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Panorama das Certificações e Etiquetas para Construção Sustentável e Eficiência Energética no Brasil e Rio de Janeiro

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RESUMO

Certificações e Etiquetas para construções sustentáveis consistem em conjunto de critérios e pontuações e são estratégicas para a difusão e adoção de soluções que direcionem a sustentabilidade, bem como norteadores de boas práticas.

Certificações e Etiquetas indicam níveis de sustentabilidade e geram diferenciadores para usuários e criam um cenário positivo de busca pela maior sustentabilidade. Muitos itens incluídos em certificações derivam de legislações existentes em cidades e/ou países e tem na superação de exigências das mesmas atribuídas maiores pontuações.

Atualmente no Brasil, por exemplo, a etiqueta Procel para eletrodomésticos é uma referência para escolha quando de uma compra. A mesma etiqueta já existe, até o momento de forma não obrigatória, para edificações. No Rio de Janeiro a qualificação Qualiverde está sendo submetida a Câmara de Vereadores. Esta qualificação apresenta benefícios fiscais e edilícios para edificações que atinjam níveis de pontuações propostos.

Este artigo apresentará as certificações, etiquetas, selos e qualificações disponíveis no Brasil e, em particular, no Rio de Janeiro e propostas iniciais para inclusões das mesmas.

Palavras-chave: Certificações, Etiquetas, Sustentabilidade, Construção Sustentável, Eficiência Energética.

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An Overview of Energy Efficiency and Sustainable Construction Certifications and Labels in Brazil and Rio de Janeiro

ABSTRACT

Certifications and Labels for sustainable construction consist of a set of criteria and points which are strategic to the diffusion and adoption of sustainable solutions, as well as guidelines for good practices. Certifications and Labels indicate levels of sustainability and generate reference levels for users as well as create a positive scenario in the pursuit of greater sustainability. Many items included in certifications originate from existing laws in cities and/or countries, and points are awarded as their requirements are excelled.

Currently in Brazil, for example, the *Procel* label for household appliances is utilized as a reference when you purchase them. The same label has already been established on a non-mandatory basis for buildings. In Rio de Janeiro, the *Qualiverde* qualification is being submitted to the City Council for appraisal. Such qualification offers tax benefits for buildings that achieve the proposed score.

This paper aims at presenting the certifications, labels, seals and qualifications available in Brazil, particularly in Rio de Janeiro, as well as some proposals to include the certifications and labels.

Keywords: Certifications, Labels, Sustainability, Sustainable Building, Energy Efficiency.

1. INTRODUCTION

1.1. Initial Overview

Certifications for Sustainable Construction and Labels for Energy-Efficient Buildings are a set of criteria and points which are strategic to the diffusion and adoption of sustainable solutions for buildings by professionals and construction companies, as well as the practice and comparison between buildings with benefits for users.

Many of the items included in certifications are derived from existing laws in cities and/or countries and more points are awarded as their requirements are excelled. The internationalization of certain certifications with the adoption of common rules for countries with different realities requires special attention and is also the focus of criticism.

Figure 1: Some certifications around the World (Source: FUNDAÇÃO VANZOLINI, 2009)



One of the differentiating aspects in relation to the Brazilian reality – the strategies oriented to the social aspect (e.g., labor relations and education) – is also one of the items of lowest score in many certifications. This is explained by the evolution of social issues in countries where the labor relations are established and incorporated into all sectors. In Brazil, informal employment is still a reality that poses as a challenge in civil construction, which is one of the sectors that absorb the work force of the less skilled and educated.

This article is partially based on the Thesis developed by Marcelo Bezerra de Mattos between 2009 and 2013, entitled *Renovation of the Urban Block towards Sustainability: Challenges and Solutions*.

1.2. Methodology

This article on Certifications and Labels adopted in Brazil evolved using the following steps: information based on bibliographic research, interviews and attendance to events and courses.

2. OVERVIEW OF CERTIFICATIONS AND LABELS IN BRAZIL AND QUALIFICATION IN RIO DE JANEIRO

This chapter will present certifications and labels for energy efficiency used in Brazil. Two of them are originated from other countries such as LEED¹ and AQUA². Others were established by Brazilian entities: PBE Edifica³ and Selo Casa Azul⁴. As a fifth certification, the qualification that is being approved in the Rio de Janeiro City Council is called Qualiverde. The objective is to introduce the key concepts of each certification, label or qualification.

2.1. LEED – Leadership in Energy and Environmental Design – The United States and Brazil

The USGBC – United States Green Building Council – was created in the United States from the idea of reducing emissions in the building sector, which in the U.S. accounts for 40% of the greenhouse emissions. What motivated the founding group was the vision of green building as a whole system. They also decided to create a certification that could be used as a reference and a comparison tool between buildings (SENGE, 2009).

The first version of LEED (Leadership in Energy and Environmental Design) was the 1.0, defined as beta (for testing) and was created after four years of meetings between 1994 and 1998. Twenty buildings were certified and the LEED 1.0 enabled analyses and adjustments to a fuller version introduced in 2000: LEED 2.0. Since the beginning, the score corresponded to levels named Platinum, Gold, Silver and Certified. LEED 2.1, released in 2002, practically repeated the version 2.0, but with a simplification of documentation requirements. Until that moment, there was only one category of buildings under review: LEED-New Construction. The next version, LEED 2.2, had scope changes, replacing the use of documents in hard copy with electronic format using the process called LEED-Online⁵ and adding new categories (KIBERT, 2008):

- LEED-EB: Existing Buildings.
- LEED-CI: Commercial Interiors
- LEED-CS: Core and Shell.
- LEED-H: Homes
- LEED-ND: Neighborhood Development.

In 2009, LEED 3.0 was released with changes in the scoring system, from 69 to 110 points, and greater attention to the category corresponding to water (KIBERT, 2008). In this version, the categories have the following scores (USGBC, 2009).

¹Leadership in Energy and Environmental Design originally from United States.

²High Environmental Quality originally from France.

³Brazilian Label Program for Buildings Energy Efficiency by *Eletrobras* (the Brazilian federal utility company).

⁴Blue House Seal by CaixaEconômica Federal.

⁵In the USGBC website.

Table 1: LEED points categories (source: USGBC, 2009)

CATEGORIES		PREREQUISITE REQUIREMENTS				POINTS		
Sustainable sites		1				26 (24%)		
Water efficiency		1				10 (9%)		
Energy and atmosphere		3				35 (32%)		
Indoor environmental quality		2				15 (14%)		
Materials and Resources		1				14 (13%)		
Innovation		0				6 (5%)		
Regional priority credits		0				4 (4%)		
TOTAL		8				110		
LEVELS OF CERTIFICATION	40	49	50	59	60	79	80	110
	Certified		Silver		Gold		Platinum	

It is mandatory that the required prerequisites are met in order to obtain the LEED certification and, after that, to define the scoring of each category for the project (KIBERT, 2008):

- Prerequisites: These are the minimum requirements. If they are not achieved, the project cannot be certified.
- Scoring: The scoring varies according to the category (see above): from a minimum number of points, the building can be certified as *Platinum*, *Gold*, *Silver* or *Certified*.

The certification is made by presenting three types of documents (KIBERT, 2008):

- LEED standard statement (or template) signed by the designer or professional in charge;
- Building documents and descriptive memorials of projects and systems;
- Calculations (developed in a standard statement or as attachments).

In Brazil, the Green Building Council (GBC) Brazil has been in charge of disseminating the LEED certification. The USGBC (U.S.) also certifies projects. Other countries such as Mexico and India have adopted the LEED (KAWAKAMI, may. 2009).

With 158 certified projects and other 857 of the most different types under accreditation process, with commercial buildings among the largest number of records, over 45% of the total (GBC Brazil, 2014), Brazil is currently the fourth country with most requests for LEED (Leadership in Energy and Environmental Design) certification, awarded by the Green Building Council (GBC), behind only of the U.S., China and UAE (LOUZAS, 2014).

The new LEED v.4 operates on four key elements (Architectural Record, 2014):

- Integrative Process.
- Life Cycle Assessment (LCA).
- Material Sourcing and Transparency.
- Enveloping Commissioning.

According to Josh Radoff (Architectural Record, 2014), from the consulting firm YR&G Sustainability, the new policy regarding materials could make the new LEED v.4 harder to sell and use, and the main point of criticism regarding the new update (Source: Architectural Record, 07/15/2014); however, it dismisses the use of materials based on their performance, waste management and energy and water-saving opportunities throughout their construction.

The new focus over material and integrated design makes the new LEED v.4 a key element in the construction of high-performance, cost-effective buildings, offering early feedback on its design process. The significant changes on Materials & Resources credits (Architectural Record, 2014) are listed below:

- Raw Material Extraction.
- Material Ingredients Report.
- Construction and Demolition Waste Management.

2.2. HQE and the AQUA – France and Brazil

In France, the HQE Process (*Haute Qualité Environnementale*⁶) is a certificate developed by Certivéa. In Brazil, the Vanzolini Foundation at the Polytechnic University of Sao Paulo (USP) is responsible for adapting the French certificate to Brazil, named *AQUA Process – Alta Qualidade Ambiental* (High Environmental Quality) – and is also currently its exclusive certifier (MARTINS, June 16th- 19th, 2009).

The certificates are awarded in the three stages of the project (MARTINS, June 16th - 19th, 2009):

- Program: Ratification that the program can fulfill the demands from the QAE⁷ profile undertaken by the entrepreneur in its commitment.
- Project (Design): Confirmation that the project and contracts include the provisions that comply with the QAE.
- Completed Building: Verification that the building meets the QAE profile concerned upon the completion of the building.

The steps to obtain the certificates are approved through audits performed by the certifier's professionals (MARTINS, June 16th - 19th, 2009). The QAE⁸ is structured in 14 categories:

Figure 2: AQUA 14 categories (source: VANZOLINI FOUNDATION, 2009)

MANAGE THE IMPACTS OVER THE EXTERIOR ENVIRONMENT		CREATE A HEALTHY AND COMFORTABLE INTERIOR SPACE	
Eco-construction		Comfort	
1	RELATION OF THE BUILDING WITH ITS SURROUNDING	8	HYGROTHERMIC COMFORT
2	INTEGRATED SELECTION OF PRODUCTS, SYSTEMS AND CONSTRUCTIVE PROCESSES	9	ACOUSTICS COMFORT
3	CONSTRUCTION SITE WITH LOW ENVIRONMENTAL IMPACT	10	VISUAL COMFORT
		11	OLFACTORY COMFORT
Eco-Management		Health	
4	ENERGY MANAGEMENT	12	ROOM SANITARY QUALITY
5	WATER MANAGEMENT	13	AIR SANITARY QUALITY
6	MANAGEMENT OF RESIDUES IN BUILDING USE AND OPERATION	14	WATER SANITARY QUALIT
7	MAINTENANCE - PERMANENCE OF THE ENVIRONMENTAL PERFORMANCE		

The assessment is based on qualitative and quantitative aspects (MARTINS, June 16th - 19th, 2009):

- Qualitative: the description of the arrangements taken in operational documents, memorials, drawings, studies and others.
- Quantitative: assessment methods utilized, algorithms, notes and calculations, measurements results, among others.

⁶High Environmental Quality.

⁷Qualidade Ambiental do Edifício (Building Environmental Quality).

⁸Qualidade Ambiental do Edifício (Building Environmental Quality).

The performance is associated with the categories that the QAE expresses in its three assessment levels (MARTINS, June 16th - 19th, 2009):

- Good: current practice performance.
- Superior: superior performance – good practices.
- Excellent: performance calibrated according to the highest performance in recent operation of high environmental performance – better.

To implement the demands and obtain the certification it is necessary obtain the following combination of levels for the 14 categories (MARTINS, June 16th - 19th, 2009):

- A maximum of 7 “Good” levels.
- The other 7 categories will be required to obtain levels between “Superior” and “Excellent”.
- A minimum of 3 “Excellent” levels.

Figure 3: Graphic showing the combination of levels (graphic made by the author after data from the Vanzolini Foundation) (source: VANZOLINI FOUNDATION, 2009)



The eventual impossibility of achieving a certain goal can be justified and accepted by the certifying organization (MARTINS, June 16th - 19th, 2009).

The Vanzolini Foundation has certified 133 projects (LOUZAS, Jul. 2013) and over 1 million square meters in dwellings in Brazil (LOUZAS, Nov. 2013). The types of project include 46 residential buildings, 25 office buildings and 15 educational buildings (e.g. Schools) (LOUZAS, Jul. 2013).

2.3. PBE Edifica – Energy Efficiency Label – Brazil

The Label Energy Efficiency of Buildings is a partnership between the *INMETRO* (Brazilian National Institute of Metrology, Quality and Technology) and Eletrobras within the *PBE* - Brazilian Labeling Program – and provides the building with an A to E rating, depending on the level of energy efficiency (ELETROBRAS [et al.], 2009). Current versions available are listed below:

- Commercial, service and governmental buildings.
- Residential buildings.

According to Eletrobras, the power consumption in buildings accounts for about 45% in Brazil. Eletrobras (2009) estimated a potential to reduce this consumption by 50% for new buildings and by 30% for existing buildings that promote energy efficiency renovation.

The National Program for Energy Efficiency in Buildings –*PROCELEDIFICA*–was established in 2003 by ELETROBRAS/PROCEL and acts jointly with the Ministry of Mines and Energy, the Ministry of Cities, universities, research centers and government entities from the technological

and economic development areas, in addition to the construction industry (ELETROBRAS, 2009).

Labels can be granted for new and existing buildings. In order to define the level of efficiency, two methods can be used: the prescriptive and the simulation methods. Documents and resources are being generated to enable the dissemination of knowledge on the regulations: free downloadable worksheets, booklets for inspection laboratories, among others (ELETROBRAS [et al.], 22-24 Nov. 2010).

Each item is scored 0-5 points. Depending on the energy consumption observed, the buildings are rated "A" through "E", being "A" the most efficient. According to INMETRO, the difference in efficiency between categories "A" and "E" reaches 40% (ELETROBRAS, 2009).

Commercial and governmental buildings are assessed according to three individual systems: envelope (façades and roof), lighting system and HVAC system. The general classification will consider these three systems, and add even bonuses, which can be obtained through the use of water, the use of alternative energy sources and any technological innovation that results in energy savings in the building. The allocation of labeling is 30% for envelope, 30% for lighting and 40% for the HVAC system. Subsidies provides incentives to reduce water consumption, use of renewable energy, among others (ELETROBRAS, 2009).

The Labeling for Residential Buildings is analyzed on (LAMBERTS, Nov. 8th - 9th, 2010):

- Independent Housing Units (UH): houses (isolated or condominiums) and independent units of apartment buildings (apartments).
- Apartment buildings:
 - From the consideration of the Independent Housing Units (UH) – houses or apartments.
 - Common-Use Areas: Frequent use and occasional use.

In the Independent Housing Units reviewed, envelope and water heating system with the following items for bonuses: natural ventilation; natural lighting; rational use of water; artificial air conditioning; ceiling fans; refrigerators; individual metering (LAMBERTS, 8th - 9th, 2010).

For the Common-Use Areas of Residential Buildings (LAMBERTS, 8th - 9th, 2010):

- Common areas of frequent use: artificial lighting; centrifugal pumps and elevator.
- Common areas of no frequent use: artificial lighting; equipment (air conditioners, appliances etc.); water-heating systems (showers and swimming pools) and sauna.
- Bonuses: rational use of water; natural lighting in areas of frequent use; natural ventilation in areas of frequent use.

The labeling process of buildings comprises two steps (ELETROBRAS, 22-24 Nov. 2010):

- Project Evaluation – It is held by the inspection body (OI) designated by the INMETRO based on the project and specifications. This step is mandatory for existing buildings. The deadline is within 15 to 60 days and it is valid for three years.
- Building Evaluation – Inspection conducted by inspection body (OI) after completion of the construction. They are assessed in case the projects were faithfully executed and the Constructed Building label is issued with a 5-year validity.

A regulation was published in Brazil in June 2014 requiring that public buildings adopt energy efficiency label *PBE Edifica*, being the achievement of level A mandatory. Buildings with net area inferior to 500 m² are exempt from complying with this standard (PINI, Jun. 2014). The BNDES (Brazilian Development Bank) provides a funding line for the construction and renovation of buildings from the national tourist network that make use of the *Programa Brasileiro de Etiquetagem* (Brazilian Labelling Program, PBE Edifica) as a prerequisite. In order to obtain the funding, new buildings should achieve level A label, whereas for renovations, modernizations and expansions, buildings should achieve level A or B (BNDES, 2014).

PBE Edifica has issued 83 ENCE⁹ labels for commercial and governmental buildings, and for 2,068 residential buildings, including houses, units, condominiums and common areas, totaling 2,151 projects (ELETROBRAS, Nov. 2013).

2.4. *Selo Casa Azul* (Blue House Seal) – Brazil

The *Caixa Econômica Federal*¹⁰ is the greatest governmental funding agent in the construction market, and it holds a range of projects related to sustainability (BENEVIDES, 2009):

- Caixa develops contamination reports.
- Caixa has adopted the PBE Edifica¹¹ branding for all administrative edifications built and under construction by the company.
- Caixa holds especial funding for solar water heating.
- Delivery of low-consumption fridges to low-income buyers in the northeastern states.

The *Selo Casa Azul* (Blue House Seal) was launched in June 2010, as a social-environmental rating for projects and real estate (BENEVIDES, 2009). Caixa's technical team developed the seal, after a research period comprising many existing certificates in Brazil and abroad. Renowned researchers and specialists in the respective areas developed the chapters in the Guide (JOHN AND PRADO, 2010).

The main goals of the seal are (JOHN AND PRADO, 2010):

- To acknowledge and stimulate the production of more sustainable dwellings.
- To promote the integration between construction and urban environment.
- To motivate the rational use of natural resources.
- To lessen the cost of building care.
- To promote the awareness towards the advantages of more sustainable constructions.
- To disseminate the concept of sustainable enterprise.

Adhering of the seal is voluntary, which does not impair the enlisting for funding the construction if the project does not comply with the minimum items (MOTTA, 9 Nov. 2010). Caixa's team grants the stamp. Caixa does not intend to operate as a certifier. In the first step, there will not be interest discounts for floating or other incentives, which could be added on a later step. From Caixa's viewpoint, in addition to the direct benefit, the enterprise could use the seal at its marketing and to raise future consumer satisfaction (BENEVIDES, 2009).

The seal is subdivided into 6 categories and 53 evaluation criteria. Each category contains criteria that may be mandatory or optional. The amount of criteria fulfilled determines the seal level (JOHN AND PRADO, 2010):

- Bronze: mandatory criteria fulfilled = 19 criteria.
- Silver: fulfilling all mandatory criteria + 6 optional criteria (chosen by the entrepreneur) = minimum of 25 criteria.
- Gold: fulfilling all mandatory criteria + 12 optional criteria (chosen by the entrepreneur) = minimum of 31 criteria.

The 6 categories are subdivides into 53 evaluation criteria with an equivalency of 1 point each (JOHN AND PRADO, 2010):

- Urban Quality (5 criteria)
- Project and comfort (11 criteria)
- Energy efficiency (8 criteria)

⁹National Energy Conservation Label.

¹⁰Brazilian Federal Savings Bank.

¹¹ Brazilian Label Program for Buildings Program focusing in Energy Efficiency.

- Conservation of natural resources (10 criteria)
- Water management (8 criteria)
- Social practices (11 criteria)

The mandatory items involve (JOHN AND PRADO, 2010):

- Fulfilling the legislation: installment of the ground, Master Plan, construction codes, agrarian and environmental regularization.
- Work, health and environmental honors regularization.
- Approved projects by competent organs.
- Environmental licensing.
- Use of wood from legal origins – Real State Credit Program.
- Fulfilling of the Program of Floating and Repass rules.

The first step is the confirmation of the applicant's interest and submission of the documents for examination and request: project, Caixa templates, details and plans. After the acceptance, a contract is signed. Caixa's multidisciplinary team of architects, engineers and social technicians (JOHN AND PRADO, 2010) follow up the analysis.

In May 2011, the first Gold category stamp was granted. So far, the Casa Azul seal certified 11 projects, totaling 5,593 housing units. 2 out of these 11 projects received the silver seal and the remainder received gold seal (QUINTINO, 2014).

Currently, incentives for projects with the Casa Azul seal in the silver or gold levels are for projects financed with the SPBE (Savings) resources and they are part of a package intended for builders, they may reduce the interest rates according to the company's relationship with Caixa. At the end of 2013, there were changes in certification methodology, and the most significant ones were the compliance with the Performance Thermal Performance Standard (NBR 15575) criteria and the creation of Criterion Bonus for items not included in the methodology, such as point for charging electric cars etc (QUINTINO, 2014).

2.5. Qualiverde – Rio de Janeiro – Brazil

This is a specific legislation proposed by the city of Rio de Janeiro, launched during the Rio +20 in 2012, aiming to provide benefits and incentives to the adoption of sustainability practices and actions with a view to reducing environmental impacts. Qualiverde will qualify projects that adopt sustainability initiatives with construction (e.g. area) and tax benefits. The qualification is optional and applies to projects for new and existing buildings. There is freedom to choose the sustainability actions. For the purposes of the benefits, there are two classifications: QUALIVERDE (70 points) and QUALIVERDE TOTAL (100 points) (SECRETARIA DE URBANISMO RJ, 2012).

The Qualiverde envisages and systematizes the following sustainability actions in buildings: Water Management, Energy Efficiency, Thermal Performance and Sustainable Design. This qualification also aims to make benefits available to qualified projects QUALIVERDE and QUALIVERDE TOTAL through 2 Laws¹² (SECRETARIA DE URBANISMO RJ, 2012):

- Tax Benefits Law.
- Construction Benefits Act.

The Qualiverde certification grants, for a maximum period of two years, 50% discount on the IPTU (Urban Property Tax) during the construction phase, while for Qualiverde Total certification, constructions are exempt from IPTU. Upon completion of the work (*Habite-se*, an occupancy permit), the Qualiverde certification grants 10% discount on the IPTU and the Total Qualiverde 20%, both of which are reassessed every three years. About the 1st purchase tax

¹²In progress at the CMRJ (Rio de Janeiro City Council).

(ITBI, Inter-Vivos Property Transfer Tax), the Qualiverde has a discount of 50% and the Total Qualiverde is exempt from it (SECRETARIA DE URBANISMO RJ, 2012).

Benefits for QUALIVERDE Construction (SECRETARIA DE URBANISMO RJ, 2012):

- Exemption of the area of open balconies and plantations in the calculation of the ATE – Building Total Area.
- The Common Use Floor premises may occupy 100% of the upper deck projection.
- The roofing floor may occupy up to 75% of the floor immediately below.
- Parking on ground floors may be covered with green roof, associated with a storm water reuse system.
- Occupation of the front setback with an underground parking.
- Half the number of parking space for the same unit can be locked.
- 20% reduction of the minimum parking space dimensions in the total parking space designed.

At this point, the benefit is the priority in the approval process, with the project being examined in advance than those who are not subject to Qualiverde (ROLIM, 2014)

Currently, three projects are applying for the Qualiverde. One of these projects is the Rio de Janeiro Olympic Village, in Jacarepaguá (for the 2016 Olympics). The other two projects are under licensing process (SECRETARIA DE URBANISMO RJ, Aug. 2013).

3. CONCLUSION

Many countries have their own certifications. In Brazil, some international certifications have been adopted over sustainability with minor or major adaptation, according to the local conditions, and there is a big visibility over the inclusion of certifications and stamps on enterprises and, in some cases, such as the Qualiverde in Rio de Janeiro, advantages over the adoption of certifications for its gauging over specific scoring.

Until that moment the inclusion of these certifications are in the land developers' and constructors' criteria over the request of clients or their vision of opportunities that sustainable solutions generate benefits and attractions to the stakeholders.

The corporate market has been leading the quantity of certification with items of better resources management mainly as energy, water and a window of opportunity for reducing bills and visibility. Another motivation is the same real estate companies (facilities) and the origin of these companies' clients, in many cases multinationals branches, that already adopt those certifications in their country of origin.

Brazilian cities such as Rio de Janeiro have, in their building legislation, required goals that need to be achieved for the approval of projects for new buildings and relevant renovations to existing buildings. In other countries, some cities have adopted certifications in their respective legislation as a strategy for the inclusion of sustainability.

A suggestion for the inclusion of certifications would be the granting of advantages, for example, the priority of approval for projects that adopt certifications. These advantages could be related to scores and/or levels obtained.

Alternatively, there could be a requirement for basic levels of certifications and stamps. For example, an energetic efficiency stamp such as PBE Edifica would obtain levels B or C. This action would also have the advantage of generating knowledge on the respective stamps in the architecture, engineering and constructions sectors. In addition, its simple adoption would naturally enable the competition in the sector, in which projects aim to achieve, even at an initial stage –when specific scoring is not mandatory – higher ratings in stamps and certifications.

At a further moment, tax incentives and/or apartments could be defined, as suggested by Qualiverde.

Another aspect would be the inclusion of specific certification categories such as water and/or energy. The analysis of the legislation regarding water and energy related items for buildings in order to associate certifications requirements of the legislation itself may be key to the success of inclusion proposed herein.

The assessment of the needs, gaps and opportunities in the city in terms of water and energy will be important to when including certifications categories in the legislation, in order to obtain data that allow even adaptations of certifications items. Such action could arise from agreements of the bodies of the municipality with the certifying bodies with the involvement of public water and energy utilities, in order to take advantage of the complementary knowledge of these players. The other way round could also occur with the inclusion of certification items in the legislation with the following steps:

- Analysis of the legislation to include items that allow reduction of energy and water consumption.
- Analysis (survey) of the city economy needs
- Water and energy utilities with a focus on services and associated with the development of better management instructions.

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