

Non-Adherence to GRI Guidelines in the Disclosure of Economic Performance Indicators in the Energy Sector in Brazil: Reflections on the Condition of Management Control Systems (MCS)

Abstract:

Public companies in the Energy Sector in Brazil have disclosed information about corporate social responsibility in their sustainability reports and achieved good grades according to the application level criteria defined by the GRI Guidelines. However, previous studies suggest lack of quality in the disclosed information. To support the preparation process and disclosure of corporate indicators regarding sustainability, it is assumed that the management control system is appropriate to sustainability disclosure. The economic performance indicators (EC1 to EC9) consist mostly of quantitative information that, according to accuracy requirements, should be verifiable with the financial information disclosed by the companies. We investigated adherence to the GRI Guidelines in the disclosure of economic performance indicators of a sample comprising 7 companies in the energy sector in Brazil in 2010. Adherence interpretation has followed accuracy and clarity principles, as defined for the financial information and the GRI, to ensure quality to the information reported by the companies. Research design adopted the content analysis technique to define the set of information to be analysed, the framework for categorization of this information, as well as its evaluation criteria. The results suggest that the non-adherence index is high and indicate several flaws in the production of the reports that may be related to the formal conditions of the management control system of the companies. The framework provides a supplementary guideline for the quality of sustainability reports.

KEYWORDS: Disclosure. Sustainability Report. Global Reporting Initiative. Economic Indicators. Management Control System. Energy Sector.

1. Introduction

The use of the GRI propositions for preparation of the sustainability reports (SR) has been verified in worldwide research (Faisal et al., 2012). Several studies have presented the reasons for the voluntary adhesion to the GRI Guidelines by companies (Guthrie and Parker, 1989, Deegan 2002, Gray 2006, Islam and Deegan 2008, Du and Vieira 2012, Faisal et al. 2012, Legendre and Coderre, 2013). The main reasons are anchored to the supposition of the need of acceptance of the company's operations by society, which is consistent with the pursuit of legitimacy. Despite the reasons motivating the companies, the GRI Guidelines seem to have been accepted by them as a reliable guide to demonstrate their CSR (over 2,500 companies disclosed their SR based on the GRI in the year 2012).

According to Waddock (2004, p. 10), in her extensive essay on the evolution of the concept of corporate responsibility, the CSR is "the subset of corporate responsibilities that deals with a company's voluntary/discretionary relationships with its societal and community stakeholders." For the author, corporate responsibility (CR) is a wider and relative concept, representing a degree of responsibility or irresponsibility that is manifested in the company's strategies and operational practices in response to the impacts caused to stakeholders and the natural environment.

Studies of economic, social and environmental impacts disclosure are important to verify the responsibility of organizations towards their stakeholders. In this sense, the purpose of the GRI work is to assist companies by providing a standard structure of concepts, language and metrics for them to be able to communicate clearly and openly about sustainability in their SR (Global Reporting Initiative [GRI], 2006). The sustainability representation built by the GRI various stakeholders, comprises the TBL approach, according to the perspective of

Elkington (1997), for whom it is a development model that may overcome not only financial challenges, but also environmental and social ones.

In spite of these efforts, many criticisms have been levelled at the GRI standards for being too complex, applying misleading scientific theories and holding no consistency among the sections of indicators (Tilt, 2009). In addition, many authors have found flaws in the disclosure of SR (Leszczynska, 2012; Bouten et al. 2011) and questioned the level of quality of the information and its use to meet the needs of stakeholders.

Norman and McDonald (2004, pp.243-244) affirmed that the novelty of TBL lies in the framework's support that the obligations to the diverse stakeholders should be measured, calculated, audited and reported just as the financial performance of the public companies has been for more than a century. "To produce a regular sustainability report, organizations set up a reporting cycle – a program of data collection, communication, and responses. This means that their sustainability performance is monitored on an ongoing basis" (GRI, 2013b). "Any management undertaking external social disclosure – whatever the drivers for that might be – will need an internal information system to support that disclosure.", claim Gray et al (1996, p.217).

However, is the management control system in companies sufficiently developed to attend to the economic, social and environmental themes with a broad focus on stakeholders, representing the TBL, designed and implemented to collect, measure, monitor and discharge accountability through their SR?

For this discussion, the economic dimension on TBL reports should be discriminated from the traditional financial statements. For the "real bottom line", profitability is one topic but not all of it (Henriques, 2004). The financial performance is essential for the sustainability of any organization and this is reported periodically in accounting reports. The expectation of stakeholders in the disclosure of the economic dimension comprises the demonstration of the contribution of the organization for the sustainability of the economic systems in which the organization operates, and not only a demonstration of its own economic sustainability.

We suppose that, at least in the economic and financial aspects, the information systems are more suitable to the demands of the SR, since the main emphasis of companies over time has been to demonstrate their financial performance. Moreover, in Brazil, a *Statement of Value Added* in Portuguese (DVA) has been a mandatory disclosure report since 2008 (Brazil, 2007). The information in the DVA is similar to that requested by the GRI in the EC1 indicator (the comparison will be presented in section 2.3).

Thus, the economic performance indicators proposed by the GRI were expected to consist mostly of quantitative information verifiable with the financial information disclosed by the companies.

Therefore, in this study we investigated the adherence to the GRI Guidelines in the disclosure of economic performance indicators of a sample of companies in the Brazilian energy sector in the year 2010¹. The adherence analysis proposed in this research consists in the verification of compliance with clarity (*CL*) and accuracy (*AC*) aspects (GRI, 2006). These quality requisites are verified with the use of the content analysis, which is explained in details to allow the understanding of the inferences obtained from its application in the SR (Bouten et al. 2011). The information SR reported was categorized as follows: Conform (C);

¹ This work is a partial result of Research Project 2010/18007-3 called "Corporate Sustainability: Evaluation of the Economic, Social and Environmental Equilibrium of Brazilian Companies", funded by the São Paulo Research Foundation – FAPESP. We have been working on the collection of indicators of companies from several sectors of the economy (Energy, Energy Utilities, Mining, Paper and Cellulose). The collection comprises the indicators of the three dimensions of the GRI. The team is made up of the coordinator, with four permanent research professors and students working periodically in the development of their scientific initiation works.

Non-Conformity (NC); Non-Informed (NI); Unavailable (UN); Non-Segmented (NS) and Non-Applicable (Nap). The C and NC categories considered the verification of CL and AC through a thematic analysis and the other categories were interpreted through a vocabulary analysis. A framework was defined for each indicator for verification of CL and AC. The CL verification takes into account the presentation and understanding of information, while AC is carried out through the confrontation with the information of disclosed financial statements. Data was collected by a team of coders from 2009 to 2012.

This study endeavours to contribute to the consideration and construction of integrated information systems to meet the needs of sustainability reporting. The article is organized as follows. Section 2 situates the role of the MCS in meeting the sustainability reporting; discusses the necessary quality attribute in the disclosures presented in the SR and comparatively examines the proposal of the GRI and the DVA. Section 3 describes the content analysis structure used to define the categories, frameworks and classification criteria of the disclosed information. Sections 4 and 5 show the non-adherence results and the discussion on the flaws in the disclosure and preparation of the information and propose further research developments.

2. Literature Review

2.1 Management Control Systems for Sustainability

Several authors have presented their definitions and hold different understandings of management control systems (MCS): from Anthony (1965) to Ferreira and Otley (2009) with Otley and Berry (1980), Simons (1995), Malmi and Brown (2008) and others in between, just to name a few (for a recent review see Berry et al. 2009). They developed their frameworks to help analysing, understanding and implementing organizational controls. Their approaches give differential emphasis to the various elements (Berry et al., 1995).

Antony's framework (1965) has been responsible for the usual notion of management controls. However, his work has been criticized for overemphasizing accounting based controls (Otley, 2005). More recent MCS propositions include other types beyond accounting controls. Management accounting, along with financial accounting and reporting, is one type among a range of management controls. The concept of control "has evolved over the years from one focusing on the provision of more formal, financially quantifiable information to assist managerial decision making to one that embraces a much broader scope of information" (Chenhall, 2003).

Simons (1995) affirmed that control in organizations is achieved in many ways, from direct surveillance to feedback systems to social and cultural controls. Simons et al (2000) defined management control systems as "routines and formal procedures, based on information, used by managers to maintain or to change organizational patterns of activity". Simons (1995) claims that his 'levers of control' model is "a comprehensive theory illustrating how managers control strategy using four basic levers: beliefs systems, boundary systems, diagnostic control systems, and interactive control systems" (Simons, 1995, p.4). Companies use these systems to implement and monitor strategies, but MCS can be more proactive: influencing strategies (Dent, 1990) and eventually pointing new directions (Hopwood, 1987). So they might influence behaviour and the distribution of resources in organizations.

Although control is often associated with the idea of dominance through the exercise of power, there is also other meaning that emphasizes the idea of regulation and monitoring of activities (Otley and Berry, 1980). In the latter sense, management control can be described as things the managers do to ensure that their organizations perform well against their objectives. Merchant and Otley (2007, p.785) affirmed "[a]n organization that 'in control' is likely to achieve good performance against its objectives, regardless of whether these objectives are to maximize shareholder returns, heal the sick, or educate the young." Today

these shall include efforts to meet stakeholders' interests and the search for sustainability. How to conciliate the different stakeholders' interests with regard to the three different TBL dimensions and at the same time achieve the company's strategic objectives? This is the challenge organizations have been facing. It is an opportune time to make sure management control systems in operation contain the information required to accomplish the mission and as part of the organization's accountability (Epstein and Birchard, 2000).

Nevertheless, the literature in MCS linked to sustainability is scarce: either applying MCS theories/models or empirical studies focusing on sustainability within companies (Adams, 2002; Norris and O'Dwyer, 2004; Schaltegger and Wagner, 2006; Epstein and Wisner, 2005; Bonacchi and Rinaldi, 2007; Durden, 2008; López-Valeiras et al, 2009; Perego and Hartmann, 2009; Riccaboni and Leone, 2010; Albelda, 2011; Cintra and Carter, 2012; Gond et al. 2012).

There has been calls for MCS studies in these emerging fields (Otley et al, 1995; Berry et al, 2009) and for a more active participation of the management accounting discipline to engage with companies and implement sustainability accounting and management controls for sustainability (Adams, 2002; Adams and Larrinaga-González, 2007; Durden, 2008; Skouloudis et al., 2009; Cintra and Carter, 2012).

The TBL and sustainability accounting

Blowfield and Murray (2008, p. 403) define the TBL as "a framework for measuring company performance and added value, in terms of economic, social, and environmental parameters". They see the triple bottom line accounting as "an extension of the conventional financial accounting framework to measure these additional areas of performance". On the other hand, Ball (2002) believes that sustainability accounting "encompasses a range of new accounting and reporting tools and approaches" for a different type of decision-making that focus on ecological and social sustainability, in addition to the most usual economic rationality. Moreover, sustainability is an interdisciplinary subject and requires strong interaction among several knowledge fields. The importance of a sustainability accounting relies on what Schaltegger et al. (2006) argued: "if accounting collects information on, analyzes and communicates companies' sustainability, it becomes a trigger for sustainability management".

There have been emerging attempts to define methodologies for social and environmental performance evaluation and reporting. At least 30 standards, codes, and metrics have been created to assess and measure social and environmental performance of corporations (Hawken, 2004, p. 28). Lately, SR has become very popular. According to Lozano (2013), SR mushroomed worldwide: from around twenty (1992) to over three thousand disclosed reports (2008). The GRI Guidelines have emerged as the most accepted and used global guidelines for corporate SR. In 2012, according to GRI Sustainability Database, 2.698 reports used GRI Guidelines in any of its versions (GRI, 2013a).

In line with the TBL framework, a SR is an organizational report that gives information about economic, environmental, social and governance performance. It is an important tool for the accountability of the organizations, and a platform for communicating positive and negative sustainability impacts to the society. It also helps companies to set their goals, measure their performance, and manage change. Information can also be provided regularly to senior decision makers to shape company strategy and policy, and improve performance (GRI, 2013b).

There is considerable critique to the TBL model and SR, such as new dressing to old concepts; difficulties to operate the concept objectively; a way of manipulating the company's image showing good results only; empty discourses, among others (Norman & MacDonald, 2004; Gray, 2006; Moneva et al, 2006; Deegan, 2007). To the extent that aggregately everything we produce under current production systems is unsustainable, it

would be more appropriate to call the reports ‘unsustainability reports’, claims Gray (2010). In addition, GRI standards are criticised for being too complex, applying misleading scientific theories and holding no consistency among the sections of indicators (Tilt, 2009). Imperfect as it may be, the TBL model has introduced the sustainability subject by using a language recognized by the business world . The SR has been able to create and improve consciousness in the business community. Nevertheless, even considered as a mere legitimization tool, the discourse contained in those reports is capable of transforming social reality (Phillips et al, 2004). One of the deeds of a SR is the cultural cognitive change towards sustainable development it triggers. This may be initiated by external pressures demanding changes, and critical reflections internal to the organisation started up by exposure to sustainability values and indicators brought by the SR (Hess, 2008). Sustainability information and reporting need to be integrated with regular management information systems as Gray et al (1996, p.218) claims “[i]nternal social and environmental information systems, if properly integrated with the conventional economic systems, may lead to changes in the organisational culture”. They also understand that human-centred values need to be in some way internalized in the organization and integrated into the existing performance appraisal systems.

2.2 Quality of SR Disclosure

Even though the GRI presents a structure consistently and objectively created in view of the needs of the multiple stakeholders (since they take part in these definitions), several studies (Leszczynska, 2012; Bouten et al, 2011) have questioned whether there are quality attributes in the disclosures made in the SR of the companies. Information quality is needed to allow stakeholders to be able to make a reasonable analysis of the organization's performance and, thus, take appropriate decisions (GRI, 2006). Lambertson (2005) discusses the qualitative attributes of the information reported in the SR and understands that the attributes defined by the GRI (already defined in the first 2004 version) are equivalent to those prescribed for the Financial Accounting data. In addition to the overall attributes of the report, such as transparency, inclusiveness, and auditability, the GRI Guidelines presents the principles that should be followed by companies to ensure the quality of the information reported (Table 1):

Principle	Definition
Balance	The report should reflect positive and negative aspects of the organization’s performance to enable a reasoned assessment of overall performance.
Comparability	Issues and information should be selected, compiled, and reported consistently. Reported information should be presented in a manner that enables stakeholders to analyze changes in the organization’s performance over time, and support analysis relative to other organizations.
Accuracy	The reported information should be sufficiently accurate and detailed for stakeholders to assess the reporting organization’s performance.
Timeliness	Reporting occurs on a regular schedule and information is available in time for stakeholders to make informed decisions.
Clarity	Information should be made available in a manner that is understandable and accessible to stakeholders using the report.
Reliability	Information and processes used in the preparation of a report should be gathered, recorded, compiled, analyzed, and disclosed in a way that could be subject to examination and that establishes the quality and materiality of the information.

Table 1: Information Quality Principles in the SR
Source: GRI (2006)

For each attribute there is a set of tests that should be applied by the companies to guarantee the quality both in the preparation process and the reported information. In the disclosure analysis work, the quality attributes have been discussed in a quantitative approach. In general, the authors try to verify the level of compliance or adherence to the GRI propositions by using the content analysis technique (Deegan and Rankin, 1997; Castro et al, 2010; Dias, 2007, Carvalho, 2006) under the perspective of some or several groups of stakeholders. The

results show percentages of different items disclosed from one year to the other; the measurement of the disclosure extension and the number of positive and negative disclosures by counting items, numbers of words, sentences or pages. Toms (2002) apud Bouten et al. (2011, p.190) argues that “that investigating only the volume of CSR disclosures is potentially misleading when it is the quality of disclosure that is important.”

In our opinion, accuracy and clarity are attributes that require a higher level of rigor to verify its quality from the vision of the stakeholders. Accuracy concerns data measurement and is commonly employed in monetary quantitative information. It concerns (GRI 2006) the suitability of the techniques and calculations to describe and reapply the reported numbers; the use of estimates and error margins that do not compromise the conclusions on performance; the validity of the information in other bases available or reports disclosed by the organization. Clarity is an attribute that depends on the effort of an organization to comprehend and be willing to present what is necessary to inform in an understandable manner. It also depends strongly on the level of knowledge of the audience interested in the information. These attributes confer objectivity to the information and, from an accountability perspective, Gray (2006) points out that the SR should provide objective information that allows stakeholders to make a reliable estimate of the organization’s social and environmental performance.

A parameter that indicates quality in the preparation of the SR is the statement of application level (GRI, 2006). However, it is important to make clear that this classification represents an adherence degree to the form, but no verification is made about the content of the information reported. The GRI reinforces the meaning assigned to the application levels: “They do not give an opinion on the sustainability performance of the reporting organization, the quality of the report, or on formal compliance with the G3 or G3.1 Guidelines” (GRI, 2006).

The qualitative verification approach of the quality attributes in the SR has been used in academic research, but its results are difficult to be compared due to the different approaches, concepts and methodologies employed.

Another problem with the preparation of the SR disclosure reports claiming to have used content analysis is the lack of detailing of procedures to allow the comprehension of the results found. Bouten et al (2011) refer to this problem “many content analysis studies do not provide sufficient information to enable others to understand how the content analysis has been conducted”. It is very difficult to understand the results of these researchers, since they present statistics or percentages based on each one of the items disclosed. However, an accurate analysis of the information requested, for example, for each one of the GRI performance indicators makes us comprehend that, in order to meet the proposition, a set of information must be disclosed. Thus, the procedures for analysis of the quantity or quality of the disclosed information, as well as for other derived analyses, must take into account the openness of these indicators in number of detailed information, otherwise, it is not possible to analyse adherence or comparability between companies. In Brazil, some papers have addressed this concern (Fernandes et al, 2010), but we have not identified any papers in the foreign literature discussing this aspect.

2.3 Statement of Value Added (DVA) in Brazil and the EC1 indicator

In the EC1 indicator, the GRI Guidelines propose the presentation of a table (EVG&D) with information on the direct economic value generated (EVG), composed by revenues, and the economic value distributed (EVD), composed by the sum of the operating costs; employee wages and benefits; payments to providers of capital; payments to government and community investments. The difference between EVG and EVD is the economic value retained (EVR). According to the GRI, the purpose of the information is to indicate “how the organization has created wealth for stakeholders”.

In Brazil, companies have been submitting a *Statement of Value Added* in Portuguese (DVA) to report the information of the EVG&D table in the SR. The DVA is an accounting report aimed at evidencing the contribution of companies for the formation of the local economic wealth and the way such wealth is distributed among the agents that contributed to its achievement. Thus, it is regarded as an efficient instrument to reflect the economic facet of the sustainability triad, which is made up of the social, environmental and economic aspects. According to Hopwood (1976, p.1), “a great deal of the consequent work on social accounting is expressed in the possibility of measuring the economic performance of business enterprises in terms of added value and reporting on the distribution of the added value amongst all the stakeholders in the enterprise.”

In Brazil, the DVA started to be academically studied in the mid-1990s (De Lucca, 1996, 1998). From 1997, the business periodical *Exame*² started to stimulate its preparation by companies interested in good classifications in the periodical’s yearbook. The periodical’s initiative was successful and, in 2008 (Brazil, 2007), when it became mandatory for public corporations, it was not a novelty and, therefore, there were no disputes against the legal constraints. The Brazilian Accounting Pronouncements Committee³ (CPC) issued the standard CPC 09 (Comitê de Pronunciamentos Contábeis [CPC], 2008a) with the purpose of reaching other companies in addition to public corporations. Although the Brazilian proposal is to follow strictly the standards established by the International Accounting Standard Board (IASB), the CPC 09 on the statement of value added and the CPC 12 on the adjustment to current value are the only standards specific to Brazil for reflecting characteristics peculiar to the Brazilian reality and widely used during implementation of international standards. The approval term of the said CPC 09 states that the IASB does not require, but jointly with the United Nations Organization (UNO), encourages the use of the DVA (CPC, 2008b).

A synthesis of the model defined by the said entity is shown in Table 2.

DESCRIPTION	Thousands of Reais (R\$) 20X1	Thousands of Reais (R\$) 20X0
1 – Revenues		
2 – Input Acquired from Third Parties		
3 – Gross Added Value (1-2)		
4 – Depreciation, Amortization and Depletion		
5 – Net Added Value Produced by the Entity (3-4)		
6 – Added Value Received in Transfer		
7 – Total Added Value to Distribute (5+6)		
8 – Added Value Distribution		
8.1) Personnel		
8.2) Taxes, charges and contributions		
8.3) Remuneration of third party capital		
8.4) Remuneration of Own Capital		

Table 2: Statement of Value Added (SVA)

Source: Adapted from the CPC 09

Revenues include the total of sales made in each period with the respective taxes incurring on these revenues. Inputs and services acquired from third parties comprise acquisitions of raw materials, merchandise, materials, energy, services and others, not including expenses with own personnel. The gross added value is the difference between revenues and input acquired from third parties, and spent with the purpose of meeting the goal the company has committed itself to and that will create conditions to generate sales revenue. The value thus obtained, plus the added value received in transfer may be thus distributed: (i) to employees

² *Exame* is a business periodical published by Editora Abril. Since 1997, the periodical *Exame* has published the yearbook of the Best and Biggest companies in Brazil based on information from the DVA.

³ The CPC is the Brazilian Accounting Pronouncements Committee, created in 2005, to promote the convergence of the Brazilian accounting standards into the international standards developed by the International Accounting Standard Board (IASB).

(Personnel); (ii) to the government (Taxes, charges and contributions); (iii) holders of the capital made available to the company, such as third-party owners of personal property, real estate and financial resources (remuneration of third-party capital); and (iv) to shareholders (remuneration of own capital). The added value received in transfer represents the wealth not created by the entity itself, but by third parties, to which it is transferred. It includes the result of equity, financial revenues and other revenues, such as dividends related to investments assessed with regard to cost, rentals, royalties, and others.

The users of the information contained in the said statement may be varied; all of them with a different interest in the continuity of the organization in question: employees are concerned about the labour relation, mainly their salaries; the government is specially interested in collecting taxes; capital holders want to be remunerated; and all of this is possible only if the company is capable of adding value to the economy; otherwise, it will be consuming the assets generated in previous periods.

In addition to the DVA recently instituted, other statements are mandatory in Brazil: balance sheet (BS) and Explanatory Notes (EN), income statement (IC), statement of owner's equity (SOE) and cash flow statement (CFS).

In comparison with the information requested by the GRI in the EVG&D table, the DVA presents some differences in the form of presentation and composition of the items. The item Revenues includes, in addition to sales revenues, revenues from values received in transfer (in the DVA terminology). The item operational costs include, in addition to third party input, depreciation, amortization and depletion items, rentals and royalties paid, which are included in remuneration of third-parties' capital according to the DVA. The items remuneration of own capital and remuneration of third party capital are requested by the GRI in one sole item named "capital providers".

The most relevant difference concerns investments in the community, whose value is not mentioned or highlighted in the DVA, as requested in the GRI.

Investment in the community comprises voluntary contributions and contributions to the community funds. It includes voluntary donations and investments of resources in the community, with beneficiaries external to the company. They include contributions to charities, NGOs and research institutes (not related to the company's Research and Development department), resources to support community infrastructure projects (ex.: recreational areas) and direct costs of social programs (including artistic and educational events). The values included must represent the actual expenses in the period covered by the report, but not the liabilities. Note that the companies disclosing in the *ECI* the DVA statement will not have this item because the DVA does not contemplate this information.

Also, the EVR, in the view of the GRI, does not correspond to the zero difference between the added value and the value distributed according to the DVA. In the GRI, due to composition differences, this difference may be positive.

3. Research Method

3.1. The sample

This paper analyses the disclosure of Brazilian companies in the Energy sector that disclosed, in the year 2011, the SR referring to their activities in the year 2010 based on the guidelines of the GRI G3 Protocol. In general, access is also possible through the area of relationship with investors, in the same block where annual reports, financial analysis reports and financial statements are presented.

The sample defined for this research is made up of 7 companies, at a total of 15 companies with disclosure registered in 2011 in the Energy sector (GRI, 2013a). Companies of the sugar and ethanol sector were excluded because their reports are presented in crop plans and not in

an annual basis. The characterization of the sample and the classification of its level of application in the GRI are shown in Table 3.

Company	GRI Application Level	Description
Oil and Gas Sector		
1.Petrobrás	A+	Petrobrás is the world's 3 rd largest energy company with average daily production of 2.6 million barrels of oil.
2.Comgás	C	Comgás is Brazil's largest piped natural gas distributor. It distributed 4.9 billion m ³ of gas in 2010, which represents a share of one fourth of the domestic market.
Electric Power Sector		
3.Itaipu Binacional	A+	Itaipu Binacional is the world's largest hydroelectric power plant. In 2010 the company's total energy production was 87,970 GWh.
4.Red de Empresas Energia	B	Rede de Energia is a holding with direct and indirect control of nine electric power distributors, one electric power plant, one trader and one service provider. It holds a concession for electric power distribution in 2,787,107 km ² , corresponding to 34% of the national territory.
5.Tractebel Energia	A+	Tractebel owns an industrial park with installed capacity of 6,472.0 MWh, equivalent to about 6.6% of Brazil's total installed capacity. It is made up of eight hydroelectric power plants, six thermal power stations and seven complementary plants.
6.EDP Energias do Brasil	A+	EDP in Brazil obtains businesses organized in generation, distribution and commercialization of energy. The generation assets amount an installed capacity of 1,741 MWh.
7. Furnas Centrais Elétricas	Undeclared	Furnas is in charge of approximately 40% of the energy produced in Brazil. It has an electric power generation complex with 15 hydroelectric power plants and two thermal power stations. The transmission system has 20 thousand kilometers of transmission lines.

Table 3 – Characterization of the Sample Companies

3.2 The Method of Content Analysis

In order to analyse the level of compliance and quality in the disclosure of economic indicators in the SR of companies in the Energy sector in Brazil, a content analysis framework was developed. According to Guthrie et al (2004, p.287), the content analysis is a “technique for gathering data, it involves codifying qualitative and quantitative information into pre-defined categories in order to derive patterns in the presentation and reporting of information”.

Guthrie and Mathews (1985), Milne and Adler (1999) and Guthrie et al (2004) discuss the technical requirements to guarantee effectiveness in the application of content analysis: the categories for information classification must be clearly and operationally defined; there must be objectivity in the criteria defined to decide whether or not a piece of information belongs to a category; the information must be quantifiable and there must be a process to demonstrate the reliability of the instruments used or the results achieved with application of those instruments.

As pointed out by Bouten et al. (2011), it has been also observed in the Brazilian reality that researchers fail to appropriately explain how they content analysis application was carried out. Thus, the following sections present details on the procedures developed in this research⁴ so as to define the categories and criteria for classification of the information, its quantification, as well as the validation process of the content analysis application.

3.2.1 Coding Structure

Figures 1 and 2 present the coding structure defined in two parts: (i) Content and (ii) Information Type. The Content dimension (Fig. 1) has 3 levels, with the first two derived from the option of adopting the GRI as reference. Level 1 corresponds to the Economic dimension and level 2, to the EC1 to EC9 indicators of the performance indicators structured

⁴ Based in Bouten et al (2011) Research Method section.

proposed by the GRI to represent the Economic dimension. The GRI performance indicators are subdivided into three aspects: economic performance (*EC1* to *EC4*); market presence (*EC5* to *EC7*) and indirect economic impacts (*EC8* to *EC9*). The category of economic performance indicators aims to identify and measure the distribution of the wealth generated by the organization to its relationship audiences. The category of market presence seeks to demonstrate the interaction of the organization with the local community with regard to practices for salaries, hiring employees and suppliers. The category of indirect economic impacts aims to demonstrate the level of investments and services offered to the community, as well as the comprehension of the needs and impacts created as a result of the organization's economic activities.

Level 3, referred to as sub-indicators, was built from the application of the content analysis in the text of the GRI Guidelines, as detailed in the following section.

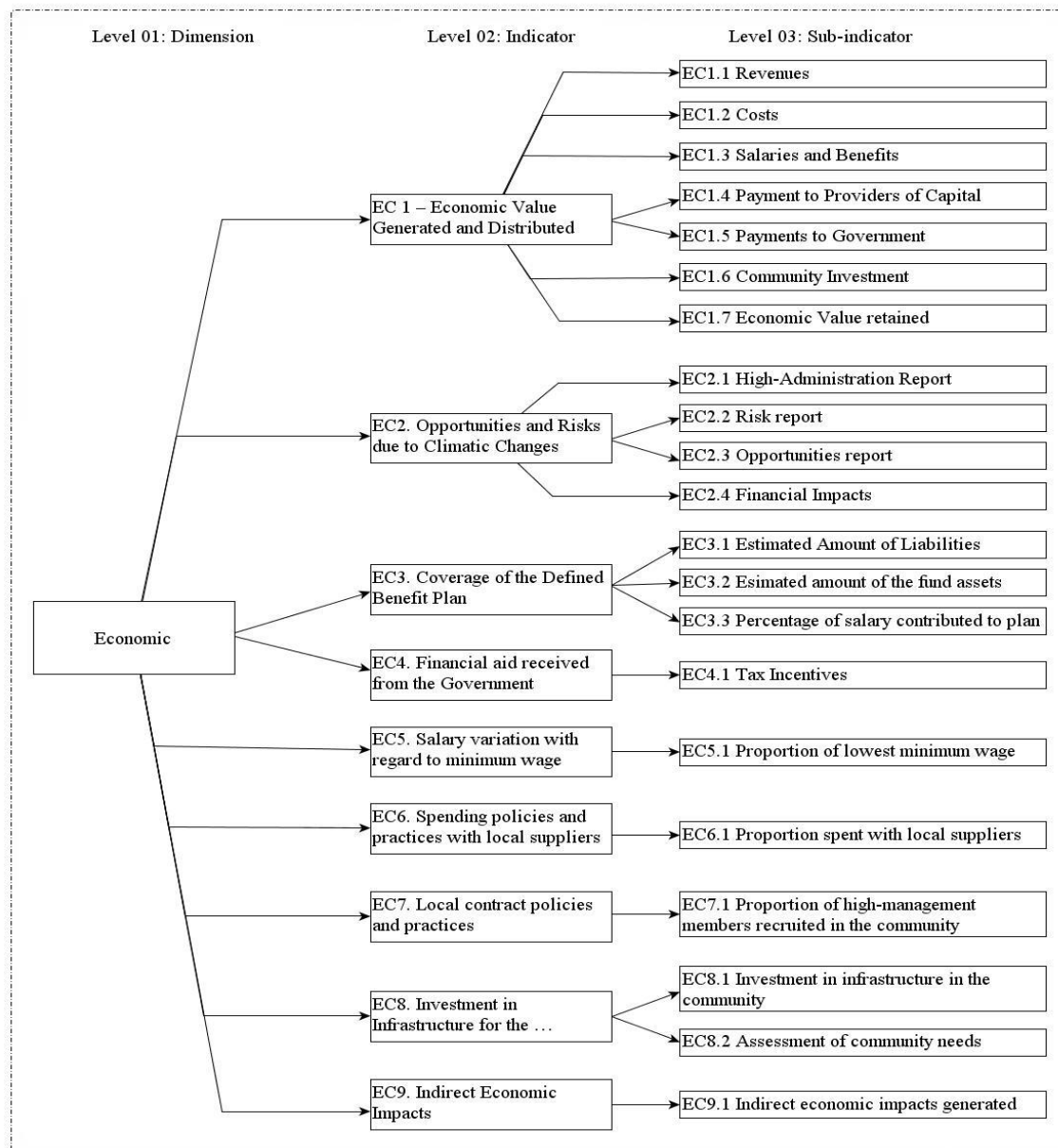


Figure 1: Content Coding Structure

The Information Type dimension (Fig.2) presents the coding of the level 3 information in the Quality category, which is represented by the Clarity (*CL*) and Accuracy (*AC*) attributes. These attributes were defined from the information quality principles presented in the GRI

Guidelines (GRI, 2006) to ensure quality to the information reported by the companies. The Balance, Comparability, Timeliness and Reliability principles are also defined by the GRI. In this research we have decided to analyse only the *CL* and *AC* principles because they are more aligned with the purpose of the performance analysis and can define more operational criteria when one proposes to do this analysis from an external view, as is the case of this research. The other criteria require the collection of internal information about the preparation of reports, which are not part of the external disclosure proposition of the GRI. Level 3 information is coded in the Adherence category, which is represented by the attributes Conform (*Cf*); Non-Conformity (*NCf*); Non-Informed (*NI*); Unavailable (*UN*); Non-Segmented (*NS*) and Non-Applicable (*Nap*). Finally, from the Quality and Adherence coding of sub-indicators, the Economic dimension is classified as Adherent (*Adh*) and Non-Adherent (*NAdh*).

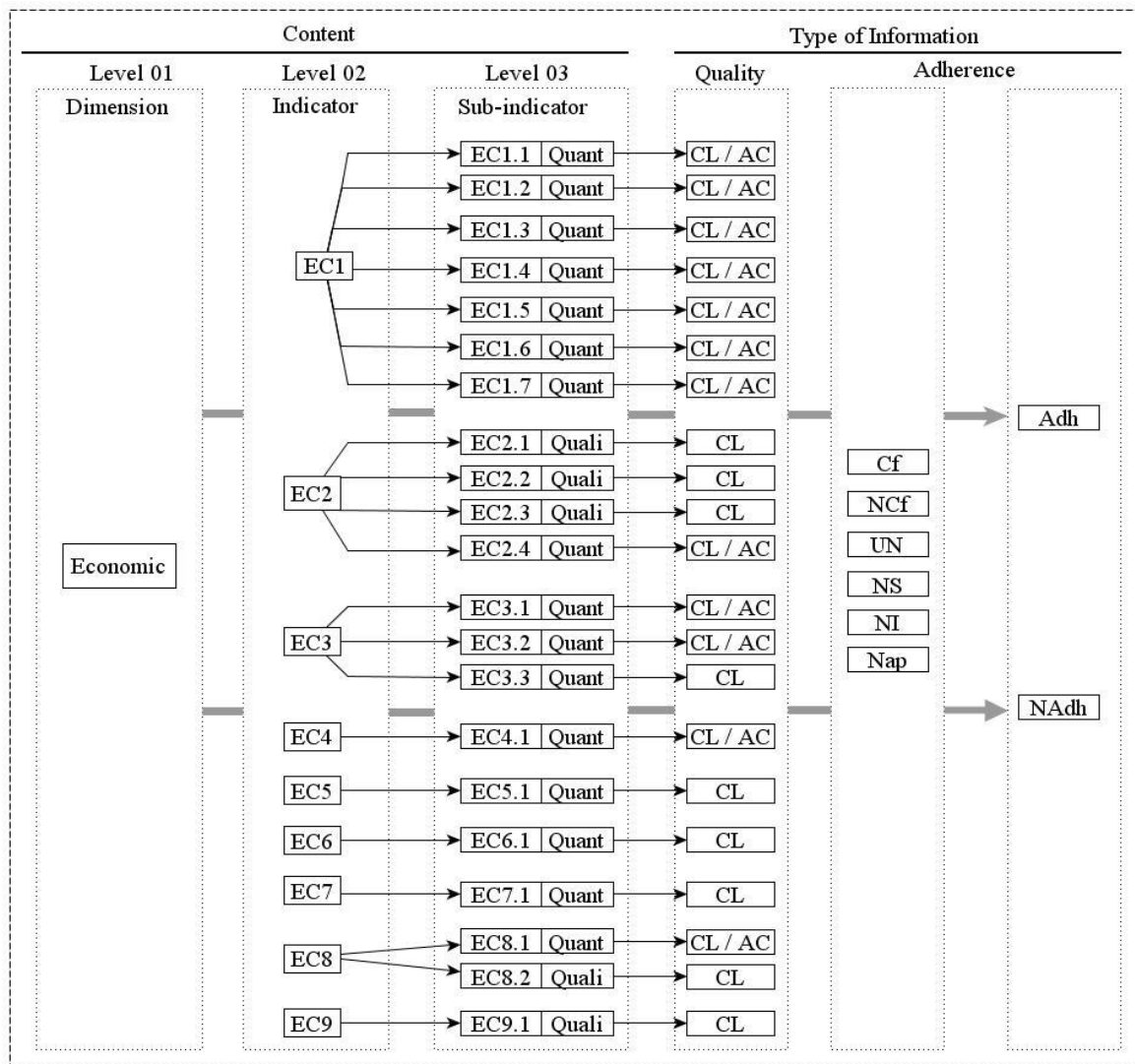


Figure 2: Types of Information

The use of the GRI indicators framework is justified by the following (i) it is an internationally-used methodology; (ii) it offers a standard that allows reporting analysis of companies of any size, sector and location; (iii) the definition of the indicators is influenced by multiple stakeholders.

No distinction has been made between core and additional indicators (EC5 e EC9), for we consider the complete GRI framework to be an ideal disclosure standard. In this case,

disclosure quantification must demonstrate whether the companies are close to or far from this standard.

3.2.2 Codification of Sub-indicators

The codification of the opening of indicators into sub-indicators corresponds to a segregation of information that must be reported in each one of the indicators (EC1 to EC9). This means that each indicator does not correspond to one sole piece of information. In most of them, a set of information is required to comply with the GRI proposal. It is important to highlight that the Indicator Protocol, attached to the document Sustainability Reporting Guidelines provides definitions, compilation guidance, and other information aimed to assist report preparers and to ensure consistency in the interpretation of the Performance Indicators (GRI, 2006). For each indicator, the text is subdivided into the following topics: Relevance (highlights the importance of the indicator in the CSR context); Compilation (explains how to obtain information about the indicator and what must be reported about it); Definitions (defines the terms used in the Compilation); Documentation (indicates in which of the company's documents the information may be founded) and References (provides international standards and rules that may be consulted).

However, the item Compilation is a continuous text requiring a more detailed analysis in order to understand "what" must be reported, since it includes conditional terms: "It is recommended"; "Should be presented"; "Explain"; "Report"; "Identify"; "Indicate"; "Show"; "Relate"; "must be ..". Therefore, we used the vocabulary analysis technique in the text of the Indicator Protocol and the codification of the openings of the indicators was carried out with the use only of words in the imperative form: "Report"; "Indicate"; "Explain", "Show", "Relate", "must be..."). The result of the application is shown in Fig. 1 (level 3).

3.2.3 Construction of the Quality Category

The Quality category is represented by the *CL* and *AC* attributes. As illustrated in Fig. 2, all sub-indicators were evaluated through the *CL* attribute and only the monetary quantitative sub-indicators were evaluated through the *AC* attribute.

The *CL* is defined in the GRI Protocol as "information [that] should be made available in a manner that is understandable and accessible to stakeholders using the report". Each of the Principles has a set of tests to guide its use and work as a self-diagnosis tool for the reporting organizations. From the description of the tests, the following aspects were considered to define a framework (*FR*) for each one of the indicators: i) The information may be found without unreasonable effort; (ii) The information is presented with the use of abbreviations, words or technical terms that are comprehensible to stakeholders who have a reasonable understanding of the organization; (iii) The information is organized in graphs and tables which help make the report understandable; and (iv) The level of aggregation of the information is comprehensible or explained in the text.

In this case, we have used the theme analysis, as explained by Bardin (2011). Considering the clarity of each level-2 indicator as a Theme, questions were prepared to be answered by a team of coders (answers: Yes or No). The questions, in their affirmative wording, represent an *FR* for a *CL*. As an example, Table 4 presents the *FR* for the EC8 indicator.

The *AC* is defined in the GRI Guidelines (GRI, 2006) as "reported information [that] should be sufficiently accurate and detailed for stakeholders to assess the reporting organization's performance." However, the document explains that the characteristics that determine *AC* vary when the information is qualitative or quantitative. The *AC* of the qualitative information depends on the degree of clarity, detailing and balancing of the information. The *AC* of the quantitative information depends on the methods used by the organization to collect, compile and analyse the information.

Indicator	THEME: Sub-indicator Clarity	Questions to verify Clarity (Y/N)
EC8	<p>EC8.1 Investments or costs in infrastructure or services for local communities or economies</p> <p>EC8.2 Evaluation of the needs of local communities or economies</p>	<p>EC8.1.1 Describes the infrastructure projects or services for a local communities or economies</p> <p>EC8.1.2 Reports the amount of investments or costs in infrastructure or services for local communities or economies.</p> <p>EC8.1.3 Reports the duration of investments or costs in infrastructure or services for local communities or economies.</p> <p>EC8.1.4. Describes whether the investments or services represent a commercial engagement, in-kind or pro bono.</p> <p>EC8.2.1. Describes whether the organization carried out an evaluation of the needs of the community with regard to infrastructure and other services.</p> <p>EC8.2.2. Describes the result of the evaluation.</p>

Table 4: Framework (FR) of the EC8 indicator for the Clarity (CL) Category

The description of the tests, as presented in the GRI Guidelines (GRI, 2006), was considered to define a FR for the monetary quantitative indicators. In this case, we have used the theme analysis, according to Bardin (2011), considering the accuracy of each level-3 monetary quantitative indicator as a theme. Thus, questions were prepared to be answered by the team of coders with affirmative wording representing an FR for the AC. The questions considered the possibility of validation of the monetary quantitative information in the financial reports of mandatory disclosure in Brazil (Income Statement, Balance Sheet, Accompanying Note and Statement of Value Added). Since we are carrying out this analysis from the accounting researchers, these stakeholders are expected to have a suitable level of understanding to (i) analyse the composition differences of each type of report; (ii) reproduce and/or replicate the information requested by the GRI Guidelines, and (iii) analyse whether there are significant variations that may influence the evaluation of the information. As an example, the FR defined for sub-indicator EC8.1 is presented in Table 5.

Indicator	THEME: Accuracy of the Sub-indicator	Questions for accuracy verification (Y/N)
EC8	<p>EC8.1 Investments or costs in infrastructure or services for a local community or economy</p> <p>EC8.1.2 Reports the amount of investments or costs in infrastructure or services for local communities or economies.</p>	<p>EC8.1.2.1 The data were found in the financial statements mandatorily disclosed. and</p> <p>EC8.1.2.2 The data found were sufficient to replicate (reproduce) the information disclosed in the CRS Reporting. and</p> <p>EC8.1.2.3 The data doesn't present significant variation with regard to the data disclosed in other statements.</p>

Table 5: Framework (RF) of the EC8 indicator for the Accuracy (AC) Category.

While the *CL* may be represented by an index, representing a degree of *CL*, we understand that the *AC* evaluation requires a binary response (Y:Yes or N:No). Thus, the evaluation questions are linked by the connective “AND”, that is, the sub-indicator must comply with all the RF conditions to obtain an *AC* classification. The *AC* characteristics of the qualitative information are covered mostly by the *CL* attribute and, for non-monetary quantitative information, there are no proper comparison parameters in mandatory-disclosure reports. Therefore, all quantitative and qualitative sub-indicators were evaluated through the *CL* attribute and only the monetary quantitative sub-indicators were evaluated through the *AC* attribute.

3.2.4 Identifying and Quantifying the SR Disclosure

Indexes are commonly used to quantify the disclosure in the SR. Marston and Shrivs (1991, p. 208) conclude that “measuring company information disclosure cannot be carried out in a precise scientific way. Researcher subjectivity cannot be completely removed, nor is it

reasonable to expect that it can be. The value of the resulting disclosure scores and their subsequent use in testing hypotheses cannot, therefore, be viewed uncritically. The efforts of the researcher to minimize subjectivity and design a more objective disclosure index are of relevance here.”

In this study, we have defined that adherence or non-adherence are classifications related to the current level of compliance of the organization with the GRI Guidelines with regard to their AC and CL degree in the disclosure of information. For this purpose, the *Adh* or *NAdh* classification in the Economic dimension was created in two steps through a quantification process of the sub-indicators constituting this dimension. In the first, the (level 3) sub-indicators are categorized and, in the second, the (level 1) dimension is quantified.

1st Step – Quality Quantification and Adherence of Sub-indicators

All sub-indicators were quantified, pursuant to their type, in the *CL* and *AC* attributes through a *CL* (I_{CL}) index and an *AC* (In_{AC} : *Y* or *N*) indicator. Based on pre-defined decision criteria, the sub-indicators were classified in *Cf*, *NCf*, *NI*, *UN*, *NS* and *Nap*. The description of the characteristics of these attributes is presented in Table 6.

Attributes	Description of the Characteristics
Conform (<i>Cf</i>)	Fully conforms to what is requested by the GRI without the need of extra calculations or search in other parts of the report in addition to the summary information. For monetary indicators, corresponds to what is indicated or informed in the accounting reports.
Non-Conformity (<i>NCf</i>)	The information is presented but does not correspond to what is requested by the GRI. There may be non-conformity with regard to the scale, unit, content, concept, or when the information is present, there is the need of extra calculations to obtain what is requested by the GRI or search in other parts of the report. Does not correspond to what is informed in accounting reports.
Non-Informed (<i>NI</i>)	Does not present the indicator in the Summary or mention any information regarding the indicator in the page informed in the Summary.
Non-Segmented (<i>NS</i>)	The Company informs that the information is not yet prepared or assessed, but that it will be available after some process or specific system implementation.
Unavailable (<i>UN</i>)	Informed by the company as unavailable information, providing the reason, which may be: secrecy; strategic information (market, competition); dependent on other governmental agencies under which the Company does not have authority with regard to the information.
Non-Applicable (<i>Nap</i>)	The Company communicates that the information does not apply to its business segment (the type of product does not exist or the type of situation requested, among others) or to the type of company (for example, a state-owned company which must participate in competitive biddings).

Table 6: Description of the Characteristics of the Adherence Attributes of the Sub-indicators

Table 7 presents the composition of the *CL* index, the *AC* indicator, as well as the decision criteria for classification of the sub-indicators in the quality and adherence category. The criterion to decide whether a level-3 sub-indicator is *Cf* or *NCf* involves the quantification of the *AC* and *CL* attributes for the respective sub-indicator. For monetary quantitative sub-indicators, the indicator is required to have a high *AC* degree and a high *CL* degree or a high *AC* degree and an average or low *CL* degree. The *AC* and *CL* degree is quantified according to the formulae and scales presented in Table 7. The choice of these criteria is justified by the fact that *CL* is a quality attribute that helps to interpret the information, but its absence may not compromise the comprehension of the figures required for the performance analysis by accounting researchers, in case the organization reported as *AC*. For non-monetary qualitative or quantitative indicators, the requirement is for them to have a high *CL* degree and any *AC* degree. This is justified by the fact that in this type of information there are no validation parameters in statements mandatorily disclosed.

The classification in the others (*NI*, *NS*, *UN*, *Nap*) is carried out through a vocabulary analysis, as described in Table 7.

Adherence	Quality	Decision Criteria	Index/Indicator	Scales
Conform (Cf)	Accuracy Y Clarity $0 \leq I_{CL} \leq 1,0$	Monetary Quantitative: Accuracy AND Clarity OR Accuracy and Non-Clarity	In_{AC} : Accuracy Indicator $In_{AC}: Y \text{ or } N$	Binary: Y: Yes, has accuracy N: No, does not have accuracy
	Clarity $I_{CL} \geq 0,6$	Qualitative or Non-Monetary Quantitative Clarity	I_{CL} : Clarity Index $I_{CL} = \frac{CL_y}{TQ_{CL} - TQ_{Nap} - TQ_{UN}}$	Interval: $I_{CL} \geq 0,6$: High $0,4 \leq I_{CL} < 0,6$ Average $I_{CL} < 0,4$ Low
Non-Conformity (Ncf)	Accuracy N Clarity $0 < I_{CL} < 1,0$	Monetary Quantitative: Non-Accuracy AND Clarity OR Non-Accuracy and Non-Clarity		
	Non-Clarity $I_{CL} < 0,6$	Qualitative or Non-Monetary Quantitative Non-Clarity		
Not Informed (NI)		Vocabulary analysis		
Non-Segmented (NS)		Vocabulary analysis		
Unavailable (UN)		Vocabulary analysis		
Non-Applicable (Nap)		Vocabulary analysis		

Legend: TQ_{CL} : Total of clarity questions; TQ_{Nap} : Total of non-applicable questions; TQ_{UN} : Total of inavailable questions

Table 7: Criteria for Classification of Quality and Adherence of Sub-indicators (SI)

Table 8 illustrates the classification of the sub-indicators of the EC8 indicator:

Indicator	Sub-indicator	Type	Index	Classification
EC8	EC8.1 Investments or costs in infrastructure or services for local communities or economies.	Quant	$In_{AC} = N$ $I_{CL} = 0,75$	<i>Ncf</i>
	EC 8.2. Description of the results of the evaluation of the needs of the community regarding infrastructure and other services.	Quali	$I_{CL} = 0,66$	<i>Cf</i>

Legend: I_{CL} : Clarity Index; In_{AC} : Accuracy Indicator; *Ncf*: Non-Conformity; *Cf*: Conform

Table 8: Adherence Classification of Sub-indicators EC8.1 and EC8.2

2nd Step – Adherence Quantification of the Economic Dimension

The quantification of the economic dimension is carried out through an Adherence (I_A) and Non-Adherence (I_{NA}) index and a decision scale. After classifying all level-3 sub-indicators, the quantification of the adherence and non-adherence degree of the Economic dimension (level 1) was performed according to the formulae and scales presented in Table 9.

The totals of sub-indicators defined by indicators *EC1* to *EC9* are considered, whereas the sub-indicators classified as *UN* and *Nap* are disregarded.

The adherence degree is defined by the proportion of the *Cf* information with regard to the valid information. The non-adherence degree is defined by the proportion of *Ncf*, *NI* and *NS* information in a total of valid information.

One parameter to analyse the scales, both *CL* and *Adh*, is the GRI application levels. To obtain the A level, all essential indicators must be reported or have their omission explained. The economic dimension comprises indicators *EC1* to *EC4* and *EC6* to *EC8*, which, according to the definition in this paper, correspond to 19 sub-indicators in a total of 21 (90.5%). The *Nap* and *UN* indicators are also being withdrawn from the calculation basis, since its omission was explained in the report. Thus, given the higher degree of disclosure requirement produced by this research, as a result of the rigour of analysis and detailing of the information requested by the GRI, we define a percentage over 60% as high adherence level.

Adherence Classification	Classification Criterion	Index/Indicator	Scale
ADHERENCE (Adh)	$I_A \geq 0,6$: High $0,4 \leq I_A < 0,6$: Average $I_A < 0,4$: Low	I_A: Adherence Index $I_A = \frac{T_{Cf}}{T_{SI} - T_{NAp} - T_{UN}}$	Interval: $0,6 \leq I_A$ or $I_{NA} \leq 1$ High $0,4 \leq I_A$ or $I_{NA} < 0,6$ Average $0 \leq I_A$ or $I_{NA} < 0,4$ Low
Non ADHERENCE (NAdh)	$I_{NA} \geq 0,6$: High $0,4 \leq I_{NA} < 0,6$: Average $I_{NA} < 0,4$: Low	I_{NA}: Non – Adherence Index $I_{NA} = \frac{T_{NCf} + T_{NS} + T_{NI}}{T_{SI} - T_{NAp} - T_{UN}}$	

Legend: T_{SI} : Total of sub-indicators (SI); T_{Cf} : Total of conform SI; T_{NCf} : Total of non-conformity SI; T_{NI} : Total of non-informed SI; T_{NS} : Total of segmented SI; T_{NAp} : Total of non-applicable SI; T_{UN} : Total of unavailable SI;

Table 9: Adherence Classification of the Economic Dimension

3.2.5 The Content Analysis Application Process

This section explains how the process of application of content analysis was developed. An important aspect is to demonstrate the codification reliability, which according to Milne and Adler (1999, pp. 238-239), may be reached in different ways: “The most usual ways in which this is achieved is by demonstrating the use of multiple coders and either reporting that the discrepancies between the coders are few, or that the discrepancies have been re-analysed and the differences resolved.” Moreover, according to the author, a good training could reduce the requirement of multiple coders and the execution of a pilot sample could guarantee the reliability of the coded data. Another way that may reduce the time and cost of procedures is to try to guarantee the reliability of the instruments and methods employed through the definition of categories and well-specified decision rules.

Fig. 3 illustrates the structure of the stages proposed by Bardin (2011, pp. 125-132) and the procedures (Proc) we developed in each stage of the application. The research team was made up of a main researcher (coordinator), senior researchers (3 professors) and a team of beginner researchers (7 students), who acted as coders. This team was constituted by undergraduate accounting students at FEARP USP working on scientific projects from 2009 to 2013. The team roles is shown in Fig. 3.

Therefore, in Proc 1, the following documents were chosen for the analysis:

- (i) GRI Guidelines (GRI, 2006): with the purpose of building the information codes, the content categories and their respective attributes, as described in sections 3.2.1 to 3.2.3;
- (ii) SR Reporting of the sample companies: with the purpose of obtaining inferences of the *CL* and *AC* degree about the indicators and the adherence degree of the Economic dimension.

In Proc 2, the definition of codes, categories and attributes was interactive, with the definition of the data record instruments (Proc 3) and application of the procedures by the team of researchers (Proc 6). The following instruments were built for registration of the data collected of the SR: (i) Opening form of the indicators in sub-indicators with a brief description of the information that should be analysed in each one of them. For that purpose, the coordinator used the vocabulary analysis technique; (ii) *FR* for *AC* and a form with questions referring to the standards of compliance of the references for each one of the sub-indicators. In turn, we used the vocabulary analysis technique; (iii) *FR* for *AC* and a form with questions referring to the standards of compliance of the references for each one of the sub-indicators. We used the theme analysis technique for this purpose; (iv) Classification form of sub-indicators into adherence and non-adherence attributes. For that purpose, the *CL* and *AC* indexes were used for the *Cf* and *NCf* classification and the vocabulary analysis technique was used for the other classifications (*NI*, *NS*, *UN*, *Nap*).

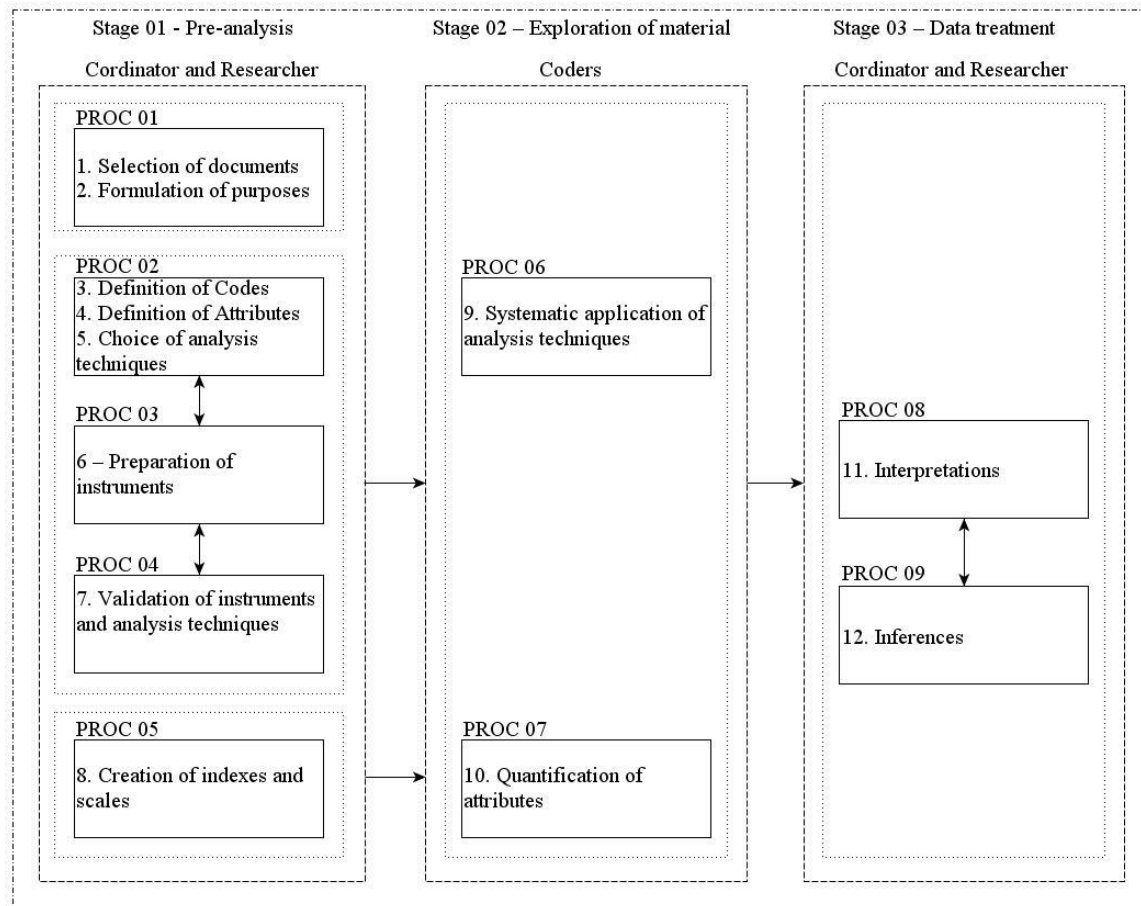


Figure 3: Content Analysis Application Process

The validation of the techniques used (Proc 4) was carried out in a repetitive process of data collection prepared by the coders. This process was developed for several sectors of the economy, at different times and by different students along the research term (2009 to 2013) (i)each coder analysed the SR of the companies of the same sector and, based on the reading of the GRI Guidelines, the adherence and non-adherence classification was performed. This classification was made without the support of any pre-defined instrument, and only a prior description of the attributes was given with no coding regarding the opening of the indicators; (ii) the group focus technique was used with the participation of the coordinator in order to discuss the results and comprehension of the coders; (iii) the coordinator prepared a version of the Opening Form of indicators into sub-indicators and the classification form of sub-indicators into adherence and non-adherence attributes; (iv) other coders repeated the collection in some companies and, once again, the focus group was held to enhance the instruments; (v) the coordinator developed the *FR* for the *CL*, the appropriate questions and explanations for the coders; (vi) the coders repeated the collection in some companies and, again, the focus group was held for adjustments; (viii) the Energy-sector codifier carried out, under the guidance of a senior researcher, an exploratory research in the financial reports with the purpose of confronting the monetary quantitative information; (viii) the coordinator developed the *FR* for the *AC* and the questions; (ix) the Energy-sector codifier carried out a the *AC* classification and reviewed the classification for adherence and non-adherence attributes; (x) the faults presented in the report were registered by the coder; (xi) a senior researcher analysed the faults found for interpretation and analysis of results.

In Proc 5, indexes and scales were created to quantify the collected data (Proc 7), which were used for inferences about the adherence or non-adherence of the Economic dimension, as

well as for derivative inferences regarding the *CL* and *AC* degree of the indicators and the interpretation of internal faults of the companies during the preparation of the reports (Proc 8 and 9).

4. Results

A total of 21 sub-indicators was analysed for each one of the companies. Altogether, 65 questions referring to *CL* were defined, of which 12 sub-indicators, corresponding to monetary quantitative information, were also analysed with regard to *AC* through 3 questions for each item, at a total of 36 *AC* questions. Table 10 summarizes the results and shows the numbers and general indexes obtained by the companies.

	<i>Sub-indicators</i>							<i>Questions</i>		<i>General Indexes</i>		
	T_{SI}	T_{Cf}	T_{NCF}	T_{NI}	T_{NS}	T_{Nap}	T_{UN}	TQ_{CL}	TQ_{AC}	I_{CL}	I_{AC}	I_{Adh}
Comgás	21	8	8	2	0	3	0	58	30	0,40	0,30	0,50
EDP	21	7	11	0	0	3	0	58	30	0,53	0,40	0,39
Itaipu	21	7	10	0	0	4	0	54	30	0,59	0,50	0,41
Petrobrás	21	10	7	3	0	1	0	61	36	0,59	0,33	0,50
Tractebel	21	5	11	2	0	3	0	58	30	0,33	0,20	0,28
Rede Energias	21	4	15	2	0	0	0	65	36	0,11	0,25	0,19
Furnas	21	2	11	7	0	1	0	57	36	0,13	0,08	0,10

Legend: T_{SI} : Total of sub-indicators (SI); T_{Cf} : Total of conform SI; T_{NCF} : Total of non-conformity SI; T_{NI} : Total of non-informed SI; T_{NS} : Total of segmented SI; T_{Nap} : Total of non-applicable SI; T_{UN} : Total of unavailable SI; TQ_{CL} : Total of clarity questions; TQ_{AC} : Total of accuracy questions; I_{CL} : Clarity Index; I_{AC} : Accuracy Index; I_{Adh} : Adherence Index

Table 10: Results of Sample Disclosure

5. Discussion of Results

5.1 Discussion on the non-adherence inference

According to Bardin (2011), the purpose of the application of the content analysis techniques is to infer on another reality different from that of the message. Therefore, the calculated indexes allow researchers to obtain inferences with regard to adherence and non-adherence to the Economic dimension of the companies of the sample, as well as make inferences on the *CL* and *AC* degree in the report of economic performance indicators.

Since the sample is small, the analysis and interpretation of the results will be carried out by inspection, without the use of descriptive statistics.

ECI – Economic Value Generated and Distributed: In the *ECI* indicator, all sub-indicators are monetary quantitative and, therefore, they were analysed with regard to their *CL* and *AC*. Then, the interpretation of the disclosure of the *ECI* indicator was made in comparison with the information reported in the *DVA*, since all companies, except for Furnas, presented the data of this statement in the *SR*.

Comgás, Tractebel and Rede Energia did not present the information of the Revenue (*ECI.1*) and Costs (*ECI.2*) items, but only the distribution of the added value according to the *DVA* (*ECI.3* to *ECI.5*). Furnas did not even present the *DVA* in the *SR*, but only indicated the statement, which was not found in the report, and thus the company received the *NI* classification in all items. EDP presented the information, which was confronted with the

DVA information. However, since the company's financial income was high, the variation of the *ECI.1* sub-indicator was significant with regard to what is requested in the GRI and, therefore, it was classified as *AC*. Itaipu and Petrobrás presented *AC*, but as mere circumstance, since their financial incomes were not high to present a significant variation between the numbers in the two reports. The item investment in the community (*ECI.6*) was not reported by any of the companies and the item accumulated economic value (*ECI.7*) did not present *AC* because it is a result of a composition that is not similar in the two reports.

The use of the DVA also reflected in the *CL* analysis, since the information was not presented in a comprehensible manner, with the due correspondences between the two reports. Petrobrás presented the highest clarity index in the *ECI* indicator (0,59).

The *AC* and *CL* analysis demonstrates that none of the companies prepared the information as proposed by the GRI. Given the existence of a report already prepared and of mandatory disclosure, this was used to represent what is proposed by the *ECI* indicator.

This result may be an object of reflection in two aspects. First, the information of sub-indicators *ECI.1* to *ECI.5* is already available in the accounting system, since it is used in the DVA preparation. Thus, only some composition adjustments would be required for its presentation with *CL* and *AC* in the *SR*. Second, the information of the *ECI.6*, investment in the community, is not available in the accounting systems (if it were, it would have been reported) and its preparation demands efforts in the identification and accumulation detached from other expenses incurred in the period, most of which must be accumulated in Costs (*ECI.2*) and Salaries and Benefits (*ECI.3*). Although there is no requirement in this report, it does not explain the non-adherence as verified.

EC2 - Opportunities and Risks due to Climatic Changes: In this indicator, the GRI requests the reporting of risks and opportunities to the company's business arising as a result of climatic changes. It must not be confused with the environmental dimension indicators, which deal with the reporting of greenhouse gases emissions (*EN16*) and volumes and actions that the company has been undertaking to reduce greenhouse gases (*EN18*). It is here where risks and opportunities that will bring financial consequences to business are reported. The indicator is made up of sub-indicators *EC2.1*, *EC2.2* and *EC2.3*, which were analysed only with regard to *CL*, for being qualitative and the sub-indicator *EC2.4*, which was analysed with regard to *CL* and *AC*.

Tractebel and Rede Energias do not present an administration report concerning the risks and opportunities to business (*EC2.1*). The description of risks to business (*EC2.2*) was made only by Comgás, EDP and Petrobrás and the one of opportunities (*EC2.3*) was made only by Comgás and Petrobrás. The report of financial impacts (*EC2.4*) was made only by Petrobrás and Furnas, but there was no quantitative information to be confronted in the reports for verification of *AC*. Petrobrás mentions past environmental problems that caused fines and expenses to clean up some regions that suffered with oil spills. However, the company does not refer to environmental risks.

The disclosure analysis of the companies that did not present *CL* in the report of the requested items shows the gap between what is requested and what is reported by them. The GRI highlights many examples for the report of the items. The fact that the information is descriptive, and companies are more encouraged for its disclosure, directs our reflection on the misinterpretation by the companies of what is requested by the GRI, whether due to lack of internal efforts in understanding and in the debate of the topics or for not giving importance to the topic. As for *AC*, quantification efforts concerning the estimates of revenues, costs and investments would be required for the disclosure in accounting reports or explanatory notes (*EN*).

EC3 – Coverage of the Benefits Plan: The essential point of this information is in the Defined Benefits Plan for retirement that the organization offers its employees. This is a

modality of retirement plan in which both the employee and the company contribute so that the former may receive retirement benefits with a previously defined value. These plans, which have financial implications to the company and offer guarantee and quality of benefits to employees, have their accounting duly standardized in Brazil, both for entities managing Funds and the sponsors (companies that make contributions to the Fund to the benefit of the employees).

This information has been classified as *Nap* for Comgás, EDP, Itaipú and Tractebel, since these companies have openly stated that they do not have this modality of plan for their employees. They present information about their plans in the defined contribution modality. Petrobrás did not provide this information and Rede Energias and Furnas did not present *CL* or *AC*. Petrobrás describes in the *SR* the various retirement plans of the companies of the group, including in other countries, but does not make clear whether there are defined benefits plans. Rede Energia informs various benefits offered to employees, such as medical and dental care and insurance, but none of them relative to pension plans. Furnas informs having the plan modality, but no quantitative information, referring to items *EC3.1* to *EC3.3*, is reported in the *SR*.

The analysis of this item leads us to reflections on the absence of effort to understand what information is requested by the GRI and the willingness to present it in the *SR*, since for companies that have a defined benefit modality, the information on estimates of liabilities and assets of the funds is available in the accounting systems.

EC4 - Financial aid received from the Government: They are significant direct or indirect financial benefits received from governments to contribute with the organization, which does not expect a direct financial return of the help offered. They include: tax/credit incentives; subsidies; subventions for investment, research and development and other relevant types of concessions; awards, royalty holidays; financial help from Export Credit Agencies (*ECAs*); other financial benefits received or receivable from any government for any operation that does not represent a transaction of goods and services.

Itaipu and Furnas were the only companies that presented the *Cf* classification, for not having tax incentives and having clearly stated it in the *SR*. Petrobrás described several incentives related to income tax deduction, but the values were not highlighted or consolidated in the financial statements to allow analysis of *AC*. EDP reported the values of tax incentives and Rede Energias cited the percentages and amounts of tax incentives for specific programs (“Electricity for all” and “Interconnection of the electric power system”), but the values were not informed for neither in the financial statements in order to verify *AC*. Comgás and Tractebel did not provide this information.

In this case, the information exists in the accounting systems, but effort is needed for consolidation and explanation of several items to represent them with *CL* in the *SR*. In addition, the consolidation of information should be highlighted in *NE* in the financial statements, thus allowing the analysis of its *AC*.

EC5 - Salary variation with regard to minimum wage: The purpose of this indicator is to disclose the comparison of the lowest salaries paid by the organization with regard to the local minimum wage in important operating units. The concept of local minimum wage takes into account the diversity of minimum wages that may exist in different operation locations of the company, which may be based in different geographical regions as it happens in some Brazilian states. That is why it is important for the company to define and present its important operating units and inform where they are located. This definition is requested in the item Profile or Scope and Report Limit. In general, they were not presented in the disclosure of this indicator and only Comgás and Petrobrás achieved *CL* classification (index higher than 0.60). Rede Energias did not provide this information.

The analysis suggests lack of provision of internal information for preparation of the SR and the need of a little effort to make it available and describe it appropriately to users, mainly seeking coherence with the other information requested in other parts of the SR.

EC6 - Spending policies and practices with local suppliers: The focus of the indicator is in the support the organization provides to local businesses, favouring additional investments to a stable local economy. The first point to consider is the definition of ‘local’, since this definition may vary from one company to another, also including existing operating units in other countries. Local suppliers are understood as suppliers of materials, products and services located in the same geographical market of the reporting organization, disregarding any transnational payment. The proportion of the budget spent with local suppliers may be presented by important operating units or by the organization’s global budget. The total purchases of the organization, whether local or global, may be considered by the total acquired in the country, in case the company has acquisitions in other countries. When the organization reports the percentage in average terms, it must make clear how the number was obtained, since it is neither simple nor immediate to understand how it is reporting. All companies presented *CL* in the indicator, except for Furnas and Rede Energias, which prepared a report, but failed to approach the *CL* issues as described herein.

EC7 - Local contract policies and practices: The indicator attempts to demonstrate the presence of local residents in management activities of the organization in local operations. “Local residents” may be considered the individuals born, the residents or those with legal right to reside indefinitely in the geographical market of the operating units. The organization is free to choose the parameter, but the definition must be clearly informed. The organization must also clearly define what is considered as high-management positions in local operations. Finally, it must report the percentage of workers in high-management positions among the unit’s total number of workers, who are local residents. When the organization reports the percentage in average terms, or by the total of the organization, it must make clear how the figure was obtained, since it is not simple or immediate to understand how it is reporting. For many companies in Brazil, having a preference policy for local workers is *Nap*, since they are subject to national public admission exams, as reported by Furnas, Itaipu and Petrobrás. Rede Energias and Tractebel did not provide this information and Comgás and EDP did not state *Cl* as described herein.

The analysis suggests lack of provision of internal information for preparation of the SR and the need of a reasonable effort to make it available and describe it as proposed by the GRI. Information on personnel in high-management positions must be separated by operating units and, subsequently, by local residents.

EC8 - Investment in Infrastructure for the Community: They are investments in infrastructure and services made by the organization to meet the needs of local communities or economies. Therefore, it does not refer to investments in the company’s operations, but to investments that aim to offer a public service or good. Local economies are understood as the economies that may be influenced by the company’s operation, which may reach other more distant localities, in addition to the locality where it is installed.

The indicator is made up of sub-indicators *EC8.1*, which deals with the amount of the investment made, and *EC8.2*, which requires the description of the community’s needs. The first was analysed with regard to *AC* and *CL*, for being a monetary quantitative, whereas *EC8.2* was analysed only with regard to *CL*, for being qualitative. In *EC8.1*, only Rede Energias presented *AC* and Comgás, EDP and Itaipu presented *CL*. In *EC8.2*, only Petrobrás and Tractebel presented *CL*.

For *EC8.1*, the analysis is similar to *EC1.6*, since it requires efforts to assess costs, investments and duration of specific projects dedicated to the community’s infrastructure. For *EC8.2*, the company needs to have an internal organization dedicated to communication

with the community so as to understand its needs. Good disclosure should at least inform whether the assessment is carried out or not and what are the results found. As an example, Petrobrás explained in details how they survey the needs, the results and the projects undertaken from the analysis.

EC9 - Indirect Economic Impacts: The purpose of the indicator is to demonstrate to the public the additional impacts, both positive and negative, of the company's operation in the local or regional economy. Indirect economic impacts are understood as the additional consequences of the direct impact of financial transactions and monetary flow between one organization and its stakeholders, such as: productivity, employment, income, schooling, qualification, investments, social and environmental development/depletion, which are duly exemplified in the GRI document.

Petrobrás, Tractebel and Rede Energias presented *CL*, Comgás did not provide this information and the others presented low *CL* index, since they describe the actions, but do not report the relevant points as defined by indirect impacts.

The analysis suggests lack of internal preparation to comprehend the economic impacts that the activities generates, as well the degree of importance of these impacts with regard to the compliance with public policies, standards and national and international protocols.

5.2 Reflections on the causes of non-adherence

This research paper dedicated to validate economic indicators disclosure (non)adherence against GRI guidelines and protocols by developing an assessment methodology. One would expect that the preparation and disclosure of TBL economic indicators would not be an issue for companies as they are familiar with the production of financial statements. However, the findings of the present research show that the disclosure of economic indicators does not present high adherence to the GRI protocol and guidelines. This is coherent with previous studies that found gaps in different disclosures media – annual report, SR and other – or throughout the years or against GRI (Adams et al., 2004; Frost et al., 2005; Adams and Frost, 2007). The Adherence Index proposed was not high for any of the companies in the sample investigated. So why is that?

Many problems regarding the process of elaborating SR have to do with existing (or non-existing) appropriate management control systems. Professional-services firms, such as KPMG and Accenture, also realised that one of the big challenges to integrate traditional financial reporting with sustainability reporting is to develop expertise in data gathering, processing and analysis, as well as IT support and automation (The Economist, 2010; Accenture, 2013).

Research evidences suggest that organisations may not yet have adequate systems to support comprehensive reporting (Adams and Frost, 2007). A Brazilian consulting company, specialized in sustainability services and education, interviewed 50 companies on the preparation of SR (Ideia Sustentável, 2009). Thirty (60%) of the companies interviewed pointed out the lack of a system for gathering and managing information as a main problem for the preparation of SR. Cintra (2011) carried out a survey with financial controllers to investigate the management control practices for sustainability in companies which disclose SR in Brazil. Sixty-six percent (66%) of the respondents claimed that their accounting systems fully contain the financial data required to prepare SR. This number reaches 75% considering the partial information, as well. However, regarding physical non-financial figures, only 29% of the respondents said the accounting system contains, at least partially, the data for the SR. Skouloudis et al (2009, p.298) findings showed that the economic performance in SR scored poorly (23% average) and that there are major gaps in reporting practices, suggesting “the need for further development of internal systems and processes in order to collect essential non-financial performance data”.

GRI economic indicators are “based on the value added statement scheme” (Moneva et al; 2006; GRI, 2006). So it would be expected that the expertise with value added statement in Brazil (DVA) would help to meet the GRI indicators. Notwithstanding this, the analysis shows that the companies limited themselves to disclose DVA figures “as is” and did not process minor adaptations to GRI requirements, resulting in a compliance gap. This also happens with other information contained in the accounting systems (pension funds, for instance) that should go through adjustments, synthesis and compilations in order to generate the indicators, but presently they do not. While on one hand it is said that the trend for companies is to move to more sophisticated approaches to sustainability; on the other, the present research showed that “there are still difficulties in gathering simple economic figures for sustainability reports within the systems in use.” (The Economist, 2010).

Coherent with previous research (Ideia Sustentável, 2009; Cintra, 2011) other problems found by the present research pointed to cultural and behavioural topics preventing the production of quality SR, such as lack of expertise on sustainability reporting and GRI, non-priority for the voluntary sustainability reports, and lack of internal culture. These shortcomings can also be worked under the management control system jurisdiction by working on training, compensation and other behavioural controls.

Certainly the number of companies (quantity) disclosing social information has increased, although some are suspicious about the quality of the disclosure or the integration to managerial decisions (Epstein, 2004; Moneva et al, 2006). Research showed that there is integration up to a point (Cintra, 2011), but there is room for improvement so that MCS may support reporting and decisions consistent with sustainable business operations (Adams & Frost, 2007). Relatively few organisations have “robust systems and procedures to embed these (sustainability policies) consistently and effectively into the "DNA" of their businesses.” (Accounting for Sustainability, 2010). Consequently, there is an urge for Management Control Systems for Sustainability.

6. Conclusions

The results of the analysis of the disclosure of the economic indicators of a sample of the Energy sector in Brazil suggest that adherence is not high with regard to the GRI Guidelines. Even though the results are not surprising when compared to other researches, the methodology used in this work has allowed advances in the reflection on the preparation of the information and the suitability of the MCS for reporting sustainability. The findings derive from the low quality of the information disclosed in terms of clarity and, mainly, accuracy, when confronted with the information disclosed in financial reports that are known to be present in the information systems of companies. The discussion leads to the conclusion on the urgency and need of adapting or creating the MCS for sustainability.

A limited number of SR was examined due to the stage of development of the ongoing project. However, this fact did not compromise the methodology developed for the analysis of the disclosure or the general reflection on the MSC of the companies. Certainly, a study including all companies of the electric energy sector could contribute for a more complete picture on the particulars of the disclosure of the energy sector in Brazil.

The study enabled an innovative application in the analysis of the disclosure in SR. Based on the content analysis, the sets of information (sub-indicators) that need to be filled to comply with the GRI Guidelines were defined the framework for verification of clarity and accuracy in the report of the information were built. The developed framework are an additional result of the research and they contribute, as a complementary guide, to objectively detail the information proposed by the GRI and improve the quality of the disclosure of information by the companies.

Future studies could concentrate on the empirical analysis of the companies to understand the non-adherence causes presented in this work.

Acknowledgments

We are very grateful to the São Paulo Research Foundation (FAPESP) for the financial support granted to the project. We also thank the students, who took part in the study in focal groups from 2009 to 2013, for codification of the sustainability reports: Heloisa Motta Morisue, Vanessa Gaebler, Bruna da Silva Pedroso, Amanda Cristina de Souza and João Nascimento Nerasti. Their participation was essential for the construction of the methodology presented in this work.

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Authors

Garcia dos Reis, Solange

Professor

Accounting Department of the School of Economics, Management and Accounting (FEARP) of Universidade de São Paulo (USP), Ribeirão Preto, São Paulo, Brazil

Av Bandeirantes, 3900, Ribeirão Preto, São Paulo - SP Brazil, CEP: 14040-900

Telephone (55 16)3602 3899. email: solangegarcia@fearp.usp.br

Cintra, Yara Consuelo

Professor

Accounting Department of the School of Management and Accounting of Universidade Federal do Rio de Janeiro (UFRJ), Rio de Janeiro, Brazil.

Av. Pasteur, 250, Urca, Rio de Janeiro – RJ Brazil, CEP: 22.290-902.

Telephone (55 21)2146 0708, email: yaracintra@facc.ufrj.br

Dibbern , Bruno Ruvier Santiago

Undergraduate Student of Accounting

Accounting Department of the School of Economics, Management and Accounting (FEARP) of Universidade de São Paulo (USP), Ribeirão Preto, São Paulo, Brazil

Av Bandeirantes, 3900, Ribeirão Preto, São Paulo - SP Brazil, CEP: 14040-900

Telephone (55 16)3602 3899. email: brsdibbern@fearp.usp.br

Ribeiro, Maisa de Souza

Professor

Accounting Department of the School of Economics, Management and Accounting (FEARP) of Universidade de São Paulo (USP), Ribeirão Preto, São Paulo, Brazil

Av Bandeirantes, 3900, Ribeirão Preto, São Paulo - SP Brazil, CEP: 14040-900

Telephone (55 16)3602 3899. email: maisorib@usp.br