

## Formosa Petrochemical and the Sunshine Project: Environmental Justice Risks in 2022



*November 12, 2020, Formosa Petrochemical's Sunshine Project Factory.*

### Summary

In 2022, a client requested that Responsible Alpha develop 12 case studies and the underlying business, economic, and investment analysis used by 123 environmental, indigenous rights, and racial justice organizations in their letter to the Honorable Gary Gensler, Chair, U.S. Securities and Exchange Commission on the proposed rule "The Enhancement and Standardization of Climate-Related Disclosures for Investors."

Responsible Alpha's analysis suggests investors need companies to disclose their climate-related financial risks and strategies for managing them, their greenhouse gas (GHG) emissions, their plans to remain viable or thrive in a low-carbon future economy, and their financial resilience across these dimensions, as it relates to and is in support of the communities where these companies exist, and their impacts are often felt and underreported. To further buttress and support this analysis, Responsible Alpha wrote 12 business cases of which the case below on Formosa Petrochemical is one.

Formosa Petrochemical Corporations ("FPCC") owns 57 percent in FG Inc., and FG Inc. owns 100% of FG LA LLC ("Sunshine Project"). According to Moody's Orbis, FPCC is the global ultimate owner of the

Sunshine Project. A Global Ultimate Owner (“GUO”) is the individual or entity at the top of a corporate ownership structure with ultimate legal liability.

*Note on ownership: Formosa Petrochemical Corporation is 75.82% owned by three other publicly traded corporations:*

- *Formosa Plastics Corporation (1301 TT Equity) owns 28.56% of FPCC.*
- *Formosa Chemicals & Fibre Corporation (1326 TT Equity) owns 24.15% of FPCC.*
- *Nan Ya Plastics Corporation (1303 TT Equity) owns 23.11% of FPCC.*

*Together, these four closely owned Taiwan-based companies – Formosa Plastics Corporation, Nan Ya Plastics Corporation, Formosa Chemicals & Fibre Corporation, and FPCC are engaged in oil refining and the manufacture of a wide range of chemicals and electronic materials, generating a combined EBITDA of \$4.1 billion in 2020.*

The Sunshine Project was created in 2017 to be the operator of a proposed petrochemical plant on a 2,400-acre site in St. James Parish, Louisiana called the Sunshine Project. The Sunshine Project is a \$9.4 billion petrochemical plant, now forecast to cost at least \$12 billion. This complex will use ethane, a byproduct of fracking, as the feedstock to produce various plastics (polyethylene, polypropylene, polymer and ethylene glycol).

The Sunshine Project is located in St James Parish’s Fifth District, between State Road 3127 and State Road 18, on the west bank of the Mississippi River, at approximately 30.056, -90.901, and one mile from the local elementary school.

The Sunshine Project is planned to be built in two phases with an estimated total investment of around \$9.4 billion originally, now raised to \$12 billion.

The first phase would include:

- 1.2 million ton/year ethane cracker.
- 400,000 ton/year linear low-density polyethylene (LLDPE) plant.
- 400,000 ton/year high density polyethylene (HDPE) plant.
- 800,000 ton/year ethylene glycol (EG) plant.
- 600,000 ton/year propane dehydrogenation (PDH) plant.
- 600,000 ton/year polypropylene (PP) plant.

The second phase of the project would include:

- 1.2 million ton/year ethane cracker.
- 400,000 ton/year HDPE plant.
- 400,000 ton/year LLDPE plant.
- 800,000 ton/year EG plant.

In total, this would be equivalent to adding 13,628,091 tons annually in greenhouse gas (GhG) emissions (see Annex 1: Table 1).

When completed the Sunshine Project would be the largest new single source of GhG emissions in the US. It would double toxic air pollution in St James Parish.

Finally, the Sunshine Project enjoys the support of Louisiana Governor John Bel Edwards. However, the US Army Corps of Engineers (ACE), which has regulatory authority for development along the Mississippi River, is feeling pressure, including from several northeastern state Attorneys General raising environmental justice concerns. The ACE has rescinded permits already issued and placed the project on hold for at least two years to produce a thorough Environmental Impact Statement including consultation with affected communities.

## **Company Overview**

Formosa Petrochemical Corporation refines crude oil and markets petroleum and petrochemical products. The Company operates refineries and naphtha cracking plants that provide products such as gasoline, diesel, jet fuel, fuel oil, naphtha, ethylene, and liquefied petroleum gas. FPCC also owns three utility centers and generates electricity.

Formosa Petrochemical Corporation (FPCC) is second only to Chinese Petroleum Corporation for oil refining in Taiwan. The company produces refined petroleum products (jet fuel, liquid petroleum gas, and gasoline) and petrochemicals (ethylene, propylene, and butadiene) from its naphtha cracking operations. It owns gas stations through subsidiary Formosa Oil. FPCC also sells electricity and steam from its co-generation plants. Its engineering and maintenance divisions carry out planning, construction, and daily maintenance services on behalf of group companies.

## **Climate Risks**

When completed the Sunshine Project would be the largest new single source of GhG emissions in the US. It would double toxic air pollution in St James Parish. This project would be equivalent to adding 13,628,091 tons annually in greenhouse gas (GhG) emissions (see Annex 1: Table 1).

Forty percent of St. James Parish is classified as wetlands. Loss of absorptive capacity from wetlands and climate change contributed to severe flooding in St. James Parish in 2016.

## **Community Risks**

If the Sunshine Project is built, estimated total permanent jobs (excluding temporary construction jobs) would be 1,200 new jobs. But this has a cost of \$150 million in annual property taxes reduction totaling \$1.5 billion over ten years, which equals an enormous amount of lost money for schools, libraries, climate resilience, healthcare and services in a community that is already being devastated by hurricanes and toxic chemical pollution. In 2018, St. James Parish had \$24 million in lost tax revenue and \$9.8 million in lost school funding from Louisiana's Industrial Tax Exemption Program (ITEP).

*The Louisiana Industrial Ad Valorem Tax Exemption Program (ITEP) is a state incentive program, which offers a tax incentive for manufacturers who make a commitment to jobs and payroll in the state. With approval by the Board of Commerce and Industry and local governmental entities, the program provides an 80% property tax abatement for an initial term of five years and the option to renew for five additional years at 80% property tax abatement on a manufacturer's qualifying capital investment related to the manufacturing process in the state.*

*For more information see Annex 2 and Table 3, Table 4 and Table 5.*

## **Environmental Risks**

Proceeding with the project presents an exceptional environmental justice risk on top of the climate risk the project has. St. James Parish is recorded in the 2020 Census as being composed of a population that is 49 percent White and 47 percent Black. The parish has a poverty rate of 17 percent between 2015-2019. In 2000 the per capita income was \$14,381, and 20.7 percent of the population lived under the poverty line. Out of the total people living in poverty, 27.7 percent are under the age of 18 and 15.1 percent are 65 or older.

According to data from the U.S. EPA's Risk-Screening Environmental Indicators (RSEI) database, the Cancer Hazard of facilities in St. James Parish has increased by nearly 800 percent over the last decade (2007 – 2018). Each year, the Sunshine Project would be permitted to emit 86,000 kilograms of benzene, 1,3-butadiene, acetaldehyde, formaldehyde, and ethylene oxide – all known carcinogens. There are already twelve toxic petrochemical facilities within a 10-mile radius of the planned project, which forms part of an 85-mile stretch of the Mississippi River, predominantly inhabited by historic Black neighborhoods, that is widely known as "Cancer Alley." The complex will be built adjacent to a residential area of the 5th District and one mile from an elementary school that serves an almost entirely Black student population.

*For more information, see Annex 1: Table 2 and Figure 1.*

## **Risks Facing Formosa Petrochemical Corporation and the Sunshine Project**

- The Formosa Petrochemical Corporation and Subsidiaries Consolidated Financial Statements for the period from January 1, 2021, to September 30, 2021, and for the period from January 1, 2020, to September 30, 2020, contain no appropriate disclosures on climate related risk management.
- April 23, 2018. Gov. John Bel Edwards and Formosa Petrochemical Corporation executive Keh-Yen Lin announced the company has selected St. James Parish in Louisiana for a \$9.4 billion chemical manufacturing complex and has purchased a 2,400-acre site along the west bank of the Mississippi River. To secure the project, the State of Louisiana offered a competitive incentive package that would include a \$12 million performance-based grant to offset infrastructure costs.
- March 11, 2019: Formosa Group announced a \$150 million investment in its FG LA cracker that FPCC owns a 57% stake.
- September 23, 2019: J.P.Morgan states the Sunshine Project costs \$10.5 billion, not \$9.4 billion.



- Oct 30, 2019. ProPublica releases report of investigation into discriminatory plant siting in Cancer Alley favoring poor rural areas that tend to be majority black.
- January 15, 2020: J.P.Morgan states “Sunshine project FID (final investment decision) by March 2020: FPCC (Formosa Petrochemical Corporation) mentioned that they expect the Sunshine project to take FID by March 2020, with construction expected to start “no later” than 2Q20.”
- February 2, 2021: J.P.Morgan states “While management is confident to regain the permit in 2H21, construction might be delayed in 2022 due to sluggish rollout of COVID-19 vaccines in the US”.
- On a related note, in July 2017, Diane Wilson, a retired shrimper, sued Formosa Plastics (1301 TT Equity) and won a \$50 million judgement against the company because of its toxic chemical and nurdle pollution of the region’s shrimp fisheries. U.S. District Judge Kenneth M. Hoyt ruled against Formosa calling the company a "serial offender". Interestingly, Formosa Plastics is a frequent recipient of Chapter 313 property tax limitations in Texas.

### **Risks Facing Formosa Petrochemical and FG LA’s Investors and Lenders**

- In 2020, the Norwegian Government Pension Fund announced the exclusion of Formosa Chemicals and Fibre (1326 TT Equity) from its portfolio citing “unacceptable risk for violation of human rights.
- April 27, 2021. RISE St. James issues an open letter to banks and finance managers asking that they not invest in FG LA LLC or the Sunshine Project.
- S&P Global stated, when assessing all four interlocking companies (Formosa Petrochemical, Nan Ya Plastics Corporation, Formosa Chemicals & Fibre Corporation, and Formosa Plastics Corporation) with a material ownership in the Sunshine Project: “We forecast the four companies' aggregate ratio of debt to EBITDA will fall below 1.0x over 2021-2022 and rise slightly to 1.2x-1.4x for 2023 if they decide to go ahead with a planned chemical complex project in the U.S. state of Louisiana. This is materially lower than our previous projection of 2.0x-3.0x for the same period.”
- S&P Global is clear in its credit outlook for Formosa Petrochemical, stating that a delay or cancellation of the Sunshine Project would “strengthen the financial buffer for the ratings.” In fact, S&P forecasts that pursuing the project would weaken FPCC credit outlook, potentially pushing its ratio of debt to EBITDA below 1.0x than the base case of 2.0x-3.0x if they choose to not pursue the project. The project clearly weakens the credit profile for FPCC putting lenders and bondholders at greater risk.
- According to S&P Global, without the debt overhang from financing the project, the four companies and FPCC could “repay and refinance its debt faster” and “The cancellation of the project could prevent deterioration in the group's debt leverage during what would have been the construction period”.

Transition risks include ongoing exposure to litigation due to toxic releases, and its reported high GhG emissions, which are out of line with current administration policies regarding the Paris Agreement and the need to reduce GhG emissions as a matter of priority. The Sunshine Project will use the oversupply of fracking gas as a feedstock for plastics production. In addition to GhG emissions public sentiment and

consumer preference is turning away from single use plastics in view of the ocean plastics pollution issue.

Regulation to curtail plastics use and reduced consumer demand may pose market risks to the Sunshine Project also. RISE St James argues in an open letter to bankers that The Formosa Group of interlocking corporations – Formosa Petrochemical Corporation, Nan Ya Plastics, Formosa Chemicals & Fibre Corporation, and Formosa Plastics Corporation – are serial offenders, citing \$650 million in fines and penalties across a dozen sites, and averaging \$10 million a year in fines to address environmental and worker safety violations.

Finally, climate risks must be understood to include secondary risks from the production of GhG emissions, because the toxic releases and GhG production are one and the same process. In this line of reasoning, poisoning the environment and communities through toxic emissions is a climate impact. As such it should be disclosed, along with the costs of remediation.

## Annex 1: Climate Risks and Environmental Risks

Table 1: Emissions permitted for the proposed St. James Complex.

Pollutant	Annual Tons	Health Risks
<u>Particulate matter (PM10 + PM2.5)</u>	703.67	Aggravated asthma, respiratory distress, premature death in people with heart or lung disease
<u>Sulfur dioxide</u>	82.90	Death or permanent injury, eye and respiratory irritation, aggravated asthma
<u>Nitrogen oxides</u>	1242.53	Asphyxia or breathing difficulty, headache, drowsiness, frostbite on contact
<u>Carbon monoxide</u>	2768.93	Headache, dizziness, weakness, confusion, nausea, unconsciousness, and possibly death
<u>Ethylene oxide</u>	7.70	Respiratory irritation, lung injury, headache, nausea, vomiting, diarrhea, shortness of breath, cyanosis, cancer, reproductive effects, mutagenic changes, neurotoxicity, sensitization
<u>Benzene</u>	36.58	Skin and eye irritation, dizziness, weakness, headache, vomiting, possible coma, cancer, death
<u>1,3-Butadiene</u>	23.89	Nose and eye irritation, frostbite on contact, cancer
<u>Formaldehyde</u>	8.90	Skin and eye irritation, coughing, wheezing, a probable carcinogen

<u>Acetaldehyde</u>	17.78	<i>Nose and eye irritation, nausea, vomiting, headache, unconsciousness, severe burns on contact, possibly carcinogenic</i>
<u>GHGs (CO2 equivalents)</u>	13,628,091	<i>Climate change; increased respiration, headache, unconsciousness</i>

*Table 2: Health impacts from proposed chemical production by Project Sunshine.*

<b>Chemical</b>	<b>Applications</b>	<b>Health and Safety Impacts</b>
<b>Ethylene</b>  [Resultant plastics: polyester, polyethylene terephthalate chip (PET, US resin identification code #1), 72 high-density polyethylene (HDPE, US resin identification code #2), low-density polyethylene (LDPE, US resin identification code #4)]	Packaging and containers for consumer and industrial goods (personal care products, food and beverage, oils and cleaning products, films, bags, shrink wrap), industrial piping, toys, computer parts, industrial and laboratory equipment.	Exposure to ethylene can cause headache, dizziness, fatigue, lightheadedness, confusion, and unconsciousness. It is a highly flammable chemical and is a fire and explosion hazard.
<b>Ethylene glycol</b>	Used to manufacture polyester fiber and for consumer products including antifreeze.	Short-term exposure includes intoxication, impacting the central nervous system, the heart, and the kidneys. Severe exposure can result in coma, loss of reflexes, and brain damage.
<b>Ethylene oxide</b>	Used in the production and manufacture of industrial chemicals (e.g., ethylene glycol).	Ethylene oxide is carcinogenic to humans when inhaled. Acute exposure may result in respiratory irritation and lung injury, headache, nausea, vomiting, diarrhea, shortness of breath, and cyanosis. Chronic exposure has been associated with the occurrence of cancer, reproductive effects, mutagenic changes, neurotoxicity, and sensitization.
<b>Ethylene dichloride</b>	The raw material used to manufacture vinyl chloride monomer.	Inhalation induces respiratory distress, nausea, and vomiting. It affects the central nervous system, liver, and kidneys. The chemical is also highly flammable. When it burns, it releases toxic fumes of hydrochloric acid and is a suspected human carcinogen.

<b>Propylene</b>  [Resultant plastics: polypropylene (PP, US resin identification code #5)]	Consumer goods and food packaging, automotive components.	High levels of propylene exposure can cause dizziness, lightheadedness, or fainting. Exposure may affect the heart, liver, or nervous system. Direct contact can cause frostbite.
<b>Vinyl chloride monomer (VCM)</b>  [Resultant plastics: polyvinyl chloride (PVC, US resin identification code #3)]	Primarily industrial piping, building, and construction products.	VCM is a known human carcinogen and is highly explosive. Acute exposure, typically via inhalation, can lead to dizziness, irritation to the eyes, membranes, and respiratory tract, fatigue, coma, or even death. Chronic exposure can cause liver dysfunction, including liver injury or cancer, other forms of cancer, congenital disabilities, genetic changes, neurological or behavioral symptoms, chronic bronchitis, ulcers, skin diseases, deafness, vision failure, indigestion, and changes to the skin and bones. PVC is recognized as a major source of phthalates, known endocrine disruptors, which harm reproductive and nervous systems.
<b>Chlorine</b>	A building block ingredient used to manufacture PVC plastics and other chemicals such as pesticides and antifreeze. Also used in cleaning and bleaching processes.	Chlorine production uses and emits highly toxic pollutants. Breathing high levels of chlorine causes fluid buildup in the lungs and further lung damage. Contact with chlorine may cause frostbite of the skin and eyes.
<b>Caustic soda (Sodium hydroxide)</b>	Used to manufacture a variety of products such as paper, alumina, soap, and detergents. It is a feedstock to manufacture a wide range of chemicals and is also used in the fracking process.	Can cause severe burns and permanent damage to any tissue that it comes in contact with because it is corrosive. Inhaled sodium hydroxide can negatively impact the lungs. Ingestion may lead to vomiting, drooling, abdominal pain, or gastrointestinal shock.
<b>Hydrochloric acid</b>	Used in the production of polyvinyl chloride, polyurethane foam, and calcium chloride.	Hydrochloric acid has toxic effects on human skin and eyes, by causing severe skin irritation, burns, or frostbite. It can have acute health effects if inhaled, ingested, or absorbed, including inflammation, irritation, corrosive burns, severe respiratory distress, or even death.
<b>Paraxylene</b>	Used as feedstock material to manufacture other chemicals such as terephthalic acid and dimethyl-terephthalate, the building blocks to manufacture polyesters.	Xylene can have negative effects on health, in both the short and long term. High concentration exposure can cause a number of effects on the nervous system, such as headaches, lack of muscle coordination, dizziness, confusion, and changes in one's sense of balance. Some people exposed to very high levels of xylene for a short period of time have died.



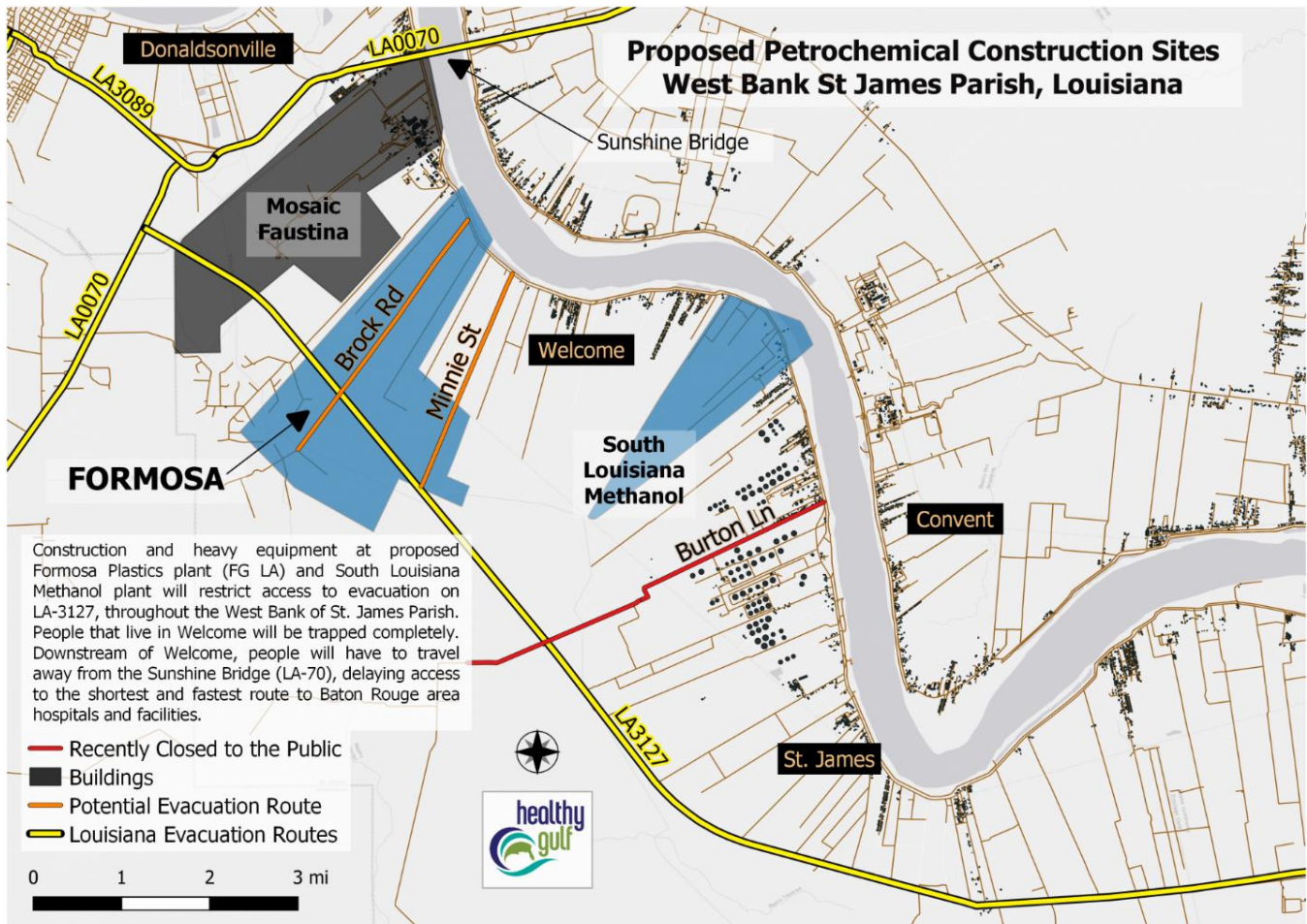


Figure 1: Location of proposed Sunshine Project.

## Annex 2: Louisiana’s Industrial Tax Exemption Program and the Sunshine Project

Table 3: ITEP for 11 Louisiana parishes.

Parish	Investment (\$ millions)	Ad Valorem Taxes (annual \$ millions)	New Jobs*
Calcasieu	25,344	441	1,475
St. James**	13,711	220	1,722
Formosa Petrochemical	9,400	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
<b>Total 11 Parishes</b>	<b>56,625</b>	<b>922</b>	<b>5,027</b>
<b>All 64 Parishes</b>	<b>109,866</b>	<b>2,109</b>	<b>13,208</b>

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

\*\* Includes FPCC’s 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.

Table 4: 11 Louisiana parishes ITEP funds lost.

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 FPCC, 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 5.

Table 5: Top 30 petrochemical to plastics companies in Louisiana’s ITEP\*.

Company	Investment (\$ millions)	Ad Valorem Taxes (annual \$ millions)	New Jobs*	% Ad Valorem
FPCC	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%
<b>Top 30 Companies</b>	<b>55,314</b>	<b>902</b>	<b>4,580</b>	<b>91.1%</b>
<b>Total 74 Companies</b>	<b>56,625</b>	<b>922</b>	<b>5,027</b>	<b>100.0%</b>

*\*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.