for manufacturing facilities. The facilities can extend their property tax exemptions for an additional five more years at 80%. Some projects even qualify for 100% tax exemptions over ten years.

In 2019, Louisiana's ITEP program impacted two-thirds of Louisiana's 69 school districts who lost about \$269 million revenues that would have otherwise funded schools.

Sometimes local institutions do reject tax exemption requests. In January 2019 as covered by The New York Times, the East Baton Rouge School Board voted 5 to 4 to reject ExxonMobil's \$2.9 million property tax exemption request under ITEP.^{vii}

The Texas Economic Development Act, called Chapter 313, allows school districts in Texas to limit the appraised value of property over a 10-year period to attract industries. This reduces the chosen industry's property taxes, and in return, the school district and chosen industry work out fees to be paid directly to the school district. This program has saved companies more than \$10 billion in taxes over the 10-year agreement period. Like the current ITEP, Chapter 313 involves a reduction of property taxes and district-level control as well. However, the reimbursement mechanism of Chapter 313, which involves industry paying school districts directly, removes those funds from the larger "pot"

of statewide school funding. Critics of this program say that this often leaves poorer districts to the wayside.

During the Texas legislative session in May of 2021, a bill to renew and expand Chapter 313, which is set to expire in December of 2022, was widely rejected by the Texas House. Yet it is expected that Chapter 313 will be renewed later this.

In 2019, lost school revenue in Texas was estimated at \$290 million. One-third of Texas school districts lost more than \$1,000 per pupil annually due to this corporate tax break.

Finally, these companies and the communities they reside in face many ESG and sustainability risks related to plastics production.

Climate change: Chronic and acute physical risks from climate change, such as sea-level rise, storm surge risk from increasing extreme weather events, and soil subsidence that can impact facility utilization rates while incurring potential financial risks. Louisiana has lost 1,900 square miles from sea-level rise and soil subsidence since the 1930s.

Toxic chemical releases: Toxic chemicals often are also released during plastic production that include chemicals such as benzene,^{viii} which is a known human carcinogen. Other toxic chemicals released during production can cause negative health impacts such as endocrine disruption, asthmas, diabetes, and many other detrimental impacts to human health. Cancer Alley, along the lower Mississippi River between Baton Rouge and New Orleans, Louisiana, has nearly 150 oil refineries, plastics plants, and chemical facilities. Cancer Alley has a higher risk of cancer the much of the U.S.^{ix}

Plastic pollution spills: Nurdles are lentil-sized pellets which are the foundation of most everyday plastic products.^x Nurdles are heated and formed into the single-use plastic products we use – and throw away – bottles, wrap, film, plastic in clothes and other products. Nurdles are frequently spilled, entering the environment and food chains, e.g., via shellfish and commercial fisheries.^{xi, xii}

For example, on August 2nd, 2020, the container ship CMA CGM Bianca^{xiii, xiv, xv, xvi} spilled 750 million nurdles^{xvii} in the Chemical Coast allegedly produced by Dow Chemical when a 40-ft container fell off the vessel's deck after the vessel became adrift in New Orleans, Louisiana.^{xviii}

"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."^{xix} For clean-up, CMA CGM the 3rd largest shipping company globally, who reported \$31.4 billion in revenue in 2020,^{xxi} hired two men to use leaf blowers to blow the nurdles into the Mississippi River and then try to scoop them out.

Unfortunately, the U.S. Coast Guard and other U.S. regulatory agencies chose to not to penalize or fine CMA CGM or Dow as they do not consider nurdle plastic pollution a "hazardous material" under the U.S. Clean Water Act.^{xx}

In another example, Diane Wilson, a retired shrimper, sued Formosa Plastics^{xxi} in July 2017, alleging that its Port Comfort plant had illegally discharged thousands of plastic pellets and other pollutants into Lavaca Bay and other nearby waterways along the Chemical Coast.^{xxii} U.S. District Judge Kenneth M. Hoyt ruled against Formosa calling the company a "serial offender".^{xxiii} Texas RioGrande Legal Aid (TRLA) said the \$50 million settlement is the largest in U.S. history^{xxiv} involving a private

citizen's lawsuit against an industrial polluter under federal clean air and water laws. Formosa Plastics is a frequent recipient of Chapter 313 property tax limitations in Texas.^{xxv}

Louisiana's Industrial Tax Exemption Program (ITEP)

Louisiana's Industrial Tax Exemption Program (ITEP) exempts 100% of property taxes over three years for manufacturing facilities with an option for five-year renewal at 80%. Some projects still enjoy benefits of pre-executive order exemptions of 100% for ten years. In 2019, about two-thirds of Louisiana's 69 parish school districts were affected by ITEP, losing roughly \$269 million in property tax revenues to the program that would have instead funded schools. The program is frequently used by petrochemical producers and plastics manufacturers. Local governing authorities, such as school boards, have decision-making power regarding ITEP.

According to latest figures, and only assessing ITEP's "active" and "active renewal contracts", the petrochemical to plastics complex^{xxvi} in Louisiana's 11 Chemical Coast parishes are responsible for \$56.6 billion in investment with an Ad Valorem tax (loss) of \$922 million, see Table 1. The estimated annual tax loss in these 11 parishes from the 352 different ITEP contracts in the petrochemical and plastics industry is 44% of all state-wide losses.

Table 1: ITEP for 11 Louisiana parishes in the Chemical Coast.

Parish	Investment (\$ millions)	Ad Valorem Taxes (annual \$ millions)	New Jobs*
Calcasieu	25,344	441	1,475
St. James**	13,711	220	1,722
Formosa Plastics	12,000	150	1,200
Ascension	9,247	134	892
Iberville	3,873	56	476
St. Charles	1,330	22	22
East Baton Rouge	1,196	17	122
St. John the Baptist	849	15	3
West Baton Rouge	634	10	75
St. Bernard	341	7	74
Jefferson***	52	1	165
Plaquemines	49	0	1
Total 11 Parishes	56,625	922	5,027
All 64 Parishes	109,866	2,109	13,208

* Category is "estimated new jobs" and excludes construction jobs, as reported by ITEP applicants to the State of Louisiana.

** Includes Formosa Plastics' controversial single-use plastic facility.

*** Jefferson Parish has lost 30% of its land since 1960 due to subsidence, saltwater intrusion, and sea level rise. It is forecast to lose 42% of its remaining land area over the next 50 years due to these same climate-impacted physical risk factors.^{xxvii}

In fact, the estimated losses for these 11 parishes given their overall ITEP commitments measured by public services is significant, with the highest losses – at \$291 million in 2018 – for school districts funding, see Table 2.

Table 2: 11 Louisiana parishes possibly lost revenue (\$ thousands).

11 Parishes	School districts	Parish & other	Sheriff	Fire	Libraries	Health & EMS	Parks & Rec	Roads	Levees	Drainage & flooding
Ascension	80,300	10,500	20,200	5,000	8,900	5,200	0	0	4,600	7,000
Calcasieu	27,100	25,400	19,600	4,600	5,200	4,400	4,800	3,700	0	5,300
East Baton Rouge	29,400	9,400	9,800	6,000	6,900	2,000	9,200	87	124	0
Iberville	42,000	5,500	16,100	479	2,900	0	2,200	0	2,800	3,600

Jefferson	4,300	4,500	2,400	3,500	1,200	443	0	445	812	1,800
Plaquemines	1,900	1,200	1,300	0	78	491	0	117	0	0
St Bernard	4,400	1,400	3,300	3,000	399	927	233	328	1,200	0
St Charles	55,800	10,500	21,200	1,500	4,500	6,300	3,000	7,000	7,600	0
St James	9,800	2,300	5,800	1,000	675	1,300	230	1,300	827	675
St John the Baptist	27,000	15,800	24,000	0	6,800	660	1,500	2,600	2,400	0
West Baton Rouge	9,100	4,800	4,700	0	1,200	453	1,500	0	1,200	2,100
11 parishes summary	291,100	91,300	128,400	25,079	38,752	22,174	22,663	15,577	21,563	20,475
11 parishes % overall statewide	52%	31%	58%	21%	47%	49%	47%	37%	54%	55%

The top 30 companies in the petrochemical to plastics industries in the 11 parishes are led by Formosa Plastics, Sasol and Louisiana Integrated Polyethylene (a joint venture between LyondellBasell and Sasol), who together are responsible for 49.1% of all Ad Valorem tax relief issued to the industry in these 11 parishes, see Table 3.

Table 3: Top 30 petrochemical to plastics companies in Louisiana's ITEP*.

Parish	Investment (\$ millions)	Ad Valorem Taxes (annual \$ millions)	New Jobs*	% Ad Valorem
Formosa Plastics	9,740.20	154.11	1216	16.7%
Sasol	8,337.59	150.52	342	16.3%
Louisiana Integrated PE	8,208.92	148.32	323	16.1%
Shintech	3,618.98	51.71	365	5.6%
Magnolia LNG	3,179.00	50.16	191	5.4%
South LA Methanol	2,216.29	35.99	75	3.9%
LACC	1,832.00	30.45	135	3.3%
Shell	2,063.43	28.11	110	3.0%
Methanex Fortier	1,600.00	25.90	25	2.8%
BASF	1,728.60	24.47	169	2.7%
Lotte Chemical	1,085.80	18.05	80	2.0%
Big Lake Fuels	1,100.00	18.03	123	2.0%
REG Geismar	1,380.61	17.74	83	1.9%
Shell	1,001.62	16.78	0	1.8%
Westlake Chemical	885.86	13.77	92	1.5%
Methanex	899.25	13.73	447	1.5%
YCI Methanol One,	850.27	13.72	247	1.5%
NOVA	806.15	13.11	1	1.4%
Valero	747.18	13.02	25	1.4%
KMe St. James Holdings	800.00	12.91	200	1.4%
ExxonMobil	705.71	10.85	109	1.2%
Marathon	552.96	9.92	1	1.1%
Indorama	522.54	7.86	135	0.9%
Garyville Refining	263.04	4.64	0	0.5%
BR Port Services	222.76	3.82	27	0.4%
Huntsman	265.92	3.30	0	0.4%
Phillips 66	202.84	3.16	2	0.3%
SE Tylose Louisiana	195.91	3.06	45	0.3%
Occidental	143.31	2.32	12	0.3%
Dow	157.34	2.27	0	0.2%
Top 30 Companies	55,314	902	4,580	91.1%
Total 74 Companies	56,625	922	5,027	100.0%

*Not adjusted for joint ventures.

These three companies Ad Valorem tax relief, equal to \$453 million dollars, is almost enough to pay for the missing School Districts, Fire, Libraries, Health & Emergency Services, Parks & Rec, Roads, Levees and Drainage & Flooding funding on annual basis. Instead of Ad Valorem tax relief, these corporations should be funding their contribution to health and emergency services costs.

Conclusion

In conclusion, local municipal authorities and petrochemical companies along the Chemical Coast are using property tax relief and municipal bond issuance strategies to finance the petrochemical to plastics complex.

Given the analysis above, investment professionals including buy-side and sell-side analysts, lenders and portfolio managers should assess public financing impacts when determining their chemical sector and plastics products strategies.

There are clear concerns that corporations may be using local public finance taxing and bonding authority for their advantage, at the detriment to these same authorities funding schools and other public services.

Advocates and socially responsible investors alike may find that their interests align in addressing the role of municipal tax and bonding authority in maintaining the petrochemical to plastics complex with detriment to other public services, such as fully funding schools, health care, and parks.

Appendix

Table 4: U.S. plastic production, 2019 capacity. Sources: Bloomberg Finance L.P., NexantECA data accessed via Bloomberg Finance L.P., Moody's Bureau van Dijk Orbis, corporate filings, and U.S. counties layers via Living Atlas of the World, ESRI.

Chemical Type	Chemical Category	Plastics Supply Chain	Capacity 2019 (kt)	# Lines	Chemical Coast (kt)	Chemical Coast % US Capacity
2-Ethylhexanol	Basic	Chlor-Alkali & Vinyls	508	2	260	51%
Benzene	Basic	Aromatics	8,059	34	6,188	77%
Butadiene	Basic	Olefins/polyolefins	2,376	10	2,376	100%
Ethylene	Basic	Olefins/polyolefins	35,047	38	33,266	95%
Methanol	Basic	Syngas/Methanol	7,452	7	7,192	97%
Mixed-Xylene	Basic	Aromatics	8,092	22	6,317	78%
Paraxylenes	Basic	Aromatics	2,859	5	1,759	62%
Propylene	Basic	Olefins/polyolefins	15,158	50	13,426	89%
Acrylic Acid	Intermediate	Olefins/polyolefins	1,280	5	1,280	100%
Acrylonitrile	Intermediate	Olefins/polyolefins	1,349	4	1,149	85%
Cumene	Intermediate	Aromatics	3,154	6	2,509	80%
Cyclohexane	Intermediate	Aromatics	1,609	8	1,491	93%
DMT	Intermediate	Aromatics	249	1	0	0%
EDC	Intermediate	Chlor-Alkali & Vinyls	15,343	13	14,342	93%
Ethylene Oxide	Intermediate	Olefins/polyolefins	4,271	14	4,119	96%
iso-Butanol	Intermediate	Olefins/polyolefins	160	6	92	57%
Isopropanol	Intermediate	Solvents	830	4	830	100%
MEG	Intermediate	Aromatics	3,193	11	3,089	97%
n-Butanol	Intermediate	Solvents	1,121	7	989	88%
Phenol	Intermediate	Aromatics	2,329	7	645	28%

Material	Category	Sub-category	Value	Count	Value	Percentage
Polybutadiene	Intermediate	Aromatics	742	6	675	91%
PO	Intermediate	Olefins/polyolefins	2,346	5	2,346	100%
PTA	Intermediate	Aromatics	3,024	4	0	0%
Styrene	Intermediate	Aromatics	4,985	6	4,985	100%
VCM	Intermediate	Chlor-Alkali & Vinyls	9,036	12	8,437	93%
ABS	Resin	Aromatics	675	5	0	0%
EPS	Resin	Aromatics	390	4	0	0%
HDPE	Resin	Olefins/polyolefins	9,005	30	8,770	97%
LDPE	Resin	Olefins/polyolefins	3,648	14	2,858	78%
LLDPE	Resin	Olefins/polyolefins	7,674	18	7,184	94%
PET Bottle Grade	Resin	Aromatics	3,459	10	0	0%
Polypropylene	Resin	Olefins/polyolefins	7,856	17	0	80%
Polystyrene	Resin	Aromatics	2,146	11	6,267	32%
PVC	Resin	Chlor-Alkali & Vinyls	7,905	19	6,525	83%
SBR	Resin	Olefins/polyolefins	863	6	763	88%
Grand Total			178,192	422	150,808	85%

Acronyms are dimethyl terephthalate (DMT), ethylene dichloride (EDC), propylene oxide (PO), purified terephthalate acid (PTA), vinyl chloride monomer (VCM), acrylonitrile butadiene styrene (ABS), expandable polystyrene (EPS), high density polyethylene (HDPE), low density polyethylene (LDPE), linear low-density polyethylene (LLDPE), polyethylene terephthalate (PET), polyvinyl chloride (PVC) and styrene butadiene rubber (SBR).

Table 5: Industrial revenue bonds CUSIPs. CUSIP numbers are unique identifiers used identify U.S. and Canadian securities.^{xxviii}

Company	Amt Out	CUSIP	Maturity	Description	S&P Rating
Chevron	37	735222AH4	10/1/2024	West Baton Rouge Parish Industrial District #3	AA-/A-1+
Dow	4	951340AF5	11/1/2025	Dow Chemical Variable 12/18/00	BBB/A-2
Dow	30	951340AJ7	11/1/2025	Dow Chemical Variable 12/29/04	Not rated
ExxonMobil	300	270777AC9	8/1/2035	East Baton Rouge Parish LA Industrial Development Bond	AA-/A-1+
ExxonMobil	200	270777AD7	12/1/2040	East Baton Rouge Parish LA Industrial Development Bond	AA-/A-1+
ExxonMobil	23	270777AE5	12/1/2051	East Baton Rouge Parish LA Industrial Development Bond	AA-/A-1+
ExxonMobil	74	270838AJ4	3/1/2022	East Baton Rouge Solid Waste Revenue	AA-/A-1+
ExxonMobil	9	270852AB2	12/1/2028	Adjustable ExxonMobil	AA-/A-1+
ExxonMobil	275	402207AD6	11/1/2041	Gulf Coast Waste Disposal Authority	AA-/A-1+
ExxonMobil	25	40222PAD4	6/1/2030	Adjustable ExxonMobil	AA-/A-1+
ExxonMobil	25	40222PAF9	6/1/2030	Gulf Coast Waste Disposal Authority	AA-/A-1+
ExxonMobil	25	40222PAG7	6/1/2025	Variable ExxonMobil Series B	AA-/A-1+
ExxonMobil	25	40222PAL6	12/1/2025	Gulf Coast Waste Disposal Authority	AA-/A-1+
ExxonMobil	25	40222PAN2	9/1/2025	Adjustable ExxonMobil	AA-/A-1+
ExxonMobil	25	402230ER3	10/1/2024	Adjustable ExxonMobil	Not rated
ExxonMobil	17	54834RAA7	4/1/2029	Lower Neches Valley Industrial Development Corp.	AA-/A-1+
ExxonMobil	72	54834RAB5	11/1/2029	Variable ExxonMobil Series A	AA-/A-1+
ExxonMobil	87	54834RAC3	11/1/2029	Variable ExxonMobil Series B	AA-/A-1+
ExxonMobil	6	54834RAE9	8/1/2022	Variable ExxonMobil Series A-2	AA-/A-1+
ExxonMobil	33	54834RAF6	12/1/2039	Lower Neches Valley Industrial Development Corp.	AA-/A-1+
ExxonMobil	6	54834RAG4	4/1/2026	Variable ExxonMobil Series B-3	AA-/A-1+
ExxonMobil	3	54834RAH2	5/1/2022	Variable ExxonMobil Series A-3	AA-/A-1+
ExxonMobil	10	54834RAJ8	3/1/2033	Lower Neches Valley Industrial Development Corp.	AA-/A-1+
ExxonMobil	163	548351AC9	11/1/2038	Variable ExxonMobil	AA-/A-1+
ExxonMobil	59	548351AD7	11/1/2051	Lower Neches Valley Industrial Development Corp.	AA-/A-1+
ExxonMobil	100	548351AE5	5/1/2046	Variable ExxonMobil Series A	AA-/A-1+
TotalEnergies	96	733508AF2	12/1/2040	Port Arthur Navigation District Industrial Dev Corp.	Not rated
TotalEnergies	100	733508AG0	6/1/2041	Variable TotalEnergies	Not rated
TotalEnergies	150	733508AH8	3/1/2042	Variable TotalEnergies	Not rated
TotalEnergies	100	733508AJ4	9/1/2042	Port Arthur Navigation District Industrial Dev Corp	Not rated
TotalEnergies	50	733508AK1	12/1/2042	Variable TotalEnergies Series B	Not rated
TotalEnergies	18	735225AC8	5/1/2033	Fina Oil & Chem Co.	Not rated
TotalEnergies	10	735225AF1	5/1/2035	Port Arthur Navigation District Revenue	Not rated
TotalEnergies	10	735225AH7	4/1/2027	Variable Atofina Series B	A+/A-1
TotalEnergies	5	735225AJ3	4/1/2027	Variable Atofina Series C	A/A-1
TotalEnergies	10	735225AL8	5/1/2038	Port Arthur Navigation District Revenue	Not rated
TotalEnergies	50	73522WAA3	4/1/2038	Port Arthur Navigation District Revenue	Not rated

TotalEnergies	50	73522WAB1	3/1/2039	Variable TotalEnergies	Not rated
TotalEnergies	50	73522WAC9	3/1/2040	Variable TotalEnergies	Not rated
Westlake	89	546282HW7	11/1/2035	Louisiana St. Local Gov. Environ. Dev. Auth. Revenue	BBB
Westlake	250	54628CDX7	11/1/2032	Westlake Project 11/29/17	BBB

References

ⁱ Percentage is an estimate. Not all petrochemicals are converted 100% to plastics. Chemical facilities' capacity measured for calendar year 2019. Only reviewed olefins and polyolefins, aromatics and chlor-alkali & vinyls supply chain across three plastic production stages – basic chemicals, intermediate chemicals, and plastic resins. Chemicals assessed include acrylonitrile butadiene styrene (ABS), acrylic acid, acrylonitrile, benzene, butadiene, caustic soda, chlorine, cumene, cyclohexane, dimethyl terephthalate (DMT), ethylene dichloride (EDC), expandable polystyrene, ethylene, ethylene oxide, high density polyethylene (HDPE), iso-butanol, linear-low density polyethylene (LLDPE), low density polyethylene, (LDPE), monoethyl glycol (MEG), mixed-xylenes, paraxylenes, polyethylene terephthalate (PET for bottles), phenol, polybutadiene, polypropylene, polystyrene, propylene, propylene oxide, purified terephthalic acid (PTA), polyvinyl chloride (PVC), styrene butadiene rubber (SB rubber), styrene, and vinyl chloride monomer (VCM).

ⁱⁱ While these companies may have related policies, they are not being tracked or easily available to investors and analysts who use Bloomberg.

ⁱⁱⁱ Bloomberg Finance, L.P. (2022)

^{iv} In Louisiana, counties are called parishes.

^v Municipalities includes counties and parishes.

^{vi} cusips 270777AC9, 270777AD7, and 270777AE5.

^{vii} Leger, 225 Magazine (31 March 2019). *How a showdown between the school board and ExxonMobil gave state leaders the sweats and made national news*. <https://www.225batonrouge.com/our-city/showdown-school-board-exxonmobil-gave-state-leaders-sweats-made-national-news>.

^{viii} European Chemicals Agency, (<https://echa.europa.eu/substance-information/-/substanceinfo/100.000.685>).

^{ix} <https://grist.org/justice/united-nations-environmental-racism-cancer-alley-louisiana/>

^x Nurdle Hunt (2021). The Great Nurdle Hunt, (<https://www.nurdlehunt.org.uk/nurdle-finds.html>).

^{xi} Beaumont, et al. Marine Pollution Bulletin (2019). *Global ecological, social and economic impacts of marine plastic* (<https://doi.org/10.1016/j.marpolbul.2019.03.022>).

^{xii} Smith, et al. Current Environmental Health Reports (2018). *Microplastics in Seafood and the Implications for Human Health* (doi: 10.1007/s40572-018-0206-z).

^{xiii} Planet Tracker analysis 2021.

^{xiv} Bloomberg Finance L.P. 2021.

^{xv} Orbis data 2021.

^{xvi} The CMA CGM Bianca flies under the flag of Malta. The ship is owned by CMA CGM. It was built in 2011 by Shanghai Jiangnan Changxing. Skuld provides protection and indemnity insurance for the Bianca. Bianca's International Maritime Organization number is 9436367. French-based CMA CGM is 74% owned by Lebanese-based Merit Corporation SAL, ^{xvii} Nurdles are packed in 25 kg bags. 990 sacks per container, which equals 24.75 mt, with average weight per nurdle of 0.033g, yielding about 750 million nurdles.

^{xviii} Dermansky, DeSmog (28 August 2020). *Pollution Scientist Calls Plastic Pellet Spill in the Mississippi River 'a Nurdle Apocalypse'* (<https://www.desmog.com/2020/08/28/new-orleans-louisiana-plastic-spill-mississippi-river-nurdle-apocalypse/>).

^{xix} Baurick, The New Orleans Advocate (5 September 2020). *Nurdle spill cleanup is 'too little, too late' as plastic pellets continue to spread, gather in drifts* (https://www.nola.com/news/environment/article_9b56e060-ef8c-11ea-bb00-73582b1649de.html).

^{xx} Baurick, The New Orleans Advocate (1 February 2021). *A new crop of nurdles is washing up in New Orleans, renewing calls for cleanup, penalty* (https://www.nola.com/news/environment/article_820710fc-64cc-11eb-85ce-93b2793068d5.html).

^{xxi} [Environmentalists take Formosa to court over plastics pollution | The Texas Tribune](#)

^{xxii} [Texas judge approves historic settlement agreement in water pollution case | The Texas Tribune](#)

^{xxiii} [Federal judge rules against Formosa Plastics in Texas pollution case | The Texas Tribune](#)

^{xxiv} [Final+consent+decree.pdf \(squarespace.com\)](#)

^{xxv} https://comptroller.texas.gov/search/?site=ctg_collection&q=formosa+plastic

^{xxvi}

NAICs code assessed	Industry
324110	Petroleum Refineries
324191	Other Petroleum
324199	Other Petroleum

324291	Other Petroleum
325100	Basic Chemical Manufacturing
325110	Petrochemical Manufacturing
325180	Other Basic Inorganic Chemical Manufacturing
325181	Other Basic Inorganic Chemical Manufacturing
325182	Other Basic Inorganic Chemical Manufacturing
325188	Other Basic Inorganic Chemical Manufacturing
325190	Other Basic Organic Chemical Manufacturing
325199	Other Basic Organic Chemical Manufacturing
325210	Resin and Synthetic Rubber Manufacturing
325211	Plastics Material and Resin Manufacturing
325212	Synthetic Rubber Manufacturing
326100	Plastics Packaging Materials and Unlaminated Film and Sheet Manufacturing
326113	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing
326160	Plastics Bottle Manufacturing
326199	All Other Plastics Product Manufacturing

^{xxvii} <https://www.risq.io/2021/06/weekly-preliminary-os-climate-risk-review-6-17-21/>

^{xxviii} Bloomberg Finance L.P. 2021.