

SUSTAINABILITY RETURN ON INVESTMENT: Redefining the Value of Emerging Market Multinationals' Investments in Brazil



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Participating Companies



TEAM

Study

Sustainability Return on Investment: Redefining the Value of Emerging Market Multinationals' Investments in Brazil

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Graphic Project

Brunharo Comunicações



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LIST OF ABBREVIATIONS

BNDES	Brazilian Development Bank
BRL	Brazilian Real
CAPEX	Capital Expenditure
CDI	Interbank Deposit Certificate
CO ₂	Carbon Dioxide
COGS	Cost of goods sold
CRM	Customer Relationship Management
DC	Distribution Center
DCF	Discounted Cash Flow
DCNS	Direction des Constructions Navales et Services
DIFAL	Tax Rate Difference
EBTDA	Earnings Before Interest, Taxes, Depreciation and Amortization
EMM	Emerging Market Multinationals
EMSD	Emerging Market Sustainability Dialogues
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GVces	Fundação Getúlio Vargas Center for Sustainability
ICMS	Tax for Goods and Services
ICN	Itaguaí Construções Navais
IRR	Internal Rate of Return
ISO	International Organization for Standardization
LIBOR	London Interbank Offered Rate
MARR	Minimum Acceptable Rate of Return
MM	Million
NPV	Net Present Value
OECD	Organization for Economic Co-operation and Development
PROSUB	Brazil's National Submarine Development Programme
R&D	Research and Development
ROI	Return on Investment
SEBRAE	Brazilian Micro and Small Business Support Service
SELIC	Special Clearance and Escrow System
TJLP	Brazil Long Term Interest Rate
WACC	Weighted Average Cost of Capital



PREFACE FROM THE GERMAN FEDERAL MINISTRY FOR ECONOMIC COOPERATION AND DEVELOPMENT (BMZ)

Dear readers,

The world finds itself in a situation where the traditional approaches to development cooperation are not sufficient anymore. New challenges such as the sustainable development of the world economy, financial stability and the protection of public goods that are at the forefront of today's global challenges cannot be addressed by governmental, bilateral aid flows alone but new partnerships between different stakeholders. The "Emerging Market Sustainability Dialogues" (EMSD) programme is a flagship programme of German International Cooperation, which set out to address these challenges and strengthen the capacities and global responsibility of our cooperation partners in industrialized, emerging and developing economies.

EMSD's goal is to foster the exchange and creation of knowledge between various stakeholders from emerging and industrialized economies on the topic of innovative economic policy making, sustainable business development, financial stability and green finance. It comprises three dialogue platforms and networks: The Economic Policy Forum (EPF), the Emerging Market Multinationals (EMM) Network for Sustainability and the Emerging Markets Dialogue Financial Sector (EMDF). Commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ), the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH facilitates and supports these platforms in a coordinating and secretarial role.

One of the results of the EMSD (with the EMM Network and the EPF joining hands to lead the initiative) have been efforts to reveal and quantify the "true value" of Emerging Market Multinationals' investment projects, including social and environmental external effects, both positive and negative ones. The actors involved in this "Sustainable Return on Investment (ROI)" initiative include prominent representatives of the leading EMMs and Think Tanks in Brazil, Mexico and China.

With this report, I am delighted to present to you the first results of the pilot initiative on Sustainable ROI in Brazil, which was put together with valuable support of the EPF member Think Tank Fundação Getúlio Vargas Center for Sustainability (GVces).

I would like to thank all partners involved in this initiative of the EMSD and am looking forward to jointly taking the lessons learned from this pilot to other parts of the world in our joint effort towards global responsibility for the sustainable development of the world economy.

Best regards.

Anja Wagner

Anja Wagner

Head of Division 114, Cooperation with the private sector, sustainable economic policy



1. EXECUTIVE SUMMARY

This study, entitled Sustainability ROI, conducted by the Fundação Getúlio Vargas Center for Sustainability (GVces) in partnership with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH is the outcome of the joint work of member companies of the Emerging Market Multinationals (EMM) Network for Sustainability.

Emerging Markets Multinationals Network for Sustainability (EMM)

The Emerging Market Multinationals (EMM) Network for Sustainability is a swiftly growing network of leading sustainability managers and executives of multinational companies that are based or operating in emerging economies. Jointly, they work on developing and implementing progressive sustainability and environmental standards, and turning them into successful business solutions that benefit the companies, their customers, stakeholders, and the environment. The EMM network ensures that the insight from these business solutions feeds into global fora and processes such as the OECD, G20, World Economic Forum, etc. The EMM is part of the Emerging Market Sustainability Dialogues (EMSD). For more information, see www.emm-network.org and www.emsdialogues.org

The goal of this initiative is to measure the sustainable and financial return of sustainability projects implemented by companies in emerging markets. The initiative was driven by i) the need to incorporate sustainability aspects in financial choices and decision-making processes; and ii) to contribute to the advancement of formal and explicit incorporation of sustainability in projects' financial assessments through a discussion that questions how these aspects impact projected cash flows and discount rates.

In order to meet the project's overall goals, eleven case studies were developed with seven participating companies based in Brazil, considering that three companies carried out a multiple project implementation of different divisions. The presented case studies refer to: **AES Brasil**, **Boticário Group**, **Odebrecht Defense and Technology**, **Construtora Norberto Odebrecht**, **Siemens Healthcare**, **Siemens Foundation**, **Adidas Brasil**, **CPFL Energia** and **Votorantim Cimentos**.



In order to conduct the risk and return analysis, companies adopted either a static financial analysis model, such as the incorporation of project impacts into the Income Statement, or carried out a dynamic analysis, estimating the project's economic value through a Discounted Cash Flow (DCF)¹ model. The Internal Rate of Return (IRR), Payback Period and Return on Investment (ROI) were also calculated, as these measure the return of every project related investment.

The analysed Sustainability ROI case studies underline the importance of measuring/assessing the financial return of sustainability projects as a means to assist in the decision-making process, demonstrating that sustainability initiatives go way beyond their ethical domain: in fact, these initiatives demonstrate the existence of tangible financial gains of participating companies, that could even represent a competitive advantage.

All environmental initiatives in the present study reveal a potential for cost savings, as well as the generation of additional revenue. Some socio-environmental initiatives not only reduce costs and/or generate revenue, but also contribute to obtaining the social licenses to operate, which ultimately leads to corporate image gains. Furthermore, the incorporation of sustainability aspects offers the possibility of accessing profitable opportunities, such as credit lines with competitive interest rates due to better corporate sustainability practices. From any standpoint, all cases illustrate the importance to consider sustainability aspects in decision-making processes, as well as the fact that the incorporation of such aspects strengthens and contributes to their value.

In light of this context, measuring sustainability results puts forth a challenge and opportunity for all companies that operate within this realm. In addition to supplying qualitative information about the implemented initiatives, the challenge to prove that individual engagement and sustainability investment positively contributes to the economic performance of businesses is imperative in order to build a new paradigm where these investments receive the acknowledgment they deserve.

¹ The Discounted Cash Flow (DCF) analysis process consists of the estimated value for a company or project and is based on a mathematical method used to estimate financial values across different periods of time.



2. INTRODUCTION

This study was devised by the Center for Sustainability Studies (GVces) in partnership with **Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)** GmbH. The study is the outcome of a one-year pilot initiative that aimed to showcase alternative reporting methodologies for sustainability projects. It was executed within the domain of the Emerging Market Multinationals (EMM) Network for Sustainability as part of the Emerging Market Sustainability Dialogues (EMSD).

Emerging Markets Multinationals Network for Sustainability (EMM)

The Emerging Market Multinationals (EMM) Network for Sustainability is a swiftly growing network of leading sustainability managers and executives of multinational companies that are based or operating in emerging economies. Jointly, they work on developing and implementing progressive sustainability and environmental standards, and turning them into successful business solutions that benefit the companies, their customers, stakeholders, and the environment. The EMM network ensures that the insight from these business solutions feeds into global fora and processes such as the OECD, G20, World Economic Forum, etc. The EMM is part of the Emerging Market Sustainability Dialogues (EMSD). For more information, see www.emm-network.org and www.emsdialogues.org

This initiative was entitled “Sustainability ROI” so as to incorporate the financial term “Return on Investment”, i.e. ROI.

The purpose of the Sustainability ROI initiative is to determine the economic and financial return of sustainability projects implemented by EMM member companies. As a result, the initiative aims to:

- Assist the participating companies in identifying and simulating the return of certain sustainability aspects and, at the same time, create an environment that fosters exchange of learnings and experiences between companies;
- Create a dialogue-based environment to discuss topics of finance and sustainability, therefore contrib-



- uting to the integration and engagement of different departments within the participating companies;
- Offer innovative tools for decision-making to measure project investment returns;
- Contribute to the initiatives of the EMM Network for Sustainability to turn sustainability challenges into successful business solutions.

In order to meet the project's overall goals, eleven case studies were developed in seven participating companies based in Brazil, considering that three companies carried out a multiple project implementation of different divisions. These cases refer to: **AES Brasil, Boticário Group, Odebrecht Defense and Technology, Construtora Norberto Odebrecht, Siemens Healthcare, Siemens Foundation, Adidas Brasil, CPFL Energia** and **Votorantim Cimentos**.

All cases were selected by taking into account the strategic importance of the project area at hand and/or the ease with which the company could obtain data for this analysis. The sustainability concept and its core topics were tackled in accordance with ISO 26000², which incorporates the issues of corporate governance, environment, human rights, labor practices, community involvement and development, consumer issues, as well as practices that are loyal to operations.³ In order to develop the analysis, primary and secondary data sources were used, all of which were collected by the representatives of the participating organizations and used by said organizations in their calculations.

In order to conduct risk and return analyses, companies used either a static financial analysis model, such as project impacts on Income Statements, or carried out a dynamic analysis, estimating the project's economic value through the DCF model.⁴ The IRR, Payback Period and ROI were also calculated, so as to measure the return on every invested dollar.

² According to ISO 26000, social responsibility is expressed by the purpose and desire of organizations to incorporate socio-environmental considerations in their decision-making processes and be held accountable for the impacts of their decisions and activities in society and the environment. This involves an ethical and candid behavior that contributes to sustainable development complying with applicable laws and is consistent with international standards of behavior. It also implies that social responsibility must be integrated across the entire organization, that it must be practiced in all relations and that it takes into account the interest of stakeholders.

³ http://www.inmetro.gov.br/qualidade/responsabilidade_social/pontos-iso.asp

⁴ The Discounted Cash Flow (DCF) analysis process consists of the estimated value for a company or project and is based on a mathematical method used to estimate financial values across different periods of time.



3. CONTEXT AND MOTIVATION

Introducing sustainability aspects in corporate practices and decision-making processes is a challenging task for companies, whose investments and strategic decisions are often made based on partial analyses of future impacts.⁵ Moreover, most corporate decisions involve weighing and adding different costs and benefits that are difficult to measure. Besides, project analyses are commonly based on a short-term outlook, considering only those preferences that are subject to interferences within this period. However, by definition, sustainability has a long-term component which makes it hard to assume preferences to be stable and fixed.⁶ In the long-term, largely due to market dynamism, projects are subject to adversities that affect their generation of cash flow, rates of return and economic feasibility periods. Moreover, good socio-environmental performance can translate into lower corporate risks.

Within this context, actions aligned with sustainability principles end up taking on a strategic role for investment projects, thus becoming extremely relevant socio-environmental variables to boost performance. However, managers lack the know-how and tools to measure socio-environmental aspects of investment projects in order to incorporate them in project feasibility analyses.⁷ Therefore, obtaining information about the return of investment in case of sustainability projects through data and assessment methods comparable to those applied for traditional investment decisions becomes of the utmost importance for leadership of the company and for the dissemination and internalization of sustainability within its operations.

Thus, the need to explore and popularize tools that measure the return of sustainability projects becomes imminent. In 1995, a growing number of academic studies were conducted seeking to create a link between financial performance and sustainability.⁸ Likewise, practical studies and tools started to come to the surface within the corporate environment, looking to respond to the challenge of measuring the return of sustainability actions of private sector actors. In 2007, the book “The Sustainability Advantage”⁹ pioneered the attempt of quantifying the real benefits of sustainability organized around seven easy-to-grasp aspects: i) ease to hire the best talents; ii) greater retention of the best talents; iii) increase in employee productivity; iv) reduction

⁵ Smit e Trigeorgis (2012).

⁶ Constanza (2000).

⁷ Warren, Bienert e Warren- Myers (2009).

⁸ Google Scholar

⁹ Willard (2007)



of production cost through eco-efficiency actions; v) cost reduction of sale; vi) revenue increase; and vii) risk reduction and greater ease in obtaining funding. By means of financial assessment methodologies, the presents study sets out to assess and measure the benefits of sustainability initiatives in order to offer/contribute compelling (and comparable) arguments for corporate leaders.

The link between financial and sustainability performance connection not only concerns the fact that companies use and depend on the external environment as a basis for their business - as changes in the eco-system and in the social framework directly affect their performance - but also implies that organizations that incorporate socio-environmental variables in their analyses can manage and reduce this type of risk exposure or leverage new business opportunities.

Therefore, the main drivers of this study are as follows:

- The need to incorporate sustainability variables in financial choices and decision-making processes;
- Contribution to the advancement of the formal and explicit incorporation of sustainability aspects in projects' financial assessments through the discussion how these aspects relate to projected cash flows and discount rates.

Since this project is only the first step in a long process to incorporate sustainability variables in financial choices, the involvement of EMM member-companies as cases is crucial. It contributes to the progress of the discussion on economic and financial gains in determined socio-environmental attributes.

4. CASE STUDIES

In the following, ten case studies of EMM member companies that participated in this Sustainable ROI initiative are presented. These cases illustrate the sensitivity of socio-environmental variables in corporate investment assessment. The monetary values of base-case scenarios are presented both with and without the implementation of sustainability projects. The difference between both scenarios represents the financial return of investments in socio-environmental causes.

Each case entails a risk and return analyses through a static or dynamic financial model. Variables considered in the static model include: cost reduction, revenue gains and adjustment of operational margins – in short, it is a “snapshot” of the impact on a company’s Income Statement. Conversely, in the dynamic analysis, the economic value was calculated through the DCF model in order to determine a project’s Net Present Value (NPV). If the NPV is greater than zero, we can conclude that the project is profitable.

In addition, other indicators/measures are also used by companies to calculate financial return on projects, such as: i) payback periods, which measures the period between the initial investment and the time when cumulative net project profit is equal to the value of said initial investment; ii) the IRR, defined as the rate at which the NPV reaches 0; and finally iii) the ROI, so as to measure the return on every invested dollar.



ADOPTED METHODOLOGY: INCOME STATEMENTS AND NET PRESENT VALUE.

In order to carry out the risk and return analyses, companies applied either a static financial analysis model by determining the sustainability projects' impact on the Annual Income Statement, or performed a dynamic analysis, estimating the project's economic value through the DCF method.

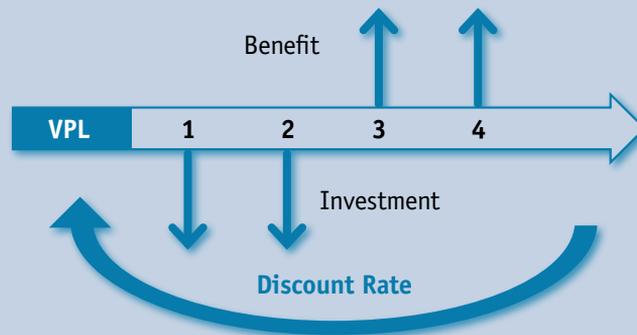
Static Model: Annual Income Statements are compared and contrasted in order to define gains or losses in operational margins. Please see an example of an Annual Income Statement below. In this example, operational margins are compared both with and without a sustainability project.

Dynamic Model: The DCF analysis estimates the value of a company or project based on a mathematical model that adds up financial values across different periods of time. The discount rate takes into account the future risk a company faces due to the uncertainty of cash flows. According to Damodaran (2002), the concept of risk is used to explain the possibility of obtaining return that falls short from what was predicted. For the present study, the Weighted Average Cost of Capital (WACC) method is applied to determine the discount rate. WACC performs a weighted sum of capital costs according to the firm's sources of capital, equity and debt (DAMODARAN, 2002), while the cost of equity measures the firm's investment risk and the cost of debt measures the risk of default payments.

income Statement	
<i>Nominal mn in BRL</i>	2014
Net Income	1,000
Cost of goods sold (COGS)	700
Net Profit	300
<i>Gross Margin</i>	<i>30.0%</i>
Commercial and Administrative Expenses	15
GENERAL AND ADM. Expenses	10
Others	0
EBITDA	276
<i>margin %</i>	<i>27.6%</i>
Operational Results	275
Financial Results	2
Others Expenses	1
Non-Operational Expenses	3
Results before Taxes	272
Net Profit	180

Source: Damodaran (2002)

The Discounted Cash Flow model aims to estimate the present value of a company's future cash flows by discounting these to reflect the risky nature of future operations. The NPV is the sum of all Discounted Cash Flows



The IRR, Payback Period and Return on Investment are determined to measure the return of the investments. The IRR is the interest rate that turns the NPV of a project investment into zero. Generally speaking, an investment is worthwhile when the IRR is greater than the Minimum Acceptable Rate of Return (MARR), which is the investment's expected return. The IRR is useful when comparing two or more investment projects that are mutually exclusive. From a financial perspective the project with the higher IRR value is more attractive.

The Payback Period is the length of time it takes to recover the initial investment. As soon as the initial investment is recovered (or "paid back"), it begins to acquire financial advantage. Simple payback takes place as soon as there is positive cumulative cash flow. However, the simple payback period does not take the time value of money into account. In contrast, the discounted payback calculation uses the discounted value of each cash flow for the cumulative sum of all cash flows to determine the time at which the net present value becomes first positive.

ROI measures the return on dollar invested. In other words, it is the ratio of money earned or suffered as a loss in an investment in association to the invested amount of money, namely the investment's cost-benefit relationship.

$$\text{ROI} = (\text{Investment Gain} - \text{Investment Cost}) / \text{Investment Cost}$$

It is worth noting that the following case studies rely on primary as well as secondary data. All data was collected by representatives of all entities involved. Therefore, all participating EMM member companies were involved in the ROI calculations.

Case studies are categorized in two topic areas: **environmental project cases and social project cases**. Each case study presents the context of the sustainability project for which calculations were developed. The scenarios primarily differ in their underlying assumptions. The case study results also include the companies' perception of gains and challenges of participating in the Sustainability ROI initiative.



TOPIC AREA: ENVIRONMENTAL PROJECT CASE STUDIES.

Companies aiming for a “greener” operation model usually do so by increasing the efficient use of production inputs. These companies mitigate risks across their entire value chain, given that sensitivity to a sudden drop in input supply and/or output demand is reduced. “Value Chain” refers to the full range of activities that businesses go through to bring a product or service to their customers, ranging from relationship management and production cycle planning to the delivery to end-consumers.

Direct operation and revenue risks that cannot be mitigated with better environmental management processes:

- Drop in productivity due to a lack of natural resources;
- Competitive disadvantage, e.g. competitors have lower operational costs due to lower input requirements;
- High costs of reverse logistics and final product disposal collected from end-consumers;
- Increase of corporate image risks through involvement in environmental matters.

With a reduced usage and dependence on resources, such as energy and water, companies become more resilient, not only to the climate change and other environmental issues, but also to the increasing regulatory pressures that will arise in the years to come. Therefore, it becomes clear that companies that incorporate environmental management systems reap the benefits of a reduction in production costs and operational risks related to climate change and public policy changes. Besides, there is a high chance to profit from reputational gains and/or new income sources that arise parallel to the core business. All cases below describe qualitative and quantitative benefits that stem from project initiatives of environmental nature.



Three Eco-Efficiency projects and three Value Chain & Reverse Logistics projects are outlined, namely:

Eco-Efficiency Case Studies:

- **AES Brasil:** Impact of efficient water consumption in AES Eletropaulo's operations;
- **Grupo Boticário:** Reduction in water, energy and gas consumption;
- **Odebrecht:** Efficient water consumption on construction sites - installation of a concrete recycling unit.

Value Chain & Reverse Logistics Case Studies:

- **Boticário Group:** Packaging recycling system and product life cycle assessment;
- **Siemens:** "More Life, Less Pollution, More Tests" campaign: reduced disposal of dangerous waste;
- **Adidas Brasil:** Comparative assessment between two end-of-life product allocation and introduction of new closed-loop lifecycle management solutions.

Each case study is particular in its characteristics, which enables the evaluation of different business scenarios. This study also features a comparative examination of all cases so as to analyze the different challenges and opportunities related to the investment in assessment procedures for sustainability initiatives. The thorough description of each case and its assumptions follow below.

ECO-EFFICIENCY CASES

AES/Rafael Koga



AES Brasil: Impact of efficient water consumption in AES Eletropaulo's operations

AES Eletropaulo, one of the five companies held under the **AES Brasil** Group's umbrella, is the country's largest electricity provider. The company offers services to 24 cities in the metropolitan region of São Paulo, including the state's capital that concentrates approximately 1.5 thousand consumer units per km², covering a radius of up to 4,526 km². The company has 6,152 employees and 8,788 outsourced professionals, providing services to over 6.9 million consumer units and more than 20 million people¹⁰.

For **AES Brasil's** business, e.g. hydroelectric generation and distribution, water is a critical capital input. The water crisis that hit the Southeast region of Brazil in 2014 and 2015 was ranked as the direst in the last 84 years. Mainly due to a lack of rainfall and the consequent reduction in the water level of major reservoirs that supply big cities like São Paulo¹¹, the supply of water across 70 cities (13.8 million people) in the State of São Paulo, as well as the state capital itself is endangered¹². Distributors and generators are affected by the cost of energy acquisition due to the increased participation of thermal power plants in the system. As a result, the scarcity of water directly influences distributors' ability to operate and provide their services.

As a result of unfavorable climate and hydrological conditions, Brazil's electric power sector as a whole has been facing major challenges. Over the last few years, reservoirs in different regions have operated well below their capacities, which ultimately impacted Brazil's whole electric system, since 65% of the domestic energy is generated by hydroelectric dams¹³.

Due to these climate risks and to uphold the company's reputation, **AES Brasil** has started to launch own corporate programs that aim to enhance the efficiency of water consumption. The drought that hit **AES Eletropaulo's** radius of operation highlighted the importance of maintaining efforts to reduce the use of water in corporate operations. In order to overcome the water supply crisis, **AES Eletropaulo** developed a contingency plan to reduce the operational impacts, including a commitment to target a 10% reduction in water consumption per employee by 2019 (2014 as base year).

¹⁰ Information available at: <www.aesbrasil.com.br>.

¹¹ Available at: <<http://noticias.uol.com.br/ultimas-noticias/agencia-estado/2015/02/08/governo-de-sp-cria-gatilho-para-acionamento-de-agua.htm>>

¹² Available at: <<http://sao-paulo.estadao.com.br/noticias/geral,sp-tem-70-cidades-afetadas-por-seca-onde-vivem-13-8-mi,1577466>>

¹³ <http://aesbrasil sustentabilidade.com.br/pt/noticias/item/qual-a-importancia-da-agua>



The Case

The objective of this case study was to assess the potential financial return of an investment in a more efficient water usage system, plus the introduction of a water reduction target per employee. The DCF model was used for the purposes of this analysis, comparing the NPV of the two scenarios: with and without the investment in an efficient water usage system.

One of **AES Eletropaulo**'s largest locations was selected for the execution of this eco-efficiency project. This location had a workforce of 589 employees in late 2014, out of which 70% were operational and 30% were administrative. This locality was selected because it had already experiences with a number of case-by-case solutions for water reuse, such as rainwater collection. **AES Eletropaulo**'s main objective to participate in the Sustainable ROI initiative was the possibility to explore new tools to support the decision-making process and to meet own eco-efficiency targets.

Projected Scenarios

- **Without project implementation:** If project implementation was not to occur, this would not only compromise the water reduction set by the company, but also rise water consumption and sewage treatment costs. Moreover, the company would have to rely on contingency measures in case of supply shortages.
- **With project implementation:** The implementation of this project leads would reduce water consumption per employee (in comparison with base year 2014) and increase the probability of meeting the reduction targets, thus ultimately lowering costs. Besides, the higher the potential of a rise in water costs, the larger the benefit of project implementation. In this sense, the project cuts financial, operational and also reputational costs..



Adopted Assumptions

- **Number of employees:** The quantity of people operating in this location affects total water consumption in absolute numbers. Projections for the following years are adjusted on a yearly basis;
- **Rise in water tariff per m³:** Different scenarios for the increase in water tariff are included that vary in the level of cost impact, the same applies for sewage treatment (value equivalent to that of water consumption);
- **Average unit cost (BRL/m³) – water and sewage:** Projected values were determined by multiplying the base year value (2015) with the rate at which costs are expected to increase in respective years;
- **Consumption per employee (m³) with and without the project:** Total base year water consumption divided by the number of employees in December 2014. In the non-implementation scenario, we preclude behavioral changes, e.g. consumers maintain the 2014 level of water usage. With project implementation, this variable is adjusted based on the consumption reduction target set at 10% per employee by 2019 (gradual reduction of 2.5% per year);
- **Annual water consumption - Sabesp (m³) with and without the project:** The value for absolute consumption bases on real records obtained until October 2015. This value was calculated for both scenarios: with and without project investment. It is defined as the product of water consumption per employee and the number of employees;
- **Water/sewage bill (BRL) with and without the project:** Estimated based on the total water consumption (product of the number of employees and **consumption per employee**) multiplied by the expected tariff in every period. Without project implementation, average consumption stays constant and other variables adjust. With the project investment, consumption per employee drops by 2.5%, contributing to the overall reduction water costs if the total number of employees and tariffs maintain their current values. It was taken into account that the number of employees and tariffs are also variables;
- Potential behavioral changes that affect the consumption level per employee and were initiated by the project fall outside the scope of the present study and were not taken into account.



Calculation

- **Projected scenarios:** The projection of the annual increase in water tariff is based on the increase requested by Sabesp during the last crisis (23%). This cost increase varies between 10% and 15%. Another factor that could affect the price level are extra fines, as water bills that exceed the average consumption level by over 20% are penalized with an 40% tariff increase (in case average consumption exceeds average consumption by over 40% a 100% penalty is effective). However, these fines were not taken into account in the calculations. The following scenarios are proposed: (1) Annual tariff increases by 10%; (2) Annual tariff increase by 15%;
- **Avoided costs:** Defined as the difference between the total value of the unit's water and sewage bill with and without the project;
- **Project NPV:** Calculated based on the total amount invested in projects that aim to enhance water consumption efficiency per employee between 2015 and 2019. The present value of expected annual costs from 2015 to 2019 were determined assuming a discount rate of 12%;
- **ROI:** Defined as the difference between the cost savings resulting from the reduction in water consumption per employee after project implementation and the project's per employee investment between 2015 and 2019 (both in NPV). An important assumption is that the project should guarantee the planned reduction per employee so that the avoided cost accurately reflects the project cost. This indicator demonstrates whether an investment will provide a positive return, break even or a negative return for the company. It is one main reference used in course of capital allocation decision-making.



Maintenance in the electric network of AES Eletropaulo

Results

Table 1 shows the calculation results for AES Eletropaulo's eco-efficiency project for both project scenarios.

Table 1: Results of the **AES Brasil** Case Study – Impact of efficient water consumption in **AES Eletropaulo's** operations.

Variables	Projected Scenarios for Project Implementation	
	1	2
	10% per year increase in water tariff	15% per year increase in water tariff
Number of Employees	644	644
Increase in Water Tariff	10% per year	15% per year
Available Budget (NPV)	BRL R\$ 65,904.00	BRL R\$ 74,219.00
Total Investments (NPV)	BRL R\$ 56,203.00	BRL R\$ 56,203.00
Investment – 2015	-	-
Investment – 2016	BRL R\$ 30,000.00	BRL R\$ 30,000.00
Investment – 2017	BRL R\$ 20,000.00	BRL R\$ 20,000.00
Investment – 2018	BRL R\$ 10,000.00	BRL R\$ 10,000.00
Investment – 2019	BRL R\$ 10,000.00	BRL R\$ 10,000.00
Return on Investment	BRL R\$ 9,701.00	BRL R\$ 18,016.00

Source: AES Eletropaulo, 2015.

Based on these calculations, an implementation of this eco-efficiency project leads to a positive Return on Investment in both projected scenarios (BRL R\$ 9,701.00 in scenario 1, BRL R\$ 18,016.00 in scenario 2). The result of this calculation has great relevance for the business operations of AES Eletropaulo given its alignment with the current sustainable strategic plan for the period of 2015-2019, which defines efficient resource use and discipline in execution as one of its main drivers. It is worth noting that only one variable was changed in both scenarios so as to generate directly comparable results.



Moto service on the operational basis of AES Eletropaulo

To outweigh the time-consuming development of such calculations, it is important to highlight some benefits for the company after participating in this case study. These benefits are as follows:

- Definition of a useful calculation tools to assist the company's leadership in the decision-making process regarding different project alternatives;
- Measurement of financial return on eco-efficiency projects, as a tool that was validated by the financial area and aligned with sustainable strategic planning;
- Knowledge-sharing between different departments that seldom interchange in usual business operations.

In addition, the developed methodology has potential for replication, since it is adoptable to many other bases and facilities of **AES Brasil**. Hence, there even exists the chance that the company permanently integrates a respective model into its internal reporting procedures, which would enhance the efficient allocation of capital means and contribute to the financial result.

Another important aspect is that this methodology can also serve to reduce the consumption of other resources, such as energy (where there is also a reduction target set for 2019) and other input factors used in the company operations and maintenance. It is noteworthy that the obtained results limit to the analysis of available information that differ in reliability. Therefore, all calculations have to undergo constant updates and revisions to consider most recent information, both internally (number of employees, reduction in water consumption, etc.) and externally (e.g. water tariff). The project also strengthens the resilience to public policy changes that affect the water services regulation in the metropolitan area of São Paulo State and to any other form of restriction on companies and/or specific regions.

Finally, building on the insights of their participation in this study, companies start to reconsider and redefine their operational objectives through the integration of eco-efficiency targets. For the future realization of similar projects, we recommend the setup of an intersectional committee to facilitate internal coordination and communication, which are common challenges faced during project implementation. AES BRASIL's internal departments involved in the development of this case study were: Sustainability; Investment Analysis; Support and Services; Human Resources.

Impact of water consumption efficiency in AES Eletropaulo's operations

CHALLENGE: Alternatives to increase water use efficiency in **AES Eletropaulo's** operations, reducing the risk of shortage in water supply.

METHOD: NPV

ASSUMPTIONS:

- Comparison between gains with the implementation of the project and the scenario without the implementation of the project;
- 5-Year Model;
- Discount Rate: 12%;
- Scenarios varied mainly due to:
 - Investment made
 - 10-50% increase in the water tariff

RESULTS:

- Average Investments: BRL R\$ 60-70.000
- Tariff Increase: 10%
- Return: BRL R\$ 5,513
- Tariff Increase: 15%
- Return: BRL R\$ 12.062

LESSONS LEARNED:

- Results help company choose between greater returns on the project or bigger investment;
- The tool can be constantly updated;
- Given that there is no concrete and/or disclosed forecasts on the increase in water tariffs in São Paulo, the water reduction initiative can mitigate risks;
- Sustainability ROI has the potential of becoming part of the standard process in **AES Brazil's** companies

PROFITABLE PROJECT

ECO-EFFICIENCY CASES



Boticário/Guilherme Pupo

Factory in São José dos Pinhais

BOTICÁRIO GROUP: **Reduction in water, energy and gas consumption.**

Boticário Group consists of four business units that operate in the perfumery and cosmetics industry: **O Boticário**, **Eudora**, **Quem Disse**, **Berenice** and **The Beauty Box**. It also controls the **Boticário Group** Foundation for Nature Protection. The Group has 7,000 employees and has been in business in the industry since 1977. It has factories in São José dos Pinhais (PR) and Camaçari (BA), Distribution Centers in Registro (SP) and São Gonçalo dos Campos (BA), as well as offices in São Paulo (SP) and Curitiba (PR).

The Group re-examined its sustainability strategy in 2012 by taking into account the social and environmental challenges faced until 2024. The revised strategy focuses on the topics of raw materials and packaging (product lifecycle and reverse logistics), sales channels (points of sale and resellers), eco-efficiency and also value chain engagement, aiming to contribute to the business and enhance the relationships with key stakeholders: employees, public suppliers, retail audiences, consumers and the surrounding community.

As part of the sustainability operations of the Group, the reduction of the resource consumption (i.e. the consumption of water, natural gas and energy) is included into the eco-efficiency projects, which helps to reduce the financial costs of the Group.



Boticário/Guilherme Pupo

Natural lighting of the distribution centre in Registro

The Case

This case study aimed to value the results of eco-efficiency projects was carried out by the Group in factories, distribution centers and the administrative offices of the **Boticário Group**. The DCF model was used for the purposes of this analysis, comparing the NPV of the two scenarios: with and without the investment of the water, energy and natural gas reduction project.

In addition, the IRR, Payback Period and the ROI were also calculated. This calculation of ROI differs from the traditional ROI analysis – instead of computing return at the end of the project, it intends to identify the project's ROI every year.

Eco-efficiency initiatives featured the following projects: i) natural lighting – utilizing the sunlight for the lighting of three buildings during daytime; ii) water reuse and rainwater recycle; iii) installation of solar panels for water heating; iv) installation of photovoltaic plates to generate power; and v) LED lighting.

Projected Scenarios

- **Without project implementation:** If the eco-efficiency projects were not executed, there would be no reduction in the consumption of water, energy and natural gas and, therefore, no cost reduction. Furthermore, if the water and energy crisis that hits the country is taken into account, potential supply risks would increase without the implementation of these projects;
- **With project implementation:** With the execution of the eco-efficiency projects, expenses related to water, energy and natural gas were reduced and risks of supply issues were also mitigated.



Photovoltaic

Adopted Assumptions

- Investments considered for the implementation of these projects took place between 2012 and 2015;
- Dedicated headcount costs were allocated within the projects;
- Financial returns considered for the calculation of this study were up to 2018, however, once the initiatives are implemented, the return will be obtained over time;
- Only additional investments for sustainability gains were considered. Project investments and costs that were going to occur regardless were not taken into account.

Calculation

- **Avoided costs:** Reduction of operational costs due to the reduction in water, energy and natural gas consumption as a result of eco-efficiency projects;
- **Project financial indicators (IRR, NPV and Payback):** Calculated based on investment decisions in projects that increase the company's efficiency between 2012 and 2018. Annual investment values and financial gains from 2012 to 2018 were taken to present value based on discount rates set at 13.58%, which is the MARR;
- **ROI:** Calculated based on the difference between the avoided cost related to the eco-efficiency projects (NPV of the benefit) and the investments made in these projects (NPV of the project between 2012 and 2018).



Factory in São José dos Pinhais

Results

Table 2 shows the investments and financial returns of eco-efficiency projects and the results of the case analysis.

Table 2: Results of the **0 Boticário** Case Study – Reduction in water, energy and gas consumption project

Investment (Equipment, materials and services for the execution of projects) (BRL – R\$)		Return (Avoided cost due to the reduction in water and energy consumption) (BRL – R\$)		ROI Financial Analysis	
2012	1.000.000	2013	235.187	2012	14,11%
2013	1.078.302	2014	495.695	2013	18,66%
2014	1.746.018	2015	1.814.676	2014	25,28%
2015	1.151.200	2016	2.342.101	2015	43,17%
		2017	2.671.226	2016	65,91%
		2018	2.980.122	2017	84,95%
				2018	100,78%
TIR	12%				
Payback (years)	6,95				
VPL (BRL - R\$)	48.863				

Source: Grupo 0 Boticário, 2015.

It can be observed that the project is economically feasible under the adopted assumptions. The NPV of the eco-efficiency projects implemented by the group is positive, which represents a financial gain for the company; IRR equals 12% and Payback Period is less than seven years. Therefore, the measurement of project gains demonstrates that real benefits are to be obtained from the implementation of the project.



The case study by the **Boticário Group** enabled the internalization of a Return on Investment calculation methodology in the company, involving several key learnings, such as:

- Practice good planning and management of indicators;
- Insert the metrics of valuation of sustainability aspects in projects from the very beginning of each initiative carried out in the company;
- Promote dialogue between the sustainability team and the finance team, as well as make tools more available;
- Involve the financial team that develops sustainability projects early on (at the time of creation of the initiative);
- Carry out multi-departmental brainstorming sessions for transversal initiatives.

Based on its participation in the Sustainability ROI initiative, the company is able to replicate this metric of valuing project returns early in its execution. Furthermore, the ROI calculation through the Discounted Cash Flow methodology will be internalized for the analysis of all upcoming sustainability projects. The company also aims to further develop ways of measuring intangible aspects of its sustainability projects.

Reduction in water, energy and gas consumption

CHALLENGE: Reduction of resource consumption (water, energy and gas) through eco-efficiency projects.

MÉTODO: NPV

PREMISSAS:

- Some projects that were considered: natural lighting, water heating through solar plates, reuse of water and use of rainwater, photovoltaic plates, etc.;
- Period considered for the ROI** calculation: 7 years;
- Investments: 4 first years;
- Benefits calculation started from the second year.

RESULTS:

- Payback Period: 6.95 years
- Investment: BRL R\$ 5,625,400

APRENDIZADOS:

- Profitable and innovative projects;
- Calculation of ROI for sustainability initiatives should be an ongoing activity starting from 2015;
- Involve the financial team from the very beginning;
- Use financial tools and jargon.

** The project has continuous return from the beginning of the operation. However, this study considered the planning cycle to take place from 2012 to 2018 in order to calculate the ROI.

ECO-EFFICIENCY CASES



Concrete Recycling - Ilha Pura - Rio de Janeiro / RJ.

CONSTRUTORA NORBERTO ODEBRECHT: Efficient water consumption in construction sites – implementation of the concrete recycling unit

Construtora Norberto Odebrecht provides engineering and infrastructure construction services for the fields of: transportation and logistics, energy, sanitation, urban development, mining and buildings of public and corporate use. This includes building subways, ports, hydroelectric dams, sports arenas, highways, airports and railways, among many others¹⁴.

During the construction period, several kinds of waste are produced reflecting the type and stage of the building process. One of the alternatives that were studied to reduce the generation of concrete waste and water consumption was the installation of the concrete recycling system, which will be able to recycle all the concrete leftovers in mixer trucks that belong to an active fleet at the construction site. The concrete recycling unit generates economic return for the company, as well as environmental gain. It enables the firm to save on water consumption and treatment additives.

The recycling unit enables the reuse of water from cleaning the barrels of concrete mixer trucks. After proper treatment by the recycling unit, the composition of water, rich in fine particles (mostly those that make up cement) is incorporated into the concrete mix produced at the construction site. The equipment also reduces the generation of solid waste, which provides reduced cleaning time of the barrels and reduces the production cycle of the concrete area.

The Case

This case study aims to calculate the economic return generated by the installation of the concrete recycling unit in **Construtora Odebrecht's** construction sites and, in doing so, encourage the implementation of recycling units across all of the Group's construction sites that produce a significant amount of concrete.

The Discounted Cash Flow model was used for the purpose of this analysis, comparing the NPV of scenarios with and without the investment and, consequently, assessing the return on the implementation of the concrete-recycling-unit project.

¹⁴ <http://odebrecht.com/pt-br/negocios/nossos-negocios/construtora-norberto-odebrecht>



Projected Scenarios

- **Without project implementation:** Usually, when there isn't a concrete recycling unit at the construction site, clean water is used to wash the mixer trucks. Water with concrete remnants is very alkaline and, by law, may not be disposed without prior treatment;
- **With project implementation:** With the installation of the concrete recycling unit, clean water is still used to wash mixer trucks, however water with concrete remnants from the wash is reused in the production of new concrete. Within this scenario, less fresh water is used to produce new concrete. It is also cost-efficient because it uses fewer acids to neutralize the water and reduces the need of a vacuum truck to properly allocate the residues of the wash. When the recycling unit was first installed, a ratio of 50% of fresh water and 50% of recycled water was used – this proportion is already enough to reuse all the water from the truck-wash. By consolidating the use this method which is backed by analyses of the lab in order to ensure high-quality concrete, the ratio can reach up to 70% of recycled water and 30% of fresh water.

Adopted Assumptions

- To calculate the investment:
 - Value negotiated to acquire the recycling unit;
 - Opportunity cost of this investment (Interest Rate – CDI - 12.6%);
 - Monthly cost of labor, including two employees to run the unit;
 - Monthly cost with preventative maintenance of the equipment;
- To calculate the flow of benefits:
 - Total volume of concrete: 69,328 m³ in the analyzed period of 21 months;
 - Volume of water used per wash: 1 m³;
 - Volume of concrete per wash: 8 m³.
- The number of washes per month and the amount of water used per month were calculated;



- The price per m³ of water at BRL R\$ 7.5/m³ multiplied by the volume of water consumed per month for the washes equaled to the monthly expenses on water in the base scenario (without the project);
- Cost with acids (to neutralize the water resulting from the mixer washing process) per m³ of concrete at BRL R\$5.0/m³, multiplied by the volume of concrete consumed per month equaled to the monthly expenses on acids in the base scenario;
- Monthly cost with the vacuum truck (necessary for the transportation of water resulting from the mixer washing process), based on the premise that the truck's cost is equal to BRL R\$ 2,43/m³;
- Costs for civil constructions to adapt the location where the recycling unit was installed were not taken into account. It was understood that approximately the same cost would incur to install water treatment tanks for the truck wash in the base scenario.

Calculation

- **Avoided costs:** Drop in estimated operational costs due to the reduction in the consumption of water, acids and vacuum trucks as a result of the installation recycling unit;
- **Project NPV:** Calculated based on the value of investment decisions in projects that boost the company's efficiency, between 2015 and 2016. Annual values of the projected cost from 2015 to 2016 were brought to present value based on the discount rate, set at 16%;
- **Return:** Calculated based on the difference between the avoided cost related to the reduction in water consumption per employee due to efficiency projects (NPV of the benefit) and the investments made in efficiency projects (NPV of the project) between 2015 and 2016. This indicator demonstrates whether an investment will provide a positive return, break even or a negative return for the company.



Results

Table 3 shows the investments and financial returns obtained from the installation of the concrete recycling units in **Odebrecht's** construction sites.

Table 3: shows the investments and financial returns obtained from the installation of the concrete recycling units in Odebrecht's construction sites

Outflow:			
Investment + Opportunity Cost			
Investment – BRL R\$	2015	2016	TOTAL
Operational Gains	(28,639)		(28,639)
Contribution of Capital	(80,361)		(80,361)
Total Investment	(109,000)	-	(109,000)
Opportunity Cost – BRL R\$	(9,000)	(12,741)	(21,741)
Total Cost of the Project	(118,000)	(12,741)	(130,741)
Inflow (Benefits):			
Operational costs without the recycling unit – Operational costs with the recycling unit			
Cost without Recycling Unit - BRL R\$	2015	2016	TOTAL
Cost of Water	39,975	27,282	67,257
Cost of Acids	211,640	143,162	354,802
Cost of Vacuum Truck	102,857	69,577	172,434
Total Cost – BRL R\$	354,472	240,020	594,492
Generated Benefit - BRL R\$	2015	2016	TOTAL
Cost without Recycling Unit	354,472	240,020	594,492
Cost with Recycling Unit	(63,000)	(89,190)	(152,190)
Generated Benefit	291,472	150,830	442,302
Net Cash Flow: Inflow (–) Outflow – BRL R\$	173,472	138,089	311,561
NPV: Net cash flow at present value using a discount rate of 16%, creating a value of BRL R\$ 252,167 for shareholders.			

Source: Odebrecht, 2015.



Based on the adopted assumptions, we are able to conclude that the investment on the concrete recycling unit is not only feasible, but also generates an economic return of BRL R\$ 252,167 for the construction site. It should be noted that the amount of return depends on the volume of concrete that is actually produced at the site. Therefore, the installation and operation of the recycling unit is economically feasible because it not only generates environmental return to shareholders, but also creates tangible financial value.

The company's participation in the ROI Sustainability initiative introduces a methodology and practice for the economic assessment of socio-environmental projects in the Odebrecht Group. In addition, there's the possibility of replicating the method of calculation in other construction sites with high consumption of concrete, further substantiating the decision to invest in the concrete recycling unit at an economic level. The methodology can also be applied to other types of environmental projects, such as energy and waste, demonstrating added strategic value for the company.

The case study involved the sustainability department with the support engineering department of the construction site in order to come up with the assumptions and validate them.

Efficient water consumption in construction sites – implementation of the concrete recycling unit

CHALLENGE: Improve water consumption efficiency in concrete production – reusing water from mixer truck washes for the production of new concrete.

METHOD: NPV

ASSUMPTIONS:

- Comparison of costs with and without the project to test profitability
- Reduction of water usage, disposal of solid waste and treatment of liquid waste;
- Relationship between the monthly volume of used water and the monthly volume of produced concrete;
- Price per m³ of water at BRL R\$ 7.5;
- Price per m³ of acid at BRL R\$ 5.0;
- Price per m³ of vacuum trucks at R\$ 2.43;
- Discount Rate: 16%

RESULTS:

- Investment: BRL R\$ 130,741;
- Cost without Recycling Unit: BRL R\$ 594,492;
- Benefit: BRL R\$ 442,301;
- NPV: BRL R\$ 252,167

LESSONS LEARNED:

- Potential of replicability;
- Consolidation of the methodology and practice for the economic assessment of socio-environmental projects in the Group.

PROFITABLE PROJECT



Boticario/Fernando Dias

Reverse Logistic Collector

GRUPO BOTICÁRIO: Packaging recycling program and product lifecycle assessment project.

The sustainability strategy developed by the **Boticário Group** in 2012 was driven by operations in the domains of product lifecycle and reverse logistics for packaging. In this respect, the Group launched the packaging recycling program, which encourages consumers to return empty product packages to the Group's in-store stations. A consumer survey conducted in 2013 enabled the company to evaluate their perception about the program. The result of the survey showed that, on average, each consumer returns 2 packages per visit to the store and some of the consumers also go on to make a spontaneous purchase in the store, which boosted the company's sales.

In the product lifecycle domain, there was a process of repacking two of the Group's products (*Lily* Perfume, by **O Boticário** and another item by **O Boticário** that is still in the process of being launched). In the *Lily* Essence line, the perfume flask design was changed, and the company began to print information on the cartridge instead of on paper inserts, which resulted in a 51% reduction of its environmental impact. Other design improvements resulted in a 24% reduction in environmental impact (according to the packaging lifecycle analysis methodology adopted by the Group), lower product costs and, consequently, a reduction in the company's financial expenses.

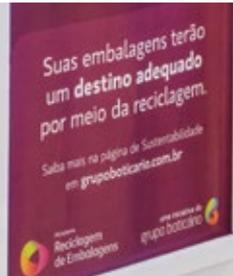
The Case

This case study aims to assess the financial benefits from the sales related to the packaging recycling program and the gains of the reduced production costs related to the implementation of the repacking project.

For the purposes of this analysis, the Discounted Cash Flow model was used. In addition, financial indicators, such as ROI, NPV, IRR and Payback Period were also calculated. This calculation differs from the traditional ROI analysis – instead of computing return at the end of the project, it intends to identify the project's ROI every year.



Boticario/Fernando Dias



Projected Scenarios

- **Without project implementation:**
 - **Packaging recycling program:** In the absence of the program, there would be no potential for sales based on the consumer's journey to the store to dispose packaging materials;
 - **Product lifecycle assessment project:** Without the incorporation of sustainability concepts in repacking projects, there would be no reduction in the product's environmental impact and the company wouldn't benefit from decreased costs due to lower use of inputs;
- **With project implementation:**
 - **Packaging recycling program:** Part of the consumers who go to the stores to return packaging materials make spontaneous purchases of products, leveraging sales and, consequently, increasing revenue for the company;
 - **Product lifecycle assessment project:** Due to the role that sustainability plays in repacking in terms of introducing product lifecycle assessment concepts, product packaging was modified and resulting in reduced product costs and, consequently, reduced financial expenses for the company. The financial gain was calculated by taking sales projections for the following years into account.

Adopted Assumptions

- Investments considered took place until 2015 and maintenance costs for the packaging recycling program, until 2018;
- Dedicated headcount costs were allocated within the projects;
- Financial returns considered for the calculation of this study were up to 2018, however, once the initiatives are implemented, the return will be obtained over time.



Calculation

- Packaging recycling programs:
 - **Generated benefits:** Additional profit from the increase in sales as a result of the packaging recycling initiative;
- Project lifecycle assessment project:
 - **Reduced product costs:** Reduced production costs due to repacking, ultimately decreasing the amount of used inputs by proposing a new product design. To calculate return, sales projections for the following years were taken into account;
- **Project financial indicators (IRR, NPV and Payback):** Annual investment values and financial gains from 2012 to 2018 were taken to present value based on the discount rate applied by **Boticário Group** at the time when the Minimum Acceptable Rate of Return of the project is being calculated;
- **ROI:** Calculated based on the difference between the sum of the reduced product cost (lifecycle assessment) and revenues from the sales (packaging recycling program), with the generated benefit (NPV of the benefit) and the investments made in these sustainability projects (NPV of the project), between 2013 and 2018.

Results

Table 4 and **Table 5** illustrate, respectively, investments made for the packaging recycling program and product repacking project, with the benefits from the implementation of these projects.

Table 4: O Boticário Case Study – Investments with the implementation of the packaging recycling program and repacking project

Initiative	Investment Description	2013 (BRL R\$)	2014 (BRL R\$)	2015 (BRL R\$)	2016 (BRL R\$)	2017 (BRL R\$)	2018 (BRL R\$)
Packaging Recycling:	Marketing efforts, collection stations and development of co-ops	-591,372	-633,753	-664,027	-441,407	-476,719	-514,857
Product Lifecycle	Acquisition of molding for product repacking	-2,106,763	-464,639	-608,648	0	0	0

Source: Boticário Group, 2015.

Table 5: O Boticário Case Study – Benefits generated from the implementation of the packaging recycling program and repacking project

Initiative	Return Description	2014 (BRL R\$)	2015 (BRL R\$)	2016 (BRL R\$)	2017 (BRL R\$)	2018 (BRL R\$)
Packaging Recycling:	Projected revenue growth driven by consumers who delivered packages to the stores and ended up making purchases, multiplied by the collection target of the following years.	288,864	393,243	530,879	716,686	967,526
Product Lifecycle	Reduced costs from the repacking of 2 products due to sustainability actions, multiplied by production/sales projections.	3,654,211	2,124,620	4,643,905	4,829,661	5,022,847

Source: Boticário Group, 2015.



Reverse Logistic Collector

The results of the financial analysis are illustrated below in a **Table 6**.

Table 6: Result of the **O Boticário** Case Study – Packaging recycling program and product lifecycle assessment project

Packaging Recycling								
Financial Analysis		2012	2013	2014	2015	2016	2017	2018
ROI			0.00%	22.13%	33.60%	46.40%	58.24%	69.67%
Total Investment (BRL R\$)	Discount Rate	IRR	Payback (years)	NPV (BRL R\$)				
3,322,134	13.58%	0%	12.13	-714,386				

Product Lifecycle								
Financial Analysis		2012	2013	2014	2015	2016	2017	2018
ROI			7,11%	97,02%	115,48%	151,00%	173,04%	188,01%
Total Investment (BRL R\$)	Discount Rate	IRR	Payback (years)	NPV (BRL R\$)				
3,180,050	13.58%	102%	3.06	5,663,852				

Source: Boticário Group, 2015.

The results obtained for the product lifecycle project attest to its economic feasibility given that the positive NPV indicates real financial gains for the company. The fact that the IRR exceeds 100% and the short payback period reinforces the project's economic efficiency.

Conversely, the packaging recycling program currently presents a negative NPV considering the amount of customers who make spontaneous purchases when they return packages. However, it is important to remember that the presented calculations have not considered intangible benefits resulting from the sustainable projects and the alignment of the initiative with legal and regulatory issues in this case, as the company now complies with the national policy on solid waste. Furthermore, if the investments of all three environmental projects are summed up, the payback period decreases to almost five years, with a positive NPV of BRL R\$ 5.3 million which is profitable.

Reduced product costs with lifecycle initiatives

CHALLENGE: Repackaging of two products to reduce environmental impact and eventually decrease costs.

METHOD: NPV

ASSUMPTIONS:

- Example: Alteration of the top, removing the aluminum cover, turning it into a single part;
- Period considered for the ROI** calculation: 7 years;
- Investments: 3 years, most relevant in the first year;
- Only additional sustainability investments taken into account;
- Benefits calculation started from the second year.

RESULTS:

- Payback Period 3.06 years
- Investment: BRL R\$ 3,180,050.

APRENDIZADOS:

- Reduced packaging costs;
- ROI calculation for sustainability initiatives will be an ongoing activity starting in 2016;
- Involve the financial team from the very beginning;
- Use financial tools and jargon.

** The project has continuous return from the beginning of the operation. However, the study considered the planning cycle to take place from 2012 to 2018 in order to calculate the ROI.

Growth in financial results due to the sales leverage that resulted from the packaging recycling program.

CHALLENGE: Encourage consumers to return empty product packages at the store and increase product sales when customers visit the store

METHOD: NPV

ASSUMPTION:

- Average number of packages returned by consumers;
- Part of surveyed consumers went to the stores only to return packages but did not purchase other products;
- Period considered for the ROI** calculation: 7 years;
- Ongoing cost for program maintenance.

RESULTS:

- Payback Period: 12.13 years
- Investment: BRL R\$ 3,322,134
- Projetos Ambientais: 3
- Payback: 4,99

LESSONS LEARNED:

- Project has the potential of being lucrative, but largely depend on communication efforts and the consumers' knowledge of the existence of the program;
- ROI calculation for sustainability initiatives will be an ongoing activity starting in 2016;
- Involve the financial team from the very beginning;
- Use financial tools and jargon.

** The project has continuous return from the beginning of the operation. However, the study considered the planning cycle to take place from 2012 to 2018 in order to calculate the ROI.

VALUE CHAIN AND REVERSE LOGISTICS PROJECT CASE STUDIES



SIEMENS: Campaign: More Life, Less Pollution, More Tests

Siemens is a German industrial conglomerate – it is the largest in Europe and one of the biggest in the world. Its main offices are located in Berlin, Munich and Erlangen in Germany. The company has a total of 15 divisions and operates mainly in three areas: automation, digitalization and electrification. At a global level, **Siemens AG** and its subsidiaries employ more than 360,000 people across 190 countries. It is listed on the Frankfurt Stock Exchange since 1897 and on the New York Stock Exchange since 2001.

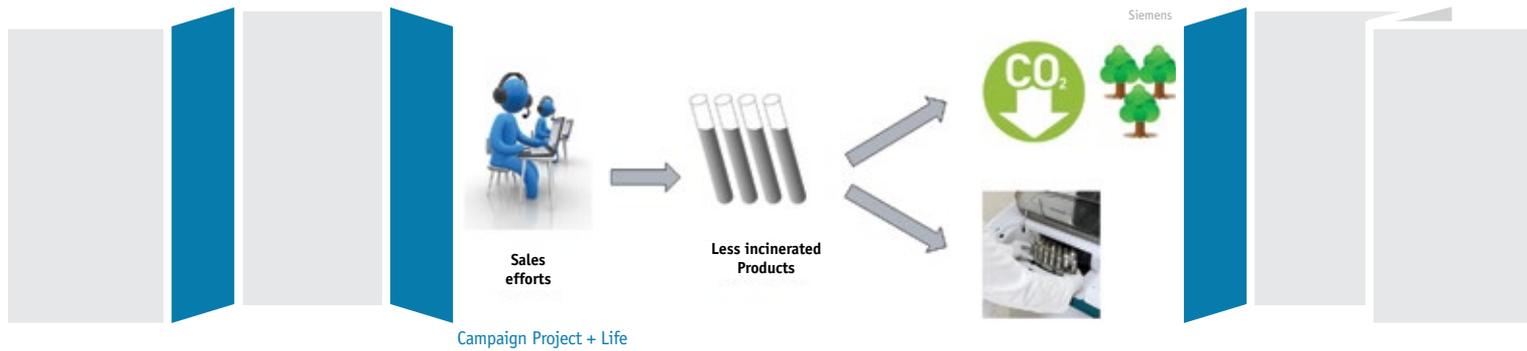
Siemens' operations in Brazil are one of the world's largest and encompass ten different companies. The company's Brazilian unit employs approximately 8,000 employees working in 13 factories, 7 R&D centers and 13 regional offices. The main business of the company's healthcare division is machine renting in order to make profit from selling reagents and consumables for laboratory diagnostic tests. Reagents and consumables are incinerated upon reaching their expiration dates.

The losses that result from incinerated reagents are many. For incinerating every 100 kg of reagents and consumables more than 334 kg of CO₂ is emitted and about 50 thousand laboratory tests are wasted, not to mention the costs faced by the company. In order to tackle this issue, Siemens started the "More Life, Less Pollution, More Tests" campaign, which aims to reduce the disposal of reagents and consumables by raising environmental awareness among those involved. This campaign provides: i) financial gains, avoiding costs from product loss; ii) environmental gains, by reducing the quantity of CO₂ emissions from product incineration; and iii) social gains by turning items that were going to be destroyed into products that can be used in diagnostic tests.

The Case

The case study aims to measure economic and financial gains resulting from the "More Life, Less Pollution, More Tests" campaign based on the volume of a business unit that corresponds to 77% of Siemens' diagnostic division.

The model used for the financial analysis was income statement (static) to compare cost reductions and operational margins and gains in the same year.



Scenarios

- **Without project implementation:** There would be increased volume of waste which is the average of the diagnostic segment in the industry;
- **With project implementation:** Waste was reduced, ultimately avoiding costs and generating socio-environmental benefits.

Adopted Assumptions

- There were no additional investments for the development and implementation of the project except for a quarterly award ceremony for campaign participants;
- Only in-stock products with an expiration date less than 45 days were considered;
- Direct costs of materials, storage (volume) and incineration (weight) were considered;
- Direct raising of customer awareness was not considered.

Calculation

- **Avoided costs:** Reduction in costs related to storage and incineration of reagents and consumables;
- **Generated benefits:** Gains in operational margin and additional profit from avoided costs.



Results

Avoided costs and generated benefits include:

- 6.2% reduction in incineration costs;
- 10.6% reduction in other costs related to incineration and storage;
- Potential 6.2% cost reduction of tests that were never taken due to incineration of expired products.

These reductions contributed to an increase of 0.1% in gross margin and 3.1% in the EBITDA¹⁵ margin of the company. In addition, the perceived environmental benefit of 7.1% reduction in carbon equivalent emissions is achieved. As a result, the project demonstrated cost reduction without additional investment, while increasing company's social, environmental and financial benefits at the same time.

Furthermore, the project has the great potential for replication as it can be applied to any business that deals with perishables or processes where waste can be reduced simply by raising environmental awareness. And what's more: this project contributes to the implementation of the national climate change policy for the fact that it reduces carbon emissions. For the years to come, the company intends to maintain the ongoing project and gradually achieves the proposed target.

¹⁵ Earnings Before Interests, Taxes, Depreciation and Amortization

More Life, Less Pollution, More Tests Campaign

CHALLENGE: Reduce the disposal of reagents to be expired and consumables (for laboratory diagnostic tests¹) through a sales campaign

METHOD: Income Statement.

ASSUMPTIONS:

- There were no investments;
- Avoided costs of materials, storage (volume) and incineration (weight);
- Volume of a single business unit that corresponds to 77% of Siemens' diagnostic division.

RESULTS:

- 6.2% reduction in incineration costs;
- 10.6% reduction in other costs related to incineration and storage;
- 6.2% cost reduction in untaken tests;
- 0.1% increase in gross margin;
- 3.1% increase in EBITDA margin.

LESSONS LEARNED:

- Project with no need for additional investments;
- Reduction of risky stock and improvement of customer relationships;
- Potential of replicability in other units.

PROFITABLE PROJECT

VALUE CHAIN AND REVERSE LOGISTICS PROJECT CASE STUDIES



ADIDAS BRASIL: Comparative assessment between two processes of end-of-life product allocation and introduction of new closed-loop lifecycle management solutions

Addidas is a German sporting goods company that employs 53,731 people in over 160 countries and produces more than 660 million product units annually. The company's products are sold in 160 countries through 80 subsidiaries with 1,800 Adidas stores. In Brazil, the company has approximately 40 stores in operation.

Adidas has been working on closed-loop lifecycle project, which will recycle the material from the products that reach the end of their shelf life. In order to implement a project of this nature, a partnership was established between companies specialized in reverse logistics and lifecycle management. Based on a thorough screening of the collected materials, it was identified that a significant part of the products (approximately 50%) could be reused in secondhand markets. Another part (approximately 25%) could be recycled, thus turning the recycled material into new products. The remainder would be destroyed through co-processing. Thus, Adidas' allocation program in Brazil works based on the following two aspects:

- Allocation of products with minor imperfections, returned through consumer service channels;
- Take-back program (consumers return products after using them), entitled "Sustainable Footprint" (in Portuguese, "Pegada Sustentável"). In this program, consumers can return sports products of any brand at **Adidas** stores. In order to raise sustainability awareness of the consumers, Adidas encouraged them to participate in the Sustainable Footprint Program by offering a 15% discount on purchases correspond to this program made in **Adidas** stores.

It is worth noting that the company found that there is a growing market for the used products and recycled materials. Therefore, in order to promote the closed-loop lifecycle project, it is necessary to implement transparent mechanisms to collect, segregate and allocate end-of-life products.



The Case

This study aims to compare the financial return of two different allocation processes of used products and products with minor imperfections: i) disposal by incineration to generate energy (co-processing); ii) product selection and re-use of materials. Furthermore, the impact of the “Sustainable Footprint” take-back program on the business was also analyzed. For the purposes of this analysis, the DCF model was used, comparing the NPV of scenarios with and without the investment, as well as the subsequent implementation of the project.

Projected Scenarios

- **Without project implementations:** The new partner purchases the material at a nominal price and collects it directly from São Paulo’s central Distribution Center (DC). From this adjustment alone, **Adidas** already saves on disposal and shipping costs. For this project, selling of the collected materials generates revenue for Adidas and this income is fully invested in social projects related to sports in Brazil. 75% of the products still have some utility (for reuse or recycling), which ultimately reduces the volume of disposal;
- **With project implementation:**
 - **Reduction of disposal:** The new partner purchases the material at a nominal price and collects it directly from São Paulo’s central Distribution Center (DC). From this adjustment alone, Adidas already saves on disposal and shipping costs. For this project, selling of the collected materials generates revenue for Adidas and this income is fully invested in social projects related to sports in Brazil. 75% of the products still have some utility (for reuse or recycling), which ultimately reduces the volume of disposal;
 - **Take-back Project: “Sustainable Footprint”:** Even though there are costs associated with this project (equipment, communication and administrative costs), it still presents a potential increase in revenue. With the discount (currently at 15%) granted to participating consumers, the program generated growth in sales in Adidas stores, which not only offset the store’s additional work and equipment expenses (collection station and communication materials), but also generated a positive gain for the company. It is worth noting that products collected at the stores with the Sustainable Footprint Program are transported to the central DC in the trucks that previously take the goods to the stores. As a result, the transportation process does not generate additional CO2 or costs.



Adopted Assumptions

- Administration costs: Workload and number of people involved increased due to the new process; Products need to be weighed and its materials need to be specifically identified;
- Equipment and communication costs: The take-back program invests in collection containers for consumers to deposit donated products and in-store communication assets;
- Training of store employees does not generate costs as it is included in the company's general training programs;
- Discount of 15% currently granted to customers;
- In-store collection containers are replaced every two years;
- Ignore the quality variation of products, thus revenues are directly linked to growth in product volume;
- Project implemented in 40 stores;
- Disregarded data:
 - Gains in Customer Relationship Management (CRM): Value of the consumer information obtained during the donation of used products;
 - Value of spontaneous media: Financial losses and gains from the program's communication on social media and others; ;
 - Calculation of CO2 emissions: It is estimated that the new process has less environmental impact as it reuses or recycles 75% of products compared with sending them off to be incinerated;
 - Reputation and corporate image gains.



Table 7 presents the assumptions used for the financial analysis of the Sustainable Footprint Program.

Table 7: Adopted assumptions for the Adidas Case Study – Allocation of end-of-life products

Variables	
Average Annual Inflation	6%
Interest Rate (SELIC)	14.25%
Interest Rate (LIBOR)	0.40%
Wage Agreements (administration)	9%
Increased volume of allocated products (products returned and collected in the take-back program)	5.42% per year
Revenue from Product Sales	5.42% per year

Source: Adidas do Brasil Ltda, based on data collected from 2013-2015

Calculations

- **Avoided costs:** Costs of transportation and incineration of disposed products;
- **Generated benefits:** Additional profits from growth in sales due to the take-back program, as well as the revenue from the sale of used products;
- **Project NPV:** Calculated based on the value of investment in the new allocation process over the course of ten years. Annual values of the projected cost and financial gains were brought to present value based on the discount rate, set at 14.25%;
- **ROI:** Calculated based on the difference between the sum of the avoided cost (NPV of the benefit) and investments made (NPV of the project) distributed between a 10-year-period. This indicator demonstrates whether an investment will provide a positive return, break even or a negative return for the company.



Results

Table 8 and **Table 9** illustrate, respectively, investments and avoided costs/generated benefits with the implementation of the new allocation process.

Table 8: Adidas Case Study – Investments for the implementation of the new allocation process and take-back program: Sustainable Footprint

Topic	Investment	
	Type of Cost	Cost
Administrative Costs	Additional cost, due to the new process (compared to the old process)	BRL R\$234,817
Equipment Costs (for the take-back program at the stores)	Equipment and communication materials/assets	BRL R\$250,421

Source: Adidas do Brasil Ltda, 2015

Table 9: Adidas Case Study – Avoided costs and generated benefits

Topic	Benefit			
	Avoided volume of disposal	Avoided costs (old process disposal and shipping costs)	Revenue (from selling materials to companies specialized in life-cycle management)	Additional sales at the stores due to the consumer take-back program (net margin)
NPV (10 years)	Only 25% of products are actually destroyed, others are allocated for reuse and recycling	BRL R\$ 1,162,502	BRL R\$ 597,677	BRL R\$ 2,433,371

Source: Adidas, 2015



It can be concluded that the reduction in the disposal of materials prevents a cost of BRL R\$ 1,162,502 (selling products to specialized companies), considering that the revenue is fully invested in Brazilian social projects. In addition, the consumer take-back program in 40 stores generates additional sales that result in profit amounting to BRL R\$ 2,433,371. When both projects are considered over the course of a 10-year period, savings amounting to a total NPV of BRL R\$ 1,799,392 can be achieved, which highlights the profitability of the proposed project.

This study showed that even though the new process (reuse of end-of-life products) generated additional administrative work, it also provides real and long-term financial return. This case study succeeded in showing that programs of sustainable nature have a clear and positive result.

One of the main gains of the firm in participating in the sustainability ROI initiative was that the ties between the company's sustainability and finance departments are strengthened. The ROI calculation creates a tool to objectively disclose the impact of sustainability projects and show internal stakeholders that these projects add real value to the company. It was also revealed that the DCF methodology is feasible for other sustainability projects, especially those that aim to boost efficiency and innovation. It is worth noting that the project is also replicable, but only after the thorough analysis of local legislation on used products, disposal and recycling options.

As for next steps, **Adidas** is evaluating the implementation of the take-back project in franchised Brazilian stores, in compliance with the national policy on solid waste, which will determine the shared responsibility regarding the final destination of products. With the allocation project described herein, the company is ahead of potential future regulations in the sector. Moreover, **Adidas** intends on expanding the successful model in Brazil to other countries. Finally, this project tangibly contributes to the product lifecycle issue, which is currently discussed at a global level in clothing and footwear industries.

Comparative assessment between two processes of end-of-life product allocation and introduction of new closed-loop lifecycle management solutions.

CHALLENGE: Allocate end-of-life products and encourage consumers to return used products at stores, increasing sales as a result of visitations to the stores.

METHOD: NPV

ASSUMPTIONS:

- Additional staff costs in collection preparations;
- Marketing costs (stores);
- 75% of products have market value (raw material);
- Increase in Sales: 5%;
- Project length: 10 years;
- Discount Rate: 14.25%;

RESULTS:

- Investment: BRL R\$292,888;
- Additional Revenue: BRL R\$1,483,983;
- NPV: BRL R\$1,799,392

LESSONS LEARNED:

- The process is more time consuming, however has real and long-term financial return;
- Contributes to compliance of National Policy on Solid Waste (PNRS);
- Improvement of corporate reputation;
- Replicable project;
- Ameliorated communication between finance and sustainability departments.

PROFITABLE PROJECT



SOCIAL PROJECT CASE STUDIES.

There are countless benefits that stem from the adoption of socially responsible practices. These gains range from corporate image improvement within the industry and society to the mitigation of risks such as strikes and severe industrial accidents that can lead to temporary shutdowns. The cases described below qualitatively and quantitatively illustrate the benefits derived from sustainable practices, especially those related to social aspects.

Two professional training cases, two stakeholder engagement cases and one case involving the measurement of intangible aspects will be studied, namely:

Training programs in the surrounding community:

- **CPFL:** Training of electricians in the adjacent community to cope with the scarcity of skilled labor;
- **Siemens:** Training of low-income young adults through an internal volunteering program;

Engagement of Suppliers and Stakeholders:

- **Votorantim Cimentos:** Territory Development;
- **Odebrecht:** Production Chain;

Others: Financing and Measurement of Intangible Aspects:

- **Boticário Group:** Spontaneous Media and External Financing.

COMMUNITY TRAINING CASES



CPFL ENERGIA: Training of electricians.

The **CPFL Energia** Group operates in the distribution, generation and commercialization of electric power in four states: São Paulo, Rio Grande do Sul, Paraná and Minas Gerais. Based on its eight companies, the group holds 13% market share in Brazil, providing services to 7.4 million customers across 569 cities. In the domain of electric power generation, it has a power generation capacity of 2.23 MW through conventional method and generates 1,280.7 MW of energy through alternative sources – wind power, small hydroelectric dams, sugarcane bagasse and solar power

Employers are increasingly looking for highly qualified and trained professionals. Due to this rise in demand, the scarcity of skilled labor and the need for their appreciation is a popular subject. Within this context the electrician school aims to train people from the community in **CPFL Energia's** range of operations to work as network electricians. The initiative was developed in partnership with institutions and schools accredited by MEC and with renowned expertise in professional training programs. The implementation of the project is driven by the desire of contributing to the development of the community and meeting **CPFL Energia's** need for skilled labor in an optimized fashion. The project will also reduce the length of time to fill out job posts and training costs while maintaining high quality employments. In addition, the electrician school project mitigates risks of scarcity of skilled labor for **CPFL Energia** and the sector as a whole, while also fostering the personal and professional development of students.

The Case

This case study aims to evaluate the financial return generated by the electrician school project by comparing the cost of the project with the cost of hiring and training electricians in the traditional manner, in other words, via internal training. For the purposes of this analysis, the DCF model was used, comparing the NPV of scenarios with and without the investment and implementation of the project. The calculation involves the hiring process of electricians from 2012 (when the initiative was implemented) to 2020, in line with **CPFL's** strategic planning.



Projected Scenarios

- **Without project implementation:** Candidates go through a 30-day-long selection process and then participate in a 512-hour training over the course of 90 days. The course is administered by the Corporate University and students receive a certificate at the end of the course enabling them to exercise the role. For this process, the time between the opening of the vacancy and the day when an electrician starts to work is 120 days in total;
- **With project implementation:** The selection process for the school follows the CPFL standard to hire electricians. Students are prepped by renowned schools prior to the opening of vacancies, eliminating the lengthy process of the selection and training. Vacancy replacements only include a period of admission exams and service center formalities (the process to submit documents and registration). Thus, the time between the opening of the vacancy and the day when an electrician starts to work is reduced to 20 days.

Adopted Assumptions

- Hiring rate of the electrician school: 66% (based on the historical hiring average – 2012-2014);
- Hiring rate of internal training: 100%;
- Target hiring rate of electricians between 2016 and 2020:
 - Internal training: 80%;
 - Electrician school: 20%
- Forecasted number of electricians hired between 2016 and 2020: 161 per year;
- Discount Rate: 9.8% per year;
- Period of the analysis: 5 years (CPFL strategic planning cycle);



- Size of each trained class: 15 electricians (maximum quantity to ensure quality training);
- Costs related to the development of teaching materials, consumables, tools, and collective/personal protection equipment were not taken into account, as they are the same for both scenarios.

Calculation

- **Avoided costs:** The difference between the costs of training electricians hired from an internal training program and from the electrician school, multiplied by the number of electricians hired after graduating from the electrician school;
- **Project NPV:** Calculated based on the investment in external training, between 2015 and 2020. Annual values of projected costs and financial gains from 2015 to 2020 were brought to present value based on the discount rate, set at 8.9%;;
- **ROI:** Calculated based on the difference between the sum of the avoided cost (NPV of the benefit) and investments made in the same training (NPV of the project) distributed between 2015 and 2020 This indicator demonstrates whether an investment will provide a positive return, break even or a negative return for the company.



Results

Table 10 presents the investments made for the development of the electrician-training project.

Table 10: CPFL Energia Case Study – Investments

Topic	Investment		
	Type of Cost	Cost (BRL R\$)	Description
Training - baseline	Skill Building Courses	530,268.51	Internal Training (class of 15 electricians)
Training - project	Skill Building Courses	87,276.00	Electrician school (class of 15 electricians)
Hiring - baseline	Professional Training	35,351.23	Cost per hired electrician - baseline
Hiring - project	Professional Training	8,987.35	Cost per hired electrician - project

Source: CPFL, 2015.

Table 11 and Table 12 show, respectively, the generated benefits/avoided costs and qualitative results of the implemented project.

Table 11: CPFL Energia Case Study – Annual costs

Annual Costs with and without the Project		Details	Cost (BRL R\$)
Without the project (electrician school), only internal training	Annual cost of internal training for 100% of electricians	Training and hiring of 161 electricians	5,679,764.89
	Annual cost of internal training for 80% of electricians	Training and hiring of 129 electricians (80% of hired employees)	4,543,811.91
With the project (electrician school), plus internal training	Annual cost of training via the electrician school for 20% of the electricians	Training and hiring of 32 electricians (20% of hired employees)	288,793.51

Source: CPFL, 2015.



Table 12: Results of the CPFL Case Study: Training of electricians

Results	(BRL R\$)	
Annual cost of electrician training – baseline	5,679,764.89	100% internal training
Annual cost of electrician training – with project	4,832,605.43	80% internal training
Annual Cost Reduction	847,159.46	
NPV	3,299,940.61	

Source: CPFL, 2015.

With the implementation of the project, there was a reduction of BRL R\$ 847 thousand in the annual cost of electricians' training. This value was obtained by comparing the base scenario, which consists solely of internal training without the support of the electrician school, with the current scenario, where part of the training takes place at the electrician school. In addition, with the implementation of the project, the time to fill a vacancy is reduced by up to 83% and the cost to train a hired electrician is reduced by up to 71%.

An important gain from the company's participation in the sustainability ROI initiative was the conclusion that the electrician school project is economically feasible, because it significantly reduces costs and risks associated with training and hiring of new electricians, while also enhancing relations between the company and the surrounding community. Notwithstanding, since the training model can be replicated, this project's results become even more relevant. The developed calculation model shows that sustainability is relevant to the company's business and supports the company's decision-making process and strategy.

For the next step, the company will include the sustainability ROI method into the framework of all sustainability projects, as well as further develop it so as to measure the project's return for society. It is noteworthy that the project is aligned with other governmental professional training and educational initiatives, such as the National Program for Access to Technical Education and Employment (*Programa Nacional de Acesso ao Ensino Técnico e Emprego – PRONATEC*), demonstrating the compliance with national regulations. The departments involved in this study include Senior Management of People and Performance / Corporate University and operational departments of CPFL's distribution units.

Training of Electricians.

CHALLENGE: Mitigate risks related to the scarcity of skilled labor for CPFL Energia and the sector as a whole, as well as foster the personal and professional development of students..

METHOD: NPV

ASSUMPTIONS:

- Hiring rate of the electrician school: 70%;
- Discount Rate: 9.8% per year;
- Period of the analysis: 5 years;
- Class size: 15 electricians;

RESULTS:

- Cost without the project: BRL R\$ 6,572,805.52;
- Cost with the project: BRL R\$ 5,620,017.39;
- Benefit: BRL R\$ 952,788.12;
- NPV: BRL R\$ 4,239,385.42;
- Time for replacement reduced by up to 83%;
- Cost of training reduced by up to 71%.

LESSONS LEARNED:

- Represents 20% of the demand of the hiring of electricians; Projection: 100% in the long-term;
- Meets the needs of the community and the company;
- Replicable model;
- Demonstrates sustainability as part of the business;
- Supports the company's decision-making process and strategy;
- Evolve to measure return for society.

PROFITABLE PROJECT

COMMUNITY TRAINING CASES



Class of students of the *Formare* School Project

SIEMENS FOUNDATION: *Formare* Project

Siemens Foundation was established in 1986 with the goal of contributing to the development of local communities where it operates. The Foundation was restructured to ensure that its operations become strategic and aligned with Siemens' values, thus enabling the creation of shared value. The company focuses on the local education and development through basic technologies¹⁶.

The lack of skilled labor in Jundiaí, where twelve of the group's factories are located, combined with the high costs of internship programs and hiring of new employees were the main drivers for the implementation of the *Formare* School Project. The project was implemented with the support of a partnership between **Siemens**, **Siemens Foundation** and IOCHPE Foundation. The project is based on a new corporate citizenship framework that focuses on education and volunteering work aimed to train and increase the employability of the vulnerable youth, as well as to empower responsible citizens and future employees.

The purpose of the *Formare* Project is to train 20 young people in situations of social vulnerability inside Siemens' structure by its own employee volunteers. As a result, these trainees can start working at the company without additional training, thus avoiding the process for hiring, training and probation.

The Case

This case study aims to measure the Return on Investment of the *Formare* School Project and, in doing so, ensure project sustainability, as well as the opportunity to replicate it in other regions. Income statements (static) were used as a financial analysis methodology to evaluate avoided costs and gains in operational margins in 2014.

¹⁶ <http://www.siemens-fundacao.org/>



Classroom of the *Formare* School Project

Projected Scenarios

- **Without project implementation:** New employees would be hired from the market, which would increase the costs of hiring and training, as well as the hiring period. In addition, since potential volunteers wouldn't participate in the project, they would likely have to take additional training, such as courses about leadership, presentation techniques, time and project management, citizenship awareness and other behavioral techniques;
- **With project implementation:** With the *Formare* Project, the time and resulting costs of selection processes are reduced, as well as the time and costs for trainings of former *Formare* students, hired as employees. The project enables employee volunteers to be indirectly trained in topics such as leadership, presentation techniques, among others.

Adopted Assumptions

- Year 2014 was considered as the base for the calculation;
- Investments were made in: infrastructure, project management, franchise of the IOCHPE Foundation, financial aids for 20 students and man-hours of 72 volunteers;
- Avoided costs considered in this analysis include: additional training of 72 volunteers, internship hours of **Siemens'** 20 students, hiring of 20 new employees.

Calculation

- **Avoided costs:** Calculated by the reduction in time and costs of selection processes, labor costs exempted through the execution of internship activities by *Formare* students, as well as the time and costs avoided in training these new hired employees, in comparison to the case without the *Formare* Project;
- **ROI:** Calculated based on the difference between the investment made in the project and avoided costs related to reduced time and expenses in the selection process and training. The indicators demonstrate whether the investments decisions will give rise to positive return.



Results

Table 13 illustrates the results of the ROI analysis of the *Formare* Project.

Table 12: Results of the **Siemens Foundation** Case Study – *Formare* Project

Total Investments	BRL R\$ 345.3 thousand
Resources	BRL R\$ 209.5 thousand
<ul style="list-style-type: none"> • Infrastructure: classrooms, meeting rooms, library, computer labs, energy, water, phone; • Materials for students and educators; • Project management (human resources); • Franchise of the IOCHPE Foundation; • Financial aids for 20 students; • Advertising in schools; • Selection process (interviews, aviator commute); • Platform for volunteers. 	
Man-Hour Value	BRL R\$ 135.8 thousand
<ul style="list-style-type: none"> • Man-Hour costs of 72 volunteers: total number of hours x average man-hour cost of the organization. 	
Avoided Cost Savings:	BRL R\$ 616.4 thousand
<ul style="list-style-type: none"> • Cost of additional training of 72 volunteers: total number of hours x cost of the training per hour (cost based on the simplest training offered by the organization); • Cost of a technical intern: 396 hours of internship x 20 students in Siemens business areas x BRL R\$ 13.16 (cost of the internship per hour). 	
Return:	BRL R\$ 271 thousand

Source: Data supplied by Siemens, 2015.



Formation group of the *Formare* School Project

Based on the assumptions, it is possible to conclude that the Formare Project generated a return of BRL R\$ 271 thousand for the company in the year 2014. Thus, the case study proved that the social project had a Return on Investment that brought several additional qualitative benefits to the company, such as:

- Partnership with Siemens' HR, Finance and Business departments, leading to greater engagement of the students;
- Development of employee competencies, such as techniques related to: presentation, time and project management and team building; and behavioral abilities, such as: leadership, energy and citizenship;
- Increase in the satisfaction rate of employees regarding Siemens' Corporate Citizenship, reaching up to 86.3%, according to *Você S/A*;
- Internal satisfaction survey for volunteers of the Formare Project indicated a satisfaction rate of 100%;
- Wait list for the volunteer educator, created due to the rise in demand;
- Greater visibility of the surrounding community, resulting in 200 registrations for the new class;
- Positive response from the board of directors regarding the achieved results;
- Useful results and considerations to ensure continuity of the project and possibility of future expansion;
- Replication: Application of the methodology in other social projects.

For similar projects in the future, it is recommended that the company carries out a few actions in advance: define the scope, map indicators and people responsible for monitoring and, in doing so, engage key actors. The evaluated project can even be replicated in other projects that include volunteers.

The study involved the following people and departments: senior sustainability directors/steering committee, **Siemens** sustainability and corporate citizenship, volunteer employees from all the areas of the organization, HR (Learning Campus, Talent Acquisition and Business Units), finance, trainees, and interns of the Talent Development Program, board of directors and communication, which clearly showcases the interdisciplinary nature of the project.

SIEMENS FOUNDATION: *Formare* Project

CHALLENGE: Train 20 low-income young people inside the Siemens framework with **Siemens** employees as volunteer educators

METHOD: Income Statement

ASSUMPTIONS:

- Infrastructure and project management, franchise of the IOCHPE Foundation, financial aids for 20 students, man-hours of 72 volunteers;
- Avoided costs: training of 72 employees, internship hours of 20 students, hiring of 20 new employees;
- Base year for the calculation: 2014.

RESULTS:

- Investments: BRL R\$ 343 thousand;
- Avoided costs: BRL R\$ 616 thousand;
- Project gains: BRL R\$ 271 thousand

LESSONS LEARNED:

- Partnership between the HR Dept., finance Dept. and business units of Siemens;
- Human factor calculations are more sensitive – comparisons are not recommended;
- Useful results and considerations to ensure the continuity and potential development of the project;
- Positive response from Senior Directors;
- Multiplicity.

PROFITABLE PROJECT

ENGAGEMENT OF SUPPLIERS AND STAKEHOLDERS CASES



Aerial view of Votorantim Cimentos in Primavera / PA

VOTORANTIM CIMENTOS: Territorial development.

Votorantim Cimentos operates in the business of construction materials (cement, concrete, aggregates and mortars) since 1933. Its production capacity of cement amounts to 54.5MM tons/year and it is present in 13 countries, besides Brazil. With over 16 thousand employees, it has 34 cement factories, 22 mills, 322 concrete centers, 86 aggregate plants and 9 mortar units.

In 2010, the company decided to construct a new integrated cement production unit in the city of Primavera, located in the state of Pará. The plant will start its operations in the first semester of 2016 with a production capacity amounts to 1.3MM tons per year. To make the project feasible, there was an investment of approximately BRL R\$ 800MM to cover the acquisition of assets and purchase the necessary services.

The Primavera project was remarkable not only because it provided solutions to typical technical and operational challenges but also because of its social-centric aspect. The underdevelopment of the region, the small size of the city of Primavera, historical deficits in infrastructure and public services, as well as potential impacts of the enterprise on the population's living quality were studied for the elaboration of a specific engagement strategy to drive the development of the territory.

With the support of **Votorantim Institute**, the company conducted a series of studies on the enterprise's potential impact on the region and on the identification of drivers of local development. Through dialogue with the community and local and state authorities, a local development plan named "Sustainable Primavera" (in Portuguese, "Primavera Sustentável") was developed.

To manage this voluntary commitment, a governance committee was brought together. This committee was in charge of managing and supervising the implementation of the plan. The plan focused on investments in areas such as professional training, education, health, sanitation, infrastructure, supply chain drivers, among others. The committee's duty was to set priorities, guarantee the achievement of results and manage the resources invested by **Votorantim Cimentos**. The initial commitment of the company was to allocate BRL R\$ 8MM to the Sustainable Primavera plan. However, by 2015 the company had allocated or committed funds amounted to over BRL R\$ 10MM exclusively to foster the development of the territory.



Cement production in the municipality of Primavera/ PA

The Case

This case study aims to identify and quantify the financial return of the social investment amounted to about BRL R\$ 10MM for the Sustainable Primavera Plan carried out by Votorantim Cimentos in Primavera-PA within the scope of building its new production unit in the city. For the purposes of this analysis, the Discounted Cash Flow model was used by comparing the NPV of scenarios with and without the social investment. In addition, the project's payback period and ROI were also assessed. The goal was to align the method and language of the return on social investment analysis with other financial assessments in the company.

Projected Scenarios

- **Without project implementation:** The investment would simply be the CAPEX traditionally required for the construction of a new factory, without considering any voluntary social investment. It includes the purchase of all the machinery usually used to produce cement: crushers, belts, mills, furnaces, silos, grinders, etc. It also includes expenses for project services, engineering, construction and assembly, as well as costs for socio-environmental programs in order to obtain the environmental license.
- **With project implementation:** In addition to the traditional CAPEX described in the above scenario, an investment amounting to BRL R\$ 10MM was allocated to the actions of the Sustainable Primavera Plan. According to the studies conducted by the company, this investment would give rise to positive return on the project's cash flow in three different aspects: i) savings; ii) avoided costs; and iii) added value. Savings represent cost-efficiency in cost lines that were already budgeted in the original project, but with disbursement reductions due to the return generated from the social investment. This includes savings in financial expenses due to the use of special credit lines, savings in tax expenses, savings in the costs of specific socio-environmental constraints and acquisitions of non-refundable financial contributions. Conversely, the benefit of "avoided costs" gathers gains from savings in costs that weren't budgeted in the original project, but that have a precedent of occurring in similar projects. Among others, the following avoided costs were considered: additional costs of attraction, hiring and retention of workforces from other regions and paralyzed operations due to conflicts with the community. Finally, the added value refers to future gains in the cash flow due to the impact of social investments. In this case, the analyzed components included: a drop in absenteeism rates due to the improved water distribution and sewage collection infrastructure and reduced costs in decommissioning of activities.



Cement production in the municipality of Primavera/ PA

Adopted Assumptions

- **Investments**

- **Team hours:** To execute the Sustainable Primavera Plan, an expert team was allocated. The full cost of hours, including labor costs, during the elaboration, execution and monitoring process of investments amounted to BRL R\$ 1.8MM in the cash flow (2011-2025);
- **Logistical expenses:** Expenses of meals, accommodation and commute of the allocated team. BRL R\$ 0.27MM was considered in the cash flow;
- **Social investment:** The full financial amount necessary to make these social investments feasible, be it through acquisitions that involved costs of fixed assets or the outsourced provision of services. Examples: remodeling and expansion of two municipal schools, construction of libraries and museums, driving local supply chains, public management modernization actions, among others. Between 2012 and 2016, these actions mobilized investments amounting to BRL R\$ 9.9MM.

- **Benefits:**

- **Avoided costs** (30% of the incremental cash flow)
 - **Hiring of local manpower:** **Votorantim Cimentos** wrapped up in December 2015 with 70% of its workforce in Primavera being from the local community (state of Pará, especially from the cities of Primavera, Capanema and Quatipuru). This represents an important gain when one compares the costs of locally hired employees against the cost of employees from other states. During the implementation stage, these gains amount to BRL R\$ 0.023MM/year/employee, which is further reduced to BRL R\$ 0.015MM/year/employee in the operational stage. Considering the baseline adopted in the project budget for local hires and the increment after the execution of the professional training courses, avoided manpower costs amounted to BRL R\$ 1.2MM in 2014, BRL R\$ 2.3MM in 2015 and BRL R\$ 0.24MM since the launch of the unit in 2016.
 - **Avoided shutdowns:** The Sustainable Primavera plan fostered a better relationship between the enterprise and the community, enhancing people's understanding for the inconvenient events that took place during constructions. This avoided temporary shutdowns and/or reduced time spent on community issues resolutions in several occasions. For this measurement, a comparison was made with other recent **Votorantim Cimentos** startups to evaluate average time and the type of events that led to shutdowns. Subsequently, events that could potentially lead to temporary shutdowns in Primavera were observed, as well as if the shutdown actually occurred and for how long it occurred. To calculate return, the following was considered: avoided costs with the hired labor that wouldn't

be working during the temporary shutdowns, which either didn't occur or were shorter when compared to internal benchmarking data. In 2014, four days of shutdowns were avoided, preventing a cost that amounted to BRL R\$ 0.07MM/day; six days of shutdowns were avoided in 2015, preventing a cost that amounted to BRL R\$ 0.15MM/day, reaching a total of BRL R\$ 1.2MM during both years.

- **Savings** (62% of the incremental cash flow)

- **Savings in financial expenses:** For this item, the contribution of social investments for the acquisition of specific credit lines and their resulting financial savings compared to traditional credit lines were considered. These include: lines of credit A, B, C and D made available by the Brazilian Development Bank (BNDES). According to the characteristics of each credit line, a higher or lower contribution percentage of social investments were assigned. Considering the long-term interest rate (TJLP) at 7.5% per year and the SELIC interest rate at 13.6% per year, the influence of social investments on the acquisition of each line of credit will amount to BRL R\$ 5.6MM in savings between 2017 and 2022.

- **Financial contributions:** Given the voluntary and planned nature of the social investment made by **Votorantim Cimentos** in the Sustainable Primavera Plan, other organizations offered non-refundable social investments as contributions, which reduced the cost of implementation of social actions by Votorantim Cimentos. These contributions amount to BRL R\$ 0.75MM considering the period from 2012 to 2015.

- **Constraints:** One of the environmental licensing constraints (or conditions) was the construction of a museum to preserve the assets collected during the archaeological recovery process. Since the construction of the museum was incorporated – with the consent of the city government, environmental agency and the community – into the city library that was built as part of the Sustainable Primavera Plan, it was possible to obtain savings in the construction and maintenance of the museum as these costs were provided in the environmental constraints budget.

- **Savings in tax expenses:** Considering the social and economic impacts of the project on the state of Pará, it was possible to apply for state incentive programs that relate to the import of fixed assets that were to be used in the industrial plant, thus obtaining a deferral of the tax on goods and services (ICMS) and tax rate difference (DIFAL) amounting to BRL R\$ 7MM. To calculate the savings, a financial gain resulting from this deferral from 2013 to 2019 was considered, which amounted to BRL R\$ 4.7MM.

- **Added value** (7% of the incremental cash flow)

- **Avoided absenteeism:** According to the study published by the Trata Brasil Institute, there is a direct correlation between work absenteeism and the inadequacy of water and sewage systems. As part of the actions of the Sustainable Primavera Plan, measures were taken to adjust and improve conditions and coverage of sanitation services in the city. It was calculated that this will generate a positive impact in reducing absenteeism based on Votorantim Cimentos' internal benchmark, and respective operational costs. Based on the average cost of avoided absences, BRL R\$ 0.01MM was added between 2018 and 2025;

- **Reduction of decommissioning costs:** Given the nature of the social actions carried out with the social investment, it was assumed that there would be a positive return due to cost reductions in the decommissioning of the operation in a very long term. The projected cost reduction was set at 5%, which means an increase of BRL R\$ 1.6MM in the cash flow, considering the company's internal benchmark.

- **Disregarded data:**

- Impact on value / brand reputation;
- Monetization of employee retention;
- Corrections/adjustments over time (inflation, contractual amendments, etc.).



Calculation

- **Gains:** Avoided costs related to the hiring of manpower, reduction in the number of temporary shutdowns of construction sites, savings in financial expenses through the use of lines of credit, savings in tax expenses, savings in the construction costs of the museum, financial contributions, drop in the absenteeism rate and reduction in decommissioning costs;
- **Project NPV:** Calculated based on the value of investment decisions in social initiatives, between 2011 and 2025, during which the operation would reach maturity. Annual values of the projected costs and financial gains between 2011 and 2025 were brought to present value based on the discount rate, set at 8.12%;
- **Return:** Calculated based on the difference between the sum of the avoided costs, savings and added value (NPV of the benefit) and the social investments that were made (NPV of the project) distributed between 2011 and 2025. This indicator demonstrates whether an investment will provide a positive return, break even or a negative return for the company..

Results

Table 14 and **Table 15** contain the details of the collected data for costs (necessary investments) and benefits (avoided costs/generated benefits) of the project, respectively.

Table 14: Investment Data for Votorantim Cimentos Case Study – Territorial development

Topic	Type of Cost	Total Cumulative Perpetuity 2025 (due to the implementation of the initiative) – in BRL R\$
Outflow	Team Hours (project + operation)	BRL R\$ 1,883,059
	Logistical Expenses	BRL R\$ 273,185
	Subtotal	BRL R\$ 2,156,244
	CAPEX (considered)	BRL R\$ 9,937,603
	Subtotal	BRL R\$ 9,937,603
	Total	BRL R\$12,093,847

Source: Votorantim Institute, 2015



Table 15: Generated Benefits/Avoided Costs Data for Votorantim Cimentos Case Study – Territorial development

Topic	Type of Gain	Total Cumulative Perpetuity 2025 (due to the implementation of the initiative) – in BRL R\$
Avoided Cost	Hiring of local manpower	BRL R\$ 5,928,744
	Avoided temporary shutdowns at the construction site	BRL R\$ 1,204,384
	Subtotal	BRL R\$ 7,133,128
Savings	Savings on financial expenses	BRL R\$ 5,594,910
	Contributions	BRL R\$ 752,350
	Archaeology Museum	BRL R\$ 3,568,000
	Savings on tax expenses	BRL R\$ 4,799,614
	Subtotal	BRL R\$ 14,714,874
Added Value	Avoided absenteeism	BRL R\$ 83,803
	Reduction of decommissioning costs	BRL R\$ 1,625,000
	Subtotal	BRL R\$ 1,708,803
	Total	BRL R\$ 23,556,805

Source: Votorantim Institute, 2015

Table 16 presents the economic feasibility of the project.

Table 16: Economic and Financial Analysis for Votorantim Cimentos Case Study – Territorial Development

Investment	BRL R\$ 9,937,603 (when the team hours in the execution of the projects and logistical expenses are taken into account: BRL R\$ 12,093,847)
NPV:	BRL R\$ 5,085,279
ROI:	4.4 times for every invested BRL R\$1,00
DISCOUNTED PAYBACK:	Year 7 of the flow (2017)

Source: Votorantim Institute, 2015



The positive NPV of over BRL R\$ 5 million confirms the economic feasibility of the project. And what's more, the profitability of the investments generates a ROI of BRL R\$ 4.54, that is, for every invested BRL R\$ 1.00 it is possible to achieve a return of about BRL R\$ 4.54.

The study is limited to the return obtained from the Sustainable Primavera Plan, implemented along with the construction of **Votorantim Cimentos'** new cement factory in Primavera-PA. Even though the calculations of the benefits are related to specific actions of the Sustainable Primavera Plan, the calculation of the individual return of every executed action is not advisable. To a large extent, the benefits were only possible due to the elaboration of a consistent plan that was fully implemented under the supervision of a committee and with the participation of the local community. It also wouldn't be sound to compare the performance identified in this case with other implementation processes of new production units that belong to **Votorantim Cimentos** or other companies, given that some assumptions can only be justified within the context of Primavera-PA.

Thus, it is possible to conclude that, with the Sustainability ROI initiative, social investment results can be measured with methodologies typically used in a company's strategic planning and financial management departments. Therefore, the results are more easily linked to the company's main activity, which ultimately facilitates the decision-making process. This aspect is largely relevant not only to the assessment of the return on ongoing investments, but also to the strategic planning of social actions connected to economic enterprises of various natures.

The experience in the calculation of the return on social investments will be replicated in several other cases of **Votorantim Cimentos** and companies of **Votorantim S.A.** under the supervision of Votorantim Institute and related departments of each company. The group will attempt to summarize calculation benefits and assumptions by building a database that will be used in other assessments and simulations.

Territory Development.

CHALLENGE: Identify and quantify correlations between positive externalities and positive financial impacts (company).

METHOD: NPV

ASSUMPTIONS:

- $\text{Avoided Costs} + \text{Savings} + \text{Added Value} = \text{Social Investment} + \text{Project Costs}$

RESULTS:

- NPV: BRL R\$5 MM;
- Payback Period: 7 years;
- ROI 4.54

LESSONS LEARNED:

- Internal benchmarks;
- Customization of indicators;
- Internal engagement;
- Sectorial benchmarks.

PROFITABLE PROJECT

ENGAGEMENT OF SUPPLIERS AND STAKEHOLDERS CASES



ODEBRECHT: Production chaining.

“**P**roduction Chaining” is one of the Brazilian Micro and Small Business Support Service’s (SEBRAE) national projects. The partnership with SEBRAE Rio enable the project’s implementation in the context of the construction company’s business, in particular the involvement of Itaguaí Construções Navais (ICN). Production chaining, in this context, is the long-term and mutually beneficial cooperative relationships established between large and small-sized companies in the value chain. The aim of the small-sized companies is to adapt to the requirements of the large-sized companies so as to facilitate businesses between them, ultimately improving competitiveness in the value chain as a whole.

This project was planned for the value chain of ICN in the region of Itaguaí, RJ, aiming to meet the requirements of ICN and foster local development. ICN’s core activities include building conventionally-propelled and nuclear submarines for Brazil’s National Submarine Development Program (PROSUB) developed by Brazil’s Navy. ICN is held by Odebrecht Defense and Technology and the French company Direction des Constructions Navales et Services (DCNS).

The project seeks to promote and validate the idea that business initiatives focused on community and territory development, associated with the company’s core business, have the power to provide economic return for the company, as well as boost local development.

The Case

This case study aims to analyze the economic feasibility of the local supplier development program of ICN’s value chain and set goals for the project to generate financial return once it is implemented. For the purposes of this analysis, the DCF method was applied by comparing the NPV of scenarios with and without the investment and the subsequent implementation of the project.



Porto Maravilha – Rio de Janeiro / RJ.

In order to estimate the flow of benefits so that the analysis is feasible, the following variables were considered:

- Overall delivery delays and returns;
- General last-minute purchases;
- Substitution of non-local to local production for uniform supply;
- Substitution of non-local to local production for the execution of events and social get-togethers.

These variables were based on the assumptions developed along with ICN's Purchase and Supply team, considering the following scenarios:

Projected Scenarios

- **Without project implementation:** Costs that ICN currently needs to bear (delivery delays due to complex logistics, acquisitions outside Itaguaí, etc.). Without the implementation of the project, there would be high numbers of delays, returns and last-minute purchases. Furthermore, high expenses for events and uniforms are also considered, given the need to acquire suppliers that are long distances away from the operations, which increases logistical costs;
- **With project implementation:** With the adoption of the project, it is estimated that there will be a reduction in delays and returns, as well as the amount of last-minute purchases, thus decreasing costs for the company. It is also forecasted that there will be reduced costs of purchasing goods and services, since professionals will be sourced in the local market. Taking into account that this project had not started when this study was devised, the feasibility analysis was executed by setting substitution targets per local purchase that would make the project economically feasible. Based on this analysis, a management tool was developed so as to identify when those targets are met and measure the actual economic value that will be generated as a result of the project.



Adopted Assumptions

- **For the investment:**
 - Corresponding value of ICN's participation for the implementation of the project in partnership with SEBRAE (BRL R\$ 300 thousand);
 - Manpower costs: 1/6 of the hours of a senior ICN employee to provide orientation and supervise SEBRAE's implementation of the project.
- **For the benefits:**
 - It was assumed that the implementation of the project will generate an impact on the number of delays and returns, last-minute purchases, uniforms that will be substituted by local suppliers and events and social get-togethers that will be substituted by local suppliers.
- **Discount Rate: 16%.**
- **Delays and Returns:**
 - Current number of delays and returns: 30 per month;
 - Time to solve an incident: 90 min;
 - Manpower costs: BRL R\$ 0.33/min;
 - Target: Reduction of 13% per year in delays and returns during the project's 3 years.
- **Last-minute purchases**
 - Current quantity of last-minute purchases: 6 per month;
 - Original average price: BRL R\$ 2,273;
 - Last-minute price: 50% more expensive;
 - Target: Reduction of 13% per year in last-minute purchases during the project's 3 years.
- **Uniforms**
 - Quantity of employees: 1,361;
 - Current average price per uniform: BRL R\$ 133;
 - Quantity of uniforms per employee per year: 3;
 - Price reduction target: 25%;
 - Target substitution for local purchase: 20% per year during the 3-year project.
- **Events and Social Get-Togethers**
 - Price reduction target: 30%;
 - Target substitution for local purchase: 3 per year



The difference between shipping costs from local purchases and from other states was not considered because there were no robust assumptions to support the analysis. In addition, due to the lack of robust assumptions, only two items out of several others were considered replaceable by local production. This indicates that the project's impact on the community and economic return has the potential to be even broader.

People costs refer to the partial cost of a senior ICN professional to supervise and provide orientation for SEBRAE's implementation of the project. Process costs refer to an investment proportional to ICN's participation in the project, so as to take on a portion of the costs related to the training of groups and consultants who will provide individual and specific support to the beneficiaries of the project.

Calculation

- **Outflow: Investment (+) Opportunity cost:** Cash outflow was calculated based on the annual sum of the investment in the project and the partial cost of a senior ICN professional to provide orientation and supervise SEBRAE's implementation of the project;
- **Inflow (Benefits):** Operational costs without the program (-) Operational costs with the program;
- **The flow of benefits was calculated based on the difference between costs with each variable in two scenarios**
 - Current scenario without the program, considering the current costs that ICN has to bear with each one of the analyzed variables;
 - Future scenario with the program, considering the aforementioned assumptions and targets to estimate the new costs with these variables upon project implementation
- **Net Cash Flow:** Inflow (-) Outflow.



Metro Line 4 South Consortium – Rio de Janeiro / RJ.

Since the study was carried out with a feasibility analysis, the model was based on future assumptions, thus no benefits have actually been generated. The variables were identified based on the available assumptions that could potentially produce to savings for ICN, which is why the strategy of setting targets for these variables was adopted. As a result, targets were set to reduce delays, returns and last-minute purchases, as well as substitution targets to replace purchases from other states with local purchases. These targets were set so that after three years of implementation, the project’s NPV was close to zero, i.e. the criterion was that the project would pay for itself in three years’ time.

However, it was also considered that the targets pursued in those three years would lag on to the four following years of ICN’s operations contract. As a result, from the fourth year onward, outflows would cease to exist due to the completion of the project and ICN would continue to absorb the generated benefits. Based on this analysis, a management and follow-up tool was developed, where the targets are substituted by the actual amounts attained by ICN over time, which will allow for the monetary measurement of the actual benefit created by the project.

Table 17 presents the investments and avoided costs of the Production Chaining project.

Table 17: Investments and Avoided Costs of the **Odebrecht** Case Study – Production chaining project

Investment	
Type of Cost	Cost (BRL)
People	46,667
Process	326,976
Estimated Avoided Costs over the contract’s 7-year period (BRL)	
Delays and Returns	19 thousand
Last-minute purchases	141 thousand
Uniforms	445 thousand
Events and Social Get-Togethers	318 thousand

Source: Odebrecht Defense and Technology, 2015.



Results

Table 18 and **Table 19** show the results of the economic feasibility analysis for the case study.

Table 18: Total Investments and Costs of the Odebrecht Case Study – Production chaining project

	2015	2016	2017	2018	Total
Investments (BRL)		102,191	108,890	115,895	326,976
Costs (BRL)	4,667	14,000	14,000	14,000	46,667
Outflow (BRL)	4,667	116,191	122,890	129,895	373,643

Source: Odebrecht Defense and Technology, 2015.

Table 19: Benefits of the Odebrecht Case Study – Production chaining project

Benefits	2015	2016	2017	2018	2019	2020	2021	2022	Total
Delays and Returns (BRL)		810	2,106	3,312	3,564	3,564	3,564	2,376	19,296
Last-minute purchases (BRL)		5,319	15,138	24,276	26,185	26,185	26,185	17,457	140,744
Events (BRL)	45,500	45,500	45,500	45,500	45,500	45,500	45,500		318,500
Uniforms (BRL)		17,649	50,231	78,062	81,456	81,456	81,456	54,304	444,613
Inflow (BRL)	45.500	69.278	112.975	151,149	156,705	156,705	156,705	74,137	923,153

Source: Data supplied by Odebrecht Defense and Technology, 2015.



Scenic lighting of the cable-stayed bridge on the South Line 4 Subway – Rio de Janeiro

Based on the assumptions and the above results, the project came to a NPV of BRL R\$ 222,711 in ICN's seven-year-long contract, which represents the creation of value for shareholders in equal amounts. Furthermore, investments in the Production Chaining Project would pay for itself after three years. It is worth highlighting that the real gain depends directly on the achievement of the targets set for this analysis. Notwithstanding, it is important to consider that the potential economic gain is even greater than what was estimated in the feasibility analysis, given that due to the lack of robust assumptions, only two of the many items that can be developed and produced by the local community were considered.

The initiative becomes relevant because the same methodology can be replicated in other projects that aim to develop micro and small-sized local suppliers within the company's value chain. However, the result is limited to the actual achievement of the set targets. Since the feasibility analysis was carried out based on future assumptions, effective absorption of the benefits will only occur if the targets set on the analysis are met in practice.

In addition, the project presented the utilization of a management and follow-up tool, replacing targets by the numbers actually attained over time, which will enable the confirmation (or lack thereof) of the project's economic gains.

It is recommended that, in the future, all projects are assessed from an economic return standpoint from the very start so as to ensure that all "affected" areas can be analyzed in different scenarios with and without the project's implementation to better determine the assumptions and facilitate the decision-making process. It is also suggested to carry out the analysis for benefits of micro and small-sized companies and for other less tangible contractual benefits, such as corporate image gains.

This study was developed by the Sustainability Department, represented by the professionals responsible for the sustainability area and for the economic analysis and feasibility of socio-environmental projects. In addition, the study involved ICN's Sustainability, Supply Chain and Purchase Departments to raise and validate assumptions.

DEFENSE AND TECHNOLOGY: Production Chaining

CHALLENGE: Develop an economic return management tool for the Production Chaining Project implemented within ICN in partnership with SEBRAE, so as to develop the local supply chain.

METHOD: NPV

ASSUMPTIONS:

- Cost comparison with and without the project to set goals that are to be met so that the project is economically feasible;
- Cost savings in local acquisitions of uniforms and events;
- Cost reduction in delays and returns;
- Cost reduction in last-minute purchases;
- Discount Rate: 16%.

RESULTS:

- Investment: BRL R\$ 354,530;
- Benefit in 3 years BRL R\$ 378,902;
- NPV: BRL R\$ 5,625;
- Payback Period: 3 years;
- In the long-term:
 - Benefit after the 7-year-long contract: BRL R\$ 923,153;
 - NPV: BRL R\$ 222,613.

LESSONS LEARNED:

- Team engagement and communication;
- Collection of reliable information that supports the adopted assumptions;
- Joint development of the indicators used in the analysis.

PROFITABLE PROJECT



BOTICÁRIO GROUP: **External financing – Socio-environmental credit line and benefits of positive spontaneous media.**

Boticário Group decided to use external financing resources for projects with sustainable strategy. Resorting to external resources shows that the adoption of sustainable practices enables the company to access markets with advantages that accelerate the implementation of sustainable practices in their business. In this case, the company benefited from lower risks associated with its own equity.

The Case

This case study aims to estimate the financial gain obtained by resorting to external financing options within socio-environmental credit lines instead of using **Boticário Group's** equity. Sustainability actions that generated spontaneous media for **Boticário Group** were also analyzed in this case study.

Projected Scenarios

- **Without project implementation:**
 - **External financing:** If the company chose to use its equity to execute sustainability projects, it wouldn't obtain financial gains by using resources from specific credit lines for sustainability initiatives;
 - **Media:** Without the company's core strategy and sustainability initiatives, it would be necessary to invest in advertising, which was avoided due to the positive media reactions;
- **With project implementation:**
 - **External financing:** By resorting to credit lines for its sustainability initiatives, the company had access to lower interest rates and better payment terms. In addition, the company was able to apply its own resources to other projects and investments;
 - **Media (expression):** The executed sustainability actions generated positive media reactions for the Boticário Group and, at an intangible level, a positive perception in the general public.



Adopted Assumptions

- Only investments up to 2015 were considered;
- Dedicated headcount costs were allocated within the projects;
- Financial return until 2018;
- Only additional sustainability investments were considered. Project investments and costs that were going to take place regardless were not considered

Calculation

- **External financing:** Calculation of the financial cost reduction given the lower interest rates of external financing;
- **Spontaneous media:** Calculation of the investment costs in advertising and propaganda that was avoided due to the generation of spontaneous media

Results

Table 20 presents the results obtained from the case study's analysis.

Table 20: Benefits of **Boticário Group** Case Study – Spontaneous media and external financing.

Savings	2012	2013	2014	2015	2016	2017	Total
Expression (BRL)	1,653,870	1,775,592	1,906,272	2,046,569	2,197,192	2,358,901	11,938,396
External Financing (BRL)	-	235,860	254,729	275,107	297,116	320,885	1,383,697

Source: Boticário Group, 2015



By resorting to specific credit lines for sustainability initiatives, the company had a financial gain that surpassed BRL R\$ 200 thousand per year and, at the same time, protected its equity from investment risks. In terms of the generation of spontaneous media, the value was assessed at over BRL R\$ 1.5 million per year, ultimately generating a gross amount of about BRL R\$ 12 million at the end of a 6-year period. Yet again, the company's equity was shielded and the company reaped the benefits of reputational gain and higher valuation from trendsetters.

The external financing initiative shows that the adoption of sustainable practices enables access to markets (in the case of specific credit lines) that can be profitably explored. In the analyzed case, the company also benefited from lower risks associated with its equity.

Conversely, the calculation of spontaneous media involves several intangible variables. It is worth noting that the calculation of economic and financial return associated with intangible sustainability aspects is an innovative practice in the Brazilian corporate environment. Thus, this initiative contributes to the implementation of this type of assessment in corporate agendas.

External Financing – Socio-environmental credit line and benefits of positive spontaneous media

CHALLENGE: Avoided cost due to positive media reactions as a result of sustainable practices;

Financing: Financial gain by resorting to an external sustainability credit line instead of **Boticário Group's** own equity

ASSUMPTIONS:

- No investment, only avoided financial costs;
- Avoided costs calculated based on the expense the company would have had with investments for communication;
- Financing: Access to more attractive credit lines for sustainability initiatives with lower interest rates and better payment terms.

RESULTS:

- Avoided Costs
 - media reactions: approximately BRL R\$ 2MM/year
 - External financing: BRL R\$ 230MM/year

LESSONS LEARNED:

- Credit lines with social and environmental additionalities are available;
- Media reactions of sustainability projects and initiatives contribute to improved corporate image.



5. LESSONS LEARNED AND SUGGESTIONS FOR NEXT STEPS OF THE EMM NETWORK

It can be said that the Sustainability ROI initiative clearly demonstrated the importance of measuring the financial return of sustainability projects and can help management in the decision-making process. Also, the ROI initiative showed that sustainability actions go far beyond the ethical domain: in the presented cases above, environmental initiatives actually generated tangible financial gains for companies.

All case studies concerning environmental initiatives demonstrated a potential for reduction or avoidance in cost and growth in revenue. Some social initiatives not only avoided costs and could potentially generate revenue, but also contributed to securing social licenses and to raising corporate reputation, creating a favorable environment for their operations. Furthermore, the implemented sustainability strategies provided the opportunity for companies to access profitable opportunities, such as credit lines with competitive interest rates due to best corporate sustainability practices. All cases demonstrated the importance of a cost-benefit analysis in the decision-making process and that the integration of socio-environmental considerations into company's decision making adds value and strengthens investment returns.

Furthermore, the methodologies presented in the ROI initiative may be replicated to other projects and turned into a management tool to be integrated with the current analysis procedures within companies.

Companies stated that one of the lessons learned was that financial teams should always involve in the project from the beginning, participating in setting the scope as well as mapping KPIs and other stakeholders that will contribute the success of the project. Another suggestion for the economic and financial analysis of sustainability projects was to create multidisciplinary committees that can assist in setting assumptions, targets and indicators.



Lessons Learned

Overall, challenges in calculations and in the link between corporate finance and sustainability issues have been identified:

- Difficulty in collecting data, systematizing and making the necessary information available for the financial analyses especially when the project was already completed;
- Language/jargon differences between Finance and Sustainability departments;
- Little knowledge of the Finance department with the Sustainability topic and vice versa;
- Difficulty in creating a basis of assumptions and determining assumptions;
- Difficulty in measuring intangible benefits.

On the other hand, the main gains identified by companies as below:

- Closer link between Finance and Sustainability departments;
- Engagement of employees with sustainability issues;
- Awareness of the need to generate financial, environmental and social information from the very beginning of the project's implementation;
- Mindset change in the company, based on the demonstration of measurable financial gains of sustainability initiatives;
- Strengthened internal credibility of the Sustainability department.

In addition, during the process, companies saw the potential of anticipating the compliance of a number of environmental regulations. Companies also stated that in a domestic market that is stimulated by financial agents, this type of sustainability practice can be initially perceived as a competitive advantage to access credit, and in the future, as a common denominator.

In terms of **next steps for the EMM network**, participating companies suggested further discussions on economic cost-benefit for sustainability projects, including the execution of new case studies and the invitation of new participating companies. Other suggestions included: additional training on financial return calculations and language standardization for the sustainability teams, as well as sustainability training for financial teams.

Intangible benefits are more challenging to measure and, therefore, was not considered in the presented case studies. However, participating companies expressed a strong desire to measure these benefits in the next cycles of the Sustainability ROI initiative.



6. FINAL REMARKS

One of the great economic challenges of sustainability is the internalization of externalities through price mechanisms. In that sense, public policies and voluntary corporate practices have been progressing in the right direction. One example is carbon pricing through taxation due to market creation or voluntary initiatives within companies (set of an internal theoretical price for carbon, even if the company is out of the jurisdiction where the tax is applied, or carbon market creation, so as to consider the price in investment assessments). Currently, 40 countries and over 20 cities, states and regions have already set a price for carbon, be it through taxes (e.g. Denmark, France, Finland, Norway, among others) or through markets (e.g. China, European Market, Quebec, New Zealand, among others). In terms of voluntary corporate practices, 150 companies worldwide are already using the internal price on carbon, such as Microsoft, BP, Exxon Mobile, AzkoNobel, Walt Disney Company, among others¹⁷. When prices in the economy begin to signal socio-environmental aspects in a more suitable fashion, the inclusion of sustainability variables in financial markets and corporate investment analysis will become mainstream. However, we certainly have not reached that point yet, and, for that very reason, the involvement of EMM member-companies in these case studies contributed to the progress of this discussion on economic and financial gains in determined socio-environmental attributes.

Ethical, behavioral, social and environmental issues are imperative for the ongoing survival of businesses. Nonetheless, in order to make the transition to an economy that is aligned with sustainability principles, it is necessary to measure the return on sustainability investments, since, given that resources are scarce, companies' investment decisions tend to favor projects with better risk-return trade-offs. As a result, this gives rise to a very contemporary dilemma: on one hand, the sustainability imperative is undeniable and managers need to make decisions that incorporate socio-environmental considerations more than ever; on the other hand, for the most part, sustainability concerns socio-environmental attributes that cannot be quantified with prices.

For this reason, measuring sustainability results presents both challenges and opportunities for all companies operating in this field. The challenge lies in proving that investments in more sustainable actions positively contributes to business' economic performance and that opportunities will arise from building a new economic paradigm, where investments in sustainability are highly valued.

Therefore, the pilot projects developed in this ROI initiative assisted in fostering greater engagement and trainings for financial and sustainability analysts who seek to incorporate investment analysis methods in sustainability projects, indicating their economic feasibility.

This was the first project of the EMM network in Brazil. Its positive repercussion led EMM/GIZ to replicate the project along with participating companies in Mexico and China, further strengthening the network, the initiative and the incorporation of sustainability attributes in the economy based on the Brazilian experience.

¹⁷ (World Bank, 2015)

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