**INNOVATIVE** 

**BUSINESS COLLABORATION** 

**Houston, USA** – Energy Efficiency in Buildings Platform











# **ABSTRACT**

A private sector-led initiative under the auspices of the WBCSD Energy Efficiency in Buildings 2.0 project (EEB2.0) worked with the city of Houston to define practical strategies to reduce energy consumption in buildings.

In October 2014, they brought together a diverse group of local stakeholders, thought leaders and experts from the private and public sector, including the Mayor's Office of Sustainability, in a three-day Energy Efficiency in Buildings Laboratory (EEB Lab). The EEB Lab followed an inclusive and participatory process to generate input from a wide range of stakeholders along the entire building value chain to understand the key barriers and identify market-specific actions to overcome these barriers. The city played an important convening and leadership role.

The EEB Lab resulted in the setting up of the new "Energy Efficiency in Buildings – Houston" coordination platform. In its initial phase, the platform is led by WBCSD and its local partner US BCSD and managed locally, with the active support of the city of Houston. This platform focuses on four themes:

- 1 raising awareness of the multiple benefits of energy efficiency in buildings;
- 2 financing EEB solutions;
- 3 building capacity to deliver EEB solutions; and
- 4 increasing real estate market competitiveness with EEB solutions. Joint private and public sector ownership based on mutual interest and the willingness to support the city of Houston's ambitious CO<sub>2</sub> emissions reductions provide the basis for continuous engagement.

The platform is led by the WBCSD and its local partner US BCSD, and managed locally by the Houston Advanced Research Center (HARC), with members including key leaders from the Gulf Coast Green Building Council, the City Energy Project and Keeping Pace in Texas.

## CITY OF HOUSTON

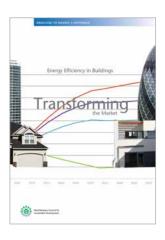
# **CONTEXT**

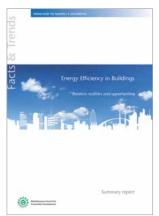
#### The EEB2.0 project

The WBCSD created the Energy Efficiency in Buildings (EEB) project in 2006 to address this key area for action on energy security and manmade contributions to climate concerns. The first EEB project identified how to overcome barriers to energy efficiency in buildings, publishing Transforming the Market in 2009 with recommendations and a roadmap. It showed that transformation requires action across the building industry, from developers and building owners to policy-makers.

The second EEB project (EEB 2.0), launched in 2013, began to implement the recommendations and to stimulate change. Its goal is to unlock financially viable investments in energy efficiency in buildings that are not being realized because of financial, regulatory, organizational and other non-technical barriers. To reach this objective, the project sets out to identify the value of energy efficiency to stakeholders in the value chain, including the co-benefits beyond pure energy and financial savings. Through local market engagement, the project aims to implement action plans in seven markets to overcome existing market barriers (Poland, Houston, Bangalore, Jaipur, Rio de Janeiro, Benelux and Indonesia/ Malaysia/Singapore).

The cornerstone of each local market engagement is the EEB Laboratory (EEB Lab), which aims to get a clear understanding of the market situation and recommend actions with the help of a panel of experts. The EEB Lab is followed by the implementation of recommended actions by local partners.







# WHY HOUSTON?

Houston had a population of 2.1 million in 2013, in an area of 600 square miles. The hot, humid climate, with average daily temperatures ranging from 53°F (12°C) to 85°F (29°C) creates high demand for space conditioning for much of the year. It is a relatively prosperous city with a gross metropolitan product on a par with the GDPs of Austria or Poland. Its significant industrial and commercial presence includes the headquarters of 23 Fortune 500 companies. A building boom in 2013/14 saw the city approve US\$ 7 billion in new construction, a 39% increase over the previous 12 months.

The WBCSD team and local partner US BCSD used a comprehensive ranking of several key factors to select Houston. It is an excellent location for the EEB Lab because it has a large, growing and dynamic real estate market and a strong public sector commitment to improving perceptions and awareness of energy efficiency. Houston offers the challenge of a substantial physical footprint and its climate. It has several high-density commercial areas and a dispersed residential population. The city benefits from regional private sector leadership in energy-efficient buildings, universities and research institutions providing expertise in energy and efficiency. Finally, the project's WBCSD and US BCSD members and partners have a business presence in Houston.

The city's leaders have positioned Houston at the forefront of energy efficiency. Former Mayor Bill White aimed to transform Houston from the "energy capital" of the world to the "energy conservation capital" of the world. Current Mayor Annise Parker made a commitment at the United Nations Climate Change Summit in 2014 to cut CO<sub>2</sub> emissions by 80% from 2005 levels by 2050. Emissions have already fallen by 32% since 2007. The city has launched the largest LED street light conversion in the country (165,000) and more than 2.3 million smart meters have been installed. In 2013, the American Council for an Energy Efficient Economy ranked Houston 13th out of America's 34 largest cities. The city ranked 10th in the US for Energy Star certified buildings in 2014 and transactions of these properties were 50% higher than in the previous year.



2.1 million

# **POPULATION**

Houston had a population of 2.1 million in 2013, in an area of 600 square miles.



# **CERTIFIED BUILDINGS**

The city ranked 10th in the US for Energy Star certified buildings in 2014



# **TEMPERATURES**

The hot, humid climate, with average daily temperatures ranging from 53°F (12°C) to 85°F (29°C) creates high demand for space conditioning for much of the year.

# **OBJECTIVES**

Emissions reductions from energy efficiency in buildings will contribute to meeting Mayor Parker's commitment to cut  $\mathrm{CO_2}$  emissions by 80% from 2005 levels by 2050. The EEB Lab set out to define strategies that will reduce energy consumption in buildings by 30%. An achievable 30% energy savings in the commercial sector alone would translate into nearly 20,000 new jobs for regional energy-efficiency contractors, the supply chain and the service sector over a five-year period. It could avoid the need to invest in 10 midsize power plants and free over half a billion dollars for other spending.

The specific objectives for the Houston EEB Lab were to:

- Demonstrate the benefits of energy-efficient buildings to convince and commit stakeholders to invest in energy efficiency;
- Deliver a tangible energy efficiency in buildings action plan for Houston;
- Launch a self-sustaining stakeholder network with knowledgeable and skilled people who can connect with government organizations and drive a progressive agenda for energy efficiency in buildings.



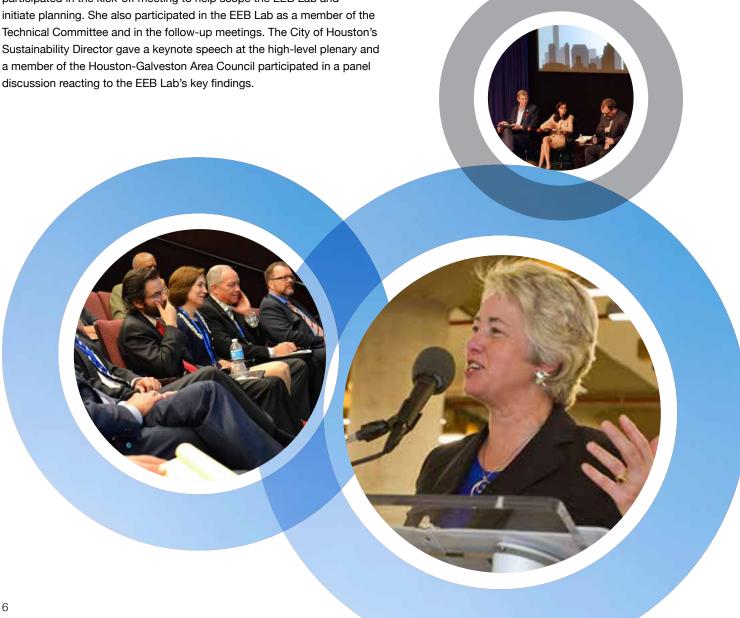
# **CONSTRUCTION**

A building boom in 2013/14 saw the city approve US\$ 7 billion in new construction, a 39% increase over the previous 12 months.

# PARTICIPANTS IN THE COLLABORATION

## CITY

The City of Houston was involved from the early stages of market engagement. A representative of the Mayor's Office of Sustainability participated in the kick-off meeting to help scope the EEB Lab and initiate planning. She also participated in the EEB Lab as a member of the Technical Committee and in the follow-up meetings. The City of Houston's Sustainability Director gave a keynote speech at the high-level plenary and a member of the Houston-Galveston Area Council participated in a panel







The EEB 2.0 project members are multinational companies who are active in all areas of buildings and energy efficiency (see box).

The companies engaged in the Houston Lab were United Technologies and Schneider Electric (project leaders), AGC, Lafarge and Siemens (members of the EEB 2.0 project) and Shell (member of US BCSD).

Local companies participating were: Hines, Thompson & Knight LLP, Gensler, Equilibrium capital, ALC, Architend and NRG. Business associations were Keeping PACE in Texas, SPEER – South-central Partnership for Energy Efficiency as a Resource, Urban Land Institute (ULI) – Houston chapter (a real estate association).

# OTHER STAKEHOLDERS

The EEB lab also included the following partners:

#### Academia

Rice University and Klein Independent School District

#### Research institute

Houston Advanced Research Center

#### Utility

CenterPoint (electric and natural gas utility)

#### Non-profit

Environmental Defense Fund (EDF)
Institute for Market Transformation (IMT)

#### EEB 2.0 project members

Lafarge (co-chair)

United Technologies (co-chair)

AGC

AkzoNobel

**ARCADIS** 

ArcelorMittal

**GDF SUEZ** 

Infosys

Schneider Electric

SGS

Siemens

Skanska



# PROCESS AND GOVERNANCE



# **COLLABORATION GOVERNANCE**

The EEB Lab was hosted by the WBCSD and its partner organization, the US BCSD. United Technologies and Schneider Electric were the project leaders.

The EEB lab initiative was also joined by the City Energy Project (led by NRDC and IMT), which is supporting the City of Houston and nine other cities to cut energy waste in large buildings and make them healthier environments and more profitable investments through energy efficiency.

**COLLABORATION PROCESS OVERVIEW** 

#### **Planning**

A kick-off meeting with EEB companies and partner organizations, including the City of Houston, took place in May 2014 to help scope the EEB Lab and initiate planning for a three-day event in early October. This meeting confirmed interest from the public and private sectors for Houston to be the focus of an EEB Lab.

A Steering Committee was created after the May kick-off meeting to guide the Lab. It consisted of members from EEB companies and partner organizations (Rice University; Thompson & Knight LLP; HARC; Institute for Market Transformation; Urban Land Institute-Houston, US BCSD and WBCSD teams). The Steering Committee identified relevant stakeholders, experts and thought leaders who constituted the Lab's Technical Committee.

The Technical Committee consisted of experts from approximately 30 organizations, including the Houston Mayor's Office of Sustainability. This group of experts was responsible for analyzing market barriers and providing recommendations to overcome these barriers during the EEB Lab.

The Lab commissioned a Houston Market Review from the Shell Center for Sustainability at Rice University to present the current state of energy efficiency in the Houston real estate market. One week before the EEB Lab, a webinar was held to present the results of the market review and discuss the practicalities of the EEB Lab.

#### The EEB Lab - 8-10 October 2014

On day one, the Technical Committee interviewed 46 building market stakeholders (see table 2) and analyzed their contributions to identify common themes. This work fed into roundtable discussions on day two (see details in Outcomes). The final day brought together all participants and other invited guests in a high-level plenary session to discuss conclusions and seek commitment from participants to take action on the opportunities for improvement identified during the Lab.

# TABLE 1: ORGANIZATIONS REPRESENTED ON THE EEB LAB TECHNICAL COMMITTEE

#### **WBCSD** members:

Lafarge

Schneider Electric

Shell

Siemens

United Technologies – Research Center

Automated Logic and Carrier

#### **Laboratory partners:**

Architend

Equilibrium Capital (Cal)

Gensl

lines

Houston Advanced Research Center (HARC

Houston – Mayor's Office of Sustainability

**Keeping PACE** 

Klein IS

NRG

Rice University – Shell Center for Sustainability

Thompson & Knight

Urban Land Institute

USGRC - Gulf Coast Chanter

Natural Resources Defense Council and

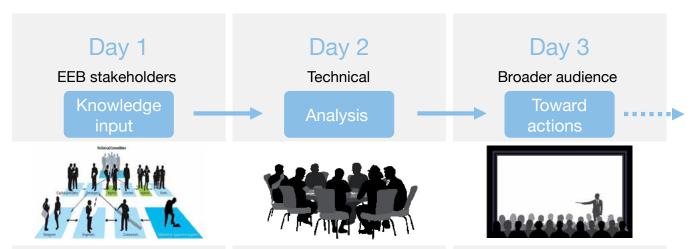
Institute for Market Transformation as part of

he City Energy Project

C40 Cities

WBCSD and US BCSD

Figure 1: The EEB Lab process



# Stakeholders interviews to identify

- Barriers/enablers
- · Key stakeholders
- Possible action

**Interview notes** 

# Working sessions and roundtables for further formal inputs

A first list of recommended actions

#### A high-level plenary session Feedback on actions, commitments and next steps with local partners

Ignite the engagement process



Table 2: Organizations interviewed

rchitects,	Developers	Real estate	Construction/	NGOs
design consulting		advisors	material/	
			component	USGBC
Archi+Designers	Kensinger Donnelly	Avison Young	providers	HARC
Gensler	New Hope Housing	ERM		
Way Holding	Hines	Baker Katz	Tellepsen Construction	
Engineering	Trammell Crow	Moody -Rambin	Services	Academia
Ascentergy	Metro National		Schneider Electric	
Consultants	Cousins Properties		HTS Engineering	Rice
Levinson Alcosar	<b>Buckhead Investment</b>	Banks, capital and		
Associates	Partners	finance providers	Facility managers	
TEAM Solutions	McCord Development			Owner occupiers
STG Design	Nexos Resource	Cadence Bank	Houston Independent	
	Partners	Pecan Street	School District	Shell
		Energy Corridor	Crimson Services	City of Houston
		Management District	CBRE	

#### Follow-up and implementation of actions

WBCSD member companies, together with HARC, Thompson & Knight; IMT and the City of Houston, met in December 2014 and February 2015 to initiate the actions identified by the EEB Lab. The report of the EEB Lab was published during the US BCSD Council Meeting on 4 March 2015 and the new platform entitled Energy Efficiency in Buildings – Houston was also launched (see Outcomes).



# OUTCOMES

# **OUTPUTS**

Following the Lab, a group of stakeholders from the original technical committee came together to form a new energy-efficiency platform called Energy Efficiency in Buildings – Houston. The platform will be the base from which four action groups will work to move Houston forward as it increases energy-efficiency investment opportunities across the city. Each group includes a diversity of energy-efficiency market participants representing building owners, building operators, equipment vendors, building tenants, the public sector and energy-efficiency consultants. The groups have the following commitments:

# 1 Raising awareness of the multiple benefits of energy-efficient buildings

Developers, managers and occupants of class A office space in Houston have accepted high environmental standards as a requirement for upscale properties. But they do not totally understand the full benefits, which include increased worker productivity and reduced absenteeism, as well as higher rental rates. The entire community also benefits from improved air quality, lower water consumption and lower energy costs. The EEB Lab found that tenants are particularly uninformed and therefore tend not to demand energy-efficient buildings.

The challenge is to spread the message further and penetrate the B and C class segments. The EEB-Houston platform aims to tackle this gap by publicizing best practices, developing roadmaps for different commercial building sectors and creating a library of information and case studies on developing cost-effective energy-efficiency programs. The action group will involve property owner associations to get through to hard-to-reach real estate professionals, helping them understand how to build a business case and where to go for energy-efficiency services.

#### 2 Financing EEB solutions

It is always going to be hard to find money for improvements that are hidden away and not always appreciated by prospective tenants. And without the help of special incentives, building owners who do consider energy efficiency can find that payback periods do not meet their criteria or just do not offer as good a risk/return prospect as alternative investments. There is also the problem of split incentives—tenants get the bonus of lower energy bills, not the owner who made the investment. But it seems that the biggest barrier in B and C class properties is lack of information on financing opportunities and how to develop a business case to convince the bank.

# Building class definitions

#### Class A

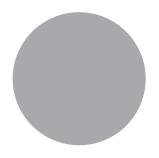
Most prestigious buildings competing for premier office users with rents above average for the area. Buildings have high-quality standard finishes, state of the art systems, exceptional accessibility and a definite market presence.

#### Class B

for a wide range of users with rents in the average range for the area. Building finishes are fair to good for the area and systems are adequate, but the building does not compete with class A at the same price.

#### Class C

for tenants requiring functional space at rents below the average for the area.





Workshops bringing together energy-efficiency solution providers and financiers will address that lack of knowledge, highlighting the information financiers need to approve energy-efficiency loans. Business case development and financing tools and templates will support these workshops. But ultimately, financing innovations are needed to bridge the gap and stimulate the market. The EEB-Houston platform will explore new financing options, including broader utility-structured financing and incentives and options such as PACE (Property Assessed Clean Energy) and MEETS (Metered Energy Efficiency Transaction Structure).

#### 3 Building capacity to deliver EEB solutions

The Lab found that even if building owners have the desire and the finances to make the necessary investments, not all building managers are as savvy as companies such as Hines. Operators are pulled in different directions in reaction to tenant complaints and staffing is often inadequate. The result is that many buildings in Houston waste energy because they are not properly managed. Sound building management practices are needed to operate a building at maximum long-term efficiency and minimize total life-cycle costs. And that depends on having good data about a building's performance.

Houston's Green Office Challenge already provides useful information and EEB-Houston will support this program. It aims to go further by promoting best practices in strategic management, operations and energy data management to the target B class (and lower) markets. The group will develop case studies and guide books for building operators to optimize building operations and maintenance practices and to convince building owners of the benefits of an energy-efficiency project. It will also recommend relevant training organizations.

#### 4 Increasing real estate market competitiveness through innovative EEB policy solutions

Efficient markets need good data and sound standards. There is little or no transparency in energy use in the Houston market, while the LEED certification scheme is complex and expensive for B and C class operators. Houston has strong building energy codes but they do not apply to state buildings. Additionally, the lack of commonality among cities in Texas makes it difficult for project developers, builders and equipment vendors. And while Houston was the first in the country in 1999 when it passed the Energy Efficiency Resource Standard (EERS) for utilities, the goals and the funding available are not enough to transform the market.

The EEB-Houston platform aims to work with city and state leaders to put this right, starting with a requirement for state buildings to meet the highest state or city codes. This should be developed with more private sector involvement. The EEB-Houston platform wants an ordinance requiring benchmarking and building performance transparency, similar to Chicago and Austin, and tougher goals, with more funding, in the EERS.

These improvements should create a stronger market for energy efficiency, but they will not make things happen on their own. To accelerate transformation, the group will encourage smaller organizations to use free tools such as Energy Star and will encourage more and better training for designers, vendors and installers.

# **LONG-TERM IMPACTS**

As the Lab took place in October 2014, the long-term impacts are not yet known. It is anticipated that the action groups will enable the city to meet its ambitious energy targets and will meet the EEB target of a 30% reduction in building energy consumption.

# PERFORMANCE AGAINST OBJECTIVES

The Lab achieved its objectives of bringing together key stakeholders to identify and implement practical strategies to transform energy efficiency in Houston buildings.

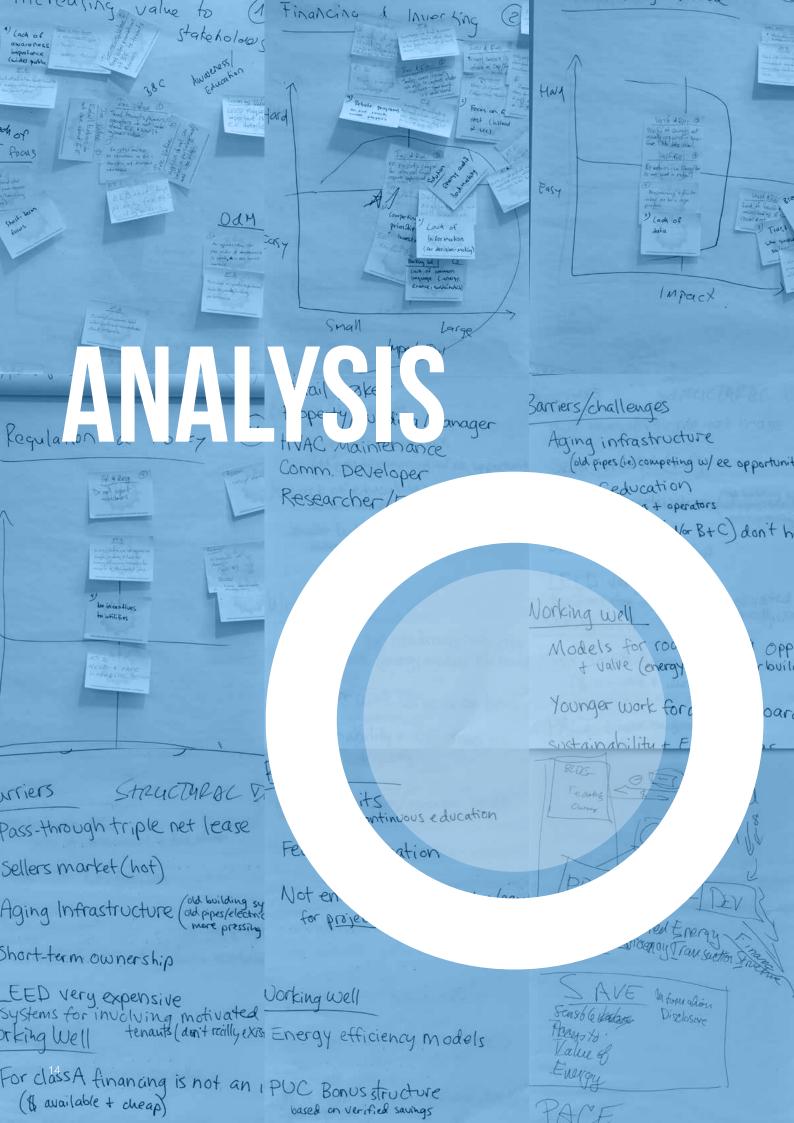
# **FUTURE COLLABORATION**

To oversee the implementation of the action plan, a new Energy Efficiency in Buildings – Houston platform has been established. Led by the WBCSD and the US BCSD, and managed locally by the Houston Advanced Research Center (HARC), a coalition of public and private sector volunteers will build and sustain the momentum. Key leaders from the Gulf Coast Green Building Council, the City Energy Project and Keeping Pace in Texas will convene and coordinate actions between stakeholder groups while providing governance to ensure effective implementation.

# Leading by example with energy data transparency

The City is helping to build capacity by disclosing data and providing training. It also demonstrates the benefits of benchmarking and disclosure and shows how competition between departments is cutting energy waste. Voluntary programs such as the Houston Green Office Challenge (HGOC) and Lights Out Houston are good models. HGOC does provide for private disclosure, although this is limited.





INNOVATION CITY OF HOUSTON

The EEB 2.0 project developed a market engagement model. Its cornerstone, the EEB Lab, is innovative and successful in fostering solution-oriented local dialogue and collaborative work.

First, before the Lab, the project makes sure it has solid foundations to achieve its goals of removing market barriers. This means setting up a Technical Committee, the key group taking the actions forward after the EEB Lab (taking ownership of the actions). This panel of experts has complementary expertise and knowledge (policy, finance, technical, business) and with a good view of the EEB market.

The three-day format of the EEB Lab formally initiates the market engagement and is the heart of the initiative. The project does not bring any pre-conceived ideas on barriers. The Lab begins by hearing from the market what works well and what the barriers are (with the Technical Committee doing more than 40 interviews on day one).

On day two, the Technical Committee analyzes the findings to achieve agreement on the barriers. This guarantees the right focus of actions. The interviews target building market stakeholders, including investors, property owners, policy-makers, building occupiers, building sector professionals and real estate professionals, gathering the differing views of each stakeholder category.

It is the role of the Technical Committee to analyze these perspectives and reach a consensus on the barriers. It then develops recommendations for action to remove these barriers.

The closing plenary on day three reports back on the findings and discusses them with the audience (interviewees and other guests) to build the necessary momentum for the implementation of the recommended actions.

This approach is being applied in seven markets and the project aims to deploy and scale up this engagement process.

# SUCCESS FACTORS AND LESSONS LEARNED

# Private-led initiative based on the involvement of key local public and private stakeholders

The support and involvement of local partners is a key success factor for the EEB Lab. The partners are identified for their core area of work in energy efficiency (such as the Green Building Council) or for their bridging capacity (like the US BCSD). Local partners take the action plans forward after the EEB Lab. They are at the heart of market engagement and their support and involvement are essential throughout the process. It is important to show the strategic value of such initiatives to local colleagues from national and multinational companies to ensure their continuous support during the EEB Lab and after.

The involvement of the city is also crucial in relation to building codes, transparency and data gathering, as well as leading by example (such as voluntary programs like the Houston Green Office Challenge and Lights Out Houston).

#### Holistic approach

The EEB Lab adopts a holistic approach, looking at core market issues (awareness and multiple benefits of EEB; financing; workforce capacity; verifying value and return on investments; policy and regulation). To best address these topics, the EEB Lab gathers experts who can share their views on the challenges and potential solutions.

#### Adaptation of the process locally

It is important to adapt the model to the local markets. This is why each market engagement starts with a kick-off meeting (a few months before the EEB Lab) to scope the EEB Lab and make sure it addresses the key topics with the right stakeholders and is adapted to local specificities.

#### **Neutral convener**

It is helpful to have a neutral convener such as the WBCSD to offer unbiased dialogue, build trust and facilitate the discussions to identify market barriers.

# Action-oriented EEB Lab: leveraging existing initiatives and championing best practices

The EEB Lab builds on existing initiatives and aims to showcase best practices. It aims to provide practical recommendations for action and define who will be taking the action forward. The EEB Lab is only the start of the market engagement—it is not a one-off workshop. It is important to use the platform to keep the momentum after the Lab and implement actions.

Read the full report of the EEB Laboratory Houston: Accelerating investment in Houston's energy-efficient buildings.

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### **IMPRESSUM**

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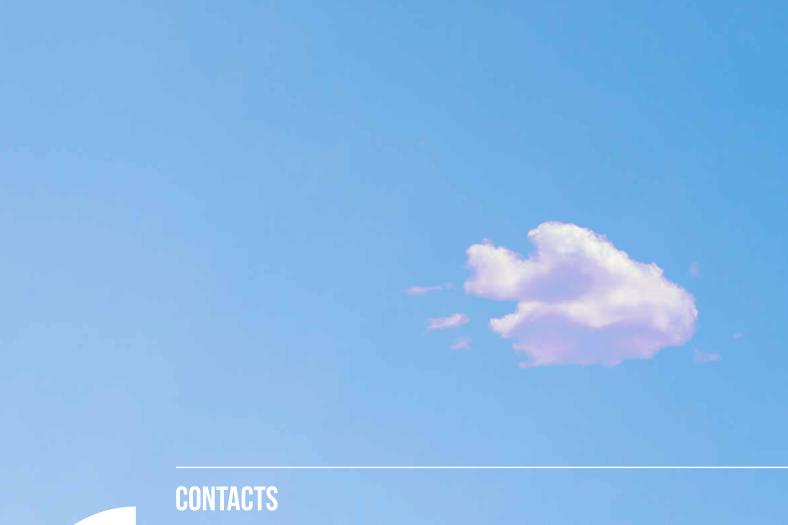
#### About the WBCSD

The World Business Council for Sustainable Development (WBCSD), a CEO-led organization of some 200 forward-thinking global companies, is committed to galvanizing the global business community to create a sustainable future for business, society and the environment. Together with its members, the council applies its respected thought leadership and effective advocacy to generate constructive solutions and take shared action. Leveraging its strong relationships with stakeholders as the leading advocate for business, the council helps drive debate and policy change in favor of sustainable development solutions.

The WBCSD provides a forum for its member companies - who represent all business sectors, all continents and a combined revenue of more than \$8.5 trillion, 19 million employees - to share best practices on sustainable development issues and to develop innovative tools that change the status quo. The council also benefits from a network of 70 national and regional business councils and partner organizations, a majority of which are based in developing countries.

#### About ICLEI

ICLEI - Local Governments for Sustainability is the world's leading network of over 1,000 cities, towns and metropolises committed to building a sustainable future. By helping our Members to make their cities sustainable, low-carbon, resilient, biodiverse, resourceefficient, healthy and happy, with a green economy and smart infrastructure, we impact over 20% of the world's urban population.



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