A CORPORATE SUSTAINABILITY INFORMATION SYSTEM TO RIO DE JANEIRO CITY

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1. INTRODUCTION

This study aims to propose the design of a **Corporate Sustainability Information System** to support sustainable management of City Agencies, by providing the basis for an **Action Plan** to track energy, fuel and water consumption; effluent, waste disposal and greenhouse gas (GHG) emissions, resulting from the operations of Rio de Janeiro City Agencies.

By not having a corporate control of their environmental sustainability limits, these Agencies cannot implement improving actions addressed to energy efficiency and consumption reducing. Thus, Rio de Janeiro City misses a great opportunity to save financial resources, minimize environmental impacts and GHG emissions from its operations, and to lead the Community by examples in sustainability actions. Assuming that GHG emission control protocols require to track and review all needed processes for City operations (such as building and fleet consumption, waste disposal), the implementation of these protocols will result in efficiency gains and cost reduction in the medium term.

The methodology adopted for this work involved the following steps: ***(a)*** the prospection of several modalities of **GHG Protocol System** for carbon Inventories, ***(b)*** a comparative analysis of Inventories and Climate Action Plans adopted by San Francisco and New York Local Governments to their operations; ***(c)*** the analysis of Rio de Janeiro Municipality Climate Change Policy; ***(d)*** the proposal of a basis for a **Sustainability Information System**, setting as a boundary the tracking of building and administrative operations impacts by Rio de Janeiro City Agencies.

It is expected that this system will be useful to set indicators to assist building conservation measures, procurement of goods and services, and quality control of the operations; and to stimulate search for new management models in support of sustainable development of Rio de Janeiro City.

2. THE ROLE OF LOCAL GOVERNMENTS IN CLIMATE MANAGEMENT

The worldwide fight against climate change was systematized with IPCC[1] support, that prepared GHG emissions tracking methodologies, and the celebration of Kyoto Protocol, that set global reduction targets for the main emissions (1997). The starting period for meeting reduction targets established ran out in 2012, without achieving the initial goals, and today nations look for a new deal. Climate Change issues involve severe impacts on national economies, and impasses between development and growth lead to delays and uncertainties in meeting the targets. However, local

[1] Intergovernmental Panel on Climate Change

government initiatives have been providing the most effective and economical solutions to achieve sustainability goals through its influence and authority on various topics related to climate, such as: urban forestry, waste management, public transport and others [(1)].

So Municipalities have a comprehensive role on climate change. They must prevent resilience in their communities, by reducing vulnerabilities; track and control citywide emissions by making GHG Inventories, designing Climatic Action Plans and implementing public strategies and policies. Finally, they should track and control their own corporate emissions, also through Inventories and Action Plans, playing a major Leading by Example role [(2)].

3. CORPORATE CARBON MANAGEMENT IN MUNICIPAL ADMINISTRATION

GHG reduction results from the control of activities that cause its emissions. The main steps for emissions control are: ***(a)*** recognizing the relevant activities and selecting the emissions to control; ***(b)*** collecting consumption and waste generation data related to these activities; ***(c)*** calculating GHG emissions; ***(d)*** planning and running actions that lead to emissions reduction.

3.1. GHG INVENTORIES AND CLIMATE ACTION PLANS

Emissions management relies on the construction of GHG inventories, which are the basis for development of Climate Action Plans. A Climate Action Plan typically considers risks, regional and local vulnerabilities, the definition of baseline and mitigation scenarios, goals and targets settings, and selection of mitigation options [(2, 3)]. The development of Inventories and Action Plans includes the following stages: ***(a)*** defining physical, organizational and operational boundaries: wich facilities, administrative units and activities will be evaluated; ***(b)*** defining scope: to decide emission sources and/or categories of activities to be included, and which GHG will be addressed; ***(c)*** choosing approach to quantification: Corporate Inventories generally adopt the bottom-up approach to data collection, aggregating information of local end users; ***(d)*** engaging stakeholders: internal stakeholders, from employees to senior managers; and external stakeholders, such as suppliers, private sector and the Academy. The joint collaboration ensures the transversality of strategies; ***(e)*** preparing inventories, by implementing tools for information collection and management needed to carbon emission calculations. Internal and external verification of inventories are desirable; ***(f)*** establishing goals, plans and emission reduction targets: to develop future scenarios, a baseline and alternative scenarios must be constructed. Baseline illustrates the amount of GHG that tend to be emitted within a certain period of time, based on Inventories already made. Alternative scenarios incorporate emission reductions resulting from efficiency measures. Once defined the measures, reduction targets and deadlines are set; ***(g)*** Establishing implementation, evaluation and measurement procedures, by identifying resources and agents, and setting tracking reports schedules; ***(h)*** Disclosing results: the disclosure of Inventories and Action Plans shows the commitment to the results.

3.2. COMMUNITY INVENTORIES AND LOCAL GOVERNMENT OPERATIONS INVENTORIES

Municipal governments can work with several kinds of emission inventories according to the desired boundaries: ***(a)*** a **Community-Scale GHG Inventory**, which covers city-wide emissions, allowing the City to promote mitigation strategies for the entire community. It is used by several cities in their climate strategies (see the sections IV and V: San Francisco, New York City and Rio de Janeiro cases). **Global Protocol for Community-Scale GHG Inventories** is the most recent protocol [(4)]; ***(b)*** a **Local Government Operations (LGO) Inventory**, which covers emissions from responsibility

of the Municipality; allowing it to control their emissions through energy efficiency strategies and sustainable consumption. San Francisco and New York City use LGO Inventories as a reference for its innovations in conservation procedures, maintenance and resource management (see section IV). Local government issues are typically a subset of the community emissions, reaching 3-7% of citywide total emissions. A specific protocol for this purpose is the **Local Government Operations Protocol** [(5)]; ***(c)*** a **Corporate GHG Inventory**, which addresses emissions of an organization: allows any Department or Agency to control its emissions and apply reduction strategies. San Francisco City Departments use it as a reference for their Action Plans (see Section IV). In Brazil, **Programa Brasileiro GHG Protocol** [(6)] provides the necessary guidelines to private and Public Sector organizations; and a specific protocol was designed for public agencies in the United States: **GHG Protocol for the US Public Sector** [(7)].

3.3. GHG PROTOCOL METHODOLOGY

GHG Protocol is one of the most widespread methodologies to elaborate GHG inventories. The establishment of an inventory under its guidelines includes the following stages [(3)]: ***(a)*** Identification of emission sources is by classifying them in Scopes (Scope 1, direct emissions controlled by the organization; Scope 2, indirect emissions from purchased electricity; Scope 3 indirect emissions not controlled by the organization), setting of sources categories: stationary combustion, mobile combustion; chemical and physical processes; and fugitive emissions; ***(b)*** Selection of emission calculation tools: the application of emission factors registered in protocols based on IPCC guidelines is the most common way; ***(c)*** data collection of the activities and selection of emission factors. In most organizations, emissions are calculated as follows: Scope 1, based on the quantity of purchased fuel and gases by applying the published emission factors; Scope 2, based on the measured electricity consumption by applying published or supplier released emission factors; Scope 3, based on activity data, by applying published emission factors; ***(d)*** Application of calculation tools: intersectoral tools (applicable in various industries) are generally used, or specific sector tools (applicable in specific industrial sectors), when necessary; ***(e)*** Data consolidation at corporate level: aggregation and synthesis of data from several facilities in different locations and hierarchies.

4. GHG INVENTORIES AND CLIMATE ACTION PLANS IN U.S. LOCAL GOVERNMENTS

According to Environment Protection Agency – EPA [(1)], there are local governments that implement Leading by Example (LBE) corporate programs on Climate Change, to reduce GHG emissions and save energy in their facilities, operations and fleet. In addition to build capacity and save resources at local government level, these programs demonstrate environmental and energy efficiency leadership from Municipalities that implement them, and also achieve community´s awareness to the benefits of green technologies. Experiences of San Francisco and New York City include those LBE strategies.

4.1. SAN FRANCISCO EXPERIENCE: DepCAPs

The commitment of San Francisco City and County to environmental goals dates back to the 1990s, and is linked to California State commitments that establish renewable energy consumption and GHG reduction targets. The first Climate Action Plan of San Francisco was launched in 2004. In 2005, San Francisco has committed to support Kyoto Protocol emission reduction targets, that were reached in 2008. From this year, City coordinates through **SF Environment Department** a

corporate climate change program by annually tracking and publishing GHG emissions from 60 Departments through the Departmental Climate Action Plans - DepCAPs [8,9]. As a reference of the relationship between LGO and citywide emissions, those accounted for 4.03% of citywide emissions in 2010 [10,11].

DepCAPs were regulated by Law in 2008, and each Department started to account their emissions and to track the following items: equipment and fleet fuel consumption, energy and water use in buildings, waste generation, employees transportation and purchasing procedures. The process, which allows Departments to identify possible improvements of their operations and reduce their carbon footprint, is assisted by Climatic Liaisons represented by employees in each Department. There were published 46 DepCAPs Action Plans in 2013 [12].

A common structure of these plans includes: Department profile (mission, activities, responsibilities, budget, facilities, fleet); its carbon footprint (City and the Department targets, annual emissions, energy use, energy efficiency measures, renewable energy use, green building, water reducing and fleet fuel measures, employees transportation raising); other sustainable practices (regulatory compliance: Zero Waste, Green Procurement, Carbon Sequestration and Urban Planting). Impacts in the Community are reported, and the Environmental Goals of the Department are declared. The Green Procurement Program is highlighted by EPA as a reference in Leading by Example, for assisting San Francisco Municipal Departments to implement City procurement policies [13].

4.2. NEW YORK CITY EXPERIENCE: PlaNYC

New York City elaborates GHG inventories since 2007, reporting both citywide emissions and local government operations (LGO) emissions. They are annually updated by legal requirement since 2008, to document progress towards the targets. As a reference of the relationship between LGO and citywide emissions, those accounted for 7.10% of citywide emissions in 2009 [14].

PlaNYC, a sustainability and resilience plan that establishes climate action as a main theme in citywide planning, was released in 2007 [15]. More than 25 City Agencies and external partners in Academy, Private Sector, and Society contributed to set goals, initiatives and milestones. OLTPS and ORR (Mayor's Office of Long Term Planning and Sustainability and Mayor's Office of Recovery and Resiliency) oversee PlaNYC progress, updating it every 4 years and providing annual progress reports. OLTPS coordinates its development transversely with other municipal agencies, and supervises other infrastructure and environment issues. From 132 initiatives presented by PlanNYC in 2011, about 10 initiatives addressed Local Government Operations, in Energy, Air Quality, Solid Waste and Climate Change areas [16].

5. CITY OF RIO DE JANEIRO CLIMATE CHANGE POLICY

The City of Rio de Janeiro published in 2011 the Municipal Law n. 5248 [17], establishing the Municipal Policy on Climate Change and Sustainable Development, and setting citywide emissions reduction targets: 8% in 2012, 16% in 2016 and 20% in 2020, related to emissions in 2005. Works, programs, activities and projects from Municipality should consider the reduction targets and estimate their emissions impacts; and procurement and contracts should consider environmental products purchasing and social sustainability[2]. Emissions accounting and tracking, and the other sustainable measures resulting from Local Government Operations, although under Law, are still waiting for specific rules for their implementation.

[2] See (17), Arts.6, 8 ad 9.

5.1. CITYWIDE GHG INVENTORIES AND CLIMATE ACTION PLANS

The first Community Emissions Inventory was published in 2000, related to 1998. The Inventory used as a reference to Law n. 5,248 was disclosed in 2011, related to 2005 *(18)*. The resulting Action Plan considered these Inventories for the baseline, and alternative scenarios were established considering not only City projects, but also State and Federal Government initiatives *(19)*. Citywide emissions were updated in the 2012 Inventory and Action Plan. It was also estimated that emissions will approach the established reduction target by 2016, considering, among other factors, initiatives in City of Rio de Janeiro Strategic Plans, regarding to urbanization projects, urban mobility, reforestation and urban arborization *(20)*.

Two voluntary initiatives of corporate GHG emissions tracking are registered in Rio de Janeiro City: ***(a)*** **COMLURB** (Municipal Urban Cleaning Company) tracks the annual emissions of fleet and landfills under its control; ***(b)*** **Fundação Planetário** (Planetarium Foundation) annually discloses its Inventories in **Programa Brasileiro GHG Protocol** since 2013, as part of its low-carbon policy *(21)*. **Rio de Janeiro Strategic Plan 2013-2016** *(22)* highlights the need for environmental sustainability actions in City operations as a Climate Action Plan: eight initiatives involve expansion of the municipal building stock, totaling at least 324 new constructions and 200 refurbishing of municipal buildings[3]. These new buildings will demand, when in use, an increase in energy, fuel, water and gas consumption, and more waste generation. The use of energy efficiency strategies in these low-scale projects would bring down maintenance costs, environmental impacts and low emissions.

There are also in the Strategic Plan initiatives in management, governance and business areas that would provide many opportunities for carbon reduction measures: ***(a)*** the efficient procurement initiative (*Governo de Alto Desempenho*) would have a potential impact in reducing waste generation; ***(b)*** Regulations of the 5248 Law to implement municipal projects and policies facing climate change, and disclosure of sustainability actions by publishing GRI Sustainability Reporting (*Rio Capital Sustentável*) would respectively allow a clear allocation of responsibilities, targets and milestones setting; ***(c)*** the initiative that engages Energy Research Centers based in Rio (*Rio Capital da Energia*) could be also used to help with performance analysis and searching for energy efficiency solutions for City operations[4].

6. CLIMATE POLICIES OF SAN FRANCISCO, NEW YORK CITY AND RIO DE JANEIRO

San Francisco and New York City are quite different from Rio in political, economic and social contexts, but observing these experiences may be helpful in evaluating potentials not yet exploited in Rio de Janeiro Climate Change Policy. Some key aspects of the three Cities are compared:

[3] New buildings and refurbishing projects are reported in the following initiatives (22): Saúde Presente (pg 26), Desospitalização e Leitos de Retaguarda (pg 28), Escola Carioca em Tempo Integral (pg 33), Espaço de Desenvolvimento Infantil (pg 34), Programa Saúde nas Escolas (pg 36), Rio em Ordem (pg 67), Revisão da Rede de Equipamentos Culturais (pg 101), Atendimento Psicossocial (pg 106).

[4] (22), pgs 75, 88, 94.

	SAN FRANCISCO	NEW YORK CITY	RIO DE JANEIRO
Population [5]	808.976	8.363.710	6,453,682
City Agencies[6]	60 Departments	128 Agencies	54 Agencies
Municipal Building Stock[7]	446 buildings (29 types)	4.000 (300 million square feet)	2190
Number of employees [8]	28.861	More than 300.000	118.503
Managers of Climate Policy (LGO)[9]	SF Environment	Mayor Office: OLTPS e ORR	No
LGO emission Inventories[10]	Yes	Yes	No
LGO emissions/ city-wide emissions[11]	4,03%	7,10%	No

Table 1: LGO Climate Policies: San Francisco x New York City x Rio de Janeiro

The size of New York City in terms of population, number of employees and public buildings stock is closer to Rio de Janeiro than San Francisco. Their climate policy began also in near seasons. One can realize two major differences in the experiences of San Francisco and New York related to Rio: ***(a)*** both cities clearly tracked and disclosed their operation emissions while preparing Community GHG inventories. So the weight of those emissions can be compared to citywide emissions (San Francisco: 4.03%; New York: 7.10%), and their LGO Climate Action Plans cand clearly target emissions reductions. ***(b)*** the establishment of detailed regulations addressed to City operations (San Francisco and New York) and centralization of climate governance process in Mayor's Office (New York) seem to be the best strategy to ensure that the investments towards Public Administration will be implemented within objective criteria of environmental economic and social sustainability.

7. THE PROJECT: PROPOSING A CORPORATE SUSTAINABILITY INFORMATION SYSTEM TO CITY OF RIO DE JANEIRO

Exposed the need for a corporate climate action plan for City of Rio de Janeiro, this plan should have the following requirements: ***(a)*** a governance structure with political, administrative and financial support; ***(b)*** a data and communication structure to enable information collection and processing, management reports and inventories, in order to build scenarios and allow decision making; ***(c)*** technical support in climate change, in order to generate inventories and build GHG emission scenarios; ***(d)*** technical support in energy efficiency, fuels, water and waste management, in order to model GHG mitigation strategies.

[5] Sources: San Franciso: *(1)*; New York: *(2)*; Rio: *(25)*
[6] Sources: San Franciso: *(12)*; New York: *(29)*; Rio: *(23)*
[7] Sources: San Franciso: *(26)*, pg 5; New York: *(15)*, pg 113, pg 147; Rio: estimate based on various data
[8] Sources: San Franciso: *(27)*, pg 5; New York: *(15)*, pg 147; Rio: *(28)*, pg 12
[9] Sources: San Franciso: see Section IV.1; New York: see Section IV.2
[10] Sources: see Section IV.1; New York: see Section IV.2
[11] Sources: San Franciso: see Section IV.1; New York: see Section IV.2

7.1. PROJECT DEVELOPMENT

If it is necessary to provide municipal managers a sustainable management view of their Agencies, information and data to be managed should be known, remembering Peter Drucker (*do not manage what you cannot measure*). So, in order to implement a corporate sustainable management culture in City of Rio de Janeiro, the first step is to organize a system with the necessary information, bringing them together in a single database. This tool will enable decision-makers to set different possibilities of data aggregation in order to elaborate different strategies addressed to emissions reducing. Data structure would be organized to meet the accounting of emissions under GHG Protocol Methodology, and the sources for the most common building and service operations to all administrative units should be monitored: fuel and water consumption; effluent and waste disposal, as shown in Table 2.

SCOPES	EMISSION SOURCES	CONSUMPTIONS AND DISPOSALS INPUT DATA[12]
Scope 1	**Stationary Sources**	• **electricity generators:** fuel consumption data and motor specifications; • **gas heaters, stoves, boilers:** Natural gas consumption data provided by CEG, and purchased LPG
	Mobile Sources	• **vehicle fleet (cars, motorcycles, trucks, buses, etc.):** data and fuel consumption, specifications, traveled distance and vehicle specifications (model / year of manufacture)
	Fugitive Emissions	• **Air conditioning systems:** data consumption of CFC, specifications, and system specifications • **Fire extinguishers:** consumption data and gas specifications
Scope 2	**Purchased Electricity**	• Electricity consumption data provided by LIGHT
Scope 3	**Effluent generation**	• Water consumption data provided by CEDAE • Recommended Return coefficient (C)[13] • Building occupancy data (number of occupants)
	Solid Waste Generation	• Recommended Waste gravimetry Data • Building occupancy data (number of occupants)

Table 2: Consumptions and disposals input data by Scopes an Emission Sources under GHG Protocol organization

There are two sets of typical data in corporate inventories not addressed in the proposed structure above: ***(1)*** **Business Travels** (Scope 3): necessary data (distances in the travel and transportation modes used) can be easily incorporated into the reports; ***(2)*** **Employees Transportation** (Scope 3): the work trips for City employees is an important part, but due to the high number of them, a specific methodology should be previously selected to raise this information. The selected data will feed both the Corporate Sustainability Information Reports and City Agencies GHG Emissions Inventories.

7.1.1. MANAGEMENT STRUCTURE

The success of the Project will require an appropriate framework for governance, as noticed in the experiences of New York City and San Francisco. It would be up to the Mayor to decide on the

[12] CEG, LIGHT and CEDAE are companies that provide respectively natural gas, electricity and water. CEDAE is responsible for sewage treatment almost citywide.

[13] *Return coefficient (C) is the average ratio between the volumes of sewage produced and water effectively consumed*.

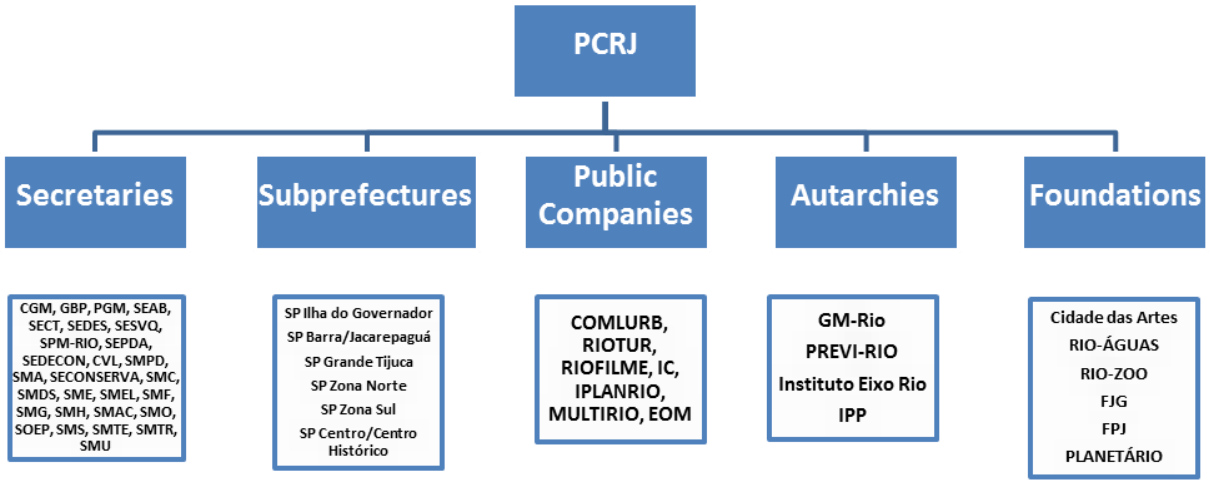
adequate management structure, whose Leader should decide on the Agencies to be monitored, the actions to be taken, the call of Agencies Managers to join the Project, schedule implementation, definition and dissemination of targets and results. A Working Group should be assigned to consolidate information and generate the Corporate Sustainability Information Reports. After developing the reports of various Agencies, the manager should enable the development of Sectorial Climate Action Plans to be consolidated with the support of the Working Group. These plans should harmonize with City Strategic Plans and the assumed emissions reduction targets. The Corporate Emissions Inventories and Sector Action Plans should be consistent with the Inventories and Climate Action Plan of the Municipality.

7.1.2. CONSTRUCTING DATABASE

The necessary database for the Information Reports and Emission Inventories should be fed by members of the various Municipal Agencies. It is suggested to be made a preliminary survey data of energy, water, gas and fuel consumption from ALL of the Agencies. This first survey will allow the Mayor to assess the most representative Agencies in order to concentrate efforts on raising other complementary data to enable better accuracy in the preparation of future GHG Emission Inventories and Climate Action Plans. Database should be updated monthly, and the closing of the reports should be annual, allowing the disclosing of the reports in the following year.

7.1.3. DEFINING CITYHALL THROUGH A PHYSICAL/ADMINISTRATIVE ORGANOGRAM

As recommended by **US Public Sector Protocol**[14], an appropriate framework for development of corporate GHG Inventories should be set, considering: the different autonomy levels within the existing hierarchy; levels where significant operational policy decisions can be implemented; and levels where data can be collected more conveniently. The City of Rio de Janeiro is current divided into 54 agencies *(23)*:



Picture 1: Rio de Janeiro City Agencies summarized Organogram

These Agencies are functionally organized in **Administrative Units**, and distributed in several **Facilities**, identified by their addresses in an Integrated Institutional Coding - SICI *(24)*. Agencies should conduct survey and data completion related to the quantities of consumed supplies and their

[14] See *(7)*, pg *51*

costs, effluents, waste and occupancy data of each Facility. In this way, it will be possible to get reports from each Facility and aggregate them by similar uses and/or by Agency and tracking its hierarchy. The Information System should relate the data according to the following physical/administrative organogram structure.

***(a)* Agencies:** each City Agency (Secretary, Subprefecture, Public Company, Autharchy or Foundation) institutionally identified, compiles the information of all controlled facilities. All its Administrative Units must be organized by address, characterizing the Facilities;

***(b)* Administrative units:** it is assumed that they are responsible for the operational control of the facilities, thus, for bottom-up data collection in accordance with each Agency characteristics;

***(c)* Facility:** group of buildings, single building, or internal occupying area of a building under the control of a specific administrative unit and holding a defined use. A Facility may correspond to an Administrative Unit (eg, school, kindergarten, hospital), to one or more buildings. On the other hand, a single building can meet various administrative units. As the control of building consumption and efficiency measures should be addressed to Facilities controlled by Administrative Units of each Agency, a Physical / Administrative Organogram should be structured. Each Facility should have the following information:

TECHNICAL SPECIFICATIONS	FIELD	DESCRIPTION
General Information	identification	name, address, phone, e-mail, homepage, contact
	type	group of buildings, single building, or internal occupying area
	Use	Administrative, educational, health, etc.
	Hierarchical subordination	Administrative unit which is subordinated to, and responsible for ordering costs
Area and occupation data	Area (m2)	land area, total area built, projection area
	Occupation (person)	Number of servers / outsourced (fixed) and users (floating population)
Technical information	Illumination system	Description and installed power
	Air-conditioning system	Description and installed power
	Motors and pumps	Description and installed power, used fuels
	Vehicle Fleet	Description, used fuels

Table 3: Technical specifications, consumption and waste data

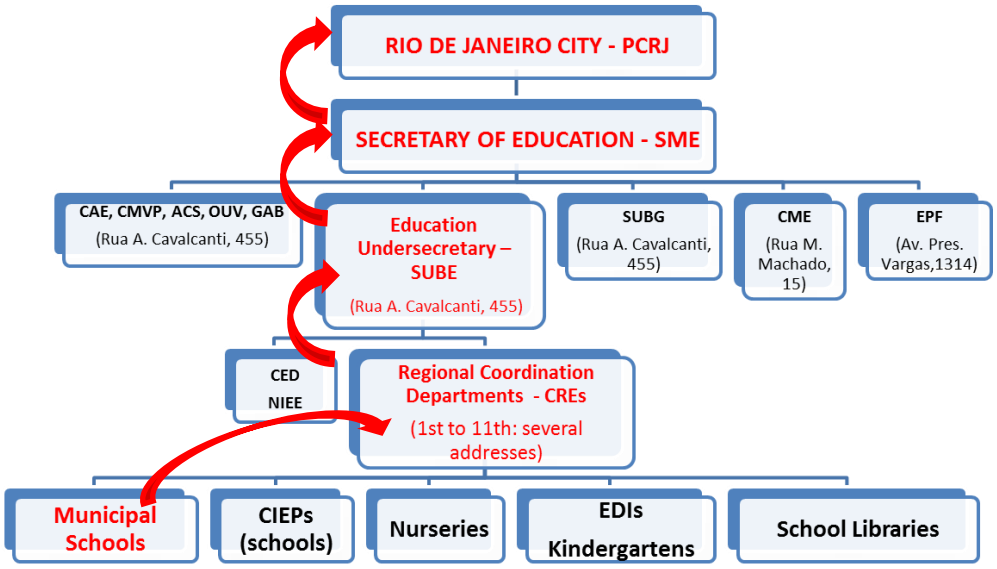
CONSUMPTION & WASTE DATA	FIELD	INDICATORS
Scope 1	Fuels (by destination and type)	**L**, L/m^2, L/ person, **R$**, R$/m^2, R$/person, TCO_2, TCO_2/m^2, TCO_2/ person
	Gas (by destination and type)	**m^3**, m^3/m2, m^3/ person, **R$,** R$/m^2, R$/ person, TCO_2, TCO_2/m^2, TCO_2/ person
Scope 2	Electric Power	**kWh**, kWh /m^2, kWh / person, **R$**, R$/m^2, R$/ person
Scope 3	Effluents	**m^3_{water}**, m^3_{water}/m^2, m^3_{water}/ person, **R$**, R$/m^2, R$/pessoa, $m^3_{effluent}$, $m^3_{effluent}/m^2$, $m^3_{effluent}$/ person, TCO_2, TCO_2/m^2, TCO_2/ person
	Solid Waste	m^3_{waste}, m^3_{waste}/m^2, m^3_{waste}/ person, R$, R$/m^2, R$/ person, TCO_2, TCO_2/m^2, TCO_2/person

Table 4. Consumption and waste data (Total and/or unit quantities monthly consumed, unit costs, disposal for effluents and waste)

7.1.4. RESULTS: INFORMATION REPORTS

Reports with different views may be generated: allowing data consumption, waste and costs to be aggregated at several levels. Taking as an example the **Secretary of Education** structure and a specific facility typology, the **Municipal School** [24], it would be possible to: view consumptions of each school; compare consumption of various schools; aggregate indicators of different schools under a Regional Coordinating Department; compare several Regional Coordinating Department consumptions; aggregate data from all Departments, as seen in Figure 2.

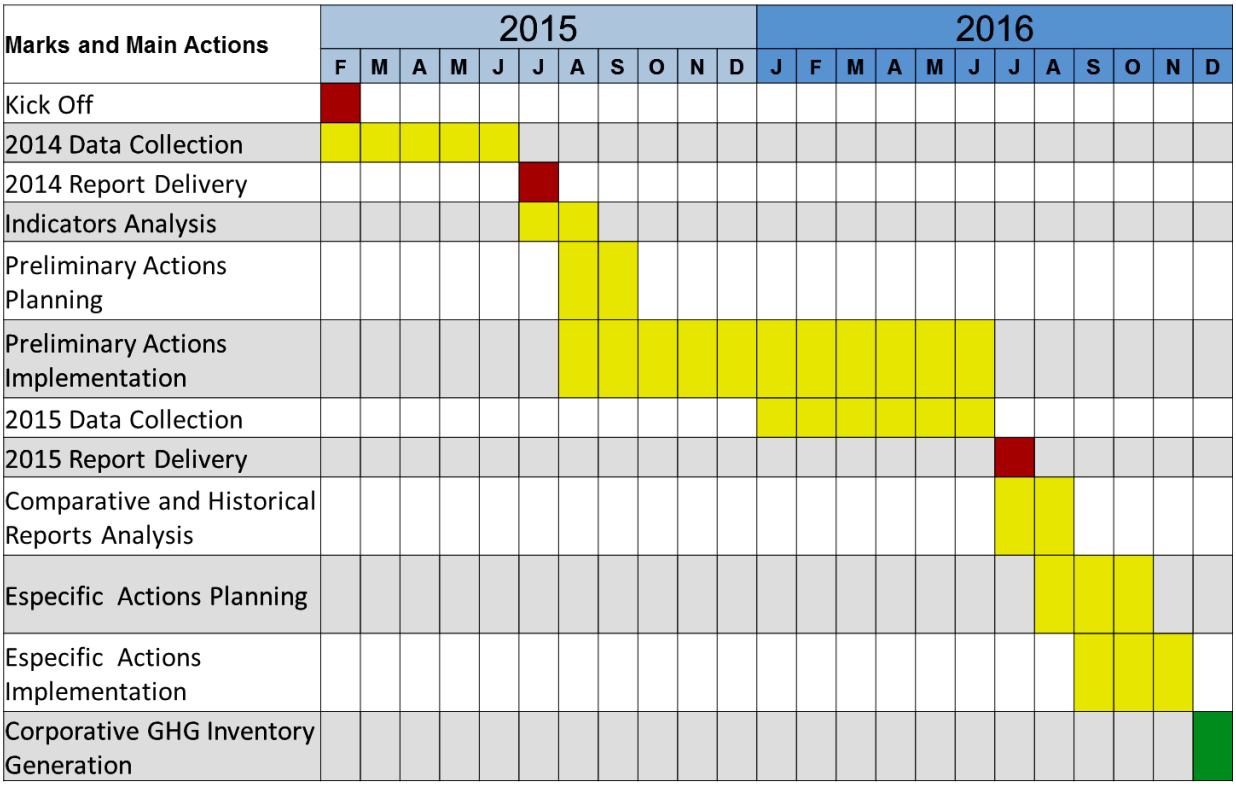
Finally, at the level of Rio de Janeiro City Hall, data from several Agencies can be addressed in different ways: viewing the consumption of each Agency; comparing consumption of several Agencies; aggregating total inputs and disposal quantities of each Agency, including involved expenses; aggregating global quantities of specific sectors for indicator comparisons; tracking data and indicators of all City Agencies.



Picture 2: Municipal Schools Data Aggregation in Secretary Of Education - SME

7.3. PHYSICAL IMPLEMENTATION SCHEDULE

The proposed physical schedule considers the structuring of the project still in the current government, enabling the development of Inventories and Corporate Climate Action Plans in future governments.



Picture 3: Physical Implementation Schedule

7.4. RESULTING BENEFITS OF PROJECT IMPLEMENTATION

7.4.1. PRELIMINARY ACTIONS FROM THE FIRST REPORT ANALYSIS

Resulting information from the initial data collection would allow an immediate assessment of discrepant indicators through statistical analysis, allowing the prospection of reasons for these deviations. Most severe problems can be detected and corrected, related to: building conservation and maintenance, engine overhauls, correction of excesses in material consumption. At the same time, campaigns involving behavioral changes, applied without significant costs, could be promoted, such as shutdown of lamps and equipment out of use, and selective waste collection.

7.4.2. RESOURCE OPTIMIZATION

Comparing consumption and costs in a same source of information would assist the Public Manager to compare the performance of agencies under his responsibility with other units and institutions, and take more accurate decisions to optimize the use of resources. Many data are not available today in the same source of information, resulting in a hard joint analysis, which may lead to delays and errors in decision making.

7.4.3. ACCOUNTABILITY AND TRANSPARENCY

he disclosure of Emission Inventories and implementation of Corporate Climate Action Plans would highlight the commitment of the Municipality to sustainability, and would provide greater transparency in public management, by reporting their results of mitigation measures to society.

7.4.4. LEADERSHIP BY EXAMPLE AND EXTERNAL REFERENCE

The disclosure of sustainability management actions, through demonstration projects and the involvement of attended population (eg. students of public schools), has great educational potential. Population would reproduce some of these actions, especially if they were accompanied by specific public policies. The implementation of a Carbon Corporate Public Policy would be an innovative initiative in Latin America. Disclosing indicators, methodologies and all technical procedures involved would be a strong contribution to sustainable development in Public Management.
Several cities are developing studies to track their own emissions, but only a few of them completed the wide approach from macro to low scale as proposed in the mentioned references that inspired this project.

7.5. NEXT STEPS: GHG INVENTORIES AND CLIMATE ACTION PLANS DISCLOSURES

The collected database and its continued upgrade would allow the production of Emissions Inventories and Climate Action Plans of City Agencies. Decisions on prioritization of agencies and sources of emissions to be addressed, considering the environmental impacts to be reduced and resource efficiency to be achieved would lie with the Mayor and Project Manager. An expansion of the project would lead to the disclosure of Inventories and City Hall Action Plans as a whole.

8. CONCLUSION

“You can´t manage something if you can´t measure it”

Peter Drucker

From this statement we notice that there is no way to propose sustainable management procedures to Rio de Janeiro City without the preparation of GHG emissions inventory basis, which demands the collection of necessary information data in a structured way, since these data are not yet organized in a proper way.

Thus, the proposed Corporate Sustainability Information System, beyond enabling an optimization of corporate resources use, constitutes the first step of a huge Municipal Climate Action Plan. This initiative becomes more urgent due to the worsening of energy and water resources crisis in Brazil, which already requires bitter decisions from public managers in cost control and investment review; and due to the future scenario of a strong climate policy realignment in Global level, from the COP-21 to be held in Paris in December 2015.

As said by Eduardo Paes, the Mayor of Rio, on his welcome message on C40

“Planet Earth is counting on all of us to make the right decisions that will secure a future for generations to come and in turn I`m counting on you to help me make those decisions on reality.”

So, we are giving our contribution

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