



# Building Efficiency Accelerator Bogotá



## Summary

Kick off workshop - November 8, 2016



# Building Efficiency Accelerator

## Bogotá

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## Introduction

Bogotá is one of the 23 cities currently committed to the Building Efficiency Accelerator (BEA) program, which is a public-private alliance made up of 30 entities. The commitment shared by the parts is to reduce the urban footprint of construction by 2030, consistent with the subscribed obligations in the Paris agreement and the Sustainable Development Objectives.

This initiative is coordinated by the World Resources Institute (WRI), with involvement of the Office of the Mayor of Bogotá and the Colombia Green Building Council (*Consejo Colombiano de Construcción Sostenible, CCCS*), among other entities. The launch workshop for the program was made to support the participation of Bogotá in the BEA program, which is also a part of UN Secretary General Ban Ki-moon's Sustainable Energy for All initiative (SE4ALL).

## 1. Kick-Off Workshop

The launch of the BEA Program along with the technical workshop took place on November 8, 2016 with an attendance of more than 70 people and 55 entities. The introduction for the technical workshop was presented by Andrés Ortiz, Secretary of District Planning, who informed on the commitment of Bogotá in terms of undertaking actions to improve energy efficiency in buildings and developing a common approach regarding the importance of energy efficiency and renewable energies.

The kick-off workshop was designed to communicate Bogotá's approach towards sustainability, make a general contextualization on the current state of energy efficiency on a global scope, both Colombia and Bogotá, and identify opportunities and potentialities of the city towards energy efficiency.

To accomplish this, a series of energy efficiency experts from around the world were invited as speakers (S), panelists (P), and moderators (M) to discuss the technical, normative and management dimensions on building and urbanization. The workshop included an overview segment and four (4) technical workshops with their respective panel discussions. The key conclusions on each part of the agenda are listed below.

### 1.1. Bogotá, environmental footprint and future

- S: **Andrés Ortiz**, Secretary of District Planning, Office of the Mayor of Bogotá
- S: **Cristina Gamboa**, Executive Director, Colombia Green Building Council

The city of Bogotá currently has a need for finding a way to achieve sustainable growth and at the same time, unlock the potential of becoming a model for efficiency around the world. The critical modification moment of the Land Use Plan (*Plan de Ordenamiento Territorial, POT Bogotá*) is a challenge and an opportunity to build a futuristic city in which energy efficiency is a key factor for sustainability. The existing partnership between the WRI, the Office of the Mayor of Bogotá and the Colombia Green Building Council, will contribute to the development of the vision of a sustainable city. Sustainable building will be promoted, and ambitious yet feasible incentives will be carried out. This common vision regarding energy efficiency will be substantiated by a collaborative leadership process, in which the Colombia Green Building Council is the facilitating entity for articulation of different strategic stakeholders that were present in the BEA Program launch.

### 1.2. Energy efficiency as an alternative for a low carbon city

- S: **Debbie Weyl**, Building Efficiency Initiative Manager, World Resources Institute (WRI) Ross Center for Sustainable Cities



- S: **Santiago Uribe**, *Climate Change Direction, Ministry of Environment and Sustainable Development (MADS Colombia)*
- S: **Carlos García**, *Sub-director of Demand, Mining and Energy Planning Unit (UPME Colombia)*
- S: **Andrea Cifuentes**, *BEA Program Technical Advisor, Colombia Green Building Council (CCCS)*

The World Bank and UN's Sustainable Energy for All program (SE4ALL) was launched in 2014 and has as one of its mayor goals to duplicate the global energy efficiency rate by 2030. As a response to this objective, the Building Efficiency Accelerator (BEA) was created, which promotes eight actions to be implemented with the help of the mechanisms that facilitate the collaboration between different strategic local/international stakeholders. Additionally, BEA is also a platform in which each of the 23 cities committed to the BEA Program can receive recognition and become energy efficiency leaders through a collaborative work within a global network.

This initiative, promoted by the World Bank, the UN and the WRI is articulated with the obligations acquired by the countries in the Paris Agreement (AP), in which Colombia aims to reduce 20% of greenhouse gas (GHG) emissions by 2030. On a global level, Colombia is responsible for 0.46% of total emissions. Greenhouse gas emissions of the commercial and residential sector are directly proportional to population levels and the aggregate value of the commercial sector, making Bogotá the highest contributor. Energy efficiency is framed within the indirect GHG emissions, where the commercial/residential sectors account for approximately 10% of all national energy emissions.

The challenge is to incorporate energy efficiency in all processes, since inefficient energy is costing the country between US \$4700 and US \$5000 million a year. This means that energy efficiency is an important factor for increasing productivity and competitiveness of different sectors. Within the usage of energy lies the commitment to improve efficiency, which requires work in innovation

equipment, implementation of the Water and Energy Saving Guide in new buildings, (Resolution 0549/15 of the Ministry of Housing, City and Territory of Colombia, MVCT) and tax benefits of the Law 1715/14, on unconventional sources of energy of the Ministry of Mines and Energy (MME). It is equally important to carry out local action articulated with the Climate Change National Police, and involve the private sector in the implementation of the Paris Agreement.

Having the global and national scopes in mind, it is clear that the BEA Program is a practical exercise for consolidating the global challenge of fighting climate change in local actions made through collaborative mechanisms. The three goals which Bogotá is committed to fulfill within the BEA Program are the following: 1) Implement public policy in order to duplicate the energy efficiency rate by 2030; 2) Implement an illustrative and emblematic project; and 3) Create a baseline in order to measure and report the annual progress.

To accomplish this, it is important to involve the strategic stakeholders from the start. This process began in October 2016 with the application of an evaluation survey on energy efficiency stocks, which helped gather preliminary information on the current state of things, and the expectations of different initiatives working towards energy efficiency in Bogotá.

### 1.3. Case studies: energy efficient buildings in Bogotá

- S: **Jorge Ramírez**, *Director, Arquitectura & Bioclimática*
- S: **Esperanza Caro**, *Professor, Universidad Nacional de Colombia*
- S: **Andrés Santamaría**, *Vicepresident of Innovation, Apiros*
- S: **Angélica Ospina**, *Technical Manager, Setri Sustentabilidad*
- M: **Mauricio García**, *Strategic Unit Manager, Prodesa*

Proper architecture is the key to guarantee energy efficient buildings; it should be articulated with climate conditions and it should use materials from



the area. Bogotá has all the potential in terms of climate, technical capacity, experience, legal framework and the political will to promote bioclimatic buildings. In social housing (VIS), where cost regulation was supposed to be a limitation for these types of strategies, it was possible to design and build energy efficient houses with a high habitability, without generating a significant impact on the costs of the project.

In houses, the highest level of consumption comes from lighting, electronic appliances, power outlets and hot water. For this reason, the efficiency strategies for these types of buildings will consist on promoting change and improvement in equipment and appliances, and designing a way to fully take advantage of daylight and natural ventilation. In other places like hotels, offices and shopping malls, the energy consumption varies mainly because of the implementation of ventilation equipment and artificial cooling/heating. In all cases it is important to prioritize the passive measures (those acting towards a reduction of energy demand through architectural design) in order to implement active measures (those acting on performance and efficiency of different lighting, heating, and cooling systems). To achieve this, it is important that the bioclimatic architect enters the project from the first design stage.

### Panel discussion

From a building **strategy** standpoint in Bogotá, the potential of achieving big results using low technology is significant. An important strategy considering that the success of these types of technologies depends greatly on the way people use it in the operational stage of the building, and the way in which the inhabitants are involved and informed on the correct usage of passive systems in the spaces they inhabit.

With respect to **Policies**, the need to build on existing regulation regarding sustainable building and energy efficiency in the city was pointed out. Technical requirements of efficiency must be

articulated according to regulations (Resolution 0549/15 MVCT, Law 1715/14 MME).

As for **mechanisms**, a general agreement was made regarding the need to generate incentives that facilitate the implementation of current regulation, which could be tax related, building specifications etc. There must be a balance between the investment the builder must make to implement new technologies and the investments that are no longer necessary once efficiency is achieved.

As a general conclusion there should be a less ambitious attitude, particularly by trying to avoid the ideas from existing only on paper. As a speaker once mentioned: “less initiative, more doing” in order to focus on developing what we already have, as a motto of what should be encouraged in this initiative.

### 1.4. Technical implementation of building energy efficiency norms in Bogotá

- S: **Alonso Cárdenas**, Director of Urban and Territorial Space, Ministry of Housing, City and Territory (MVCT)
- S: **Julia Martínez**, Climate Change Director, WRI México
- P: **Patricia González**, Sub-director of Eco-urbanism & Business Environmental Management, District Environment Secretariat (SDA)
- P: **Martha Moreno**, Manager of Camacol Bogotá y Cundinamarca (Camacol B&C)
- P: **Manuel Flórez**, Manager, IC Constructora
- M: **Miguel Orejuela**, Education Director, Colombia Green Building Council (CCCS)

On July 10, 2015 the Ministry of Housing, City and Territory (MVCT) issued Resolution 0549/15, in coordination with the Sectorial Action Plan (PAS) on mitigation and adaptation to climate change and with the Decree 1285 de 2015 on Sustainable Building Policy. This resolution adopts a guideline in order to reduce water and energy spending in buildings by collecting both passive and active strategies of energy efficiency, and new efficiency



measures regarding water usage according to climate. This new regulation brought together several actors from the public and private sector and the International Finance Corporation (IFC) from the World Bank together with the Swiss Embassy, as final technical Advisors for the baseline in the guide.

Resolution 0549/15 has a mandatory nature for all uses as of August 2016, except social housing, for which the norm adopts a voluntary nature. Implementation will be made in a gradual form throughout the national territory, starting with Bogotá, Medellín, Cali and Barranquilla, before continuing with the rest of the country. According to calculations by the Low Carbon Resilient Development Program (LCRD) of the US Agency for International Development (USAID), this resolution will reduce greenhouse gas emissions by 25% for the year 2030, with regard to an estimated baseline for the construction sector.

In Mexico's case, the goal is to reduce 18% of emissions from the residential and commercial sectors. The BEA Program launched on March 19, 2015 will make a substantial contribution to reach the goal. After a year of implementation in Mexico City, the BEA Program has managed to articulate several actors from the public and private sectors, obtaining concrete results such as the production of the first Energy Efficiency Code of Mexico City along with the adoption of the Complementary Technical Norm. These processes have been financed by the United Kingdom and the Danish Energy Agency. There is currently an active implementation process of this regulation in other states in Mexico. Additionally, the Secretary for the Environment, with the financial help of the city's Climate Change fund, is carrying out energy audits on four buildings and will be presenting the results on the C40 meeting by the end of 2016.

### Panel discussion

With respect to the private sector, there is the will to promote sustainable building, however some

needs regarding the implementation of Resolution 0549/15 in Bogotá were pointed out, such as the creation of incentives and financial mechanisms along with performance tracking methods. Furthermore, it is important to involve other important actors such as utilities companies.

With respect to the public sector, there is a need to articulate the Eco-urbanism and Sustainable Building Policy in Bogotá (*Política de Ecorurbanismo y Construcción Sostenible*) with regulation that will allow the implementation of concrete actions throughout the territory with respect to urban planning and building. The MVCT has a complementary will to embrace suggestions to improve the Resolution.

From Mexico's experience we can learn that energy efficiency, as a business opportunity, allows great advantages in buildings, and at the same time improves the quality of life of the occupants by contributing to a reduction of greenhouse gas emissions. This task must be carried out by the public and private sectors, and must involve both bilateral and multilateral cooperation actors. Equally important is to not "copy" international norms, but rather a "tropicalization" and/or analysis according to the current needs.

### 1.5. Urban planning opportunities for sustainable construction and energy efficiency.

- **S: Andrés Martínez**, Manager, Value Investment Colombia (VIC)
- **P: Fernando Montenegro**, Professor, Universidad Nacional de Colombia
- **P: Úrsula Ablanque**, Partial Plans Director, District Planning Secretariat (SDP)
- **P: Gabriel Nagy**, Manager Ciudad Río, National Development Finance Corporation
- **M: Juan Camilo González**, Manager Ciudad Norte, Office of the Mayor of Bogotá

In intermediate instruments regarding land-use planning, such as Partial Plans, a sustainability



approach must be incorporated. One way to do it is to start conceiving projects in 3D, with the goal of facilitating the integral analysis of urban morphology. In doing this, certain things must be taken into account, such as sunlight and wind both in buildings and public spaces.

The incorporation of biotechnologies in hydro-sanitary systems can generate a positive impact in the infrastructure of water run-off systems. Similarly, these systems benefit public space by incorporating green areas that also have a water treatment function. Therefore, it is important that the instruments of the Land Use Plan (POT) such as the Master Sewer Plan (*Plan Maestro de Acueducto y Alcantarillado*) and the Master Public Space Plan (*Plan Maestro de Espacio Público*) are updated and demand the implementation of these kinds of innovative technologies.

In summary, the way we design cities has to change. The overall tendency is towards utilization of new technologies with respect to infrastructure design (biotechnology in water systems), such as use of bio climate analysis software for building groups. These new dynamics must be taken into account in land-use planning instruments such as Partial Plans and Master Plans.

### *Panel discussion*

From a city standpoint, it is important to have clarity in the sustainability approach so that those who build the city act consciously and not because of imposed regulations. In that way, the problem is not in the definition of a norm but rather the construction of a new society that understands the importance of relating with the environment in a different way. Once this sustainable consciousness is adopted, the construction of feasible, socially responsible, sustainable participative projects can be achieved.

To accomplish this, normative and financial **barriers** must be surpassed. Regulations usually constrict flexibility, innovation and creativity in

designs, and forces to continue building with traditional technologies. This lack of flexibility generates consequences in urban projects on a financial level, considering the extra costs generated in buildings when savings in urban infrastructure cannot compensate incorporated sustainable strategies.

In order to overcome these barriers, incentive mechanisms must be designed for both urban projects and buildings. These mechanisms must be articulated in order to facilitate the incorporation of sustainable strategies in both scopes (urban and building). Evidently, the natural incentive for builders should be to improve sales by offering a high quality product that is socially and environmentally responsible. To this incentive, a greater development potential must be added along with financial support for technical studies required by urban modeling. Incentives must be generated to reward, in both urban and property scopes, the reduction of consumption in energy, water, residues. The proposed systems must reflect an improvement in efficiency of these uses.

As for the implementation of incentives and sustainable strategies with respect to both urban and property scopes, the Partial Plan is the instrument with the greatest flexibility. This is possible because the Partial Plan allows: the proposal of high quality technical solutions that are profitable; standardization of land costs; and from a legal standpoint, it can establish its own regulation.

Evidently, it is easier and more effective to analyze and invest on a large scale. Therefore it is important to articulate the urban scope with the property scope, in order to achieve greater and better results towards sustainability and energy efficiency.



## 1.6. Towards a road map for the BEA Program en Bogotá

- P: **Kristtían Rada**, Leader of the program of cities and governments for Latin America and the Caribbean, International Finance Corporation (IFC)
- P: **Manuel Olivera**, Regional Director for Latin America, C40
- P: **Sandra Garavito**, Director Low Carbon Resilient Development Program (LCRD) - US Agency for International Development (USAID)
- P: **Julia Martínez**, Climate Change Director, WRI México
- P: **Omar Báez**, Energy Efficiency Group, Sub-directorate of Demand, UPME
- P: **César Ruíz**, General Manager, Setri Sustentabilidad
- M: **Cristina Gamboa**, Executive Director, Colombia Green Building Council (CCCS)

### Panel discussion

Two mayor **challenges** were identified with respect to Bogotá's path towards energy efficiency: 1) Enforce current regulations; and 2) Support this practice with incentives and financial mechanisms. The normative, technical and management scopes must be oriented according to these challenges.

In the **implementation of regulations**, there must be coordination between public institutions and private actors, a task which is the basis for the BEA Program. These norms require a technical development, which can be supported by international cooperation organisms. **Technical abilities** must be developed from the different actors that are applying and verifying the norm.

In order to focus on this path Bogotá must take steps towards energy efficiency, it is important to define **measurable goals** that can size up and shorten the changes and technical developments needed for the implemented norms. We must be capable of measuring Bogotá's intended vision for the future. To accomplish this, there are several international cooperation organisms with the technical abilities to support the development of tracking mechanisms with indicators. These processes require the establishment of a baseline

using key information on an institutional, technical, normative and financial level; and also the promotion of a language regarding greenhouse gas emissions.

With respect to the creation of **incentives and financing mechanisms**, the country has models that can be applied, with the example of Bancoldex, which had financial sources for energy efficiency. A process of awareness in which the need for energy efficiency is understood in the global, national and local scale must accompany these mechanisms.

## 2. Conclusions

- S: **Debbie Weyl**, Manager Building Efficiency Initiative, WRI Ross Center for Sustainable Cities
- S: **Andrea Cifuentes**, Technical Advisor BEA Program, Colombia Green Building Council (CCCS)

Bogotá has a very good starting point in order to accelerate energy efficiency in its buildings, since it has the necessary technical capacity, with incentive models and financial mechanisms which could serve as a basis; and with the political will to reach the proposed goals. It is important to focus all this potential in the execution of concrete actions throughout the territory, with measurable impact. These measurements will allow us to understand the cost-benefit side of the policy, and also the implemented project along with its implications on a global, national and local scale.

According to the proposals during the launch of the BEA Program for Bogotá, it is clear that policy could be oriented towards the support of the implementation of Resolution 0549/15 in Bogotá, and manage its coordination with the Eco-urbanism and Sustainable Building Policy (*Política de Ecourbanismo y Construcción Sostenible*). The pilot project will be framed in an urban development context, involving new buildings of different types and uses. Finally, the tracking method could be oriented towards a program of



Monitoring, Verification and Control (MRV), whose specific outreach will be defined once the scope of the policies and the project are defined.

In this respect, the actions that could be prioritized by the BEA Program in Bogotá will be the following:

- 1) Technical development and implementation of energy efficient codes and norms.
- 2) Development and implementation of incentives and financing for energy efficiency.

### 3. Next steps

After the BEA Program kick-off workshop on November 8, 2016, the advisory panel will be conformed together with the work groups in charge of developing the policy, the project and the tracking method. These groups must define a work plan (18 months) to be issued as a draft on mid-January 2017, and as a final draft on January 31 2017. After this plan is approved, the policy implementation process will begin along with the project. (*Annexed*)

#### 3.1. Working groups

The plan is to create two base groups whose goal is to develop a coordinated work in which activities for policies, project and tracking method are articulated from the start. These groups are the following:

- 1) **Advisory Group:** in charge of supporting and offering a strategic focus to the working group. This is why it will be formed by representatives from the public sector, from the private sector, and from an international cooperation organization. The consulting group is also formed by the BEA Program coordinators in Bogotá (Office of the Mayor of Bogotá / CCCS /

WRI). The members of this group must have enough influence to motivate different strategic actors to commit to the BEA Program, and obtain resources when necessary.

- 2) **Working Group:** it will initially have at least one representative from each strategic stakeholder for energy efficiency and will be formed by three sub groups in charge of developing the policy processes, the project and the tracking method. For the first phase, these sub groups will generate a diagnosis with recommendations for the Office of the Mayor of Bogotá and the District Planning Secretary (SDP) in a critical route for the effective implementation of Resolution 0549/15 in Bogotá, and its articulation with the Eco-urbanism and Sustainable Building Policy of the capital.

The table in Annexed 2 shows the processes in which different strategic stakeholders could have greater impact. However, it is important to note that by proposing a simultaneous work form, all actors will have greater or less impact in all processes (policy, project, tracking method). (*Annexed 2*).



#### 4. Annexes

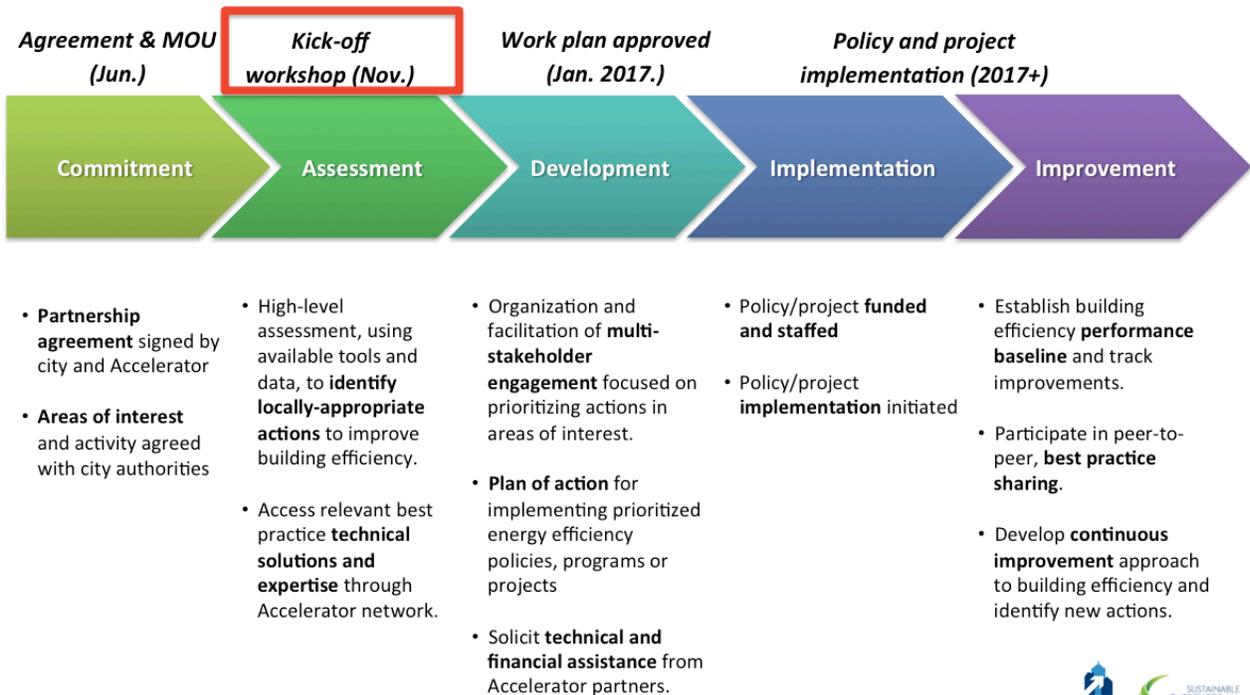
- 1) BEA Program process in Bogotá – Timeline
- 2) Leadership of strategic actors with Policy, Project and Tracking Method for the city of Bogotá
- 3) Video summary
- 4) Agenda
- 5) List of participant entities
- 6) Presentations
- 7) Pictures



1) Annexed 1

BEA Program process in Bogotá – Timeline

Source: World Resources Institute 2016





## 2) Annexed 2

Leadership of strategic actors with Policy, Project and Tracking Method for the city of Bogotá.

*Source: Colombia Green Building Council 2016*

Strategic actors for energy efficiency in building (WRI)	Policy	Project	Tracking Method
Government			
Civil society			
Owners, administrators and occupants			
Technical service providers and construction financiers			
Utilities			
International organizations			