CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-PDD)
Version 02 - in effect as of: 1 July 2004)

CONTENTS

Annexes

SECTION A. General description of project activity

A.1 Title of the project activity:

>>
"Aços Villares Natural gas fuel switch project" – Version n°02, 17 October 2005

A.2. Description of the project activity:

>>
Aços Villares S.A. is a steel company and, nowadays, operates three units in Brazil: Sorocaba, Mogi das Cruzes and Pindamonhangaba. The project is restricted to Pindamonhangaba unit, the largest site in Brazil. Pindamonhangaba started operation in 1979, and its core business is the production of steel from scrap metal. It has been using fuel oil, LPG and electricity as the main energy sources for all the processes up to the year 2002.

The natural gas pipeline arrived in Pindamonhangaba in the nineties, but only during 2002, considering the additional carbon credits revenues; Aços Villares started a fuel switch process from fuel oil to natural gas. Given the high prices of natural gas, and the high investment required to conversion, the CERs brought the benefits necessary to implement the project (details in section B.3).

The project activity consists in the investments to adapt the existing equipment to the use of natural gas instead of fuel oil, LPG or electricity (equipment listed in section A.4.3). The extra income and other non-measurable benefits derived from the sale of carbon credits and participation of Kyoto Protocol are enough to make the conversion viable.

The project is helping the Host Country fulfil its goals of promoting sustainable development. Specifically, the project:

- Diminishes the atmospheric emissions of pollutants and improves the air quality of the region;
- Brings social benefits related to improvement of labour conditions;
- Creates new employment for installation of equipment;
- Act as a clean technology demonstration project which could be replicated across Brazil;
- Is an important capacity building activity, demonstrating the use of a new mechanism for funding environmentally friendly technologies, which reduces emissions of greenhouse gases.

A.3. Project participants:

>>

Name of party involved (indicates a host country)	Private and/or public entity(ies) project participants (as applicable)	Kindly indicates if the party involved wish to be considered a project participant (yes/no)
Brazil (host country)	Aços Villares S.A	No
UK	Ecosecurities Ltd.	No
(*) In accordance with the CDM modalities and procedures, at the time of making the CDM-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.		

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

>>

A.4.1.1. Host Party(ies):

>>
Brazil

A.4.1.2. Region/State/Province etc.:

>>
South-eastern region - São Paulo State

A.4.1.3. City/Town/Community etc:

>>
Pindamonhangaba city, Moreira Cesar district

A.4.1.4. Detail of physical location, including information allowing the unique identification of this project activity (maximum one page):

>>
Rod. Luiz Dumont Villares, km2, CEP 12442-260.
The plant is located very near the Via Dutra highway, responsible to connect the two biggest cities of Brazil, Rio de Janeiro and São Paulo.

A.4.2. Category(ies) of project activity:

>>
Sectoral Scope Category: 4 (Manufacturing industries)

A.4.3. Technology to be employed by the project activity:

>>

The project activity is a fuel switch program that is based on the conversion of 48 pieces of equipment. The conversion is related to adaptations and modifications, allowing the consumption of natural gas instead of fuel oil, LPG or electricity. This process will not increase the lifetime of equipment, neither the production capacity significantly. The equipment included in the project activity is:

Villares Code	Name	#	Manufacturer	Model	Nominal capacity	Nominal Energy Consumption	Energy Source	Fuel Switch date	Remaining Lifetime
UP 300-1 and 2	Caldeira Keystone 11M	2	DEDI NI	Keystone 11M	19,8 tones of steam/hr	12,740,000 kcal/hr	Fuel oil	Jan 2004	More than 20 years
UP 520-1, 2, 3, 4 and 5	Aquecedor de Panela	5	Combustol	MGO-103	80 tones	1,200,000 kcal	Fuel oil	May 2002	More than 20 years
UP 600 - 1to 10	Forno Poço	10	IHI – Ishikawagima - Harima	-	45 tones	3,000,000 kcal	Fuel oil	Jan 2003	More than 20 years
UP 600 - 12	Forno de Viga Móvel	1	IHI – Ishikawagima - Harima	-	90 tones	34,800,000 kcal	Fuel oil	Jan 2003	More than 20 years
UP 710 – 1 and 2	Aquecedor de Panela	2	Combustol	MGO-102	5 tones	500,000 kcal	Fuel oil	Jun 2002	More than 20 years
UP 710 – 3	Aquecedor de Panela	1	Combustol	MGO-103	15 tones	1,000,000 kcal	Fuel oil	Jun 2002	More than 20 years
UP 710 – 4	Aquecedor de Panela	1	Combustol	MGO-104	25 tones	1,000,000 kcal	Fuel oil	Jun 2002	More than 20 years
UP 710 – 6	Estufa FHW	1	Euroterm	Hauck-proporcional	120 tones	1,500,000 kcal	Fuel oil	Jun 2002	More than 20 years
UP 710 – 7	Estufa WR	1	Euroterm	Hauck-proporcional	120 tones	1,500,000 kcal	Fuel oil	Jun 2002	More than 20 years
UP 710 – 8	Estufa Convencional	1	Euroterm	Hauck-proporcional	120 tones	1,500,000 kcal	Fuel oil	Jul 2002	More than 20 years

Villares Code	Name	#	Manufacturer	Model	Nominal capacity	Nominal Energy Consumption	Energy Source	Fuel Switch date	Remaining Lifetime
UP 730 – 1 to 5	Forno ToTo	5	NOFOR	N-250	78 tonesr	3,224,620 kcal	Fuel oil	Jun 2002	More than 20 years
UP 530 – 6	Forno ToTo – T1	1	-	-	200 tones	9,000,000 kcal	Fuel oil	Aug 2002	More than 20 years
UP 530-9	Forno de Aquecimento F1	1	-	-	130 tones	5,880,000 kcal	Fuel oil	May 2002	More than 20 years
UP 530-10 and 12	Forno de Aquecimento F2 and F4	2	-	-	250 tones	10,872,000 kcal	Fuel oil	May 2002	More than 20 years
UP 600 –13	Forno de Tratamento térmico de Barras	1	Combustol	-	44 tones	3,870,000 kcal	Electricity	Jun 2002	More than 20 years
UP 530 – 2 to 5	Forno ToTo	4	RETHERM	Serie 600	100 tones	1,100,000 kcal	LPG	Aug 2002	More than 20 years
UP 720 – 1 to 7	Forno Toto	7	RETHERM	Serie 600	100 tones	1,100,000 kcal	LPG	Jun 2002	More than 20 years
UP 630 – 1 and 2	Forno de Recozimento	2	BRASIMET	-	20 tones	1,200,000 kcal	LPG	Jun 2002	More than 20 years
UP 520 -7	Aquecedor de Panelas	1	Combustol	MGO-103	80 tones	1,200,000 kcal	LPG	Jun 2002	More than 20 years

A.4.4. Brief explanation of how the anthropogenic emissions of anthropogenic greenhouse gas (GHGs) by sources are to be reduced by the proposed CDM project activity, including why the emission reductions would not occur in the absence of the proposed project activity, taking into account national and/or sectoral policies and circumstances:

>>

The baseline is defined as the consumption of fuel oil, LPG and electricity in the equipment listed above, to produce steel. All the equipments are localized in Pindamonhangaba unit, and are part of steel production processes. Given that during the three previous years the natural gas prices were higher than fuel oil, the fuel switch was not the most attractive course of action, and thus not the baseline.

The project activity will reduce CO_2 emissions by replacing the fuel oil, LPG and electricity, all carbon intensive sources, with natural gas (less carbon intense fuel), in the steel production line. The CH_4 and N_2O resulting from fuel combustion are also accounted for in the calculation of baseline and project emissions.

The project activity, due to the replacement of fuel oil and LPG consumption, will reduce the fugitive CO_2 emissions related to fuel transportation. However, the increased natural gas use will increase the fugitive methane emissions in the natural gas pipeline used to supply the project activity. Only CO_2 and CH_4 are accounted in the leakage calculation.

The project activity changes significantly the emissions of CH_4 and CO_2. The other GHG emission reduction related to N_2O is negligible. During the 21 years crediting period the project will reduce GHG emissions by 571,000 tonnes of CO_2equivalent.

A.4.4.1. Estimated amount of emission reductions over the chosen crediting period:

>>

Years		Annual estimation of emission reduction in tonnes of CO2e
1	2003	27,192
2	2004	27,192
3	2005	27,192
4	2006	27,192
5	2007	27,192
6	2008	27,192
7	2009	27,192
Total estimated reductions (tonnes of CO2e)		190,344
Total Number of crediting period		21 years (three periods of seven years)
Annual Average over the crediting period of estimated emission reduction (tonnes of CO2e)		27,192

A.4.5. Public funding of the project activity:

>>

The project developer is not receiving any funding from Annex I parties.

SECTION B. Application of a baseline methodology

B.1. Title and reference of the approved baseline methodology applied to the project activity:

>>
AM 0008 "Industrial fuel switching from coal and petroleum to natural gas without extension of capacity and lifetime of the facility". Version 1, approved on 15 June 2004.

B.1.1. Justification of the choice of the methodology and why it is applicable to the project activity:

>>
The project activity attends all the applicability requirements of AM0008.

- There are no local or regional regulations or programs that constrain the facility from using fuel oil. All environmental licenses do not present any complain or request of changes related to use of fuel oil.
- The fuel oil and natural gas prices fluctuate, depending the petroleum prices and international scenarios. During the years before the fuel switch (2000, 2001), the natural gas was more expensive than fuel oil. For more detail, see section B.3, related to additionality demonstration.
- The project activity is related to conversion of equipments, allowing the consumption of natural gas instead of fuel oil or LPG. The project activity is not related to installation of new equipments, increase the equipment installed capacity, neither gains of energy efficiency or extends of equipment lifetime.

B.2. Description of how the methodology is applied in the context of the project activity:

>>
According to the methodology, the Baseline Scenario is defined as the current use of fossil fuels (petroleum and/or coke) in the existing facility up to the end of the crediting period without any retrofit, which extends its capacity or lifetime or improves its fuel efficiency. According to the baseline methodology, for this project activity the baseline is defined as the continued consumption of fuel oil and LPG for the production of steel, excluding any additional equipment or expansion.

Additionality is demonstrated by analysing the national and sector trends and elaborating a financial analysis. All the gains and costs related to the implementation of the project activity must be included, explicitly the following parameters:

- Investment requirements for using natural gas;
- Discount rate appropriate to country and sector;
- Efficiencies of fuels
- Current price and projected prices of each fuel
- Operation costs of each fuel
- Residual value of equipment at the end of lifetime of the project activity.

If the NPV of project activity is negative, the project is additional. The financial analysis parameters, emission reduction data and data sources are detailed in Annex 3.

The emission reduction calculations include CO_2, CH_4 and N_2O from combustion and CO_2 and CH_4 from fugitive emissions associated with fuel transportation and distribution. Carbon dioxide emission factors

are determined using country-specific lower heat values (specific for Brazil) and standard IPCC values for carbon content and oxidation fraction. CH_4 and N_2O from fuel combustion are estimated using IPCC standard emission factors for each fuel and equipment type. The leakage emissions related to transportation and distribution of baseline fuels and natural gas are estimated using region-specific emission factors given by IPCC. The CH_4 and N_2O emissions are converted to equivalent CO_2 emissions using the respective GWPs, 21 and 310, as agreed in the Kyoto Protocol.

All equipments that were using fuel oil and LPG before the fuel switch were considered for emission reduction calculation. As conservative approach, equipments that were using electricity were also considered in the emission reduction calculation, even if the change resulted in an increase of GHG emissions (in the case of Brazilian grid, which is dominated by hydro power, the switch from electricity to natural gas will induce in an increase of GHG emission). All energy sources were considered in the additionality analysis (financial analysis).

Following the Meth-Panel recommendation, the data used to demonstrate additionality was based on the period prior to decision-making. This means the years 2000, 2001 given that the decision was made on 2002, and the project activity started during the second half of 2002. For baseline calculations the data used is the most recent possible, meaning updated future plans, and any other recent applicable publications.

B.3. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity:

>>

The baseline is defined as what would have occurred in the absence of the project activity. The baseline definition was made according to additionality requests, and it is detailed in section B.2. This section will focus on demonstration of additionality.

The first condition related to additionality is the demonstration of absence of mandatory policy or regulations requiring the fuel switch. The project activity meets this first requirement. There are no public politics requiring the fuel switch for the project developer or other companies in the sector or region. Moreover, all the environmental licenses do not present any requirements related to diminishing of air pollutants or more specifically, requirements for fuel switch. As a transparent procedure, a digital copy of the environmental licenses and its requirements are presented in annex 5.

National and sectoral trends were analysed. According to Brazilian Energy Balance 2003, during the years 2000, 2001 and 2002 there was no significant increase in natural gas consumption, or decrease in fuel oil consumption in the iron and steel sector. The accentuated fuel oil consumption decrease happened during the 1990s (from 466 tep in 1996 to 146 tep 1999), but during 2000-2002 there was no significant decrease (changing only from 110 to 106 tep). The increase of natural gas consumption presents a similar pattern. It demonstrates that the most advantageous fuel switches already took place during the nineties (from 2,7% in 1990 to 5,1% in 2000), leaving only plants were natural gas was not available or was not viable.

Pindamonhangaba was one of first cities in the region to receive a natural gas supply, with natural gas being available since 1998 (http://www.pindamonhangaba.sp.gov.br/expansaoIndustrial.asp). However, the Pindamonhangaba plant started to use natural gas only in middle of 2002. Given the high prices of natural gas, and the consequent non-viability of a fuel switch, the switch was not done before, even with the fuel available. In other units, such as Mogi das Cruzes, where the fuel price structure were quite different than Pindamonhangaba unit, the fuel switch was done in 1997. The Pindamonhangaba is located

very near Via Dutra highway, one of the best roads in Brazil, what reduces significantly the transportation costs, lowering the price of fuel oil.

The decision on fuel switching was made based on the average price of fuels in the two years before the fuel switch (2000 and 2001), in order to avoid an analysis based on instantaneous oscillations in fuel prices. The fuel oil average price was 0.00759 R$/kJ while the natural gas price was 0.00856 R$/kJ and the LPG price was 0.01127 R$/kJ. The fuel switch represents an increase of R$ 394,798 on the annual fuel bill per year. Based on observations of fuel price variation, it was not possible to predict if the current price structure would change (see figure below).

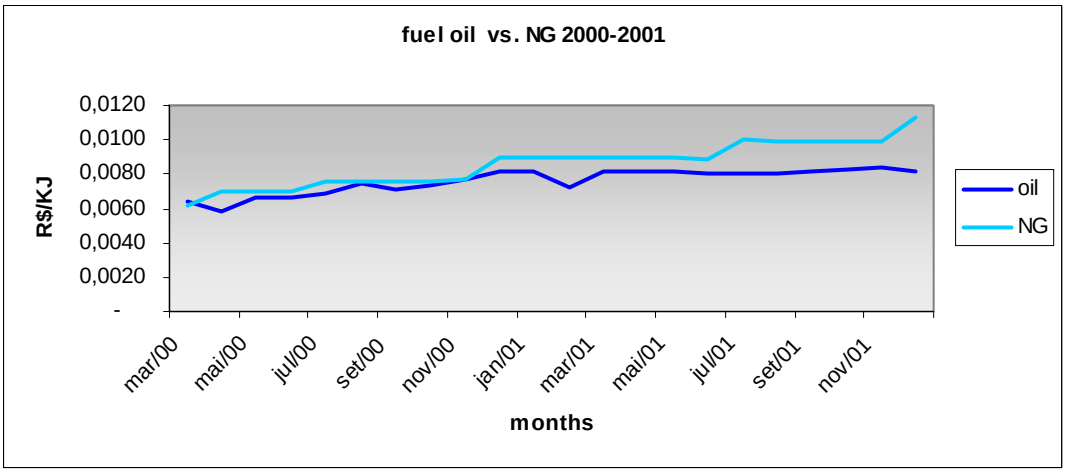


Figure1: Fuel and natural gas prices during period 2000 and 2001, prior to decision making.

Moreover, the fuel switch requires investments for connecting the plant to the gas supply pipeline, internal pipeline installation (including regulators, pumps and safety equipments), and equipment conversions from oil to gas. All these investments were estimated to sum approximately R$ 4,882,000.

Considering the investments, operational costs differences, fuel prices and a discount rate of 18%, the project activity NPV is R$ - 57,794,075 (negative) without credits, while the baseline scenario NPV was R$ - 52,770,064 (negative). The baseline NVP minus project activity NPV is R$ - 5,024,016 (negative), indicating it is not economically viable to proceed with the project without CDM revenues.

To guarantee the consistency of the result, a sensitivity analysis was done with variations as presented in table 1 below, and even in these cases, the difference between baseline and project activity NPV was always negative.

Table 1: Sensitivity Analysis

Parameter	Variation	Result (Baseline NPV minus project activity NPV)
Investment	Reduction of 50%	R$ - 2,955,071 (negative)
Natural gas prices	Decrease of 10%	R$ - 716,170 (negative)
Discount rate	Discount rate 3 times higher than default	R$ - 3,576,128 (negative)

The additionality condition presented by the methodology is:

"*Project is additional if the NPV of project is negative*"

The project activity attends this condition even after a sensitivity analysis, demonstrating that it is additional to the baseline scenario.

B.4. Description of how the definition of the project boundary related to the baseline methodology selected is applied to the project activity:

>>

The Pindamonhangaba site presents many buildings (see figure 2). The project boundary will consider only facilities that were using fuel oil in 2001 and 2002. The equipments to be considered are listed in section A.4.3. The project boundary is illustrated in Figure 3 below.

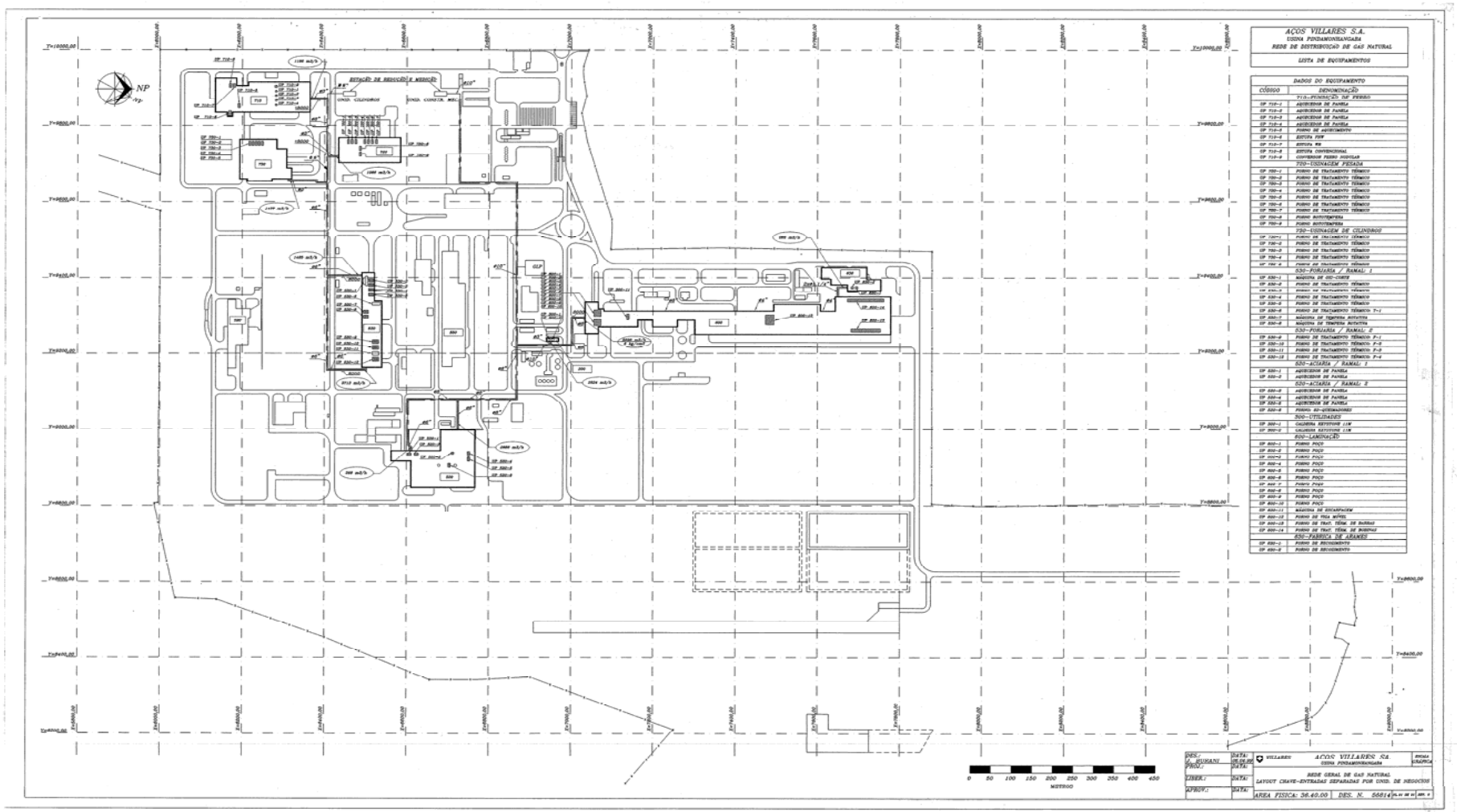


Figure 2: Map of pindamonhangaba unit, and locality of buildings and equipments.

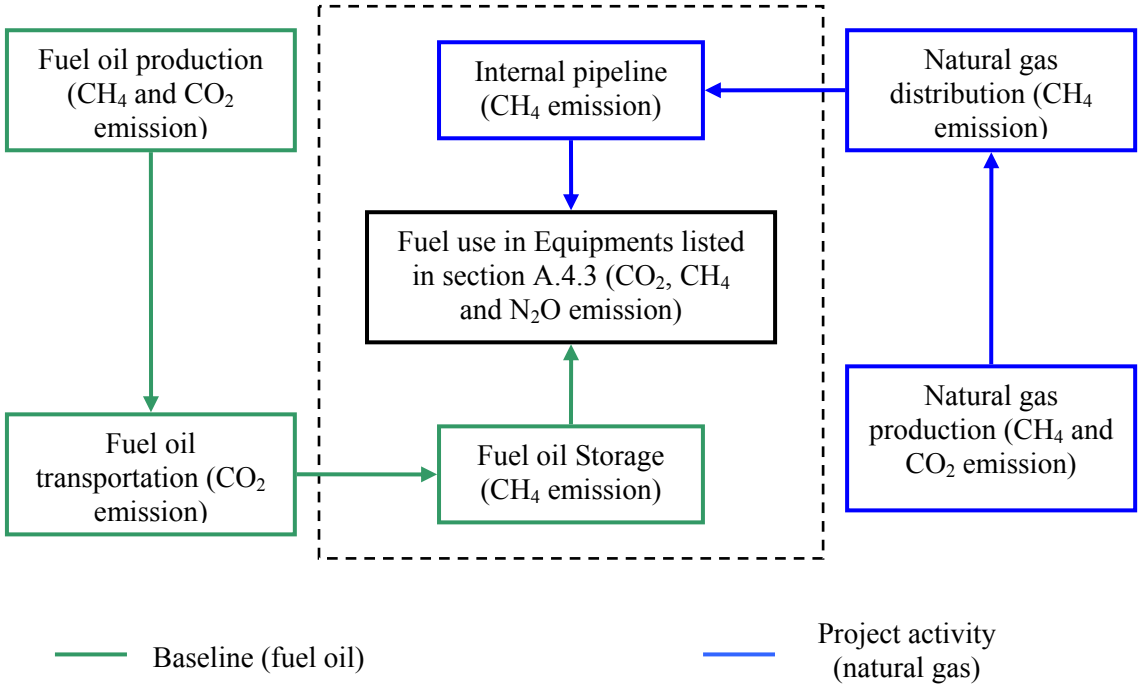


Figure 3: Definition of boundaries, and emissions inside and outside boundaries.

Besides these equipments, the fuel storage sites and the internal natural gas pipeline are also included inside the boundary. Natural gas pipeline distribution and the roads used to transport the fuels or the refineries where the fuel is produced are outside the project boundary, and emissions associated with this are considered as leakage.

Table 2: GHG emission sources included in calculations

Boundary	Source	Gas	Consider or not	justification
Outside	Fuel oil transportation	CO_2	Included	Attending methodology requests
Outside	Natural gas distribution	CH_4	Included	Attending methodology requests
Inside	Internal pipeline	CH_4	Excluded	Negligible, and not requested by methodology
Inside	Fuel oil storage	CH_4	Excluded	Negligible, and not requested by methodology
Inside	Fuel combustion on equipments listed in A.4.3	CO_2	Included	Attending methodology requests
Inside	Fuel combustion on equipments listed in A.4.3	CH_4	Included	Attending methodology requests
Inside	Fuel combustion on equipments listed in A.4.3	N_2O	Included	Attending methodology requests

B.5. Details of baseline information, including the date of completion of the baseline study and the name of person (s)/entity (ies) determining the baseline:

>>

Date of conclusion: 19 August 2005

Person/entity determining the baseline:

Pablo Fernandez
Ecosecurities do Brasil S.A
Rua da Assembleia, n°10, sala 2011, Centro
Rio de Janeiro – RJ, Brazil
CEP: 22011-000
Phone: +55 (21) 2222-9018
e-mail: Pablo@ecosecurities.com

SECTION C. Duration of the project activity / Crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

>>
01 May 2002

C.1.2. Expected operational lifetime of the project activity:

>>
More than 25 years

C.2 Choice of the crediting period and related information:

C.2.1. Renewable crediting period

C.2.1.1. Starting date of the first crediting period:

>>
01 January 2003

C.2.1.2. Length of the first crediting period:

>>
7 years or 84 months

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

>>
Not applicable

C.2.2.2. Length:

>>
Not applicable

SECTION D. Application of a monitoring methodology and plan

D.1. Name and reference of approved monitoring methodology applied to the project activity:

>>

AM 0008 "Industrial fuel switching from coal and petroleum to natural gas without extension of capacity and lifetime of the facility". Version 1, approved on 15 June 2004.

D.2. Justification of the choice of the methodology and why it is applicable to the project activity:

>>

The project activity meets all the applicability requirements of AM0008.

- There are no local or regional regulations or programs that constrain the facility from using fuel oil. All environmental licenses do not present any requirements to make any changes related to the use of fuel oil.
- The fuel oil and natural gas prices fluctuate, depending the petroleum prices and international scenarios. During the last two years before the fuel switch (2000 and 2001), representing the period of decision making on the project, natural gas was more expensive than fuel oil. For more detail, see section B.3, related to additionality demonstration.
- The project activity is related to conversion of equipment, allowing the consumption of natural gas instead of fuel oil. The project activity is not related to the installation of new equipment, an increase in the equipment's installed capacity, or gains in energy efficiency, nor does it extend the equipment's lifetime.
- The fuel switch is applied for many types of equipment, and each piece of equipment represents an element process. They are not fully integrated. An indication of this is the fact that the fuel switch process was done in many steps, one step for each element process. Each element process does not affect other processes, thus, there is no additional leakage.

D.2. 1. Option 1: Monitoring of the emissions in the project scenario and the baseline scenario

D.2.1.1. Data to be collected in order to monitor emissions from the project activity, and how this data will be archived:								
ID number *(Please use numbers to ease cross-referencing to D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
1	Quantity of Natural Gas (*Q_NG*)	*Project developer*	*Joule*	*m*	*monthly*	*100%*	*electronic*	Given that there are equipments that were not included in the project activity, the sum of Q*n*_NG will not be equal to the consumption of natural gas of Pindamonhangaba unit.
2	Quantity of Natural Gas used at the process *n* (*Qn_NG*)	*Project developer*	*Joule*	*m*	*Monthly*	*100%*	*electronic*	Process *n* is identified by the Villares code presented in section A.4.3
3	Fuel efficiency of natural gas used at process *n* (ηn_NG)	*Project developer*	*Joule*	Measured; estimated *ex ante* to calculate the total ER	*Once at early stage of project activity*	*100%*	*electronic*	Process *n* is identified by the Villares code presented in section A.4.3 The curve with significant statistical value will be presented during the verification.
4	Load Factor of operation at the process *n* (L_factor n)	*Project developer*	*Joule*	*Once before fuel switch*	*Once before fuel switch*	*100%*	*electronic*	Process *n* is identified by the Villares code presented in section A.4.3

D.2.1.2. Description of formulae used to estimate project emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

>>

$PEy = (\Sigma i\ Qi\_NG) * (EF\_NG + FC\_NG\_CH4 * GWP\_CH4 + FC\_NG\_N2O * GWP\_N2O)$

Where:

Qi_NG Is the quantity of natural gas used in the project scenario for replacing QFi quantity of fuel *i* used in the baseline scenario, measured in energy units (e.g., Joules)

Q_NG = Σi Qi_NG Is the total quantity of natural gas in the project scenario for replacing all quantities of fuel *i* used in some element process in baseline scenario

EF_NG Is the CO_2 emission factor per unit of natural gas associated with fuel combustion (e.g., tCO_2/joule)

FC_NG_CH4 Is the IPCC default CH_4 emission factor of natural gas associated with combustion, measured in tCH_4/joule

FC_NG_N2O Is the IPCC default N_2O emission factor of natural gas associated with combustion, measured in tN_2O/joule

GWP_CH4 Is the global warming potential of CH_4 set as 21 tCO_2e/tCH_4 for the 1st commitment period.

GWP_N2O Is the global warming potential of N_2Oset as 310 tCO_2e/tN_2O for the 1st commitment period.

An important algorithm for calculating the project emission is:

$QnFi * \eta n\_Fi = Qn\_NG * \eta n\_NG$

Where:

QnFi Quantity of energy consumed in process *n* of fuel *i* in energy unit (e.g.Joule)

ηn_Fi Fuel efficiency of process *n* for use of fuel *i* (e.g. ton of output/Joule)

Qn_NG Quantity of energy consumed in process *n* of natural gas in energy unit (e.g.Joule)

ηn_NG Fuel efficiency of process *n* for use of natural gas (e.g. ton of output/Joule)

D.2.1.3. Relevant data necessary for determining the baseline of anthropogenic emissions by sources of GHGs within the project boundary and how such data will be collected and archived :

ID number *(Please use*	Data variable	Source of data	Data unit	Measured (m), calculated (c),	Recording frequency	Proportion of data to be	How will the data be archived?	Comment

numbers to ease cross-referencing to table D.3)				estimated (e),		monitored	(electronic/ paper)	
5	Quantity of fuel *i* (*Q_F i*)	*Project developer*	*Joule*	*c*	*Monthly*	*100%*	*electronic*	Calculated as the sum of Q*n*_F*i*
6	Quantity of Fuel *i* used at the process *n* (*Qn_F i*)	*Project developer*	*Joule*	*c*	*monthly*	*100%*	*electronic*	Process *n* is identified by the Villares code presented in section A.4.3 . Calculated as: Q*n*_NG*(η*n_NG / η*n_F i).*
7	Fuel efficiency of Fuel *i* used at process *n (ηn_F i)*	*Project developer*	*Joule*	*m*	*Once before fuel switch*	*100%*	*electronic*	Process *n* is identified by the Villares code presented in section A.4.3
8	Load Factor of operation at the process *n* (L_factor n)	*Project developer*	*Joule*	*m*	*Once before fuel switch*	*100%*	*electronic*	Process *n* is identified by the Villares code presented in section A.4.3 The curve with significant statistical value will be presented during the verification.
9	Local regulation constraint	*Legislation pertinent to project developer*	-	*checked*	*At renewable of crediting period*	*100%*	*Paper and electronic*	The question to be answered is: Does local regulation allow to utilize the coal/petroleum fuels? If not, the project is no longer additional.

D.2.1.4. Description of formulae used to estimate baseline emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

>>

PEy = (Σi Qi_Fi) * (EF_Fi_CO2 + FC_Fi_CH4 * GWP_CH4 + FC_Fi_N2O * GWP_N2O)

Where:

Qi_Fi Is the quantity of fuel *i* used in baseline scenario, measured in energy units (e.g., Joule)

EF_Fi Is the CO_2 emission factor per unit of energy of fuel *i* (e.g., tCO_2/joule)

FC_Fi_CH4 Is the IPCC default CH_4 emission factor of fuel *i* associated with combustion, measured in tCH_4/joule

FC_Fi_N2O	Is the IPCC default N_2O emission factor of fuel *i* associated with combustion, measured in tN_2O/joule
GWP_CH4	Is the global warming potential of CH_4 set as 21 tCO_2e/tCH_4 for the 1st commitment period.
GWP_N2O	Is the global warming potential of N_2Oset as 310 tCO_2e/tN_2O for the 1st commitment period.

D. 2.2. Option 2: Direct monitoring of emission reductions from the project activity (values should be consistent with those in section E).

Not applicable

D.2.2.1. Data to be collected in order to monitor emissions from the project activity, and how this data will be archived:

ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

D.2.2.2. Description of formulae used to calculate project emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.):

>>

D.2.3. Treatment of leakage in the monitoring plan

D.2.3.1. If applicable, please describe the data and information that will be collected in order to monitor leakage effects of the project activity

ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
10	Calorific value of transportation mode *j* used in the project scenario (Q_TF j)	Project developer	Joule	*E*	*yearly*	*100%*	*electronic*	*Converted from physical quantity, if needed, using conversion factor provided by local suppliers. Rough estimation can be used if this effect is demonstrated to be minor.*
11	Calorific value of transportation mode *k* used in the baseline scenario (Q_TF k)	Project developer	Joule	*E*	*yearly*	*100%*	*electronic*	*Converted from physical quantity, if needed, using conversion factor provided by local suppliers. Rough estimation can be used if this effect is demonstrated to be minor.*

D.2.3.2. Description of formulae used to estimate leakage (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

>>

The leakage was calculated for baseline and project activity,i.e. the emissions outside the project boundary were calculated for both scenarios. The net leakage emissions are calculated as the difference between the project leakage and the baseline leakage. As a conservative approach, if the baseline leakage emission is higher than project activity, the leakage is considered equal to zero, and the emission reductions from these sources are not requested.
The leakage formula is:

$$LE = [Q\_NG * FE\_NG\_CH4 - \Sigma i\ (Q\_Fi * Fi\_CH4)] * GWP\_CH4 + [\Sigma j(Q\_TFj * EF\_TFj) - \Sigma k(Q\_TFk * EF\_TFk)]$$

Where:

Q_NG Is the quantity of natural gas used in the project scenario for replacing QFi quantity of fuel *i* used in the baseline scenario, measured in energy units (e.g., Joule)

FE_NG_CH4	Is the IPCC default CH_4 emission factor of natural gas associated with fugitive emissions (tCH_4/joule)
Q_Fi	Is the quantity of fuel *i* used in baseline scenario, measured in energy units (e.g., Joule)
Fi_CH4	Is the IPCC default CH_4 emission factor of fuel *i* associated with fugitive emissions (tCH_4/joule)
Q_TFj	Quantity of fuel transported in mode *j* for project scenario, measured in energy unit (e.g., joule)
EF_TFj	Are CO_2 emission factor related to transport mode *j* for project scenario (tCO_2/Joule)
Q_TFk	Quantity of fuel transported in mode *k* for baseline scenario, measured in energy unit (e.g., joule)
EF_TFk	Are CO_2 emission factor related to transport mode *k* for baselinet scenario (tCO_2/Joule)

D.2.4. Description of formulae used to estimate emission reductions for the project activity (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

>>

The formula used to estimate the emission reduction is:

ER = BE – PE – LE

Where:

ER	Emission reduction (tones of CO_2e)
BE	Baseline emissions (tones of CO_2e)
PE	Project activity emissions (tones of CO_2e)
LE	Leakage emissions (tones of CO_2e)

Total emission reduction is calculated *ex ante,* using an estimated value for efficiency of equipment. The accurate emission reduction calculation will be based on measured data during project activity.

D.3. Quality control (QC) and quality assurance (QA) procedures are being undertaken for data monitored

Data *(Indicate table and ID number e.g. 3.-1.; 3.2.)*	Uncertainty level of data (High/Medium/Low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.
1	*Low*	*Confirmed by natural gas distributor measurements.*
2	*Low*	*When possible, there will be a recorder for each piece of equipment. Measuring equipment will be calibrated according to manufacturer's requirements.*
3	*Low*	*Not a single value, but a pattern (function) of load factor at the process n. The measurement will be repeated with several load factors in order to get a statistically significance.*

4	*Low*	*Operational pattern will be cross-checked with actual production to avoid wrong interpretations.*
5	*Low*	*This value is calculated based on natural gas measured data, thus no QA/QC is applicable.*
6	*Low*	*This value is calculated based on natural gas measured data, thus no QA/QC is applicable.*
7	*Low*	*Not a single value, but a pattern (function) of load factor at the process n. The measurement will be repeated with several load factors in order to get statistical significance.*
8	*Low*	*No. It is calculated only once before starting the first crediting period.*
9	*Low*	*This data will be used only during the next renewable credit period to check if the applicability conditions are met. No QA/QC are needed.*
10	*Medium*	*This data only provides minor effects, so QA/QC procedures are not needed.*
11	*Medium*	*This data only provides minor effects, so QA/QC procedures are not needed.*

D.4 Please describe the operational and management structure that the project operator will implement in order to monitor emission reductions and any leakage effects, generated by the project activity

>>

Villares has an internal commission related to energy conservation (called CICE – Comissão Interna de Conservação de Energia). All information and data relating to fuel consumption and energy efficiency have been collected for a long time. Moreover, information about fuel consumption is also requested to render account. The fuel switch process will not request modifications or improvements on the existing internal process. The detailed monitoring plan is presented in annex 4.

D.5 Name of person/entity determining the monitoring methodology:

>>

Date of conclusion: 19 August 2005

Person/entity determining the baseline:

Pablo Fernandez
Ecosecurities do Brasil S.A
Rua da Assembleia, n°10, sala 2011, Centro
Rio de Janeiro – RJ, Brazil
CEP: 22011-000
Phone: +55 (21) 2222-9018
e-mail: Pablo@ecosecurities.com

SECTION E. Estimation of GHG emissions by sources

E.1. Estimate of GHG emissions by sources:

>>

The formula used for calculating the project emissions is presented in section D.2.1.2.

An important algorithm for calculating the project emissions is:

QnFi * ηn_Fi = Qn_NG * ηn_NG

Where:

QnFi	Quantity of energy consumed in process *n* of fuel *i* in energy unit (e.g.Joule)
ηn_Fi	Fuel efficiency of process *n* for use of fuel *i* (e.g. ton of output/Joule)
Qn_NG	Quantity of energy consumed in process *n* of natural gas in energy unit (e.g.Joule)
ηn_NG	Fuel efficiency of process *n* for use of natural gas (e.g. ton of output/Joule)

The QnFi, ηn_Fi and ηn_NG are determined based on the measured data and expected Natural gas efficiency of converted equipments (see annex 3 for more details). From these three values, the Qn_NG is estimated.

The total expected natural gas consumption is 52,193,170 m^3 per year, representing 86,919 tones of CO_2, 37 tones of CH_4 (in CO_2e) and zero tones of N_2O. All the GHG emissions add up to **86,956** tones of CO_2e emission per year.

E.2. Estimated leakage:

>>

Leakage emissions are associated with fugitive CH_4 emission and CO_2 fuel transportation emissions. The formula is presented in section D.2.3.2. Values used for calculating leakage are in Annex 3.

Leakage was calculated for the baseline and project activity. The net leakage emissions are calculated as the difference between the project leakage and the baseline leakage. As a conservative approach, if the baseline leakage emission is higher than project activity, the leakage is considered equal to zero, and the emission reductions from these sources are not requested.

The project leakage emissions are 3,858 tones of CH_4 (in CO_2e) per year. The baseline leakage emissions are 1,193 tones of CO_2 per year.

The net leakage emission is **2,665** tones of CO_2e.

E.3. The sum of E.1 and E.2 representing the project activity emissions:

>>

89,620 tones of CO_2e per year.

E.4. Estimated anthropogenic emissions by sources of greenhouse gases of the baseline:

>>
The total expected fuel oil and LPG consumption is 38,183 tones of fuel, representing 116,749tones of CO_2, 42 tones of CH_4 and 21 tones of N_2O (both in CO2e). All the GHG emissions totalise **116,813** tones of CO_2e emission per year.

E.5. Difference between E.4 and E.3 representing the emission reductions of the project activity:

>>
27,192tones of CO_2e per year.

E.6. Table providing values obtained when applying formulae above:

>>

Year	Estimation of project activity emissions (tonnes of CO2)	Estimation of Baseline emissions (tonnes of CO2)	Estimation of leakage (tonnes of CO2 e)	Estimation of emissions reductions (tonnes of CO2)
1- 2003	86,956	116,813	2,665	27,192
2- 2004	86,956	116,813	2,665	27,192
3- 2005	86,956	116,813	2,665	27,192
4- 2006	86,956	116,813	2,665	27,192
5- 2007	86,956	116,813	2,665	27,192
6- 2008	86,956	116,813	2,665	27,192
7- 2009	86,956	116,813	2,665	27,192
8- 2010	86,956	116,813	2,665	27,192
9- 2011	86,956	116,813	2,665	27,192
10- 2012	86,956	116,813	2,665	27,192
11- 2013	86,956	116,813	2,665	27,192
12- 2014	86,956	116,813	2,665	27,192
13- 2015	86,956	116,813	2,665	27,192
14- 2016	86,956	116,813	2,665	27,192
15- 2017	86,956	116,813	2,665	27,192
16- 2018	86,956	116,813	2,665	27,192
17- 2019	86,956	116,813	2,665	27,192
18- 2020	86,956	116,813	2,665	27,192
19- 2021	86,956	116,813	2,665	27,192
20- 2022	86,956	116,813	2,665	27,192
21- 2023	86,956	116,813	2,665	27,192
Total (tones of CO2 e)	**1,826,066**	**2,453,068**	**55,968**	**571,034**

SECTION F. Environmental impacts

F.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:

>>

The environmental authority responsible for licensing the Villares activities is CETESB. It did not request any environmental study for the fuel switch. Environmental impact studies are requested only when the activity represents a significant impacts, thus there are no significant negative impacts related to project activity.

The environment
al licenses analysed are:

Process number	Installation license	Operational / Final license	Description	Validity
03/00731/99	03000293	3000922	Regularization of the areas built without license	Without validity
03/0082/00	PU 1240/76		General beginning	Without validity
03/00183/05 (protocol number)			General renewal of the licenses	

All the documentation is attached on annex 5.

F.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

>>

Given that the project activity will not induce to significant impacts, no impact assessment was undertaken.

SECTION G. Stakeholders' comments

>>

G.1. Brief description how comments by local stakeholders have been invited and compiled:

>>

According to the Resolution #1 dated on December 2nd, 2003, from the Brazilian Inter-Ministerial Commission of Climate Change (Comissão Interministerial de Mudança Global do Clima -CIMGC), decreed on July 7th, 1999[1], any CDM projects must send a letter with a description of the project and an invitation for comments by local stakeholders. In this case, letters were sent to the following local stakeholders:

- City Hall of Pindamonhangaba;
- Chamber of Pindamonhangaba;
- Environment agencies from the state and Local Authority;
- Brazilian Forum of NGOs;
- District Attorney (known in Portuguese as Ministério Público, i.e. the permanent institution essential for legal functions responsible for defending the legal order, democracy and social/individual interests) and;
- Local communities associations (FAMEDMOC – Federação das Associações de Moradores e Entidades Afins do Distrito de Moreira César).

Local stakeholders were invited to raise their concerns and provide comments on the project activity for a period of 30 days after receiving the letter of invitation. EcoSecurities and the project developer addressed questions raised by stakeholders during this period.

The letters were posted on 25 August 2005. An electronic copy of the PDD version 01 was available at: www.villares.com from 22 August 2005 to 30 September 2005. A written copy was sent as soon as requested.

G.2. Summary of the comments received:

>>

Up to date one comment was received. The comment was made by Brazilian Forum of NGOs (Forum Brasileiro de ONGs e Mvimentos sociais – FBOMS), emphasizing the favourable position to CDM project activities and the interest in cooperate and participate more during the CDM project cycle process.

G.3. Report on how due account was taken of any comments received:

>>

The comment didn't talk about the project scope neither the data nor approach used during the elaboration of PDD, thus no modification was made on project concept neither on this document.

[1] Source: http://www.mct.gov.br/clima/comunic/pdf/Resolução01p.pdf

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Aços Villares S.A
Street/P.O.Box:	Av. Maria Coelho Aguiar 215,
Building:	bloco A- 5º floor
City:	São Paulo
State/Region:	São Paulo
Postfix/ZIP:	CEP: 05804-900
Country:	Brazil
Telephone:	+55 (11) 3748-9500
FAX:	+55 (11) 3748-9599
E-Mail:	
URL:	www.villares.com.br
Represented by:	
Title:	Organization Manager
Salutation:	Mr.
Last Name:	Muiño
Middle Name:	
First Name:	Gumersindo
Department:	
Mobile:	
Direct FAX:	
Direct tel:	+55 (11) 3748-9533
Personal E-Mail:	Gumersindo.muino@villares.com.br

Organization:	EcoSecurities Ltd, UK.
Street/P.O.Box:	21, Beaumont Street
Building:	-
City:	Oxford
State/Region:	-
Postfix/ZIP:	-
Country:	United Kingdom
Telephone:	44 1865 202 635
FAX:	44 1865 251 438
E-Mail:	uk@ecosecurities.com
URL:	www.ecosecurities.com
Represented by:	
Title:	Director
Salutation:	Mr.
Last Name:	Moura Costa
Middle Name:	
First Name:	Pedro
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	pedro@ecosecurities.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

Not applicable

Annex 3

BASELINE INFORMATION

Calculation data

Fuel data

Sources	density (Kg/m^3)	lower heating value (Kcal/kg)	Net calorific value (TJ/Ktonne)	Carbon oxidation (%)	Carbon content (tC/TJ)	Carbon Emission Factor (t CO2/TJ)
fuel oil	1.000	9590	40.15	99%	21.10	76.59
LPG	550	11100	46.47	99%	17.20	62.44
natural gas	0.829	8600	36,01	99,5%	15,30	55,82

Sources:

	Brazilian energy Balance,2003
	http://www.comgas.com.br/templates/gnatural.aspx?page=613&idiom=1 (=gram per mol / 22,4)
	IPCC 1996
	COMGAS data (Natural gas distributor)
	Calculated

Basic Technology	Basic Technology	CH4 (kg/TJ)	N2O (kg/TJ)
Chemical Processes,Wood, Asphalt,Copper, Phosphate	Dryer - Natural Gas	1.1	0
Chemical Processes,Wood, Asphalt,Copper, Phosphate	Dryer - Oil	1	0

Leakage data

Project Emission Type Factor	tonne of CH4/TJ	Source
Natural Gas Processing, Transport, and Distribution	0.118	IPCC 1996

Transportation	unit	value
Distance from purchase site	km	300
Truck capacity	ton	20
Truck consumption rate	l diesel / km	0.40
Truck consumption rate	kg diesel / km	0.336

Equipment data

Code	Name	Annual energy consumption (in TJ)
UP-300-1	Caldeira Keystone 11M	113.97
UP-300-2	Caldeira Keystone 11M	113.97
UP-520-1	Aquecedor de Panelas	9.19
UP-520-2	Aquecedor de Panelas	9.19
UP-520-3	Aquecedor de Panelas	9.19
UP-520-4	Aquecedor de Panelas	9.19
UP-520-5	Aquecedor de Panelas	9.19
UP-600-1	Forno Poço	32.27
UP-600-2	Forno Poço	32.27
UP-600-3	Forno Poço	32.27
UP-600-4	Forno Poço	32.27
UP-600-5	Forno Poço	32.27
UP-600-6	Forno Poço	32.27
UP-600-7	Forno Poço	32.27
UP-600-8	Forno Poço	32.27
UP-600-9	Forno Poço	32.27
UP-600-10	Forno Poço	32.27
UP-600-12	Forno de Viga Móvel	367.26
UP-710-1	Aquecedor de Panelas	5.69
UP-710-2	Aquecedor de Panelas	5.69
UP-710-3	Aquecedor de Panelas	5.69
UP-710-4	Aquecedor de Panelas	5.69
UP-710-6	Estufa FHW	16.78
UP-710-7	Estufa WR	-
UP-710-8	Estufa Convencional	12.81
UP-730-1	Forno de ToTo	5.90
UP-730-2	Forno de ToTo	5.90
UP-730-3	Forno de ToTo	5.90
UP-730-4	Forno de ToTo	5.90
UP-730-5	Forno de ToTo	5.90
UP-530-6	Forno de ToTo - T1	32.52
UP-530-9	Forno de Aquecimento	60.24
UP-530-10	Forno de Aquecimento	120.49
UP-530-12	Forno de Aquecimento	120.49
UP-600-13	Forno de Tratamento de barras	0.01
UP-530-2	Forno de ToTo	5.78
UP-530-3	Forno de ToTo	5.78
UP-530-4	Forno de ToTo	5.78
UP-530-5	Forno de Toto	5.78
UP-720-1	Forno de ToTo	6.77
UP-720-2	Forno de ToTo	6.44
UP-720-3	Forno de ToTo	6.44
UP-720-4	Forno de ToTo	6.32

UP-720-5	Forno de ToTo	6.32
UP-720-6	Forno de ToTo	6.14
UP-720-7	Forno de ToTo	6.14
UP-630-1	Forno de Recozimento	27.54
UP-630-2	Forno de Recozimento	-
UP-520-7	Aquecedor de panelas	82.34

Financial Analysis data

	Parameter	value	Unit	Source
investments	Total Investments	4,882,711	R$	Company data
energy prices	Natural gas price	0.00856	R$/kJ	Company data (obtained from suppliers). Average price of years 2000 and 2001
	Fuel oil price	0.00759	R$/kJ	Company data (obtained from suppliers). Average price of years 2000 and 2001
	LPG price	0.01127	R$/kJ	Company data (obtained from suppliers). Average price of years 2000 and 2001
	electricity	120.00	R$/MWh	Market price
others	Discount rate	18%		

Annex 4

MONITORING PLAN

1) General Description

Villares has an internal commission related to energy conservation- the CICE (Comissão Interna de Conservação de Energia). All information about fuel consumption and energy efficiency has been collected and reported for a long time. The main entity related to collecting, managing and reporting all information related to fuel consumption is the Utilities Sector. The Utilities Sector elaborates three different reports related to energy consumption: costs report, Monthly Energy Balance report and Annual Balance report. All these reports are interconnected. The elaboration process and the interconnection between them are detailed in figure below.

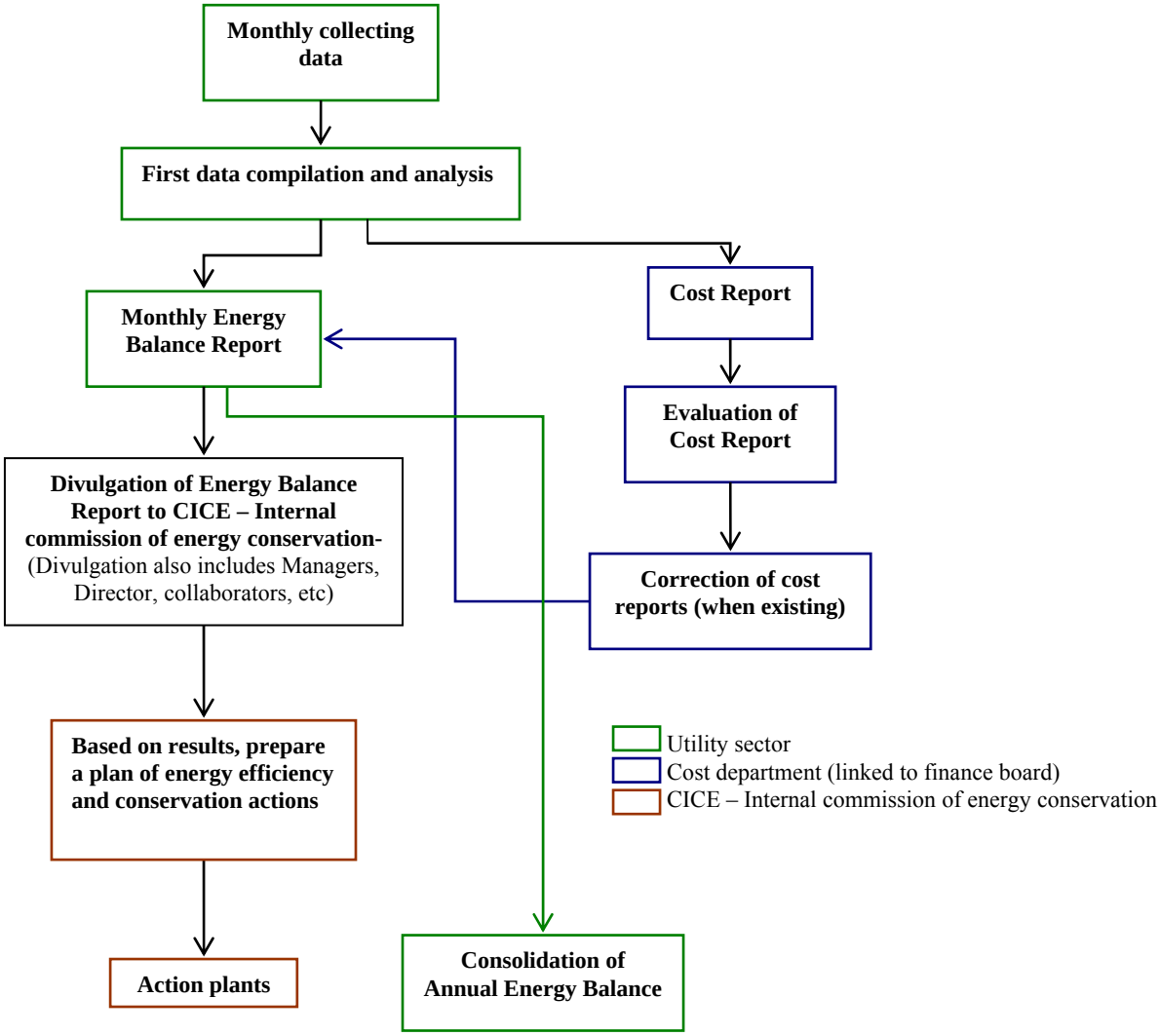


Figure A.4.1: Detailed elaboration process of Monthly Energy Balance report and Annual Balance Report, and interconnections between them.

The emission reduction calculations are done based on these reports, studies made by Villares to calculate the correlation between load factor and equipment efficiency, IPCC data, and any other additional data. All these data will be stored in electronic and paper formats.

2) Data Collection

During the last hours of the last day of moth, an operator visit all natural gas meters, and read it. The data collected is recorded in a paper report. During the morning of the same day, all data collected is transferred to the electronic system. During this transfer the data is checked by a second operator. If mistakes or discrepancies are detected, a new measurement is done as soon as possible. After all data in the electronic system is reasonable, it is validated by the area supervisor and then it is sent to utility sector for "First data compilation and analysis".

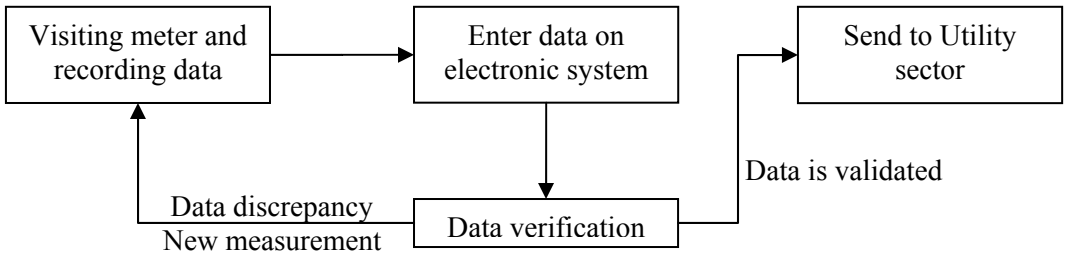


Figure A.4.2: Details of collecting and transferring data.

The "first data compilation and analysis" is the procedure related to receiving all data and cross-checking it with supplier data. There is one meter installed on the entry of the company, which meters all natural gas coming into the Villares plant. Each individual sector has natural gas meters (usually more than one). The sum of all sectoral natural gas meters is cross-checked with the supplier natural gas meter which meters overall gas use at the plant. Based on this, if necessary, the sectoral natural gas consumption records are adjusted by the Utilities Sector.

3) Reporting data

The Cost Report is written every month by the utility sector. It is the first report to be compiled based on the "Fist data compilation and analysis", and reports only the fuel consumption. The production of each equipment and efficiency are not included. This report is sent to the Cost Department, which checks all the information with the natual gas supplier invoices. If necessary, corrections and adjustments are done in the compiled data before collating with other reports.

The monthly energy balance report is finished during the second week of each month. It includes the fuel consumption (already revised by the Cost Department), production and energy efficiency of each sector. This report is send to CICE, who discuss the results in their meetings. The report is also divulgated to the CICE director, managers and collaborators. If there are no comments related to this report, the data will be added to the Annual Energy Balance Report. In case of comments and request of revisions, the report is revised before compilation of the Annual Energy Balance Report.

4) Internal Organization

Pindamonhangaba unit is organized into two independent production centers: the Cylinders area and the Mechanical construction area. Each production center has many processes related to its production line. Each process is an independent sector, in many cases located in different buildings. Parallel to all processes there is the utility sector which provides services to all processes, and centralizes all information regarding fuel consumption.

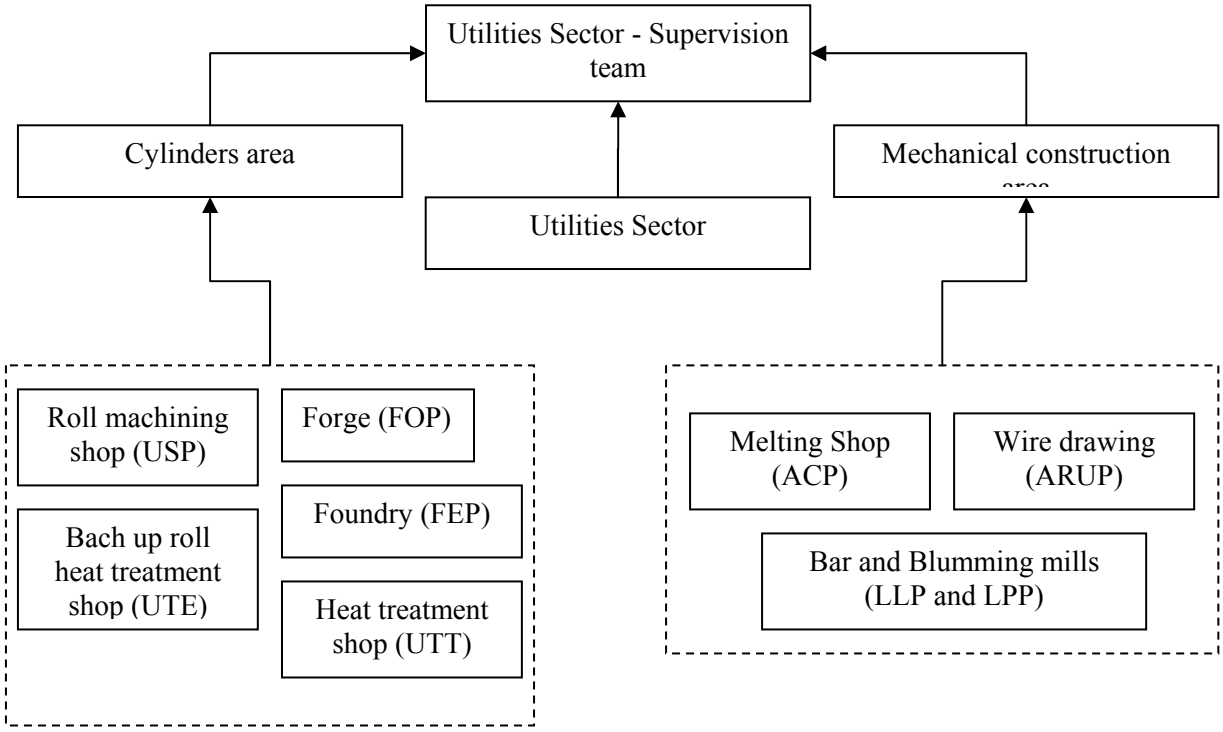


Figure A.4.3: The organization chart of fuel consumption data.

Natual gás flow meters						
area		**Equipment**	**Nº**	**Manufacturer**	**Model**	**Serial number**
FEP		**Geral do Prédio**	1	CONTECH	SVTG 2"	0212116
	UP-710-1	Aquecedor de Panela nº 1	Do not have eclusive flowleter *			
	UP-710-2	Aquecedor de Panela nº 2	Do not have eclusive flowleter			
	UP-710-3	Aquecedor de Panela nº 3	Do not have eclusive flowleter			
	UP-710-4	Aquecedor de Panela nº 4	Do not have eclusive flowleter			
	UP-710-5	Forno 911	1	CONTECH	SVTG 37/25"	03050424
	913	Forno 913	1	CONTECH	SVTG 1.1/2"	0302204
	915	Forno 915	1	CONTECH	SVTG 1.1/2"	0302205
		Forno 927	1	ELSTER	QA2525GI	69150744/2004
		Forno 929	1	ELSTER	QA2525GI	69150745/2004
	UP-710-7	Estufa WR	1	CONTECH	SVTG 37/19"	03090048
	UP-710-8	Estufa Convencional	1	CONTECH	SVTG 1.1/2"	0302206
	UP-710-6	Estufa FHW	1	CONTECH	SVTG 1.1/2"	0302207
USP		**Geral do Prédio**	1	CONTECH	SVTG 1.1/2"	0302203
	UP-730-1	Forno 901	Do not have eclusive flowleter			
	UP-730-2	Forno 903	Do not have eclusive flowleter			
	UP-730-3	Forno 905	Do not have eclusive flowleter			
	UP-730-4	Forno 907	Do not have eclusive flowleter			
	UP-730-5	Forno 909	Do not have eclusive flowleter			
		Forno 917	1	ELSTER	QA2525G	69144633/2003
		Forno 919	1	ELSTER	QA2525G	69144629/2003
		Forno 921	1	ELSTER	QA2525G	69144631/2003
		Forno 923	1	ELSTER	QA2525G	69147116/2003
		Forno 925	1	ELSTER	QA2525G	69145409/2003
F.Poço	UP-600-1	Forno Poço 01	1	ELSTER	Q65DN50PN10	71034987/2002
	UP-600-2	Forno Poço 02	1	ELSTER	Q65DN50PN10	71034984/2002
	UP-600-3	Forno Poço 03	1	ELSTER	Q65DN50PN10	71034982/2002
	UP-600-4	Forno Poço 04	1	ELSTER	Q65DN50PN10	71034983/2002
	UP-600-5	Forno Poço 05	1	ELSTER	Q65DN50PN10	71034988/2002
	UP-600-6	Forno Poço 06	1	ELSTER	Q65DN50PN10	71034979/2002
	UP-600-7	Forno Poço 07	1	ELSTER	Q65DN50PN10	71034981/2002
	UP-600-8	Forno Poço 08	1	CONTECH	SVTG 1.1/2"	5010524
	UP-600-9	Forno Poço 09	1	ELSTER	Q65DN50PN10	71034985/2002
	UP-600-10	Forno Poço 10	1	ELSTER	Q65DN50PN10	71034986/2002
Acp	UP-520-1	Aquecedor panela 01	1	INSTRUMET	SMRIXG40	IB2060
	UP-520-2	Aquecedor panela 02	1	INSTRUMET	SMRIXG41	IB2075
	UP-520-5	Aquecedor panela 03	1	INSTRUMET	SMRIXG42	IB2073
		A .Panela Basauri 01	1	SCHLUMBERGER	MTS60	06832
	UP-520-3	A .Panela Basauri 02	1	INSTRUMET	SMRIXG42	IB2071

	UP-520-4	A .Panela Basauri 03	1	INSTRUMET	SMRIXG43	IB2074
		A . Panela refrigerado		Aquecedor desativado		
	UP-520-7	A . Penela Ingener	1	INSTRUMET	SMRIXG42	IB2072
		A . Tundish 01		Do not have eclusive flowleter		
		A . Tundish 02		Do not have eclusive flowleter		
LLP	UP-600-12	Forno Viga Movel	1	ELSTER	Q650DN150PN10	73522750/2002
LLP	UP-600-11	Máquina Escarfagem	1	INSTRUMET	SMRI-Q65	182059
	UP-300-1	Caldeira A	1	ELSTER	QA2501007	69137053/2002
UTL	UP-300-2	Caldeira B	1	ELSTER	QA2501007	69137054/2002
ARUP	UP-630-1-2	Arames - Geral	1	CONTECH	SVTG 1 1/2	0212120
ACB	UP-600-13	Forno Barras	1	ACTARIS	FLUXI 2080	K5445417 03/A
	UP-720-1	Forno de Toto 612				
	UP-720-2	Forno de Toto 614				
	UP-720-3	Forno de Toto 616				
UTE	UP-720-4	Forno de Toto 618	1	Contech	SVTG2	0212114
	UP-720-5	Forno de Toto 620				
	UP-720-6	Forno de Toto 622				
	UP-720-7	Forno de Toto 628				
		Geral do Prédio	1	CONTECH	SVTG 4"	0110237
	UP-530-5	Forno de ToTo 624	Do not have eclusive flowleter			
	UP-530-4	Forno de ToTo 626	Do not have eclusive flowleter			
	UP-530-2	Forno de ToTo 630	Do not have eclusive flowleter			
FOP	UP-530-3	Forno de ToTo 632	Do not have eclusive flowleter			
	UP-530-6	Forno T1	1	ELSTER	Q250DN80PN10	71034398/2002
	UP-530-9	Forno F1	1	ELSTER	Q100DN80PN10	71031597/99
	UP-530-10	Forno F2	1	ELSTER	Q160DN80PN10	71034396/2002
	UP-530-12	Forno F 4	1	ELSTER	Q160DN80PN10	71034394/2002

- - - - -

Annex 5

ENVRIONMENTAL LICENCES

CETESB
Dossiê nº 04/0049/76
Folhas nº 196

CETESB

juízos causados pela firma, a mesma deverá tomar medidas adequadas no sentido de solucioná-los em caráter de urgência.

6.4. A firma deve requerer a CETESB, Licença de Funcionamento, conforme prevê o Decreto Estadual nº 8468/76, antes do início das atividades a que se refere este parecer.

Engº Carlos Alberto Ferreira

ENGº PÉRICLES ASBAHR

GERÊNCIA DE OPERAÇÕES PREVENTIVAS DA CPAR

1o. SERVICO NOTARIAL DE TAUBATE
TAUBATE - SP
EDISON MARTINS ROSA - Tabeliao
----- AUTENTICACAO -----
Custas pagas R$ 0,50
VALIDA PARA UMA REPROGRAFIA POR DOCUMENTO
*** VALIDO SOMENTE COM O SELO DE AUTENTICIDADE ***

SELO DE AUTENTICIDADE
AUTENTICAÇÃO
SERVIÇO PÚBLICO DELEGADO
BL Nº 908949

Companhia Estadual de Tecnologia de Saneamento Básico e de Defesa do Meio Ambiente
Av. Prof. Frederico Hermann Jr., 345 • PABX 210-1100 • Cep 05459 • São Paulo

GOVERNO DO ESTADO DE SÃO PAULO
SECRETARIA DO MEIO AMBIENTE
CETESB - COMPANHIA DE TECNOLOGIA DE SANEAMENTO AMBIENTAL

regularização área construída e seus lucros

02

Processo Nº 03/00731/99

Pasta 13

LICENÇA DE FUNCIONAMENTO

Nº 3000922

Data 23/08/2002

Ampliação

IDENTIFICAÇÃO DA ENTIDADE

Nome	CNPJ
AÇOS VILLARES S.A.	60.664.810/0047-57
Logradouro	Cadastro na CETESB
ROD. LUIZ DUMONT VILLARES	528 - 00138 - 0

Número	Complemento	Bairro	CEP	Município
S/Nº	KM 2 CP 162	MOREIRA CÉSAR	12420-000	PINDAMONHANGABA

CARACTERÍSTICAS DO PROJETO

Atividade Principal

Descrição	Código IBGE
FUNDIÇÃO E LAMINAÇÃO DE AÇO.	11.06.00-0

Bacia Hidrográfica	UGRHI
61 - PARAIBA	2 - PARAIBA DO SUL
Corpo Receptor	Classe
RIBEIRÃO DOS SURDOS	2

Área (metro quadrado)

Terreno	Construída	Atividade ao Ar Livre	Novos Equipamentos	Lavra(ha)
3267500,00	6533,00			

Horário de Funcionamento (h)			Número de Funcionários		Licença de Instalação	
Início		Término	Administração	Produção	Data	Número
00:01	às	23:59	0	0	04/01/2000	03000293

A CETESB-Companhia de Tecnologia de Saneamento Ambiental, no uso das atribuições que lhe foram conferidas pela Lei Estadual nº 997, de 31 de maio de 1976, regulamentada pelo Decreto nº 8468, de 8 de setembro de 1976, concede a presente licença, nas condições e termos nela constantes;

A presente licença está sendo concedida com base nas informações apresentadas pelo interessado e não dispensa nem substitui quaisquer Alvarás ou Certidões de qualquer natureza, exigidas pela legislação federal, estadual ou municipal;

A presente Licença de Funcionamento se refere aos locais, equipamentos ou processos relacionados no verso ou Folha Anexo;

Os equipamentos de controle de poluição existentes deverão ser mantidos e operados adequadamente, de modo a conservar sua eficiência;

No caso de exigência de equipamentos ou dispositivos de queima de combustível, a densidade da fumaça emitida pelos mesmos deverá estar de acordo com o disposto no artigo 31 do Regulamento da Lei Estadual nº 997, de 31 de maio de 1976, aprovado pelo Decreto nº 8468, de 8 de setembro de 1976, com a redação dada pelo Decreto Estadual nº 15.425, de 23 de julho de 1980;

Alterações nas atuais atividades, processos ou equipamentos deverão ser precedidas de Licença de Instalação, nos termos do artigo 58 do Regulamento acima mencionado;

Caso venham existir reclamações da população vizinha em relação a problemas de poluição ambiental causados pela firma, esta deverá tomar medidas no sentido de solucioná-los em caráter de urgência.

USO DA CETESB

SD Nº 03000913

ENTIDADE

EMITENTE

Local: Agência Ambiental de Taubaté

SELO DE AUTENTICIDADE CETESB COMPANHIA DE TECNOLOGIA DE SANEAMENTO AMBIENTAL

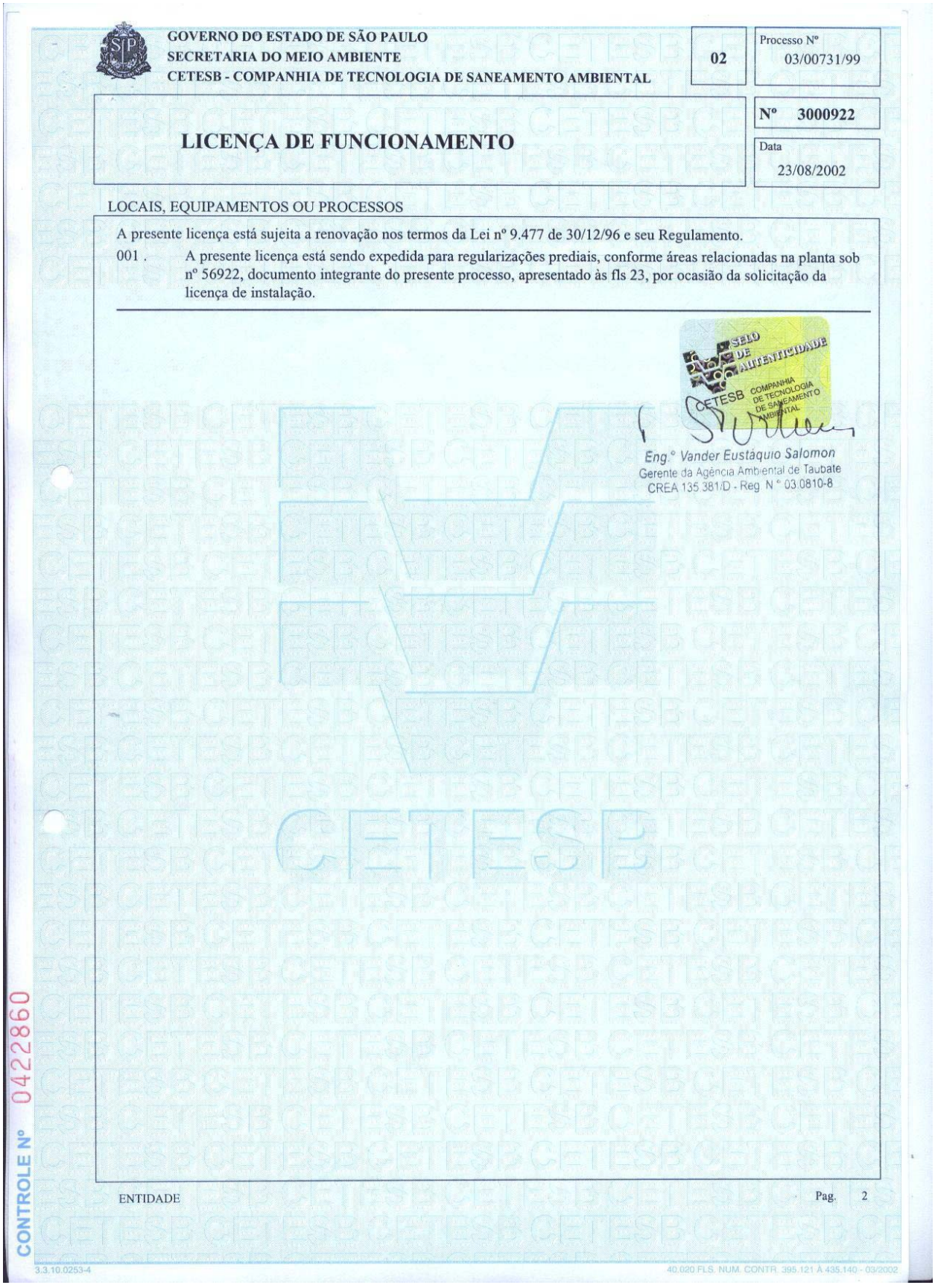
Pag. 1

Eng.º Vander Eustáquio Salomon
Gerente da Agência Ambiental de Taubaté
CREA 135.381/D - Reg. Nº 03.0810-8

CONTROLE Nº 0422859

3.3.10.0253-4

40.020 FLS. NUM. CONTR. 395.121 A 435.140 - 03/2002



GOVERNO DO ESTADO DE SÃO PAULO
SECRETARIA DO MEIO AMBIENTE
CETESB - COMPANHIA DE TECNOLOGIA DE SANEAMENTO AMBIENTAL

02

Processo Nº 03/00731/99

Nº 3000922

Data 23/08/2002

LICENÇA DE FUNCIONAMENTO

LOCAIS, EQUIPAMENTOS OU PROCESSOS

A presente licença está sujeita a renovação nos termos da Lei nº 9.477 de 30/12/96 e seu Regulamento.

001 . A presente licença está sendo expedida para regularizações prediais, conforme áreas relacionadas na planta sob nº 56922, documento integrante do presente processo, apresentado às fls 23, por ocasião da solicitação da licença de instalação.

SELO DE AUTENTICIDADE CETESB COMPANHIA DE TECNOLOGIA DE SANEAMENTO AMBIENTAL

Eng.º Vander Eustáquio Salomon
Gerente da Agência Ambiental de Taubaté
CREA 135.381/D - Reg Nº 03.0810-8

CONTROLE Nº 0422860

ENTIDADE Pag. 2

3.3.10.0253-4 40.020 FLS. NUM. CONTR. 395.121 À 435.140 - 03/2002

pasta 18

CETESB | ØB | SOLICITAÇÃO DE | Número SD | Data da Entrada

Objeto: LICENÇA DE OPERAÇÃO GERAL UP | Código | Processo Nº

FINALIDADE

☐ Novo Estabelecimento ☐ Edifício Existente ☐ Ampliação

☐ Novos Equipamentos ☐ Reforma ou Modificação

IDENTIFICAÇÃO DO EMPREENDIMENTO

Nome	Cadastro na CETESB
Aços Villares S/A	454.00003-4

Logradouro	Número	Complemento
Rod. Luis Dummond Villares	KM 02	

Bairro	CEP	Município	Fone
Moreira Cesar	12442-900	Pindamonhagaba	12 3641 8412

IDENTIFICAÇÃO DO RESPONSÁVEL PELO EMPREENDIMENTO

Nome	RG	Fone
Edenilson Donizete Sanches	17.878.980	12 3641 8311

AUTORIZAÇÃO (Funcionário do Empreendimento)

Nome	RG
Herivelto da Silva Rodrigues	25.167.224-4

Cargo	Fone
Engenheiro de Meio Ambiente	12 3641 8412

Autorizo a pessoa acima a representar-me perante a CETESB, para fins de obtenção do solicitado.

ASSINATURA REPRESENTANTE ASSINATURA RESPONSÁVEL

Deverá ser apresentado à CETESB o original do documento de identidade do responsável pela firma ou cópia autenticada.

VISTORIA (só para Licença de Funcionamento)

Solicitamos sua realização a partir de ___/___/___, quando o empreendimento estará em condições de ser vistoriado.

DECLARAÇÃO

Declaramos, sob as penas da lei, que as informações aqui contidas são a expressão da verdade.

___/___/___ ASSINATURA RESPONSÁVEL

3ª VIA - SEDE (ROSA)

OS CAMPOS ABAIXO SÃO DE USO DA CETESB

VERIFICAÇÃO DA DOCUMENTAÇÃO E PRAZO PARA DECISÃO

☐ Completa

☒ Sujeito a Complementação ☒ Faltando publicação no DOE e jornal local

Decisão até ___/___/___

No caso da CETESB necessitar de dados complementares, a decisão ocorrerá até ____ dias após o o recebimento do solicitado. A não apresentação dos dados no prazo estipulado implicará no arquivamento do processo.

CÁLCULO DO PREÇO DO DOCUMENTO (Decreto nº 17.299, de 07 de julho de 1981) e Lei nº 7.801 de 11/07/89

☒ LP, LI e LO		
☐ $P_{ufesp} = 70 + (1,5xWx\sqrt{A})$		
☐ CADRI = 70 ufesp	P = Valores em Reais (R$)	31.375,90

RECEBIMENTO

GERÊNCIA REGIONAL DE TAUBATÉ
Av. Itambé, 38 - Caixa Postal 237
CETESB CEP 12.091-200 - Fone: (12) 233-4900

RUBRICA DO FUNCIONÁRIO

RETIRADA DA DOCUMENTAÇÃO (Apresentar a 2ª via desta Solicitação)

☐ Lic. Inst. nº	___/___/___	Ass.
☐ Lic. Func. nº	___/___/___	Ass.
☐ Parecer Téc. nº	___/___/___	Ass.
☐ Vias de Plantas	___/___/___	Ass.
☐	___/___/___	Ass.
☐	___/___/___	Ass.

SECRETARIA DO MEIO AMBIENTE
CETESB - COMPANHIA DE TECNOLOGIA DE SANEAMENTO AMBIENTAL

Cálculo do Preço do Documento - Indústria	SD Nº 3005298	Data 14/03/2005

IDENTIFICAÇÃO DO EMPREENDIMENTO

Nome
AÇOS VILLARES SA

Logradouro
RODOVIA LUIS DUMMONT VILLARES - KM 02 02

Cadastro Cetesb
528 - 00138-0

CEP	Bairro	Município	UF
12422-260	MOREIRA CÉSAR	PINDAMONHANGABA	SP

Fatores

W (fator de complexidade da fonte de poluição)	5,0
Área do Terreno (m²)	3791700,00
Área Construída (m²)	228954,82
Área ao Ar Livre (m²)	152999,03
Área de Novo Equipamento (m²)	
A (Área da fonte de poluição) (m²)	381953,85

Fórmula

INDÚSTRIA	**P = 0,50 * (70 + (1,5 * W * rq(A)))**	**UFESP**	rq = raiz quadrada

Valor UFESP

Preço	2.352,59
Preço em Reais	31289,45

GERÊNCIA REGIONAL DE TAUBATÉ
Av. Itambé, 38 - Caixa Postal 237
CETESB CEP 12.091-200 - Fone: (12) 233-4900

Pasta 16

CETESB

PARECER ÚNICO

DOSSIÊ Nº.: 04/0049/76 NÚMERO PU-1240/76
DATA : 18.10.76

INTERESSADO : VILLARES - INDÚSTRIAS DE BASE S/A.

ASSUNTO : Aprovação de Plantas para Construção de Prédio Industrial

LOCAL : Km. 161 da Rodovia SP-66

MUNICÍPIO : PINDAMONHANGABA - S.P.

Tendo em vista o Termo de Compromisso apresentado pelo Vice-Presidente da Villares Indústrias de Base S.A., Sr.André Musetti em 17 de agosto de 1976 e nos termos do parecer número 065/76 emitido pela Superintendência de Controle de Poluição das Águas e do Solo e pelo parecer número 1130/76 da Superintendência de Operações de Controle de Ruídos e Poluição do Ar, após estudos da documentação integrante do dossiê supra referido, a COMPANHIA ESTADUAL DE TECNOLOGIA DE SANEAMENTO BÁSICO E DE DEFESA DO MEIO AMBIENTE - CETESB manifesta-se FAVORAVELMENTE à aprovação da planta para construção de prédio industrial no local aí indicado, à vista do que dispõe a legislação vigente sobre a preservação do meio ambiente.

Eng.º JOSÉ FRANCISCO FURQUIM DE CAMPOS
Gerente Operacional I - SCPAS

P/ Engº.MAX ARTHUR VEIT
Superintendente
SCPAS

Anexos : Parecer nº.: 065/76 - URTB
Parecer nº.: 1130/76 - CPAR/GOP

/aa.

Companhia Estadual de Tecnologia de Saneamento Básico e de Defesa do Meio Ambiente
Av. Prof. Frederico Hermann Jr., 345 • PABX 210-1100 • Cep 05459 • São Paulo

FLS 081

CETESB

Parecer nº 065/76-URTB

Interessado: Villares Indústria de Base S.A.

Município: Pindamonhangaba

Assunto: Aprovação de plantas para implantação de um estabelecimento industrial.

Sr. Chefe da Unidade Regional de Taubaté.

01 - Atendendo ao estabelecido pelo Decreto nº 6371/75 o interessado apresenta projeto para implantação de um estabelecimento industrial, tendo recolhido a taxa correspondente.

02 - Trata-se de uma indústria Siderurgica de Aços especiais em implantação.

A água a ser utilizada será proveniente do Rio Paraíba do Sul, sendo que não há determinação precisa da quantidade de água a ser retirada, estimando-se inicialmente 800 m^3/h e 19.200 m^3/h o volume enviado normalmente da usina.

Os despejos domésticos na primeira fase é de 2,54 l/s (estágio inicial 2.200 operários) na fase final está previsto 3.960 operários; serão enviados ao sistema de tratamento (gradeamento, aeração prolongada, decantação, leitos de secagem, desinfecção).

Os despejos industriais (águas de lavagem dos filtros e decantadores da ETA, as águas de recuperação das usinas catiônicas e aniônicas da estação de tratamento da água de caldeiras, as águas de limpeza das caldeiras, as águas de limpeza das torres de resfriamento, totalizando um volume aproximado de 170 m^3/dia) serão encaminhados a um Decantador e equalizador de temperatura.

O Ribeirão dos Surdos, afluente do Rio Paraíba do Sul, pela margem direita receberá os afluentes da indústria.

FLS. 082

CETESB

03 - As informações prestadas atendem as normas da CETESB, tendo a indústria assinado termo de compromisso para a apresentação do projeto de tratamento dos despejos dentro do prazo de oito meses.-

Somos de parecer favorável a aprovação, quanto ao aspecto de controle de poluição das águas.

Taubaté, 12 de Agosto de 1976.

Luiz Hamplin Ladines
Engº Fiscal - CETESB

Corpo receptor: O Ribeirão dos Surdos, afluente do Rio Paraíba do Sul, pela margem direita.

Vazão do corpo receptor:

Vazão minima: 0,194 m^3/s

Vazão máxima: 0,494 m^3/s

Vazão dos despejos: 390 m^3/dia ✓

Bacia: Rio Paraíba

Classe: II

Companhia Estadual de Tecnologia de Saneamento Básico e de Defesa do Meio Ambiente
Av. Prof. Frederico Hermann Jr., 345 • PABX 210-1100 • Cep 05459 • São Paulo

Dossiê nº 04/0049/76
Folha nº 191
Rubrica

CETESB

São Paulo, 15 de outubro de 1 976.

PARECER CPAR/GOP nº 1 130/76

Dossiê nº CETESB 04/0049/76
Interessado: VILLARES - Indústrias de Base S/A
Assunto: L.I. Novo estabelecimento - Tipo Indústria
Local: Pindamonhangaba - SP

Temos a informar:

1 . Trata-se de um pedido de Licença de Instalação para construção da firma VILLARES - Indústrias de Base S/A, no Distrito de Moreira Cesar, em Pindamonhangaba.

2 . Segundo o Memorial Industrial respondido pelo interessado , constatamos que:

2.1. Serão produzidos mensalmente a ordem de:

1500 t de aço fundido
2340 t de aço forjado
600 t de cilindros de aço forjado
300 t de cilindros de ferro fundido
1050 t de cilindros de aço fundido
7500 t de bobinas de fios de aço
22500 t de barras para construção mecânica
2250 t de aço ferramenta e aço inox.

2.2. Serão utilizadas mensalmente as seguintes matérias primas, materiais e/ou reativos no processamento:

37660 t de aço em sucata
9,9 t de propano

Companhia Estadual de Tecnologia de Saneamento Básico e de Defesa do Meio Ambiente
Av. Prof. Frederico Hermann Jr., 345 • PABX 210-1100 • Cep 05459 • São Paulo

11.400.000M m^3 de oxigênio
5000 t de refratários
210 m^3 de madeira
4800 t de calcário
99000 t de eletrodos
780.000 m^3 de água
4200 t de areia
416,67 t de ligantes para areia
5833,3 t de ferro gusa
2500 t de ligas especiais
900 Kg de acetileno (condições normais)
570.000 m^3 de óleos lubrificantes

2.3. A firma contará com 3 960 operários em 3 (três) turnos de trabalho.

2.4. Serão consumidos os seguintes tipos e quantidades mensais de combustíveis:
15.000 t de óleo combustível BTE
270 t de óleo diesel
900 Kg de acetileno
9,9 t de propano

3 . O processamento industrial da firma em questão será efetuado nos seguintes setores:

3.1. Aciaria
3.2. Fundição de ferro
3.3. Fundição de aço
3.4. Laminação
3.5. Forjaria
3.6. Tratamento Térmico
3.7. Usinagem de cilindros
3.8. Usinagem pesada
3.9. Modelação
3.10 Manutenção Central.

4 . Principais fontes potencialmente poluidoras do ar:

4.1. Na aciaria

Fusão em fornos elétricos a arco

Injeção de oxigênio efetuada nos fornos elétricos.

Vazamento de aço em lingoteiras e panelas

Aquecimento de panelas.

Côrte de refratários

4.2. Na fundição de ferro:

Preparação de areia

Desmoldagem de fundidos

Fusão de gusa e sucata em fornos elétricos de indução

Vazamento de ferro fundido em panelas

Vazamento de ferro fundido em moldes

Vazamento de ferro fundido em máquinas centrífugas de fundição.

Pintura de moldes

Secagem de moldes em estufas a óleo

Recozimento de fundidos em fornos a óleo.

4.3. Na fundição de aço:

Desmoldagem de fundidos

Vazamento de aço líquido proveniente da aciaria

Limpeza com granalhas

Cozimento de machos em estufa a óleo

Recozimento de fundidos em forno a óleo

Têmpera em forno a óleo e poço de têmpera.

4.4. Na laminação:

Aquecimento de lingotes de aço em fornos poço a óleo

Escarfagem a quente em máquina de escarfar a oxigênio

Reaquecimento de tarugos em forno a óleo

Tratamento térmico de barras e bobinas em fornos contínuos a óleo.

Jateamento de granalhas para barras leves e bobinas.

R

4.5. Na forjaria:
Aquecimento de aço em fornos a óleo.
Recozimento de peças forjadas em fornos a óleo.

4.6. No tratamento térmico:
Escarfagem a arco elétrico
Limpeza com granalhas de aço
Aquecimento, têmpera e revenimento em fornos a óleo

4.7. Na usinagem de cilindros:
Aquecimento de cilindros em fornos a óleo.

4.8. Na modelação:
Corte de madeira em serras de fita e circulares
Desbaste de madeira em tornos, tupias, desempenadeiras e fresas.
Lixamento de madeira com lixadeiras a disco e de fita.

5 . Somos favoráveis à concessão da Licença de Instalação, no que diz respeito à poluição do ar e ruídos, porém as seguintes exigências preliminares deverão ser cumpridas, antes do início das atividades:

5.1. Instalar sistema de ventilação local exaustora e equipamento de controle de poluentes de acordo com o Decreto 8 468/76 para as seguintes fontes:

a) da aciaria:

Fusão e injeção de oxigênio em fornos elétricos a arco.
Corte de refratários.

b) da fundição de ferro:
Sistema de preparação de areia.
Desmoldagem de fundidos.
Fusão de gusa e sucata em fornos elétricos de indução.