

## **APPLICABILITY OF GLOBAL REPORTING INITIATIVE TO ASSESS THE ENVIRONMENTAL PERFORMANCE OF HIGHER EDUCATION INSTITUTIONS**

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The Global Reporting Initiative (GRI) is a methodology developed to help organizations reporting on their environmental, social and economic performance. In this study, the viability of applying GRI methodology to assess the environmental performance of Higher Education Institutions (HEI) is analyzed and discussed.

GRI Guidelines to assess environmental aspect as materials, energy, water, biodiversity, emissions, effluents and waste, products and services, compliance, transport, environmental assessment of suppliers, environmental grievance mechanisms and overall environmental issues. Each environmental aspect guideline is deeply studied.

As a result, a proposal of a HEI environmental GRI is presented. A guideline to report environmental performance with fully application to higher education based on GRI.

**Keywords:** Global Reporting Initiative; environmental performance; higher education institution; university

## **APLICABILIDAD DE LA INICIATIVA DE REPORTE GLOBAL PARA EVALUAR EL DESEMPEÑO AMBIENTAL DE INSTITUCIONES UNIVERSITARIAS**

La Iniciativa de Reporte Global (Global Reporting Initiative - GRI) es una metodología desarrollada para ayudar a organizaciones en el informe de su desempeño ambiental, social y económico. En este estudio, se analiza y discute la viabilidad de aplicar GRI como una metodología para el informe del desempeño ambiental de instituciones universitarias.

GRI establece procedimientos para evaluar aspectos ambientales como materiales, energía, agua, biodiversidad, emisiones, residuos y efluentes, productos y servicios, obligaciones, transporte, la evaluación ambiental de proveedores, mecanismos de quejas y cuestiones ambientales en general. Cada guía por aspecto ambiental es analizada en profundidad.

Como resultado, se elabora una propuesta de GRI ambiental universitaria; una guía basada en GRI con aplicación directa a instituciones universitarias para su reporte ambiental.

**Palabras clave:** Iniciativa de reporte global; desempeño ambiental; instituciones universitarias; universidades

## 1. Introduction

The Sustainability Reporting Guidelines (SRG) is a guide developed by Global Reporting Initiative (GRI), an international independent organization. GRI pursue an independent and objective sustainability reporting with a common language to communicate economic, social and environmental impacts of organizations. One of the main advantages of reporting in accordance to GRI is giving stakeholders working across organizations confidence that reporting impacts can compare one into another's. Hespenheide (2015), chair of the Global Sustainability Standards Board (GSSB) presents reporting with GRI as "[...] a vehicle to try to highlight does issues organizations need to take into account in order to be fully accountable to their full range of stakeholders". GRI strive to reconcile the guidelines with other widely-recognized frameworks as UN principles, ISO standards, CDP (Carbon Disclosure Project), etc. giving organizations worldwide an extra incentive to apply this guideline.

Although SRG are developed to be universally applicable to all types of organizations, previous studies (Lozano, 2011) have shown that complex organizations as higher education institution (HEI) have serious difficulties to assess and report sustainability including their environmental behavior. HEI are lighthouses for society and have a key role in implementing sustainable and environmentally responsible practices (Alonso-Almeida, et al., 2015). Different alternatives to report environmental or sustainability performance are available and have been explored; Campus Sustainability Assessment Framework (CFAS) (Cole, 2003), Graphical Assessment of Sustainability in Universities (GASU) (Lozano, 2006), the Ecological Footprint (Lo lacono-Ferreira et al., 2011) and Sustainability Tracking, Assessment and Rating System (STARS) (Urbanski & Filho, 2014) are some examples.

Universitat Politècnica de València (UPV) is a HEI with a clear interest to constantly improve its environmental management and to set an example of good practice (Torregrosa-López et al., 2016). It has an Environmental Management System (EMS) verified in EMAS (Eco-Management and Audit Scheme) since 2010. EMS managers in association of some researching groups are constantly searching for opportunities to improve the system.

The main objective of this research is studying the applicability of GRI environmental indicators at HEI with a consistent EMS. UPV is used as case study to assess the ability of a verified EMS to apply GRI.

## 2. Methodology

To study the applicability of GRI environmental indicators, the following steps were taken:

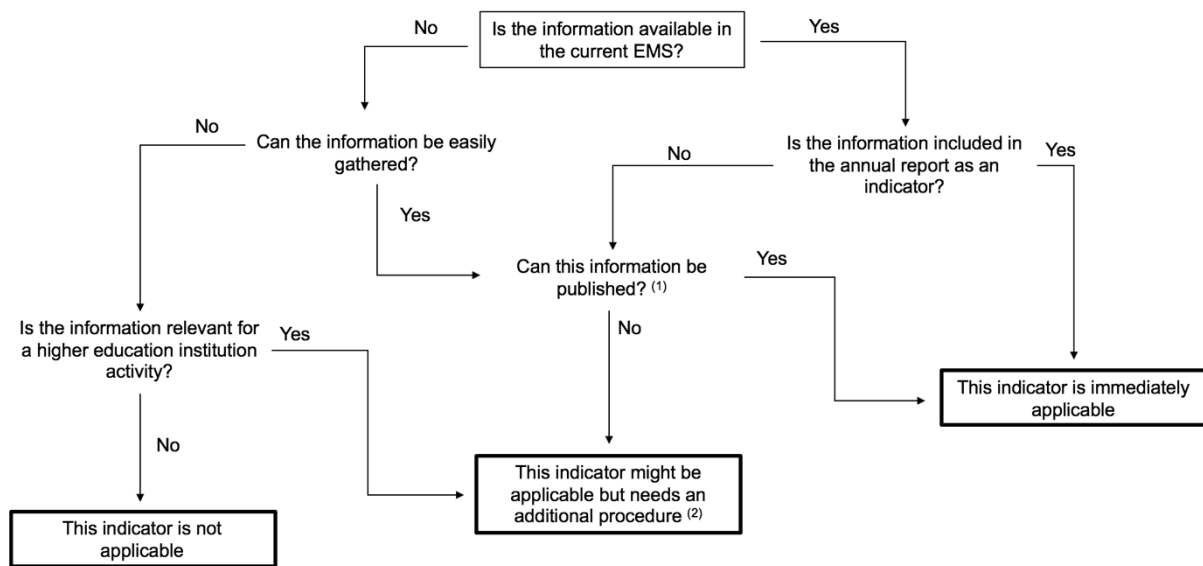
- Step 1. Select the most suitable GRI guide for HEI
- Step 2. Extract those indicators related to the environmental aspect
- Step 3. Case Study UPV. Analyze indicators environmentally related

For step 1, the three latest GRI guides were analyzed. The reasons and general characteristics of the chosen guide are provided in section 4.1.

All indicators defined in the GRI guide chosen were studied to conduct step 2. Those indicators that affects, either directly or indirectly to an environmental assessment using GRI were extracted. A classification and definition of these indicators is shown in section 4.2.

In order to assess the applicability of indicators to HEI using UPV as case study (step 3), a decision scheme (Figure 1) was applied. Analysis and results are gathered in section 4.3.

**Figure 1. Decision scheme**



(1) Some information can be considered sensitive and might not be published without a special permission of the head of the institution.

(2) Asking for special permissions, treating data, etc. Actions that are not immediate and require time and resources.

### 3. Results and discussion

Results and its discussion is presented following methodology steps.

#### 3.1 Step 1. Select the most suitable GRI guide for universities

The latest version of GRI is G4 (Global Reporting Initiative, 2014a). Some sectors disclosure guidelines are available for this latest version (G4): airport operators, food processing, construction and real estate, media, electric utilities, mining and metals, event organizers, NGO, financial services and oil and gas. Previous version, G3 (Global Reporting Initiative, 2006) and G3.1 (Global Reporting Initiative, 2011), had also pilot versions (on request) for automotive, logistics and transportation, public agency, telecommunications and apparel and footwear sectors. These supplements by sectors were not developed following current GRI's process. Although GRI only accepts reports based on G4 version, pilot versions based on G3 were also considered.

The guide selected to assess the applicability of GRI to the university was G4 attending to the following reasons:

- It is the latest version. Only reports based on G4 are accepted by GRI since January 1<sup>st</sup>, 2016.
- It environmental aspect has more indicators than the previous version; 21 instead of 20.
- General standard disclosures are defined in more detail than previous versions.
- G4 Implementation Manual is intuitive and easy-to-use.

G4 is structured in two documents: (a) the Reporting Principles and Standard Disclosures (Global Reporting Initiative, 2014a) and (b) the Implementation Manual (Global Reporting Initiative, 2013b).

### 3.2 Step 2. Extract those indicators related to the environmental aspect

G4 organize indicators according to the following categories in order to assess sustainability: economic, environmental and social. Social category adds subcategories as labor practice and decent work, human rights, society and product responsibility. The guide has also a general standard disclosure, general aspects with indicators that helps establishing the framework of the report. General standard disclosure aspects are defined by 58 indicators organized under the following titles: strategy and analysis, organizational profile, identified material aspects and boundaries, stakeholder engagement, report profile, governance and ethics and integrity. Principles for defining report content and quality must be previously defined. These principles are deeply described in sections 3.1 and 3.2 of the Implementation Manual and later applied by indicators in the General Standard Disclosures Overview.

This work focus on the environmental category. However, there are some general indicators that influence over the definition of all other indicators as those that establish material aspects and boundaries.

With the purpose of establishing the framework for the analysis of environmental indicators, the ones that identified material aspects and boundaries are firstly considered and shown in Table 1. Each indicator has an ID associated that it is also shown in the table.

**Table 1. Identified material aspects and boundaries indicators**

| ID      | Indicator   |
|---------|---|
| G4 – 17 | List all entities included in the organization's consolidated financial statements or equivalent document. Report whether any entity included in the organization's consolidated financial statements or equivalent documents is not covered by the report. |
| G4 – 18 | Explain the process for defining the report content and the Aspect Boundaries. Explain how the organization has the Reporting Principles for Defining Report Content.   |
| G4 – 19 | List all material Aspects identified in the process for defining report content.  |
| G4 – 20 | For each material Aspect, report the Aspect Boundary within the organization.   |
| G4 – 21 | For each material Aspect, report the Aspect Boundary outside the organization.  |
| G4 – 22 | Report the effect of any restatements of information provided in previous reports, and the reasons for such restatements.   |
| G4 – 23 | Report significant changes from previous reporting periods in the Scope and Aspect Boundaries.  |

As the main objective of GRI is to be fully accountable for to the stakeholders of the organizations, indicators related to Stakeholder Engagement also need to be considered despite if the goal of this work is focus only on environmental aspects. Stakeholder Engagement indicators are listed in Table 2.

**Table 2. Stakeholder Engagement indicators**

| ID      | Indicator   |
|---------|---|
| G4 – 24 | Provide a list of stakeholder groups engaged by the organization.   |
| G4 – 25 | Report the basis for identification and selection of stakeholders with whom to engage.  |
| G4 – 26 | Report the organization's approach to stakeholder engagement, including frequency of engagement by type and by stakeholder group, and an indication of whether any of the engagement was undertaken specifically as part of the report preparation process.                   |
| G4 – 27 | Report key topics and concerns that have been raised through stakeholder engagement, and how the organization has responded to those key topics and concerns, including through its reporting. Report the stakeholder groups that raised each of the key topics and concerns. |

GRI also define 5 basic indicators to establish the Report Profile. These indicators are grouped in Table 3.

**Table 3. Report Profile indicators**

| ID      | Indicator  |
|---------|--|
| G4 – 28 | Reporting period (such as fiscal or calendar year) for information provided.   |
| G4 – 29 | Date of most recent previous report (if any).  |
| G4 – 30 | Reporting cycle (such as annual, biennial).  |
| G4 – 31 | Provide the contact point for questions regarding the report or its contents.  |
| G4 – 32 | Report the 'in accordance' option the organization has chosen. Report GRI Context Index for the chosen option. Report the reference to the External Assurance Report, if the report has been externally assured (recommended). |

The environmental category has no subcategories and defines the 12 aspects and 34 indicators as shown in Table 4.

**Table 4. Environmental aspects and indicators**

| Aspects             | ID         | Indicators   |
|---------------------|------------|--|
| Materials           | G4 – EN 1  | Materials used by weight or volume   |
|                     | G4 – EN 2  | Percentage of materials used that are recycled input materials   |
| Energy              | G4 – EN 3  | Energy consumption within the organization   |
|                     | G4 – EN 4  | Energy consumption outside the organization  |
|                     | G4 – EN 5  | Energy intensity   |
|                     | G4 – EN 6  | Reduction of energy consumption  |
|                     | G4 – EN 7  | Reductions in energy requirements of products and services   |
| Water               | G4 – EN 8  | Total water withdrawal by source   |
|                     | G4 – EN 9  | Water sources significantly affected by withdrawal of water  |
|                     | G4 – EN 10 | Percentage and total volume of water recycled and reused   |
| Biodiversity        | G4 – EN 11 | Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas                                |
|                     | G4 – EN 12 | Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas |
|                     | G4 – EN 13 | Habitats protected or restored   |
|                     | G4 – EN 14 | Total number of IUCN Red List species and national conservation list species with habitats in areas affected by operations, by level of extinction risk                  |
| Emissions           | G4 – EN 15 | Direct greenhouse gas (GHG) emissions (Scope 1)  |
|                     | G4 – EN 16 | Energy indirect greenhouse gas (GHG) emissions (Scope 2)   |
|                     | G4 – EN 17 | Other indirect greenhouse gas (GHG) emissions (Scope 3)  |
|                     | G4 – EN 18 | Greenhouse gas (GHG) emissions intensity   |
|                     | G4 – EN 19 | Reduction of greenhouse gas (GHG) emissions  |
|                     | G4 – EN 20 | Emissions of ozone-depleting substances (ODS)  |
|                     | G4 – EN 21 | NO <sub>x</sub> , SO <sub>x</sub> , and other significant air emissions  |
| Effluents and Waste | G4 – EN 22 | Total water discharge by quality and destination   |
|                     | G4 – EN 23 | Total weight of waste by type and disposal method  |
|                     | G4 – EN 24 | Total number and volume of significant spill   |

**Table 4. Environmental aspects and indicators (continue)**

| Aspects                            | Indicator code | Indicators   |
|------------------------------------|----------------|--|
| Product and Services               | G4 – EN 25     | Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the Basel Convention Annex I, II, III, and VIII, and percentage of transported waste shipped internationally |
|                                    | G4 – EN 26     | Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the organization's discharges of water and runoff                                    |
|                                    | G4 – EN 27     | Extent of impact mitigation of environmental impacts of products and services  |
|                                    | G4 – EN 28     | Percentage of products sold and their packaging materials that are reclaimed by category   |
| Compliance                         | G4 – EN 29     | Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations  |
| Transport                          | G4 – EN 30     | Significant environmental impacts of transporting products and other goods and materials for the organization's operations, and transporting members of the workforce  |
| Overall                            | G4 – EN 31     | Total environmental protection expenditures and investments by type  |
| Supplier Environmental Assessment  | G4 – EN 32     | Percentage of new suppliers that were screened using environmental criteria  |
|                                    | G4 – EN 33     | Significant actual and potential negative environmental impacts in the supply chain and actions taken  |
| Environmental Grievance Mechanisms | G4 – EN 34     | Number of grievances about environmental impacts filed, addressed, and resolved through formal grievance mechanisms  |

### 3.3 Step 3. Case study. Analyze indicators environmentally related

Applying a case study requires not only the analysis of those indicators environmentally related but the general indicators that gives framework to the assessment as described in section 3.2. An EMS verified in EMAS requires certain structural committees and personnel dedicated to its maintenance and continuous improvement. Stakeholders information, environmental policy development and environmental audits engage people across all the institution including higher managers as the chancellor and offices related with infrastructure and resource management. UPV has an environmental office that takes care of EMS. EMS supporting staff and members of the environmental committee should be able to define indicators listed in section 3.2 as:

- Identified material aspects and boundaries indicators,
- Stakeholder engagement indicators,
- Report profile indicators.

The results of the applicability test of environmental indicators to UPV according to the decision scheme (Figure 1) is shown in Table 5. An analysis of each aspect is detailed below.

**Table 5. Environmental indicators applicability assessment**

| ID         | Indicator  | Applicability              |
|------------|--|----------------------------|
| G4 – EN 1  | Materials used by weight or volume   | Needs additional procedure |
| G4 – EN 2  | Percentage of materials used that are recycled input materials   | Needs additional procedure |
| G4 – EN 3  | Energy consumption within the organization   | Applicable                 |
| G4 – EN 4  | Energy consumption outside the organization  | Needs additional procedure |
| G4 – EN 5  | Energy intensity   | Applicable                 |
| G4 – EN 6  | Reduction of energy consumption  | Applicable                 |
| G4 – EN 7  | Reductions in energy requirements of products and services   | Not applicable             |
| G4 – EN 8  | Total water withdrawal by source   | Applicable                 |
| G4 – EN 9  | Water sources significantly affected by withdrawal of water  | Applicable                 |
| G4 – EN 10 | Percentage and total volume of water recycled and reused   | Needs additional procedure |
| G4 – EN 11 | Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas                                | Applicable                 |
| G4 – EN 12 | Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas | Applicable                 |
| G4 – EN 13 | Habitats protected or restored   | Applicable                 |
| G4 – EN 14 | Total number of IUCN Red List species and national conservation list species with habitats in areas affected by operations, by level of extinction risk                  | Needs additional procedure |
| G4 – EN 15 | Direct greenhouse gas (GHG) emissions (Scope 1)  | Applicable                 |
| G4 – EN 16 | Energy indirect greenhouse gas (GHG) emissions (Scope 2)   | Applicable                 |
| G4 – EN 17 | Other indirect greenhouse gas (GHG) emissions (Scope 3)  | Needs additional procedure |
| G4 – EN 18 | Greenhouse gas (GHG) emissions intensity   | Applicable                 |
| G4 – EN 19 | Reduction of greenhouse gas (GHG) emissions  | Applicable                 |
| G4 – EN 20 | Emissions of ozone-depleting substances (ODS)  | Applicable                 |



**Table 5. Environmental indicators applicability assessment (continue)**

| ID         | Indicators   | Applicability              |
|------------|--|----------------------------|
| G4 – EN 21 | NO <sub>x</sub> , SO <sub>x</sub> , and other significant air emissions  | Applicable                 |
| G4 – EN 22 | Total water discharge by quality and destination   | Applicable                 |
| G4 – EN 23 | Total weight of waste by type and disposal method  | Applicable                 |
| G4 – EN 24 | Total number and volume of significant spill   | Applicable                 |
| G4 – EN 25 | Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the Basel Convention Annex I, II, III, and VIII, and percentage of transported waste shipped internationally | Applicable                 |
| G4 – EN 26 | Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the organization's discharges of water and runoff                                    | Needs additional procedure |
| G4 – EN 27 | Extent of impact mitigation of environmental impacts of products and services  | Not applicable             |
| G4 – EN 28 | Percentage of products sold and their packaging materials that are reclaimed by category   | Not applicable             |
| G4 – EN 29 | Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations  | Applicable                 |
| G4 – EN 30 | Significant environmental impacts of transporting products and other goods and materials for the organization's operations, and transporting members of the workforce  | Applicable                 |
| G4 – EN 31 | Total environmental protection expenditures and investments by type  | Applicable                 |
| G4 – EN 32 | Percentage of new suppliers that were screened using environmental criteria  | Applicable                 |
| G4 – EN 33 | Significant actual and potential negative environmental impacts in the supply chain and actions taken  | Needs additional procedure |
| G4 – EN 34 | Number of grievances about environmental impacts filed, addressed, and resolved through formal grievance mechanisms  | Applicable                 |

The material aspect gathered two indicators, G4 – EN 1 and G4 – EN 2. Although it is clear that main product / service of HEI is to educate students and generate graduates and postgraduates the debate of allocation for materials has not been conclusively define yet (Lo

lacono-Ferreira et al., In press). However, as the entire organization is the scope of the report, these indicators should be easy to evaluate with a centralized purchasing system. Currently in UPV, purchases depend on departments and the system it is not centralized. This issue has already been detected by the environmental office and actions are being taken to centralize purchasing information.

Energy consumption and all its branches are included in the monitoring system of UPV EMS. However, as the EMS is restricted to the organization, upstream and downstream energy consumptions (energy consumption outside the organization indicator, G4 – EN 4) is not part of the current system. Additional procedures need to be applied in order to be able to estimate or count this indicator. The indicator of energy requirements of products and services is not applicable as the considering product / service are human beings. A philosophical debate can be open about the transversal competences included in academic programs that will affect on graduate's future jobs taking the most energy efficient choices. It does not seem to be the goal of the indicator but it could be considered for a sector version for HEI.

All water related indicators (G4 – EN 8 to G4 – EN 10) are applicable despite the volume of water recycled and reused that need to be measured or estimated. A similar result is obtained for biodiversity indicators (G4 – 11 to G4 – 14); except from the number of species in danger with habitats in areas affected, all indicators are currently part of EMS. UPV has traditional orchard as part of its main campus in Valencia and a flora micro-reserve as part of the campus of Gandía. Although not environmentally risk activities are developed in those lands, no there is no accounting and monitoring of resident species besides the botanic guide of the Campus.

GHG of scope 1 and 2 and other significant air emissions are annually assessed by EMS supplying information for indicators G4 – EN 15, G4 – EN 16 and G4 – EN 18 to 21. However, the environmental office has not enough information to assess scope 3 needing additional procedures if this indicator G4 – EN 17 wants to be included.

UPV environmental annual report published the balance of all wastes generated by type including paper and paperboard, light packaging, ink and tonner, debris, glass, batteries, vegetable wastes and dangerous wastes. It also includes an estimation of municipal solid waste. Both teaching and researching laboratories, as well as maintenance facilities, register any significant spill. Indicators under Effluents and waste aspect (G4 – EN 22 to 26) are already part of EMS.

Products and services indicators (G4 – EN 27 and G4 – EN 28) are not applicable as HEI does not produces conventional products. Moreover, EMS periodically monitor environmental laws and regulations applicable to the institution. G4 – EN 29 can be easily reported.

With regard to transport, UPV developed a mobility plan based on a mobility study entrusted to a third party specialist. Mobility is a big challenge for HEI and significant improvements can be accomplished in this area. G4 – EN 30 is already part of UPV EMS. Likewise, a general incident reporting system allows the environmental office to evaluate grievances periodically. This information can build indicator G4 – EN 34.

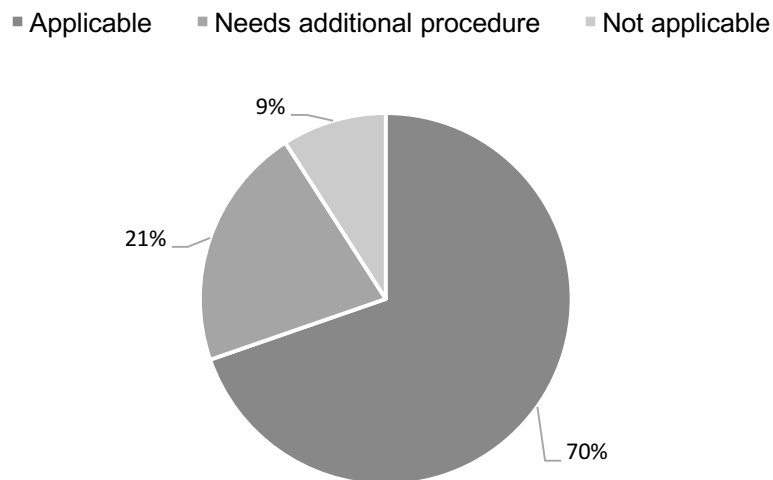
General expenditures and environmental investments (G4 – EN 31) can be reported directly from chancellor office. However, some investments may be unnoticed as departments managed certain budget items independently. Same reason why indicators gathered under supplier aspect (G4 – EN 32 and 33) need additional procedure to be assessed.

To sum up, Figure 2 shows statistics over results where the 70% of indicators can be considered as immediately applicable. Although there is a 21% that need additional procedures, they can be part of the system in a medium term.

A 9% of the indicators are considered not applicable. Note that not applicable indicators must be included in the index reported as G4 – 23. The reason for omission has to be provided. It

is recommended to include the information related to the indicator omitted in the external assurance to be verified.

**Figure 2. Results**



#### **4. Conclusions**

The report of the environmental behavior of an organization like a HEI requires the engagement of influential people to ensure the initiative. G4 GRI provides a robust guideline to deliver information about the environmental behavior of an organization as part of its sustainability report.

Overall, 23 of the 34 environmental indicators defined by GRI can be directly applicable or are already included in UPV EMS. Only 3 indicators, a 9%, are not applicable and can be justified following the guide. 7 indicators might be added in a medium term enriching EMS. G4 guideline can be part of the annual environmental report preparation. Moreover, G4 complete sustainability report can add transparency to a public institution as UPV.

Although a material flow analysis is required, aspects are defined by the guide. This is an advantage over other tools that leaves the development of the inventory of aspects to who applies it. i.e. Ecological Footprint. Despite there is no official sector or pilot versions dedicated to HEI, there are some characteristics that might be useful to define officially as if including transversal competences in environmental management reduces the environmental impact of graduates downstream.

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