Economic Impact Analysis Report for Bayway Industrial Complex

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AN IMPACT REPORT

Economic Impact Analysis Report for Bayway Industrial Complex
Sponsored by NJBIA
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5 Corporations at 1 Industrial Site Generate

$21.3 Billion
in statewide
economic output

$7 Billion
in NJ Gross
State Product

$1.2 Billion
in labor income

$1.15 Billion
in federal, state and
local tax revenue

$124.7 Million
capital investment

12,000+
direct & indirect jobs

2023 data from Economic Impact Analysis Report

Executive Summary

The Bayway Industrial Complex in Linden, New Jersey, is a major contributor to the state's industrial economy. In 2023, it generated an estimated $21.3 billion in statewide economic output and supported more than 12,000 jobs across New Jersey. These impacts reflect the combined operations of five co-located firms—Phillips 66, Infineum, Nexpera, Linden Cogeneration, and Sunoco—that together span refining, chemical manufacturing, power generation, environmental services, and fuel logistics.

Economic impact studies measure how the activity of a facility affects the broader economy. While day-to-day operations may appear limited to a single site, their effects extend outward— through supply chains, household spending, and tax revenues. This report uses the IMPLAN model, a widely used input–output framework, to trace those ripple effects.

This structure allows industrial operations to be translated into measures of jobs, income, output, and tax revenues.

These results indicate that the Bayway Complex is closely tied to New Jersey's workforce, supply chains, and fiscal outcomes. Its activity extends beyond refining and chemical manufacturing, influencing a range of industries and households throughout the state. ●

The IMPLAN framework distinguishes between:

Direct Effects – activity at the facility itself: employment, payroll, materials, and capital investment.

Indirect Effects – the supply-chain response as contractors, vendors, and service providers expand their operations.

Induced Effects – household spending by workers whose income is supported by the facility.

Total Impact – the sum of direct, indirect, and induced effects.

The Bayway Industrial Complex

> At the heart of the complex is the Phillips 66 Bayway Refinery, which processes up to 258,000 barrels of crude oil per day—**62.5% of New Jersey's total refining capacity** among active refineries.

1.1 A Strategic Industrial Hub in New Jersey

The Bayway Industrial Complex in Linden, New Jersey, is part of the state's energy, chemicals, and logistics infrastructure. The complex is a significant component of the region's industrial economy.

1.2 Refinery Leadership

At the heart of the complex is the Phillips 66 Bayway Refinery, which processes up to 258,000 barrels of crude oil per day—62.5% of New Jersey's total refining capacity among active refineries. (Phillips 66.com, 2024; U.S. Energy Information Administration, 2024). This facility, operational since 1909, supplies a wide range of transportation fuels and petrochemical feedstocks to the Northeast corridor. Its co-located polypropylene plant adds significant value to the state's advanced manufacturing sector.

1.3 Integrated Capabilities

"The co-location of refining, chemical manufacturing, energy generation, and logistics within a single site enables cost efficiencies, supply chain resilience, and environmental performance improvements." (Phillips 66.com, 2024; Survey Report, 2025). Collectively, these firms illustrate the effects of co-located operations on efficiency and regional economic activity.

1.4 Economic and Strategic Relevance

The Bayway Industrial Complex is more than the sum of its parts—it anchors Union County's industrial base, supports thousands of jobs, and generates tax revenue for local, state, and federal governments. With strong commitment to environmental compliance, sustainability, and community engagement through the Bayway Community Advisory Panel, the complex represents a model of modern industrial stewardship (Bayway Community Advisory Panel, 2024; NJDEP filings, 2024). A detailed breakdown of each company's role and output is available in the appendices and referenced business profiles. ●

TABLE 1

Summary of New Jersey Refining with Linden's Share

CATEGORY	NEW JERSEY TOTAL	LINDEN (BAYWAY)	LINDEN'S SHARE
Refinery Capacity (bpd)	~413,000 bpd across 2 major facilities (Linden and Paulsboro)	~258,000 bpd	~62.5%
Refinery Products	Gasoline, diesel, jet fuel, asphalt, petrochemicals	Gasoline, diesel, jet fuel, propane, petrochemical feedstock	Majority
Associated Industrial Assets	Terminals, additive production, cogeneration, chemical regeneration	Co-located at Bayway complex	Central hub

2.0 REFINING IN NEW JERSEY

Linden's Role

TABLE 2

Summary of Bayway Complex Facilities and Activities

FACILITY	ACTIVITIES AND ROLE IN COMPLEX
Phillips 66 (Bayway)	Core refinery operations, catalytic cracking, hydrodesulfurization, alkylation, polypropylene production (~775 million lb/yr).
Infineum	Specialty chemicals and R&D including Lubricant Additives and Driveline production, safety-certified operation, and technology innovation.
Nexpera (Morses Mill)	Regeneration of sulfuric acid and potassium hydroxide, sulfur gas recovery, and operating under stringent environmental permits.
Linden Cogeneration	Cogeneration of electricity (~980 MW) and steam supplies the Phillips 66 refinery and Infineum, capable of hydrogen blending.
Sunoco Terminal & Retail	Bulk fuel logistics and storage (~5 million barrels), pipeline and marine distribution, branded retail fuel station.

New Jersey hosts two active petroleum refineries: Bayway in Linden owned by Phillips 66 and the Paulsboro refinery owned by PBF Energy in Gloucester County. Together, they provide about 413,000 per day (bpd) of crude oil processing capacity. Bayway accounts for roughly 258,000 bpd, or 62.5% of the total, making it the largest refinery on the East Coast. Its output includes gasoline, diesel, jet fuel, heating oil, propane, and petrochemical feedstocks.

Currently operated by Phillips 66, the Bayway complex includes catalytic cracking, hydrodesulfurization, alkylation processes, and a polypropylene plant producing about 775 million pounds annually. Bayway processes primarily light, low-sulfur crude sourced from Canada, West Africa, northern Europe, and the Bakken region.

The Bayway site also anchors a cluster of related industries. Infineum, a joint venture between ExxonMobil and Shell, produces lubricant and fuel additives. Nexpera regenerates sulfuric acid and recovers sulfur gases. Linden Cogeneration, a 980megawatt combined-cycle facility, provides power to the NYISO and PJM grids and steam and power to Phillips 66 and Infineum, with recent upgrades enabling hydrogen co-firing and utilizing off-gas from the refinery to reduce emissions. Sunoco operates a major petroleum terminal with about 5 million barrels of storage and pipeline connections to major regional networks, as well as a local retail fuel station.

2.1 Economic and Strategic Significance

Linden's concentration of refining capacity, chemical processing, power generation, and fuel logistics establishes it as an industrial hub within New Jersey. Bayway's scale positions it as a significant contributor to both state economic activity and regional fuel supply stability.

2.2 The Bayway Industrial Complex (Linden, NJ)

The Bayway Industrial Complex spans Linden and Elizabeth, New Jersey. Established in 1909 by Standard Oil of New Jersey, it has grown from an initial capacity of about 10,000 bpd into a facility processing about 258,000 bpd today. Ownership passed from Exxon to Tosco in 1993, then to Phillips Petroleum in 2001. After a merger forming ConocoPhillips in 2002 and the subsequent creation of Phillips 66 in 2012, the refinery remains under Phillips 66 operation.

In addition to its core refining operations, Phillips 66 manages the polypropylene plant on site. The broader complex includes:

→ **Infineum** (ExxonMobil–Shell joint venture, est. 1999) – Produces fuel and lubricant additives, including detergents and viscosity modifiers; operates a major research and technology center.

→ **Nexpera** (historically known as Morses Mill) – Provides regeneration of spent sulfuric acid and potassium hydroxide (KOH), and sulfur recovery services under federal and state environmental permits.

→ **Linden Cogeneration Plant** – 980 MW natural gas fired combined-cycle facility supplying electricity to NYISO/PJM grids and steam to Phillips 66 and Infineum; capable of hydrogen blending up to 40% in the Linden-6 unit, which helps reduce carbon dioxide emissions.

→ **Sunoco Terminal and Retail** – Storage of ~5 million barrels with multimodal distribution links (pipeline, barge, ship and road); includes a local retail fuel station.

Since 1998, facility operators have participated in the Bayway Community Advisory Panel, a forum for communication between industrial operators and local community representatives focusing on transparency, safety, environmental management and community engagement. ●

3.0 METHODOLOGY

For example, **every dollar of payroll at a refinery might generate $1.50 to $2.00 of additional economic activity** elsewhere, depending on how interconnected the local economy is.

Economic impact studies are designed to answer a straightforward question: *What difference does this facility make to the economy around it?* While the day-to-day operations of a refinery or industrial complex are visible only within the fence line, their effects extend far beyond—supporting jobs, generating income, and creating tax revenues across the state. Such studies are valuable because they provide evidence for decision-makers. Legislators and regulators can see how a site contributes to employment and public revenues. Companies can demonstrate their role in the broader economy, and local communities gain a clearer view of how industrial activity supports businesses, households, and infrastructure.

This report uses the IMPLAN model to estimate those impacts. IMPLAN tracks how dollars move through the economy, beginning with company spending on payroll, materials, and capital projects. It then follows how that money ripples outward—through suppliers that provide goods and services, and through household spending by employees. The result is a clear picture of the direct, supply-chain (indirect), and household (induced) effects associated with the Bayway Complex.

■ 3.0.1 Understanding Economic Impact Studies and IMPLAN

At its heart, an economic impact study asks: *What happens to the wider economy when a business or facility spends money, hires workers, and makes investments?* While it is easy to measure what happens inside the facility—such as how many employees are on site or how much is spent on raw materials—most of the real impact occurs outside its fence line. Suppliers hire more workers, households spend more income, and governments collect more tax revenues. An economic impact study uses a structured model to trace these ripple effects.

One of the most widely used tools for this purpose is **IMPLAN** (short for Impact Analysis for Planning). IMPLAN is a database and modeling system that describes how industries, households, and governments interact in a given region. It works by following the flow of dollars as they move through the economy.

The process starts with **direct spending**. A refinery, for example, purchases crude oil, pays employees, contracts for maintenance, and invests in facility upgrades. These dollars do not stop at the first transaction—they trigger further activity.

When the refinery buys services from a local contractor, that contractor in turn purchases equipment and hires additional staff. This is called an **indirect effect**.

The effects go even further. Workers at the refinery, its suppliers, and its contractors all spend their wages on groceries, rent, healthcare, and transportation. These household purchases support jobs in supermarkets, construction, clinics, and beyond. This is known as the **induced effect**.

When all three layers—direct, indirect, and induced—are combined, we get the **total impact** of the facility.

IMPLAN structures these relationships using detailed national and regional data. It has built-in "multipliers" that capture how a dollar spent in one sector leads to additional spending in others. For example, every dollar of payroll at a refinery might generate $1.50 to $2 of additional economic activity elsewhere, depending on how interconnected the local economy is.

Conducting an IMPLAN study involves four steps:

→ **Collecting data from the facility** – This includes payroll, operating expenditures, and capital investment.

→ **Mapping spending into IMPLAN sectors** – Each dollar is assigned to an industry category, such as construction, utilities, or business services.

→ **Running the model** – IMPLAN applies its multipliers to estimate the indirect and induced effects throughout the state or region.

→ **Interpreting results** – The outputs are summarized in terms of jobs, labor income, value added (contribution to Gross State Product), total output (sales), and tax revenues.

The strength of IMPLAN lies in its ability to provide a consistent, transparent framework for measuring these ripple effects. It does not predict the future or capture every nuance of behavior, but it offers a reliable picture of how industrial activity spreads through an economy. For policymakers, businesses, and communities, these results translate technical analysis into understandable measures of jobs, income, and fiscal impact.

3.1 Data Collection

To estimate the Bayway Complex's statewide impact, we collected detailed 2023 expenditure and payroll data from each firm in the Complex. These figures were entered into the IMPLAN economic model, which traces how spending ripples through the economy—supporting suppliers (indirect effects) and household spending (induced effects). The result is a comprehensive picture of the Complex's contribution to jobs, income, GSP, and tax revenue.

Primary data for this analysis was obtained [by NJIT] directly, on a confidential basis, from each of the five industrial firms operating within the Bayway Industrial Complex in Linden, New Jersey, using a two-stage survey design. Survey 1 captured general information on each company's business operations and associated NAICS codes, establishing the foundational classification for IMPLAN modeling. Survey 2 collected detailed expenditure data using a structured instrument aligned with IMPLAN sector inputs. Each

firm provided itemized expenditure reports for fiscal year 2023, detailing both capital investments and operating expenses. Operating expenditures were further disaggregated into categories such as raw materials, energy consumption, labor compensation, maintenance, insurance, professional services, etc. Capital expenditures included investments in facility upgrades, equipment acquisition, and sustainability initiatives. Where granular data were unavailable, such as lump sum totals for raw materials or fixed costs, standardized assumptions and IMPLAN sectoral proxies were applied. All reported figures were reviewed for consistency, and inter-firm transactions within the complex were identified and excluded to avoid double counting in the regional economic model.

Table 3 below outlines the direct expenditure collected through surveys and the breakdown details are entered into the IMPLAN model. These represent the high-level inputs upon which indirect and induced effects are calculated.

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TABLE 3

Direct Spending Inputs (2023)

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EXPENDITURE CATEGORY	AMOUNT
Total Capital Expenditure	**$124,700,044**
Total Operating Expense	**$11,752,447,009**
– Raw Materials	$10,962,543,730
– Energy Consumption	$301,368,655
– Others	$488,534,624

3.2 IMPLAN Model

→ This study uses IMPLAN, a widely recognized input-output economic modeling tool that quantifies how economic activity flows through industries, households, and governments. The model was built using the latest IMPLAN dataset for 2023 for Union County, NJ – the county where the five companies are located.

Economic activity is modeled using the following IMPLAN event types:

→ **Industry Output:** for operating expenditures and capital investments.

→ **Labor Income:** for employee compensation not tied to a specific industry.

→ **Industry Spending Pattern:** to estimate indirect supply chain impacts.

→ **Commodity Output:** for specific material categories such as catalysts or chemicals.

In multi-regional I–O (MRIO) enabled scenarios, indirect and induced impacts that occur outside the core region (e.g., other NJ counties) are captured through linked regions, allowing for a more complete estimate of statewide or national effects.

3.2.1 Analytical Framework

This study employs an **Input–Output (I–O)** economic modeling approach using **IMPLAN**, which leverages a Social Accounting Matrix to analyze interactions across industries, households, and government. Outputs are disaggregated into **direct, indirect,** and **induced** economic impacts (IMPLAN, 2023; IMPLAN, 2025).

3.2.2 Regional Scope and MRIO Configuration

An MRIO framework was implemented, encompassing both Union County and the remainder of New Jersey. This approach captures inter-regional supply-chain flows and household consumption patterns, facilitating precise spillover impact estimation (IMPLAN, 2024).

3.2.3 Scenario Construction and Data Inputs

The model includes:

→ **Operating expenditures** (for calendar year 2023).

→ **Capital investments,** treated as one-time events.

Spending categories were mapped to IMPLAN using a combination of Industry Output, Commodity Output, Labor Income, and Industry Spending Pattern events, based on the nature of each expenditure and its alignment with NAICS codes (Appendix B). Export volumes were modeled as external final demand and were excluded from the induced local consumption calculations to avoid over-attributing economic benefits to the local economy from externally driven demand. (IMPLAN, 2023; IMPLAN, 2025). Where applicable,

expenditures were matched to the most appropriate IMPLAN sector to ensure accurate representation of inter-industry flows. The source of a comprehensive crosswalk between spending categories and IMPLAN sectors is provided in Appendix B.

The interconnected operations of companies in the Bayway Complex pose a particular challenge in the analysis. Revenues from one company are expenditures by another. To eliminate double-counting, inter-company transactions among the five firms were systematically excluded. When internal transfers were indistinct, Commodity Output events were used to ensure that only net external sales contributed to economic impact (IMPLAN, 2023).

▮ 3.3.4 Assumptions and Limitations

This analysis relies on standard I–O assumptions:

→ **Fixed technical coefficients** (Leontief framework), with no substitution effects.

→ **Unlimited regional supply capacity.**

→ **A static annual snapshot** of economic activity.

→ **Allocation of lump-sum investments** using proportional sector-based logic.

→ **Removal of known intra-complex transactions,** though some unreported internal flows may remain.

These assumptions are consistent with conventional I–O modeling, which provides gross impact account for price or behavioral responses (IMPLAN, 2017).

▮ 3.3.5 Impact Categories

The IMPLAN model estimates economic impacts across four categories: **1) Direct effects** capture the immediate activity generated by the refinery and related industries, such as employment at the facility and the wages paid to its workforce. **2) Indirect effects** reflect the broader supply-chain response as local vendors, contractors, and service providers increase their own activity to meet the refinery's demand. **3) Induced effects** are the result of household consumption: as workers employed directly or indirectly earn additional income, they spend

Mapping of Economic Effects by Spending Type

SPENDING CATEGORY	IMPLAN EVENT TYPE USED	PRIMARY EFFECT CATEGORY	EXAMPLE IMPACT TYPE
Operating Expenditures	Industry Output	Direct	Refinery payroll, facility operations
Supply Chain Purchases	Industry Spending Pattern	Indirect	Maintenance vendors, material inputs
Household Spending	Induced (via Labor Income)	Induced	Local groceries, rent, healthcare
Capital Investments	Industry Output	Direct & Indirect	Construction, infrastructure upgrades
Labor Compensation	Labor Income	Induced	Employee wages flow into economy

it on housing, groceries, healthcare, and other goods and services, which in turn stimulates further economic activity in the region. **4) Total effects** are the sum of these three layers, providing a comprehensive picture of the refinery's economic contribution.

These impact categories are evaluated consistently across four key dimensions—employment, labor income, value added (GSP contribution), and output (IMPLAN, 2025). Figure 1 provides a conceptual illustration of the IMPLAN framework. Total outputs are divided into three nested measures of impact. **Labor Income** reflects

wages, benefits, and proprietor earnings. **Value Added** expands this to include labor income, business profits, and production-related taxes, aligning with GSP. **Output** is the broadest measure, combining Value Added with intermediate inputs purchased from other industries, representing the full sales or revenue of the sector.

Table 4 illustrates how different types of spending were categorized within IMPLAN and how they contribute to the model's layers of economic impact—direct, indirect, and induced. It also provides concrete examples of how these impacts manifest in the real economy. ●
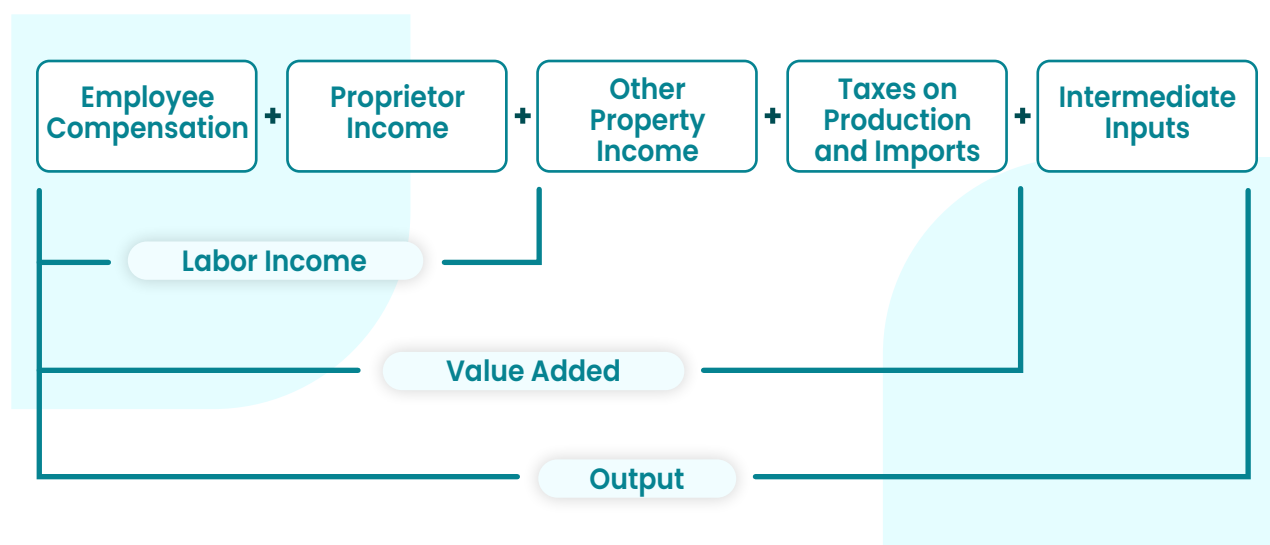

Figure 1. IMPLAN Model (Source: IMPLAN website – Understanding Output) section 3.3.5

4.0 ECONOMIC IMPACT RESULTS

The value added to the economy is equally striking. The Bayway Complex contributes over $7 billion to New Jersey's Gross State Product, nearly 1% of the entire state economy.

TABLE 5

Economic Impact for the Bayway Industrial Complex – Overall Economic Impact

IMPACT	JOBS	STATE	FEDERAL	TOTAL
1 - Direct	1,638	$372,895,123	$3,406,185,113	$13,257,677,538
2 - Indirect	4,115	$406,823,116	$1,962,139,941	$4,826,414,616
3 - Induced	6,338	$405,584,454	$1,983,407,387	$3,225,302,299
	12,091	$1,185,302,693	$7,351,732,440	$21,309,394,453

Note: Economic impact estimates are based on IMPLAN model results, with direct employment and labor income adjusted to reflect reported Bayway firm data.

4.1 Economic Impacts of Bayway's 2023 Operations

The Bayway Industrial Complex generates an economic footprint that extends far beyond its physical boundaries. IMPLAN modeling shows that its operations produce more than **$21 billion in total economic output each year,** a scale of activity that places Linden among the most important industrial hubs in New Jersey. Of this total, approximately **$13.3 billion arises directly** from the firms' spending and production, while another **$4.8 billion is created** indirectly as suppliers, contractors, and vendors respond to the Complex's demand. The remaining **$3.2 billion is induced** by household spending, as wages earned by employees circulate through the broader economy.

These cascading effects translate into employment across every corner of New Jersey. More than **12,000 jobs are supported statewide,** a figure that dwarfs the 1,600 direct positions within the Complex itself. Each job inside the fence line sustains six to seven other jobs across the state, from maintenance firms and transport companies to grocery stores, health providers, and local retailers. In total, the Complex supports nearly **$1.2 billion in labor income,** reinforcing the purchasing power of New Jersey families.

The value added to the economy is equally striking. The Bayway Complex contributes over **$7 billion to New Jersey's Gross State Product,** nearly 1% of the entire state economy. This share is relatively large compared

to most industrial sites. Its contribution extends beyond energy and chemicals into housing markets, service sectors, and regional supply chains.

The balance of direct, indirect, and induced effects illustrates both the **strength of New Jersey's industrial supply chains and the extent of household reliance** tied to the Complex. Its operations drive productivity in core industries while also sustaining the everyday services that residents depend on. The Bayway Complex connects international energy supply to local markets, transforming industrial output into jobs, wages, and community spending throughout the state.

The economic contribution of the Bayway Industrial Complex was estimated using IMPLAN's input–output framework across three categories of economic effects:

→ **Direct effects:** Resulting from the direct operations and capital investments of the five participating firms.

→ **Indirect effects:** Arising from business-to-business purchases within the supply chain (e.g., maintenance services, industrial inputs).

→ **Induced effects:** Stemming from household spending by employees whose income is supported by Bayway Complex's activity.

Table 5 presents employment, labor income, value added, and output by effect type, with results shown at the direct, indirect, and induced levels. Direct

employment and labor income were adjusted using survey-reported figures to align with observed company information, while the remaining measures were derived from IMPLAN's input–output modeling model.

As shown in Table 5, the Bayway Complex generated a total economic output of $21.3 billion statewide in 2023, including:

→ **$13.3 billion in direct output** from the companies' spending and production.

→ **$4.8 billion in indirect output** through upstream supply chain linkages.

→ **$3.2 billion in induced output** from household consumption.

These activities supported a **total of 12,091 jobs** across New Jersey:

→ 1,638 direct jobs, representing the workforce employed by the firms themselves.

→ 4,115 indirect jobs, supported through vendor, contractor, and supplier activity.

→ 6,338 induced jobs, supported by household spending from those direct and indirect workers.

The Complex also contributed significantly to labor income and value added (GSP):

→ Around **$1.2 billion in total labor income,** with 31% attributed to direct employment.

→ **More than $7 billion in value added,** which reflects the Complex's contribution to New Jersey's Gross State Product.

These figures underscore the Complex's far-reaching economic footprint, driving industrial productivity, workforce earnings, and household spending throughout the state. The balance across direct, indirect, and induced impacts reflects both the scale of operations and the strength of local supply chains and labor markets linked to the Complex.

■ 4.2 Benchmarking Bayway Against Comparable Studies

Comparative studies of other refineries help contextualize Bayway's role in New Jersey's economy. Prior to its closure, the Philadelphia Energy Solutions (PES) refinery was estimated to generate about $2.1 billion in annual output and support roughly 6,300 jobs, while a statewide study in Washington found that five refineries collectively contributed $1.9 billion in personal income and supported nearly 24,700 jobs. Bayway's estimated $21.3 billion in statewide output and more than 12,000 jobs place its impact between these benchmarks.

These comparisons suggest that while each facility or region has unique characteristics, the Bayway Complex is distinctive for its diversity: five companies—Phillips 66, Infineum, Nexpera, Linden Cogeneration, and Sunoco—operate side by side, spanning refining, chemicals, cogeneration, and logistics. Their integrated activity amplifies the scale of economic impact and underscores Bayway's role as a multi-firm industrial hub.

Table 6 presents a side-by-side comparison of Bayway's estimated 2023 impacts with results from two prior refinery studies. The figures highlight differences in scale and composition across facilities while providing context for interpreting Bayway's role in New Jersey's economy. ●

TABLE 6

Comparative Economic Impacts: Bayway, PES, and Washington Refineries

FACILITY / STUDY	TOTAL OUTPUT (ECONOMIC ACTIVITY)	VALUE ADDED / TOTAL OUTPUT	JOBS SUPPORTED
Bayway Industrial Complex (NJ, 2023)	**$21.3 billion statewide**	**~$7.0 billion (≈33% of output)**	**~12,000**
Philadelphia Energy Solutions (PA, pre-closure)	~$2.1 billion annually	~$0.6 billion (≈30% of output)	~6,300
Washington State Refineries (5 sites, 2019)	Not reported directly	~$1.9 billion in personal income	~24,700

5.0 TAX IMPACT SUMMARY

The combined operations of the five participating firms— generated an estimated $1.15 billion in total tax revenues in 2023.

Estimated Tax Revenues by Impact Type and Jurisdiction (2023) – Overall Tax Contributions

IMPACT	LOCAL	STATE	FEDERAL	TOTAL
1 – Direct	$2,454,417	$2,713, 195	$37,228,315	$42,395,927
2 – Indirect	$112,535,860	$82,399,613	$193,308,925	$388,244,398
3 – Induced	$179,859,369	$127,314,879	$412,593,553	$719,767,801
	$294,849,646	**$212,427,687**	**$643,130,739**	**$1,150,408,126**

Note: Tax contribution estimates are based on IMPLAN model results, with direct tax contributions adjusted to reflect reported Bayway firm data.

In addition to business and household activity, economic impacts also generate tax revenues for local, state, and federal governments. These include taxes on income, production, imports, property, and corporate profits. The table above estimates state, local and federal tax collections associated with this activity. This represents a strong return to public sector from private sector investment, especially at the state/local level.

Table 7 presents estimated tax revenues by jurisdiction and impact type. Direct tax totals are based on company-reported 2023 payments, with allocation across federal, state, and local levels determined by IMPLAN's tax framework. Indirect and induced taxes are calculated using IMPLAN's input–output model.

The economic activity generated by the Bayway Industrial Complex also leads to substantial tax revenue at all levels of government. As shown in Table 7, the combined operations of the five participating firms—Phillips 66, Infineum, Nexpera, Linden Cogeneration, and Sunoco—generated $1.15 billion in total tax revenues in 2023.

This includes:

→ **$643 million in federal tax revenue,** derived from income taxes (personal and corporate), social insurance contributions, and taxes on production and imports.

→ **$507 million in state and local tax revenue,** supporting New Jersey's public services and infrastructure through property taxes, sales taxes, licenses, and state-level income taxes.

These revenues stem not only from the direct operations of the firms, but also from indirect and induced activities throughout the supply chain and household sector. In particular:

→ Direct tax impacts reflect corporate and payroll taxes from the firms' own business activities.

→ Indirect tax impacts arise from taxes paid by suppliers and contractors serving the Complex.

→ Induced tax impacts result from consumer spending by employees and contractors whose income is supported by the Complex.

This level of tax generation contributes to public budgets at multiple levels of government. Beyond industrial output and job creation, its operations substantially bolster public finance at both the federal and state/local levels. These revenues support critical services such as education, infrastructure, public safety, and environmental management, indicating that the Complex is a significant recurring source of tax revenue. ●

6.0 CONCLUSION

The Bayway Complex's continued operation influences employment, labor income and public tax revenues across New Jersey, while its investments in new technology carry important implications for the future.

This study finds that the Bayway Industrial Complex makes a substantial contribution to New Jersey's economy. In 2023, the Complex generated $21.3 billion in total statewide output, added nearly $7.0 billion to Gross State Product, and supported more than 12,000 jobs. These impacts reflect the combined activity of refining, chemical manufacturing, power generation, logistics, and environmental services carried out by five co-located firms in Linden. The analysis also shows that the Complex was associated with approximately $1.2 billion in labor income and $1.15 billion in tax revenues at federal, state, and local levels.

Beyond these headline results, several broader patterns emerge. The large share of indirect and induced effects highlights the Complex's extensive connections across New Jersey's supply chains and household economy. Each direct job on site supports multiple jobs elsewhere in the state, underlining how deeply the Complex is embedded in the regional economy.

The findings also show that capital investments—about $124 million in 2023—play an important role in maintaining and upgrading the site. These expenditures generate short-term construction and supplier impacts while also positioning the facilities for longer-term changes in technology, environmental performance, and energy efficiency.

Finally, the results illustrate the significance of regional concentration. With nearly 1% of state GSP linked to a single industrial site, the Bayway Complex constitutes a large share of state GSP, which concentrates both benefits and risks in one site. Its continued operation influences employment, labor income, and public revenues across New Jersey, while its investments in new technologies carry implications for future economic and environmental outcomes.

6.1 Implications for NJ

The Bayway Industrial Complex contributes to New Jersey's economy in multiple ways, and the findings of this study highlight several dimensions of its significance:

→ **Employment and Labor Income:** In 2023, the Complex supported more than 12,000 jobs statewide, including 1,600 direct on-site positions and thousands more through supply chains and household spending. These jobs generated approximately $1.2 billion in labor income, underscoring the breadth of their impact on the state's workforce.

→ **Economic Output and GSP Contribution:** Total economic output linked to the Complex reached $21.3 billion in 2023, with nearly $7.0 billion added to Gross State Product—close to 1% of the state's economy. This level of concentration highlights both the scale of Bayway's contribution and the extent to which New Jersey's economy is tied to a single site.

→ **Supply Chain and Household Linkages:** Of the $21.3 billion in output, $4.8 billion came from supplier purchases and $3.2 billion from household spending. These figures illustrate how Bayway's activity supports a wide range of industries, extending far beyond its core refining, chemical, and power operations.

→ **Capital Investment and Technology:** In 2023, companies at the site invested about $124 million in capital projects, including facility upgrades and environmental technologies such as emissions recovery and hydrogen co-firing. These investments contribute to construction and supplier activity in the short term while shaping longer-term technology adoption and regulatory compliance.

→ **Public Revenues and Fiscal Stability:** The Complex was associated with $1.15 billion in federal, state, and local tax revenues in 2023, including $507 million at the state and local level. This recurring revenue stream makes the site relevant to fiscal planning, as changes in its operations would directly affect public budgets.

→ **Infrastructure and Energy Supply:** The Complex provides more than half of New Jersey's refining capacity and plays a role in fuel supply for the broader Northeast corridor. Its dependence on pipelines, energy systems, and transportation infrastructure underscores the importance of maintaining resilient infrastructure to support both state and regional energy needs.

Government policy choices regarding fiscal stability, workforce development, infrastructure investment, and environmental regulation will directly influence the Complex's future trajectory. ●

Appendix A: Participating Companies

The five participating companies—Phillips 66, Infineum, Nexpera, Linden Cogeneration, and Sunoco—were included in this study because together they form the integrated Bayway Industrial Complex. Each company represents a distinct but interconnected role within the site's operations: refining, chemical manufacturing, environmental regeneration, power generation, and fuel logistics. By providing detailed expenditure and payroll data for 2023, these firms enabled the analysis to capture the full scope of the Complex's economic footprint. Their combined activities illustrate how co-located operations magnify regional impact, strengthen supply chains, and ensure that the results reflect the true scale of Bayway's contribution to New Jersey's economy.

A.1 Phillips 66 Bayway Refinery – Linden, NJ

Located on the New York Harbor in Linden, New Jersey, the Phillips 66 Bayway Refinery is one of the most significant petroleum processing facilities on the East Coast. Built in 1909, the refinery is strategically positioned just 13 miles southwest of Manhattan and plays a vital role in supplying transportation fuels and petrochemical products throughout the region.

The Bayway facility processes primarily light, low-sulfur crude oil, sourced via tanker from Canada, West Africa, and Northern Europe. With a crude oil processing capacity of 258,000 barrels per day and a total throughput capability of 285,000 barrels per day, the site yields a 92% clean product rate. Major refined outputs include gasoline (145,000 bpd), distillates such as diesel and heating oil (115,000 bpd), aviation fuel, petrochemical feedstocks, and residual fuel oil.

Bayway's infrastructure includes a full suite of advanced processing units: fluid catalytic cracking, hydrodesulfurization, a naphtha reformer, and an alkylation unit, among others. The site also houses a substantial polypropylene manufacturing plant with a production capacity of 775 million pounds per year, underscoring its importance in the broader chemical manufacturing sector.

Refined products are distributed via pipeline, barge, railcar, and tank truck, allowing the refinery to serve diverse commercial and residential energy markets throughout the Eastern United States. The facility employs approximately 700 full-time workers and supports a wide array of indirect jobs through its logistics and supply chain networks.

According to Phillips 66, Bayway is a critical hub in the company's U.S. operations, linking international crude oil supply chains to densely populated and industrialized consumer markets on the East Coast. The refinery's complexity rating of 7.7 on the Nelson scale reflects its technical sophistication and ability to handle a wide range of products and regulatory requirements.

A.2 Nexpera – Linden, NJ

Nexpera, headquartered in Newark, Delaware, is a leading North American provider of regenerative chemical services focused on sustainable, circular economy solutions. The company was established in 2024 when American Industrial Partners acquired Veolia North America's acid regeneration business. This legacy dates back more than a century through predecessor firms such as Grasselli Chemical, DuPont, and Veolia. Today, Nexpera employs approximately 300 people across 13 sites, five of which are integrated within petroleum refineries. Among these, the facility in Linden, New Jersey—known internally as the Morses Mill Plant—plays a critical role in the company's operations.

The Linden site, located at 1400 South Park Avenue, is a sulfuric acid regeneration facility that supports regional refineries and industrial customers. Operating under full environmental permits from state and federal agencies (including RCRA, TRI, and NPDES), the plant is designed to clean and restore sulfuric acid, converting it back into merchant-grade products used widely in alkylation units within refineries.

Nexpera's business model centers on recovering value from chemical waste streams, thereby reducing environmental impact and lowering costs for its clients. The Linden plant also recovers sulfur gases from industrial emissions and converts them into usable sulfur-based chemicals, such as fertilizers and

TABLE 8

Summary of Nexpera Business and Activities

FOCUS AREA	ACTIVITIES & OUTPUTS
Acid Regeneration (Sulfuric, KOH)	Chemical treatment and restoration
Sulfur Gas Recovery	Conversion to sulfur derivatives
Environmental Compliance	Waste management and permitting (RCRA, TRI, NPDES)
Technical Services	Plant inspections and maintenance programs

battery-grade materials. The company supplements its core chemical processing services with technical field support, including equipment inspections, mechanical integrity assessments, and regulatory compliance services. Positions at the Linden site frequently require certifications in API 510, 570, and 653, reflecting a strong emphasis on safety and asset reliability.

Table 8 summarizes the major business activities of Nexpera and their respective outputs.

Nexpera's Linden operation is a cornerstone of its broader mission to advance chemical sustainability through industrial regeneration, emissions recovery, and high-reliability services. The site continues to support a wide range of East Coast industrial and refining clients, reinforcing its role in both economic resilience and environmental stewardship.

A.3 Infineum – Linden, NJ

Infineum, a joint venture formed in 1999 by ExxonMobil and Shell, is a specialty chemicals company with research and development capabilities around innovative chemistry. Its Linden, New Jersey site includes the Bayway Chemical Plant – one of six key manufacturing facilities worldwide, and a Business & Technology Center that and serves as the company's regional center in the Americas.

The Chemical Plant is located at the corner of Park and Brunswick Avenues, and the Business & Technology Center is located at 1900 East Linden Avenue.

Infineum develops and produces additives for the lubrication of automative, heavy-duty diesel, and marine engines, and specialty chemicals additives to driveline, gear oils, industrial oils, and fuels. Infineum is building new capabilities to generate sustainability advantages to new markets. The facility is certified under Infineum's global Operational Integrity Management System (OIMS)–equivalent to ISO 45001–to maintain rigorous health, safety, security, and environmental standards. The Linden Business & Technology Center recently marked an impressive milestone of 10 years without a recordable injury, underscoring its strong safety culture.

Infineum employs over 500 staff across its manufacturing operations and the adjacent business and technology center. Regulatory oversight includes an NJDEP Title V air permit – first issued in 2003 and renewed every five years – and active reporting for TRI-managed chemicals, reflecting comprehensive environmental compliance and community engagement.

Infineum's Linden, NJ plant exemplifies its position as a technological and operational hub within the global specialty chemicals industry. By combining additive production, advanced research capabilities, and a strong safety and compliance record, the site supports

TABLE 9

Summary of Infineum Business and Activities

FOCUS AREA	ACTIVITIES & OUTPUTS
Additive Development & Production	Engine detergents, driveline modifiers, industrial lubricants, fuel & cold-flow additives
Research & Technology Support	Laboratory testing (e.g., battery materials, performance chemistry)
Health, Safety & Environmental	OIMS-based safety regime, Title V air permitting, TRI reporting
Workforce & Regional Capability	~500 employees, regional technical & business center

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regional and international customers – particularly in the transportation, industrial, and energy sectors – with innovative solutions that optimize engine performance, improve fuel efficiency, and align with sustainability goals.

A.4 Linden Cogeneration Plant – Linden, NJ

Linden Cogeneration is a large-scale, natural-gas-fired cogeneration (combined heat and power, CHP) facility located at Railroad and Chemico Avenues in Linden, New Jersey, adjacent to the Phillips 66 Bayway Refinery. The plant is owned and operated by Linden Topco, LLC, with equity held by a consortium including JERA Americas (50%), EGCO Group (28%), Development Bank of Japan (12%), and GS-Platform Partners (10%).

Commissioned in phases from May 1992 to January 2002, the facility is comprised of the Linden 1–5 and the Lin-

den-6 units, totaling approximately 980MW of combined cycle generating capacity, including integrated steam production for onsite and offsite applications. The combined-cycle blocks utilize GE gas turbines (7EA models for Linden 1–5, 7FA for Linden 6) with corresponding heat recovery steam generators (HRSG) and steam turbines.

Functioning as a cogeneration plant, it sells electricity into the NYISO and PJM wholesale markets and delivers steam under long-term contracts to the Phillips 66 Bayway Refinery and Infineum. Fuel flexibility allows operation on natural gas, butane, distillate, and can co-fire up to 40% hydrogen in the Linden-6 unit following upgrades completed in 2022, helping to reduce annual CO_2 emissions.

A robust emissions control suite is in place; each unit is equipped with selective catalytic reduction (SCR) systems for NO_x reduction. Plant operations are substantial, producing an average 5.5 TWh annually.

The facility also includes critical infrastructure improvements, such as the installation of dual natural gas supply pipelines and metering stations in 2017 to

TABLE 10

Summary of Cogen Business and Activities

FOCUS AREA	ACTIVITIES & OUTPUTS
Capacity & Equipment	Five GE 7EA/one GE 7FA gas turbines with respective HRSGs and SCR systems, three GE dual extraction steam turbines, generating capacity totaling ~980 MW
Cogeneration	Electricity sold to NYISO & PJM; steam and electricity sold to Phillips 66 Bayway Refinery and Infineum.
Fuel & Decarbonization	Operates on natural gas, butane, and distillate; Linden-6 co-fires up to 40% hydrogen via refinery off-gas supply
Infrastructure Enhancements	Dual gas pipelines (installed 2017) for redundancy; advanced metering
Environmental & Emissions Control	Linden 1-5: SCRs and gas turbine natural gas wet combustors for NO_x, stormwater retention basin discharge permit (also provides tertiary containment), wastewater discharged to local sewerage authority via industrial discharge permit. Linden-6: SCR and gas turbine natural gas dry low NO_x combustors for NO_x, gas turbine fuel oil water emulsion system for NO_x, CO catalyst for CO, hydrogen blend from refinery off-gas lowers CO_2 emissions.
Ownership & Investment	Owned by Linden Topco, LLC—JERA Americas, EGCO, DBJ, GS-Platform Partners
Operational Impact	~5.5 TWh annual generation; supports regional grid and onsite industrial energy needs

enhance fuel reliability and operational flexibility. Water management practices include optimized stormwater treatment systems to maintain regulatory compliance while protecting local waterways.

Linden Cogeneration is a cornerstone of energy infrastructure in Linden, NJ, delivering reliable and efficient power and steam through advanced combined cycle gas turbine (CCGT) technology and robust fuel flexibility. Its integration with the Bayway Refinery and regional grids positions the plant as a critical link in both industrial and wholesale energy markets. The 2017 infrastructure improvements and 2023 hydrogen co-firing capabilities demonstrate proactive efforts toward resilience and lower emissions within the evolving energy landscape.

A.5 Sunoco LP – Linden, NJ

Sunoco LP, headquartered in Dallas, Texas, operates a significant fuel terminal facility at 3700 S. Wood Avenue, Linden, NJ. This strategic terminal contributes to the company's midstream and fuel distribution operations throughout the East Coast. Spanning a volumetric capacity of approximately 4.96 million barrels across 37 tanks, the Linden terminal is equipped with one ship dock, one barge dock, and an eight-bay truck rack. It accommodates a wide range of petroleum products, including distillates, gasoline, jet fuel, ethanol, and diesel, and supports multiple access modes—via pipeline, ship, barge, and road—through connections to the Sunoco, Buckeye, and Colonial pipelines.

As part of Sunoco's broader commercial fuels and logistics network, the Linden terminal serves both branded and unbranded customers, offering wholesale rack fuel, bulk delivery, and emergency fuel solutions. Its location on the Chemical Coast places it in proximity to key industrial and logistics centers including Elizabeth, Rahway, and Plainfield, enabling efficient regional distribution.

Sunoco also maintains a retail presence in Linden through at least one Sunoco-branded convenience location at 401 Edgar Road, offering Top Tier gasoline, diesel, high-performance fuels (including performance and racing fuels), and consumer amenities like restrooms and rewards programs.

TABLE 11

Summary of Sunoco Business and Activities

FOCUS AREA	ACTIVITIES & OUTPUTS
Wholesale & Bulk Fuel	Handles distillates, gasoline, diesel, jet fuel, ethanol via pipelines, docks and racks.
Pipeline & Marine Logistics	Connects to Colonial, Sunoco, and Buckeye pipelines; ships/barge transfers supported
Retail Fuel & Convenience	Sunoco-branded station at Edgar Road, offering Top Tier and performance fuels
Employment & Operations	Staffed by terminal operators, fuel attendants, and sales personnel, with structured roles and pay

Operational staffing in Linden includes terminal operators, fuel attendants, and sales associates.

Sunoco's Linden site plays a dual commercial role: it functions as a major midstream fuel terminal, critical for the movement and distribution of various petroleum products across the Northeast U.S., and as a retail presence serving local consumers through a convenience station. Through its integrated logistics—including pipelines, marine docks, and road-based delivery—the facility supports Sunoco's commitment to reliable energy supply and operational efficiency in one of the nation's busiest mid-Atlantic trade corridors. ●

Appendix B: IMPLAN Methodology, Sector Mapping, and Assumptions

This study employed the IMPLAN 546-sector framework to classify economic activities according to their corresponding North American Industry Classification System (NAICS) codes. Expenditure categories were mapped to IMPLAN sectors based on the functional nature of the activity—whether capital investment, operational spending, or contracted services. The sectoral alignment followed standard IMPLAN conventions to ensure analytical consistency. The full IMPLAN sector-to-NAICS crosswalk

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is available via the IMPLAN Knowledge Base: https://support.implan.com/hc/en-us/articles/6486588565915-NAICS-To-IMPLAN-Industry-Search

B.1 Study Region and Scenario Design

The study region comprises Union County, New Jersey, and the remainder of the state, modeled using IMPLAN's MRIO capability. The analysis reflects economic activity in the year 2023 and incorporates reported expenditures from five companies operating within the complex. Modeled expenditures include operating costs, capital investments, and export-related production.

B.2 Modeling Approach

Expenditures were allocated using the following IMPLAN event types:

- **Industry Output** – for industry-specific purchases and revenues.
- **Commodity Output** – used where the industry sector was ambiguous, but the spending category was clear.
- **Labor Income** – for employee compensation.
- **Industry Spending Pattern** – for estimating supply chain effects.

Sector assignments were based on NAICS alignment and IMPLAN documentation.

B.3 Assumptions and Data Controls

- **Sustainability investments** were modeled by proportionally distributing lump-sum expenditures across applicable IMPLAN sectors.
- **Intra-complex transactions** (e.g., steam from Linden Cogen to Phillips 66) were removed where reported, to avoid double-counting.
- **Ambiguities in spending categories** were resolved using conservative Commodity Output modeling.
- Although care was taken to prevent overestimation, **some minor intra-complex spending** may have gone unreported and could not be excluded.

B.4 Modeling Limitations

This economic impact analysis is based on IMPLAN model-ing, which applies industry-specific multipliers and regional purchase coefficients to estimate ripple effects across the economy. While IMPLAN is a widely accepted tool, results should be interpreted as estimates rather than precise measurements. Several factors constrain accuracy:

1. The analysis assumes that spending patterns align with industry averages, whereas actual vendor sourcing may differ.
2. Imports are excluded as economic leakages, which can understate impacts if more inputs are sourced domestically than modeled.
3. Induced effects rely on household spending patterns that may not fully reflect the demographics of refinery employees; and
4. Capital expenditures were modeled as occurring within a single year, though in practice investment spending may be spread over multiple periods.

In addition, tax contributions beyond the company's known direct payments were estimated using IMPLAN's fiscal accounts, which provide reasonable approximations but may diverge from actual collections due to differences in tax policy or reporting. These limitations are common to input–output analysis and should be considered when interpreting the results. ●

Appendix C: Industry-Level Results and Economic Definitions

- **Output:** Total value of goods and services produced by an industry.
- **Value Added:** Contribution to GSP (Output – Intermediate Inputs).
- **Labor Income:** Total compensation for workers.
- **Employment:** Number of jobs supported (part-time + full-time).
- **Indirect Effects:** Supply chain impacts.
- **Induced Effects:** Household spending impacts.
- **MRIO:** Multi-Regional Input-Output modeling in IMPLAN.

The IMPLAN platform produces detailed industry-level outputs for key economic indicators, including total output, employment, labor income, and value added. These results are disaggregated by impact type (direct, indirect, induced) and by region.

Crosswalk of NAICS to IMPLAN sectors available at: https://support.implan.com/hc/en-us/articles/6486588565915-NAICS-To-IMPLAN-Industry-Search ●

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