

Section D - Operational

1. Introduction

This section presents preliminary studies on the operations to be carried out in area **STS08**. Specifically, this section focuses on the general operating requirements for handling, storing, and distributing liquid bulk, in the Port of Santos-SP, Brazil.

2. Description of Activities

For illustrative purposes, the study segments the essence of **STS08's** operation under the following three main activities: Pipeline reception of petroleum by-products from the Presidente Bernardes refinery in the City of Cubatão, storing the product in specialized tanks and, shipping the product using cabotage vessels.



Figure 1 - STS08's operational flowchart.
Source: EPL.

The handling of liquid bulk occurs predominantly in two regions in the Port of Santos: Alamoia and Barnabé Island. The terminal in question is located in Alamoia and will use the region's existing coastal infrastructure in its handling operation in addition to a new planned berth.

In Alamoia, liquid bulk vessels currently have four berth options available: two with 400m each (AL1 and AL2) and two others with 272m each (AL3 and AL4). In addition to these berths, it is possible for smaller vessels to be moored on the inside of the pier's west side. This smaller berth was designed for barges measuring 80 meters long and 6-meter draught, and capacity of 4,000 TPB capacity. The barges themselves are used to fuel bunker to docked vessels in the Port Complex. The following figure illustrates the berthing infrastructure described above:



Figure 2: Location of liquids bulk berths in the Alamoia region of the Santos Port Complex.
Source: Master Plan for the Santos Port Complex (2018).

Section D - Operational

In addition to the primary activities of handling and storage, the following auxiliary activities are also permitted:

- Quality control;
- Heating or cooling;
- Marking;
- Weighing;
- Cleaning; and
- Other.

3. Operational Performance

The operational performance of handling and storing liquid bulk in port terminals can be measured by the following aspects:

- Average Cargo per vessel;
- Average cargo-handling rate;
- Berth Occupancy Rate; and
- Service Level.

In the next chapter the study will present liquid bulk's historical statistics in Alamoá.

3.1. Average Cargo per Vessel

This indicator measures the average cargo weight a vessel loads or unloads during its stay at the port. The following table presents the average cargo per liquid bulk vessel at Alamoá's two main berths between 2014 and 2018.

Liquid Bulk – Alamoá	2014	2015	2016	2017	2018	average
Alamoá 1 – Total	27,131	22,705	21,936	22,524	22,309	23,321
Alamoá 1 – LPG	22,745	16,914	19,189	16,473	20,304	19,125
Alamoá 1 – Petroleum By-products	28,331	24,115	22,714	24,372	22,766	24,460
Alamoá 2 – Total	24,231	19,694	17,101	18,335	19,201	19,712
Alamoá 2 – LPG	25,230	23,708	21,782	15,597	14,827	20,229
Alamoá 2 – Petroleum By-products	25,238	20,845	18,021	21,003	22,635	21,548

Table 1 - Historical average cargo per vessel, 2014 - 2018 period.

Source: adapted from Antaq Yearbook data (2018).

It is worth noting that the Alamoá 1 berth handled only petroleum by-products (including LPG) during the referred period. Meanwhile, Alamoá 2 handled petroleum by-products and smaller amounts of other liquid bulk cargo. The period's average cargo per vessel, segmented by berth and product can be seen on the table's last column.

3.2. Average Cargo Handling Rate

Section D - Operational

The mean handling rate represents the average ton of product that can be loaded or unloaded at a given berth, during a specified timeframe. The usual convention is to show this indicator on a per hour basis (ton/hour). Furthermore, the hours considered in the denominator of the ratio also allow for the two following distinctions: Operating Handling Rate (only considers the time when the vessel is being loaded or unloaded), and General Handling Rate (considers the entire time the vessel is berthed).

The following table shows productivity data for petroleum by-products in Alamoia during the period 2014-2018.

Alamoia 1	2014	2015	2016	2017	2018	average
Alamoia 1 - LPG (Operational)	640	558	559	601	539	579
Alamoia 1 – Liquid Petroleum By-products. (Operational)	1018	994	920	987	846	953
Alamoia 1 – LPG (General)	487	400	403	396	383	414
Alamoia 1 – Liquid Petroleum By-products (General)	789	699	633	661	579	672
Alamoia 2						
Alamoia 2 - LPG (Operational)	681	727	694	578	536	643
Alamoia 2 - Liquid Petroleum By-products. (Operational)	824	760	589	656	647	695
Alamoia 2 – LPG (General)	531	519	459	376	354	448
Alamoia 2 - Liquid Petroleum By-products (General)	663	558	418	485	483	521

Table 2 - Average handling rate in Alamoia during period 2014 – 2018 (ton/hour).

Source: adapted from Antaq Yearbook (2018).

It is important to mention that the berth productivity for unloading liquid petroleum by-products is strongly influenced by the model of ships served. Indeed, liquid bulk vessel's model specification determines the power of its pump, which greatly affects the unloading rate of products from the ship.

In fact, one can observe these productivity discrepancies by comparing Alamoia's berth one and two. In Alamoia 1, there is a much higher level of productivity (953 t/h). It is also the case that Alamoia 1 only handles larger petroleum byproduct vessels. On the other hand, berth AL02, which mostly handles products other than petroleum by-products, has an average cargo handling rate of 700t/h. The reasons are the available equipment for higher flow loading and the size of the vessels that dock there.

3.3. Occupancy Rate

Between 2014 and 2018, the average occupancy rates at Alamoia one and two corresponded to 66%, according to the data below. More recent measurements point to higher occupancy level of 70%.

OCCUPANCY RATE OF BERTHS IN SANTOS						
Berths	2014	2015	2016	2017	2018	Average
Alamoia 1 (SSZ0101)	52,8%	61,1%	67,7%	74,2%	72,2%	65,6%
Alamoia 2 (SSZ0102)	55,5%	67,2%	71,0%	65,8%	71,7%	66,2%

Table 3 - Berth occupancy rates of liquids and gas in Santos.

Source: Data adapted from ANTAQ (2019).

Section D - Operational

3.4. Service Level

Service level of is defined as the ratio of wait time to operating time. According to UNCTAD1, the ideal service level for any type of cargo is 30%. Levels higher than 30% may indicate a high probability of vessels incurring demurrage expenses. Finally, levels above 100% indicate that the ship's waiting time is longer than its operating time.

Next, the table below shows the service levels for the period 2014 and 2018 in Alamoá's berth 1 and 2.¹

Port of Santos	2014	2015	2016	2017	2018
Alamoá 1	250,51%	301,18%	262,31%	354,55%	239,45%
Alamoá 2	322,26%	356,03%	337,01%	442,95%	320,12%

Table 4 - Historical ship service level in Alamoá berths 1 and 2, period 2014 - 2018.

Source: Adapted from Antaq Yearbook (2018).

The service level average in last 5 years were 281.6% in the Alamoá 1 and 355.7% in Alamoá 2.

4. Operating Costs and Expenses

In this subsection, the study addresses cost and expense projections for the terminal over the contract horizon. The terminal's cost structure is divided into fixed costs and variable costs. To appropriately allocate cost to fix or variable, the study evaluates the nature of each cost according to the list below:

Fixed Costs:

- Own Labor;
- Utilities;
- Maintenance;
- General and Administrative;
- Environmental Costs;
- Fees and other Contributions.

Variable Costs:

- Independent Contractors (OGMO);
- Utilities;
- Port Tariffs.

Each cost group considered above will be further elaborated in the next few chapters.

4.1. Fixed Costs

4.1.1.Labor

For purposes of correctly sizing fixed labor costs, the study considered a team of 181 employees to operate in the STS08 lease area.

¹ The average time to dock and the average operating time

Section D - Operational

To estimate the size of the administrative staff, the study assumes a correlation between the size of the team and of the enterprise, measured by the business's expected revenue.

However, it is important to note that the evolution of the size of the teams occurs gradually, which means that the growth of the administrative team does not continuously follow the revenue curve. Indeed, the study assumes that growth of the administrative team occurs under a set of revenue intervals. As such, the following table sets out the required administrative staff for each revenue interval.

Team	Annual Gross Revenue							
	< 3800	<18,000	<30,000	<45,000	<60,000	<110,000	<160,000	> 160.000
General Manager	0	0	1	1	1	1	1	1
Senior Manager	1	1	2	2	3	3	4	6
Manager	3	2	3	3	4	5	6	10
Administrative 1	1	1	1	3	4	6	8	15
Administrative 2	0	3	2	3	3	5	6	10
Total	5	7	9	12	15	20	25	42

Table 5: Administrative staff (gross revenue x 1,000).

Source: EPL.

According to the classification in the table above, Terminal **STS08** would fall in the highest gross revenue category - a yearly revenue above R\$ 160 million/year. Thus, the terminal's corresponding administrative staff size would be 42 people.

For the environmental area, the study followed IBAMA's methodology for licensing terminals. Namely, the agency classifies a terminal as small, medium or large and assigns a recommended number of environment personnel in the company. The study started from the premise that a small terminal needs only one environmental supervisor, a medium-sized terminal needs a supervisor and an environmental technician, and a large terminal needs a supervisor and two technicians (**STS08** terminal range), as detailed in following table:

Team	Small-Sized	Medium-Sized	Large-Sized
Supervisor	1	1	1
Environment Technician	0	1	2
Total	1	2	3

Table 6: Level of the terminal's internal environmental team

Source: EPL

Additionally, in compliance with Resolution 52/2018 of the National Public Security Commission for Ports, Terminals and Waterways (CONPORTOS), a port security supervisor with direct employment was included, required for all terminals included in international traffic.

Unlike the administrative staff, the number of operational employees at any given terminal relates with the amount of cargo handled, and not with revenues generated. Therefore, to estimate the composition of the workforce, the productivity/employee ratio was applied, with data collected in eight liquid bulk port terminals

This ratio assesses the relationship between the terminal's historical handling and the number of employees in the operating sector, as detailed in the table below:

Section D - Operational

Terminal	Handling/m ³	Operational Employees	Productivity m ³ /employee	Productivity t/employee
1	1,055,631	28	37,701	34,308
2	972,193	28	34,721	31,596
3	498,739	24	20,781	18,911
4	384,546	17	22,620	20,584
5	347,409	6	57,902	52,691
6	146,164	3	48,721	44,336
7	576,000	27	21,333	19,413
8	750,000	36	20,833	18,958
			Average	30,100

Table 7: Productivity /employee in eight port terminals

Source: EPL Database

On average, liquid bulk terminals handle 30,100 tons per employee per year. Hence, considering STS08's own yearly throughput, the study arrives at 135 operational personnel. Worth noting that, in order to arrive at the volume in tons, the study assumed an average density of 0,91 t/m³.

Wage values were taken from the following government databases: SICRO (SP), SINAPI (SP) and SINE/SINE/Trabalha Brasil (Nacional). In relation to payroll taxes, the study formulated a specific composition reflecting a sample from the national collective bargaining dataset. The number of employees, wages and payroll taxes are detailed in the following table:

Administrative	Quant	Salary,	Payroll	Total	Source
General Manager	1	48.918	103,25%	1.193.105	SINE Nacional.
Senior Manager	6	18.286	103,25%	2.675.918	SINE Nacional.
Mid-Level Managers	10	12.190	103,25%	2.973.241	SINE Nacional.
Administrative Support Team (1)	15	3.051	103,25%	1.116.121	SICRO SP, 04/2020
Administrative Support Team (2)	10	1.886	103,25%	459.898	SICRO SP, 04/2020
Environment/Port Security					
Supervisors	2	4.329	103,25%	211.169	SICRO SP, 04/2020
Environmental Technicians	2	3.111	103,25%	151.753	SICRO SP, 04/2020
Maintenance					
Supervisors	7	4.329	103,25%	739.090	SICRO SP, 04/2020
Maintenance Technicians	29	1.853	103,25%	1.310.384	SINAPI SP, 06/2020
Operation					
Operational Officer	12	4.329	103,25%	1.267.012	SICRO SP, 04/2020
Ship Transfer Team	29	1.630	103,25%	1.152.580	SINAPI SP, 06/2020
Storage Facilities	29	1.630	103,25%	1.152.580	SINAPI SP, 06/2020
Receipt and Delivery	29	1.630	103,25%	1.152.580	SINAPI SP, 06/2020
Total	181			15.555.428	

Table 8 - Direct Employees of Area STS08.

Source: EPL.

Annex D-1 details unit and quantitative values.

4.1.2. Utilities

This category encompasses the fixed costs and expenses of the administrative and support areas, such as: electricity, water/sewage supply and communication.

Fixed electricity expenditures are generated by support activities, lighting, energy for non-operational and administrative uses.

Section D - Operational

Regarding electricity expenses, Companhia Piratininga de Força e Luz (CPFL) shared with EPL its unitary charges for industry in the Baixada Santista region. The full electricity tariff is the sum for distribution charge (TUSD) and energy consumption charges (TE). Hence, **STS08's** electricity rate, measured in Kwh, is **R\$ 0.49867/kWh**.

Expenses with water supply and sewage depend on the level of consumption at the terminal. The study assumed a rate of consumption equal to 100 liters per employee per day, as per PAP parameters. The total cost also depends on the relevant tariff for the region. According to Companhia de Saneamento do Estado de São Paulo, the current unit value for water and sewage for the commercial sector and services is **R\$ 33.40/m³**.

Regarding electricity and water/sewage services, the study assumes that the lessee will enter into direct contracts with the utility companies.

The communication category includes expenses with telephony, internet, correspondence, and advertising. To estimate this expense, the study consulted estimates in the Port Leases Program. To adjust for inflation, the original values were adjusted using the accumulated IPC-A index, representing 43.27% (from July/2013 to June/2020). Finally, the final expenses were set at **R\$ 14.327,00/month**.

Utilities	Cost/Year (R\$)
Electricity	459.000
Water	221.000
Communication	172.000
Total	852.000

Table 9 - Utility costs in area **STS08**.

Source: EPL.

Annex D-1 details unit and quantitative values.

4.1.3.Maintenance

Maintenance costs were divided into maintenance of civil infrastructure and equipment at the terminal. The premise used in this case is to apply a maintenance fee for the new assets that adequately reflects the outlay required to keep the goods in a state of conservation adequate for the performance of operations at the terminal.

In the case of the **STS08** lease area, considering that it is a brownfield operation which entails the acquisition of new operational assets, the level of annual maintenance required to maintain existing and future infrastructure is, respectively, 1% and 0.5% of asset value.

Regarding equipment, such as pipeline and loading stations, there is greater wear due to the recurrent utilization. Thus, the required annual upkeep to maintain existing and future equipment is, respectively, 2% and 1% of asset value.

Given the rates of upkeep defined on the last few paragraphs, once existing and future asset values are established, the study can directly calculate the maintenance expense. The estimated maintenance for **STS08**, according to the rationale discussed in this chapter, is shown on table below.

Maintenance	Asset Base (kR\$)	Cost/Year (R\$)
0.61% Infrastructure	243.865	1.487.000
1.31% Equipment	52.193	684.000
Total	296.058	2.171.000

Table 10 - Projected maintenance costs for **STS08**.

Section D - Operational

Source: EPL

Further quantitative details in Annex D-1.

4.1.4. General and Administrative

This cost group encompasses cleaning, accounting, legal consultants, insurance, security, vehicles, fuel and others.

To determine the appropriate cleaning expenses for the **STS08** lease area the following items were considered:

- Salaries and payroll taxes of the SICRO system for five employees corresponding to R\$ --- per year.
- Expenses with cleaning products were set as 10% of the cleaning team’s total wage per year.

Based on the assumptions adopted, the total yearly cleaning expenses are set at **R\$ R\$ 247.000,00** (rounded out).

For outsourced accounting, legal and consulting services, the study adopted the same assumptions as PAP, updating the original value from R\$ 100.000,00/year using the accumulated IPC-A index of 43,27% (from July/2013 to June/2020), resulting in the final amount of **R\$ R\$ 144.000,00** per year (rounded out).

The insurance policies applicable to **STS08** are summarized in the following table:

Phase	Insurance	BASIS OF	kR\$ / Year
During the Contract	Insurance guarantee of contract execution	Contract value	394
During construction	Engineering risk insurance	Construction	12
	insurance against Civil liability from construction	Construction	5
During operation	Specific/multi-risk risk insurance	Capex total	414
	Civil liability insurance for contractual activities	Contract value	58
TOTAL cost (ROUNDED OUT)			870

Table 11: Insurance policy applicable to **STS08**.

Source: EPL.

The security cost refers to expenses with the terminal’s own security personnel, as well as with security cameras, software, and equipment. The study estimates the need for a total contingent of 12 security guards, with salaries plus payroll taxes totaling R\$ 659.697,00, based on SICRO. As for the remaining cost of software and equipment, the study assumes that the related cost will be equivalent to 10% of total wages and payroll taxes of security personnel, or R\$65.970,00 per year. Therefore, the total yearly security cost was set at **R\$ 726.000,00** (rounded out).

For the expense category of vehicles and fuels, the study only considers light vehicles that circulate within the port or are used for external meetings/purchase of raw materials. The study assumes the need for three vehicles and three drivers, with salaries and payroll taxes adding up to R\$ ---per year, based on SICRO. In addition, the study also considers expenses with fuels, lubricants, IPVA taxes and insurance estimated at 20% of the amount of wages and payroll taxes. Based on such assumptions, the total annual expenses with fuel and vehicles are **R\$ 187.000,00** a year (rounded out).

Section D - Operational

On the item “Others”, less representative expenses are grouped together, such as: food, IT and supplies. To set the level of these expenses, the study assumed the expenses under “Others” to be equal to 10% of the sum of SG&A expenses discussed above. Hence, the final spending on “Other” costs is **R\$ 218.000,00** per year.

The cost categories discussed in this chapter are listed below:

General and Administrative	Cost (R\$)
Cleaning	247.000
Accounting /Legal / Consulting	144.000
Insurance	870.000
Security	726.000
Vehicles/Fuel	187.000
Other	218.000
Total	2.392.000

Table 12STS08 area.
Source: EPL.

Annex D-1 details unit and quantitative values.

4.1.5.Environmental Costs

The environmental cost is composed of expenses with licenses, studies and environmental programs. The cost must also represent disbursements related with the preliminary studies for acquiring licenses for operating the port terminal.

The preliminary diagnosis concerning environmental issues, as well as the assumptions for sizing the costs for area **STS08** are discussed in Section F - Environmental.

4.1.6.Fees and other Contributions

Regarding fees and contributions, Law No. 13,467 of July 13, 2017, is particularly significant, as it disavows all mandatory trade union contributions, lowering payroll costs for all companies. Hence, in modeling **STS08**, the study did not have to assume provisions for trade union contributions.

On the other hand, the Supreme Federal Court’s (STF) decision declaring that State-owned leased lands are subject to Urban Property and Territorial Tax (IPTU), directly increasing the cost for all current and future lessees of port terminals.

Therefore, the study recognizes annual IPTU expense in its financial model for **STS08** area. To establish the actual amount to be paid, the study bases its estimate on the unitary cost the area currently incurs, valued at R\$ 8.30/m²/year. Regarding cost classification, IPTU general classification falls under fixed operating expense. In conclusion, given **STS08’s** dimensions, total annual IPTU expense considered in the feasibility study is **R\$ 1.397.800,00/year** (rounded out up).

4.1.7.Reimbursements for preparing the EVTEA

The pricing methodology for port studies, validated by the Federal Audit Court (TCU) and defined in Technical Note 72/2015/DOUP/SPP/SEP/PR, sets a "ceiling" value for EVTEAs prepared under Ordinance No. 38 of

Section D - Operational

the Port Lease Program (PAP). The “ceiling” defined in March 2013, is the basis used to set the actual value to be reimbursed to EVTEA. On the "ceiling" value, defined at R\$ --- (03/2013), the price was adjusted according to the IPCA up to the base date of this EVTEA, that is, June 2020, resulting in R\$ **471.563,80**.

According to the internal pricing method, which considers the sum of efforts allocated for the preparation of the study, the amount due to Companhia Docas do Estado de São Paulo - CODESP is R\$ **316.655,64** (04/2019); adjusted to the base date of 06/2020, this value corresponds to R\$ **323.860,03**.

Additionally, the final reimbursement value must consider EPL’s revision of SPA’s work. Hence, the required amount due EPL for services rendered corresponds to R\$ **147.703,77**. It is worth noting that the value above is limited by TCU’s ceiling. Indeed, EPL’s unlimited reimbursement for the study would have been R\$ 186,910.87.

Finally, the final balance due to federal government entities involved in creating STS08’s feasibility study is R\$ **471.563,80**.

It is noteworthy that the reimbursement amount for the study is being considered in the economic-financial equation of the project, with input in the first year of the contract.

4.1.8. Auctioning Cost

In the case of terminal STS08, the study assumes that the auction is going to be conducted by B3 (São Paulo Stock Exchange), as established by the federal government.

The amount due to B3 is based on its contract with Antaq. Henceforth, STS08’s auctioning expense is R\$ **420.813,47** (base date of 06/2020).

In addition, as the future lessor is responsible for paying for the auctioning, it is also fair to include the value as a first-year expense in its feasibility model.

4.2. Variable Costs

4.2.1. Individual Contractor (OGMO)

In general, contracting outsource workforce in port terminals within the organized ports must be arranged through the Labor Management Entity (OGMO). However, as STS08 is a liquid bulk terminal, OGMO’s exclusivity rights do not apply.

4.2.2. Utilities

Under variable cost, the utilities expense group refers to operating disbursements with electricity consumption and equipment lubrication.

To define the variable utilities expense, the study consulted the terminal’s past expenses with these costs. In addition, for simplicity, electricity consumption values were rebased as a per ton value (Kwh/ton). Thus, the variable utilities expense per metric ton of liquid bulk handled is R\$ **0,52/ton**.

Section D - Operational

4.2.3. Port Tariffs

Regarding the port tariffs applicable to this enterprise, the study considered the schedule in force in June/2020, which corresponds to the monetarily adjusted schedule of June 2018.

The following port tariff applies to the terminal in question:

- **Table II** - Use of land infrastructure - reimburses the port authority for the use of the following state infrastructure: paved facilities, road accesses and streets, parking lots, among others. The tariff is currently priced at **R\$ 0.30/m²/month**, according to item 2.1.a (Right Bank).

4.2.4. Taxes

The taxes applicable to the enterprise can be subdivided into two groups:

- Indirect taxes on revenue: PIS, COFINS and ISS;
- Direct taxes on profit: IRPJ and CSLL.

In this study, the model attempts to minimize tax expenses by choosing the most advantageous regime at any given year. To give the reader some context, in the Brazilian tax code, there are two valid tax regimes for medium-sized companies: (I) the real profit regime, where taxes are based on actual revenue and expenses incurred and (II) the presumed profit regime, where the government estimates the company's profitability based on its revenue.

The table below summarizes direct and indirect tax rates for both regimes, as well as respective limits and qualitative differences.

Tax Rates	Real Profit	Presumed Profit
PIS (on revenue)	1,65%	0,65%
COFINS (on revenue)	7,60%	3,00%
ISS (on revenue)	5,00%	5,00%
CSLL (on profit)	9,00%	9,00%
IR (on profit)	15,00% + 10,00%	15,00% + 10,00%
IR below R\$ 240k	15,00%	15,00%
Presumed Profit Method		
Qualification criteria:	Smaller, equal to or greater	Same or less
Gross Revenues >	78.000.000	78.000.000
Tax Incentives:	%credit	Applicable on:
PIS/COFINS Credits	9,25%	Utilities
REIDI	applicable	

Table 13: Summary of tax assumptions for the **STS08** are

Source: EPL.

The study also considered the following points regarding taxation:

- Tax benefit on accumulated losses permits offsetting current tax against accumulated losses from other periods, limited to 30% of current period's profit.
- The study considers PIS/COFINS credits under the real profit regime.
- The study recognizes tax incentives for asset acquisition (REIDI).

Section D - Operational

Annex D -1 (1/4)

Opex Summary (STS08)

Base Throughput 3.685.455 Tons

Staff Salaries	Staff	Avg Salary (R\$/month)	Social Costs	Total Cost (R\$/yr)	Notes
Administrative					
Director General	1	48.918	103,25%	1.193.105	
Senior Manager	6	18.286	103,25%	2.675.918	
Mid-level Manager	10	12.190	103,25%	2.973.241	
Other admin support (lv 1)	15	3.051	103,25%	1.116.121	
Other admin support (lv 2)	10	1.886	103,25%	459.898	
-	-	-	103,25%	-	
Environmental Port Security					
Supervisors	2	4.329	103,25%	211.169	
Environmental Technician	2	3.111	103,25%	151.753	
-	-	-	103,25%	-	
Maintenance					
Supervisors	7	4.329	103,25%	739.090	
Maintenance Technicians	29	1.853	103,25%	1.310.384	
Operations					
Encarregado Operacional	12	4.329	103,25%	1.267.012	
Ship Transfer Crew	29	1.630	103,25%	1.152.580	
Storage Facilities	29	1.630	103,25%	1.152.580	
Receiving and Delivery	29	1.630	103,25%	1.152.580	
Total	181			15.555.428	
Sub-total - Admin staff				8.781.203	
Sub-total - Maintenance / Operations Staff				6.774.226	

Maintenance	Base de cálculo	%
Equipment - maintenance and spares	52.193	1,31%
Infra - civil/structural maintenance	243.865	0,61%

Electricity usage

Unit cost	0,49867	R\$/kWh	Fonte: CPFL			
Staff	Persons	Hours/day	Days/Year	Consumption (kW/person)	Cost (R\$/year)	Notes
Admin	46	12	252	2,625	182.088	
Maintenance	36	16	252	1,313	95.003	
Operations	99	16	365	0,063	18.019	
Total - Staff	181				296.000	rounded to nearest 000

Notes on electricity usage

Admin 100w light; 1500W AC; 500W for computers and misc; 25% common area
 Maintenance 100w light; 1500W AC; 500W computers & misc; 25% common area; 50% reduction factor for mainten/operations staff
 Operations 100w light; no AC; 25% common area; 50% reduction factor for mainten/operations staff

Lighting

Watt = lux * sq-m / luminous efficiency
 Luminous efficiency (lm/w) varies by type of lighting source
 Florescent lamp Range is 45 - 75 lm/w
 Sodium vapor lamp Range is 85 - 150 lm/w

Area type	Size (sq m)	Luminous Effic. (lm/w)	Light (lux)	Hour/day	Days/Year	Consumption (kW)	Cost (R\$/year)	Notes
Covered Warehouse	3.783	50,00	200	10	365	15,13	27.542	-
Open (yard / tank area)	148.541	100,00	50	10	365	74,27	135.183	-
Open (berth)	-	100,00	50	10	365	-	-	-
Total (lighting)							163.000	rounded to nearest 000

Notes Open area lighting: Avg of 50 lux used; guidelines suggest: parking areas: 20 lux; gates: 75 lux; fences: 10 lux

Fuel

Diesel Unit Cost - R\$/litro

Water

Office usage 100 litros/pessoa/dia
 Tarifa 33,4 R\$/m3
 1 m3= 1.000 litros
 Cost 3,34 R\$/emp/dia

Misc G&A Costs

Vehicles	3	vehicles at	5.176	R\$ por mês	-
Security	1	posts	725.667	R\$ por hora	-
Cleaning service	1	service/week	246.882	R\$ por serviço	-
Other misc G&A (office supplies, IT, food)	10%	staff	217.400	R\$/mês/emp	-

Payment to Port Authority

Applicable to 0,30 R\$/m² Fonte: CODESP, Tarifas Portuárias, Tabela II

2.019.888 m²/ano

Section D - Operational

Annex D -1 (2/4)

Summary of OpEx Estimate

Cost Category	Expense Type	Unit Cost	Units	Number of Units	Cost (R\$)
Labor					
Administrative	Fix	8.781.203 R\$		1	8.782.000
Operations / Maintenance / Environ.	Fix	6.774.226 R\$		1	6.775.000
Custos Operacionais	Var	- R\$/Tons		1.216.364	-
Utilities					
Electricity - office	Fix	296.000 R\$/ano		1	296.000
Electricity - lighting	Fix	163.000 R\$/ano		1	163.000
Electricity - equipment	Var	0,52 R\$/ton		3.685.455	1.916.500
Water	Fix	3,34 R\$/dia/emp		181	221.000
Communications	Fix	14.327 R\$/mês		12	172.000
Fuel & lubricants	Var	- R\$/TON		3.685.455	-
Maintenance					
Equipment - maintenance and spares	Fix	683.148 R\$/ano		1	684.000
Infra - civil/structural maintenance	Fix	1.486.613 R\$/ano		1	1.487.000
General and Admin					
Cleaning	Fix	246.882 R\$/ano		1	247.000
Accounting, legal and consultants	Fix	144.000 R\$/ano		1	144.000
Insurance	Fix	870.000 R\$/ano		1	870.000
Security	Fix	725.667 R\$/ano		1	726.000
Vehicles, fuel	Fix	15.527 R\$/mês		12	187.000
Other misc G&A (office supplies, IT, food)	Fix	217.400 R\$/ano/emp		1	218.000
Fees and other contributions	Fix				
IPTU	Fix	1.397.800 R\$/ano		1	1.398.000
Contribution to Syndicates	Fix	- R\$/mês		12	-
Payment to Port Authority	Fix	0,30 R\$/m²		2.019.888	606.000
Sub-total					24.892.500
Contingency		5%			1.214.325
Total (R\$/year)					26.106.825

Note: All costs figures are rounded up to the nearest 000.

Cost Category	Expense Type	Movimentação			
		1.842.727	2.764.091	3.685.455	4.606.818
Costs at Different Throughput Levels					
Labor					
Administrative	Fix	5.269.200	7.025.600	8.782.000	9.660.200
Operations / Maintenance / Environ.	Fix	4.065.000	5.420.000	6.775.000	7.452.500
Custos Operacionais	Var	-	-	-	-
Utilities					
Electricity - office	Fix	177.600	236.800	296.000	325.600
Electricity - lighting	Fix	163.000	163.000	163.000	163.000
Electricity - equipment	Var	958.218	1.437.327	1.916.437	2.395.545
Water	Fix	132.600	176.800	221.000	243.100
Communications	Fix	103.200	137.600	172.000	189.200
Fuel & lubricants	Var	-	-	-	-
Maintenance					
Equipment - maintenance and spares	Fix	547.200	615.600	684.000	684.000
Infra - civil/structural maintenance	Fix	1.487.000	1.487.000	1.487.000	1.487.000
General and Admin					
Cleaning	Fix	172.900	222.300	247.000	247.000
Accounting, legal and consultants	Fix	100.800	129.600	144.000	144.000
Insurance	Fix	870.000	870.000	870.000	870.000
Security	Fix	726.000	726.000	726.000	726.000
Vehicles, fuel	Fix	130.900	168.300	187.000	187.000
Other misc G&A (office supplies, IT, food)	Fix	130.800	174.400	218.000	239.800
Fees and other contributions	Fix	-	-	-	-
IPTU	Fix	1.398.000	1.398.000	1.398.000	1.398.000
Contribution to Syndicates	Fix	-	-	-	-
Payment to Port Authority	Fix	606.000	606.000	606.000	606.000
Sub-total		17.038.418	20.994.327	24.892.437	27.017.945
Contingency		5%	5%	5%	5%
Total (R\$/year)		17.860.039	22.013.744	26.106.758	28.338.543
Unit Cost		9,69	7,96	7,08	6,15

Fixed Cost Categories	PIS/COFINS Credit (1=yes, 0=no)	Fixed Cost (R\$ k)			
FO1 Labor (Admin, O&M / Environ.)	0	9.801	13.068	16.335	17.968
FO2 Utilities - Electricity, Water, Comm.	1	605	750	895	967
FO3 Maintenance - Equip / Infra	0	2.136	2.208	2.280	2.280
FO4 General and Admin	0	2.238	2.405	2.512	2.534
FO5 Fees and other contributions	0	1.468	1.468	1.468	1.468

Variable Cost Categories	PIS/COFINS Credit (1=yes, 0=no)	Unit Cost	Unit Cost	Unit Cost	Unit Cost
VO1 Labor - OGMO	0	-	-	-	-
VO2 Utilities - Electricity, water, fuel, lubricants	1	0,55	0,55	0,55	0,55
VO3 Blank	0	-	-	-	-

Summary of Volume Groups for OpEx estimates

Volume (k t)	Group
0	4
1861,15427	5
2791,73191	6
3722,30955	7
4652,88618	7

Section D - Operational

Annex D -1 (3/4)

Summary of Insurance Costs and Guarantees

Operation	870,0 k R\$/ano
Implementaion (Execution Guarantee)	400,0 k R\$/ano

INSURANCE AND GUAANTEES

Total Capex / Value of Existing Assets	296.058 k R\$
Capex/Value of Existing Assets	243.865 k R\$
Equipment/Value of Existing Assests	52.193 k R\$
Contract Value	3.152.747 k R\$
OPEX - LABOR	15.557 k R\$
Capex/Value of Existing Public Assets	102.537 k R\$

BEFORE THE OPERATION

Insurance - Engineering Risk -civil works in progress, installation and assembly

Insured Amount - Construction Capex	100%
Percentage	0,02%

Periodicity	annually during construction
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General and Cross Liability Insurance of the works

Insured Amount - Construction Capex	30%
Percentage	0,03%

Periodicity	annually during construction
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DURING THE OPERATION

Specified risks/Multi-Risks insurance

Insured Amount - Total Capex	100%
Percentage	0,14%
Cost	414,48 k R\$
Periodicity	annually during the operation period

Liability Insurance for contract's activities

Insured Amount - Contract Value	3,5%
Percentage	0,053%
Cost	58,48 k R\$
Periodicity	annually during the operation period

GUARANTEES

Contract performance guarantee (during concession period)

Insured Amount - Contract Value	2,5%
Percentage	0,50%
Cost	394,09 k R\$
Periodicity	annually during the concession period

Section D - Operational

Annex D -1 (4/4)

Opex Forecasts (STS08)

Forecasts in kR\$. All values are in Real

	Forecast O&M Expenses																								
	Ano 1 2021	Ano 2 2022	Ano 3 2023	Ano 4 2024	Ano 5 2025	Ano 6 2026	Ano 7 2027	Ano 8 2028	Ano 9 2029	Ano 10 2030	Ano 11 2031	Ano 12 2032	Ano 13 2033	Ano 14 2034	Ano 15 2035	Ano 16 2036	Ano 17 2037	Ano 18 2038	Ano 19 2039	Ano 20 2040	Ano 21 2041	Ano 22 2042	Ano 23 2043	Ano 24 2044	Ano 25 2045
Operating year (1=yes, 0=no)	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cargo Volume (k K Tons)	-	-	-	1.902	1.946	2.635	2.696	2.757	2.820	2.883	2.950	3.016	3.086	3.157	3.228	3.303	3.378	3.455	3.536	3.617	3.700	3.785	3.873	3.962	4.054
Cost Group (for fixed costs - step function)	4	4	4	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6	7	7	7	7	7
o Govt Agencies																									
Fixed Annual Payments	17.976	17.976	17.976	17.976	17.976	17.976	17.976	17.976	17.976	17.976	17.976	17.976	17.976	17.976	17.976	17.976	17.976	17.976	17.976	17.976	17.976	17.976	17.976	17.976	17.976
Pagamento dos Leilões + Estudos	892	0	0	17.119	17.515	23.717	24.266	24.815	25.382	25.949	26.552	27.146	27.776	28.415	29.054	29.729	30.404	31.097	31.826	32.555	33.302	34.067	34.859	35.660	36.489
Total Payments to Govt Agencies	18.868	17.976	17.976	35.095	35.491	41.692	42.241	42.790	43.357	43.924	44.527	45.121	45.751	46.391	47.030	47.705	48.380	49.073	49.802	50.531	51.278	52.043	52.835	53.636	54.464
FO1 Labor (Admin, O&M / Environ.)	0	0	0	13.068	13.068	13.068	13.068	13.068	16.335	16.335	16.335	16.335	16.335	16.335	16.335	16.335	16.335	16.335	16.335	16.335	16.335	16.335	16.335	16.335	16.335
FO2 Utilities - Electricity, Water, Comm.	1	0	0	750	750	750	750	750	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895
FO3 Maintenance - Equip / Infra	0	0	0	1.761	1.955	1.955	1.955	1.955	2.019	2.019	2.019	2.189	2.359	2.359	2.359	2.359	2.359	2.359	2.359	2.359	2.359	2.359	2.359	2.359	2.359
FO4 General and Admin	0	0	0	2.405	2.405	2.405	2.405	2.405	2.512	2.512	2.512	2.515	2.512	2.512	2.512	2.512	2.512	2.512	2.512	2.512	2.512	2.512	2.512	2.512	2.512
FO5 Fees (IPTU, Syndicates)	0	0	0	1.468	1.468	1.468	1.468	1.468	1.468	1.468	1.468	1.468	1.468	1.468	1.468	1.468	1.468	1.468	1.468	1.468	1.468	1.468	1.468	1.468	1.468
FO6 Blank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VO1 Custos Operacionais	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VO2 Utilities - Electricity, water, fuel, lubricants	1	0	0	1.038	1.063	1.439	1.472	1.505	1.540	1.574	1.611	1.647	1.685	1.724	1.762	1.803	1.844	1.886	1.931	1.975	2.020	2.067	2.115	2.163	2.213
VO3 Payment to Port Authority	0	0	0	606	606	606	606	606	606	606	606	606	606	606	606	606	606	606	606	606	606	606	606	606	606
VO4 Blank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fixed Operating Expenses	0	0	0	750	750	750	750	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895
Variable Operating Expenses	0	0	0	1.038	1.063	1.439	1.472	1.505	1.540	1.574	1.611	1.647	1.685	1.724	1.762	1.803	1.844	1.886	1.931	1.975	2.020	2.067	2.115	2.163	2.213
D&A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Opex Generating PIS/COFINS Tax Credit	0	0	0	165	168	202	206	209	225	228	232	235	239	242	246	250	253	257	261	265	270	281	285	290	294
Guarantee, insurance and Tax expense during construction	1.392	1.392	1.392	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Env Costs during Construction (k R\$)	949	432	393	227	227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Env Costs during Operations (k R\$)	-	-	-	646	554	515	369	403	524	492	369	515	369	447	569	403	369	515	413	492	481	403	369	558	458
D&A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D&A - Investimentos sem REIDI/REPORTO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Opex Generating PIS/COFINS Tax Credit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0