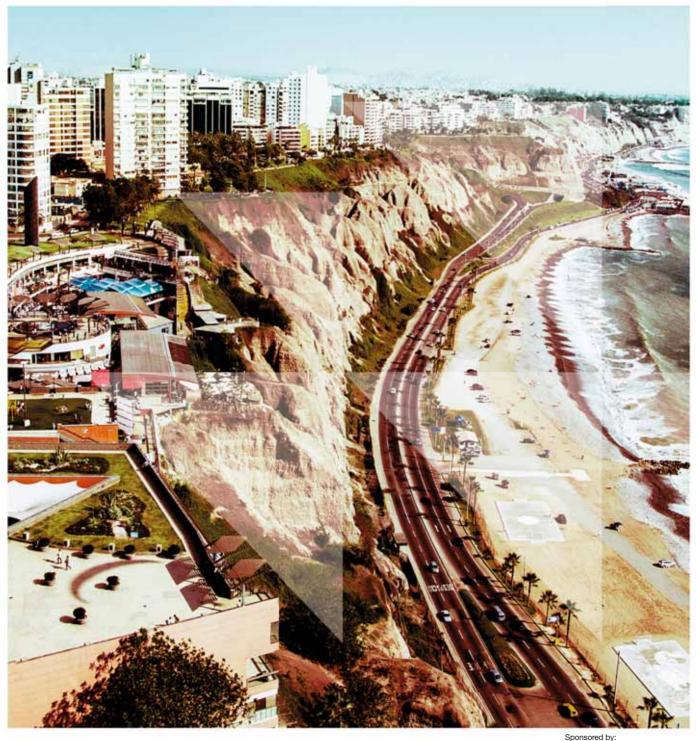


Seizing opportunities for collaboration between cities and business for sustainable economies

CDP Latin America

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Written by CDP Latin America +55 11 23056996



Foreword



Paul Simpson

CDP and the Konrad-Adenauer-Stiftung (KAS) are proud to present findings from an unprecedented number of cities disclosing their climate mitigation, adaptation and water management data. In 2014, 46 cities in Latin America reported to CDP, a 100% increase since last year.

There is significant opportunity for collaboration between city governments and business to improve climate resilience. CDP's data shows there is also increased action across the private sector. Last year, a record number of financial institutions, representing \$92 trillion in assets, asked the companies they invest in to disclose their climate emissions, risks and actions, leading to greater management and accountability. In this study we analysed data from cities and companies to understand the opportunities they could face from climate change. The benefits that business brings to cities, including jobs, tax revenue and services, are one of the drivers for cities to improve their climate resilience. Similarly, businesses are reliant on public infrastructure and environmental policies to support and guide their operations. This report shows how they plan to seize opportunities arising from the transition to a low-carbon economy.

We congratulate the 46 cities in Latin America that disclosed their environmental data to CDP this year and the significant progress they have already made in tackling climate change. This study provides cities with unprecedented information and insights how cities and businesses face similar economic opportunities. We hope this will support cities in their mission to create attractive places to work and live.





Felix Dane / Karina Marzano

Konrad-Adenauer-Stiftung (KAS)

Freedom, justice and solidarity are the basic principles underlying the work of the Konrad-Adenauer-Stiftung (KAS). The KAS is a political foundation, closely associated with the Christian Democratic Union of Germany (CDU). In our European and international cooperation efforts we work for people to be able to live self-determined lives in freedom and dignity. We make a contribution underpinned by values to helping Germany meet its growing responsibilities throughout the world. We encourage people to lend a hand in shaping the future along these lines. With more than 80 offices abroad and projects in over 120 countries, we make a unique contribution to the promotion of democracy, the rule of law and a social market economy. Alongside the country-specific programmes provided by the country offices of the Konrad-Adenauer-Stiftung in Latin America, there are cross-border regional programmes with separate thematic focuses. One of these is the Regional Programme Climate Change, Environment and Energy Security in Latin America. The global economy and society faces enormous ecological challenges. There is a need to react to climate change and the shortage of resources as well as to the growing demand for energy, especially in emerging countries. Over the past years KAS has dedicated itself to finding solutions to these challenges with great attention. It is our belief that the problems caused by global warming cannot effectively be addressed if the international community does not include the various levels of governments. The local space excels at its role to implement measures with a direct impact on the population and its capacities to respond to climate change. The work of the Konrad-Adenauer-Stiftung with regards to environmental topics has achieved important results together with cities, for example through establishing CB27, a Brazilian platform that enables exchange between the heads of the environmental departments of the Brazilian capitals. Promoting the participation of Latin American cities in tackling climate change has become a necessity. The region is ideal for the implementation of environmental projects due to the abundance of green energy sources such as sun, water, geothermal energy, wind, and biomass. To explore and develop this potential will help Latin America satisfy its growing energy demand. In order to exploit the full ecologic potential of the continent, it is necessary to understand the current state of environmental policies in Latin America. Hence, the Konrad-Adenauer-Stiftung supports this study, written by CDP, aiming to facilitate the access to information. A better understanding of the peculiarities of Latin American cities opens up a whole new range of opportunities for cooperation and exchange of best practices between municipalities. This study also addresses private sector initiatives, and thus complements the agenda of the KAS to link environmental and economic issues. We hope that this report aids the process of realising opportunities for collaboration between cities and businesses for a more sustainable economy. We would like to thank CDP for their important actions in the international environmental sphere and especially for the partnership in the composition of this document. We hope that this report meets its objective to strengthen the collaboration between municipalities and businesses for the sake of better environmental sustainability.

> "The protection of the people against damages caused to the environment requires the economy to recognise and realise its social responsibility in taking adequate measures in the development of technology preventing damage to humanity". (Ludwig Erhard, former German Chancellor (1963-1966) and Economics Minister - CDU)

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Executive summary

This study examines responses to an annual survey on climate change from 46 city governments in Latin America. The results show that climate change poses significant risks to cities in Latin America, and especially to the businesses that operate within them. A majority of both cities and businesses believe that the effects of climate change threaten business viability. However, the study also shows that cities in Latin America are undertaking a wide cross-section of activities designed to reduce the risk to citizens and businesses-often in collaboration¹ with local businesses. Finally, the report demonstrates that both cities and businesses are broadly aligned in how they plan to seize opportunities arising from the transition to a low-carbon economy. Investment in transport and energy efficiency projects, for instance, rank as activities where collaboration can be beneficial.

Main conclusions

Climate change poses significant risks to Latin American cities.

91% of cities report that climate change imposes significant physical risks to their urban infrastructure.

Climate change poses a particular threat to cities and their businesses.



of cities in Latin America expect that changes in temperature, rainfall and water availability could threaten the ability of businesses to operate successfully in their cities.

Cities and companies face similar economic opportunities from climate change.



of reporting cities expect that climate change will lead to economic opportunities, and 49% of companies in Latin America identify the same economic opportunities as those identified by cities.

1 For the purposes of this study, collaboration is defined as any project undertaken by private sector players in which the end goal is the betterment of the city, not strictly profit.

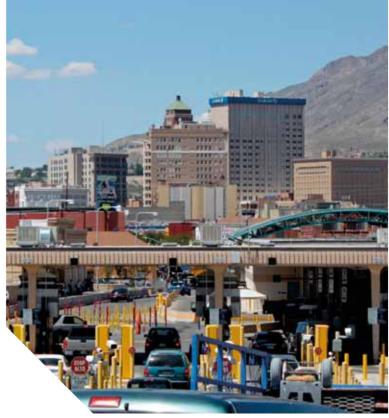


"Extreme weather conditions may cause delays in delivering raw materials, products and services, which will certainly affect the performance of companies around the city."

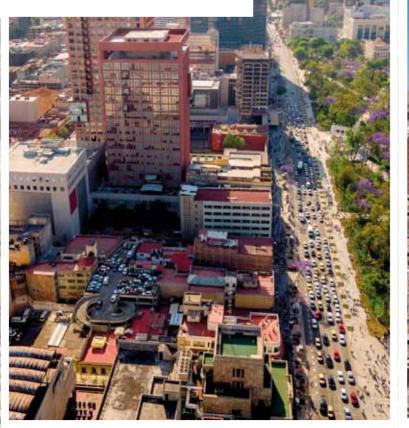
Porto Alegre

"Insufficient drainage infrastructure in the city makes it difficult to develop new industries." Ciudad Juaréz





"In the rural areas of the city, the majority of the crops depend on the seasonal rains, so when droughts related to climate change occur it results in low or null crop yield, affecting the producers and the consumers of these products with high prices and shortages." **Mexico City**



"The lack of rain will cause drought and desertification after causing a major socio-economic impact on agriculture." La Paz



Introduction

Latin American cities sit at the crossroads of climate change. The region as a whole faces significant challenges arising from warming temperatures more than \$100 billion in annual damages according to the Inter-American Development Bank (IDB)². At the same time, Latin American cities are growing rapidly—both in size and economic importance. Currently in Latin America, 79% of people live in cities — a number that is expected to rise to 86 % by 2050.³ According to the World Bank, Latin American cities contribute \$5.655 trillion⁴ in GDP, about 13% of the global total. As a result, the region's cities are essential to any discussion of climate change in Latin America.

In 2014, 207 cities around the world reported their climate change data through CDP's system. In Latin America, 46 cities responded, providing data and insights from their own experiences with climate change. This invaluable data set—which includes mega cities like Rio de Janeiro, Buenos Aires, Mexico City, Lima and others—gives us a window into the risks and opportunities that cities face from warming temperatures.

We have enhanced this data set with additional data from companies that are operating in Latin America.

Alongside cities, more than 5,000 companies report their climate change data to CDP every year. Cities and the businesses that operate in cities are inextricably linked. By looking at the data from companies and cities side-by-side, we can develop a much clearer picture of how climate change is affecting cities and how city governments and businesses are positioning themselves to reduce risk and maximize opportunity.

In this context, coordination between city governments and the businesses in cities is essential for creating resilient, protected cities. This study focuses on how businesses and cities are working together for climate mitigation and adaptation. We look first at the climate change risks: are cities and businesses facing and identifying similar risks? Are these risks interconnected? We look next at the opportunities that climate change presents: Are cities and businesses facing similar opportunities? We find that cities and businesses face complex, interconnected risks and opportunities from climate change that only a collaborative approach will begin to address.





"Nowadays, all storms cause flood in dense areas of the city, bringing losses for residents and traders who lose furniture and products. If this situation persists or gets worse, it may alienate potential entrepreneurs." **Belo Horizonte**

2 "Latin America and the Caribbean face massive economic damages from global warming, report warns". IDB, 2012 http://www.iadb.org/en/ news/webstories/2012-06-05/latin-america-and-the-caribbean-globalwarming,10011.html 4 "Latin American & Caribbean (developing only)" the World Bank 2014. http://data.worldbank.org/region/LAC

3 "World Urbanization Prospects" United Nation 2014. http://esa.un.org/ unpd/wup/Highlights/WUP2014-Highlights.pdf

Climate change threatens business in Latin America

CDP data shows that Latin American cities face varied and specific risks from warming temperatures. For some cities, like the Brazilian cities São Luis and Recife, the risk of catastrophic weather events is high. For other cities, the risks are more insidious. Nearly half of reporting cities, for example, face increasing drought and water scarcity. All together, 91% of city governments in Latin America report that climate change poses at least some risks to their cities.

Several cities are already observing notable changes in climate-related patterns. "An increase in the number of heat waves has taken place in the last three decades", reports the city of Buenos Aires, "contributing to an increase on energy demand and consumption, causing energy shortages". Rio Branco, a Brazilian city, reports that floods pose an extremely serious risk to the city, in particular because of its isolation from major roads. Recent heavy rainfall flooded the Madeira River by more than 18 meters, closing roads and restricting the food supply to the city.

The responses of Buenos Aires and Rio Branco point to an important feature of climate change impacts: their ability to disrupt business operations in cities. Across all of the cities that reported to CDP, climate change is already having a direct and significant impact on the physical infrastructure and services in the region's urban areas with potentially harmful consequences for business. 78% of Latin American city governments report that climate change will impinge on the ability of businesses to conduct operations in their cities. Cities expect that climate change will affect businesses in a number of ways: by harming agriculture, interfering with mobility, and disrupting supply chains.

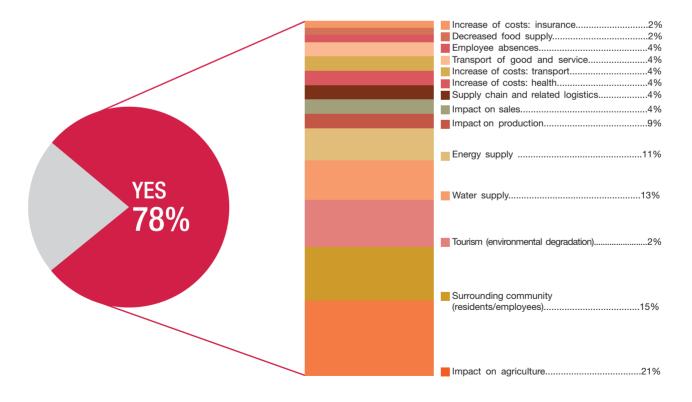


Fig 1: Impacts to businesses expected by cities % of cities, category



"Climate change might worsen water scarcity in Campinas region because of changes in seasonal rainfall." Campinas

The most commonly reported risk to business in cities is damage to agriculture (21%). The economy in the Brazilian city of Jaguaré, for instance, relies heavily on agriculture. At the end of 2013 the city experienced reduced yields in some crops due to heavy rains. "Besides the economic, social and environmental damage," says the city, "there was a reduction in the production of some crops such as papaya and passion fruit".

Similarly, the city of Mendoza, Argentina depends on reliable weather conditions for its main producthigh-quality wine. But the city is already anticipating that climate change will have an impact on the ability of its wine growers to produce high-quality wines. Changes in temperature and rainfall could affect the wine quality, reducing its marketability. "More humid summers with a higher quantity of precipitation," writes the city, "affect the grape bulk and weight and its process of maturing."

Another widely reported impact from climate change is the increase of rainfall, which may lead to flooding (24%). Flooding at a single point in the city of São Paulo after a heavy rain causes a daily loss of about half a million dollars to the economy, according to a study from the University of São Paulo. With 749 flooding points identified in the city, the annual losses within the municipality reach almost \$138 million. When considering the impact on company supply chains that run through São Paulo, that number could reach more than \$300 million⁵.

Too much water causes problems in cities; too little water also causes problems-with a corresponding impact on business. Campinas-one of the biggest cities in Brazil-frequently experiences intense water demand as a consequence of unplanned urbanization.

5 "Prejuízo ao país com enchentes em São Paulo ultrapassa R\$ 762 milhões por ano". Fapesp 2013 http://agencia.fapesp.br/prejuizo_ao_pais_com_enchentes_em_sao_paulo_ultrapassa_r\$_762_milhoes_por_ano/16968/

6 "Crise ampla: falta de água já causa danos na economia de cidades e empresas paulistas". CIESP Campinas, 2014 http://www.redebrasilatual. com.br/economia/2014/07/crise-abastecimento-causa-problemaseconomicos-cidades-empresas-paulistas

7 No interior seca quebra safra para indústrias e encalha hidrovia".

The city has recently suspended new authorizations for companies to withdraw water to combat the drought, affecting the installation of new businesses in the municipality⁶. The city of Sorocaba is also under water rationing, which is affecting 200 companies⁷ in the region. And in Buenos Aires, the utility company reports that lack of water for its thermal plants could lead to conflicts among water users.

In response to the rising risks from climate change, cities are taking actions to make their cities more resilient. More than three-quarters of Latin American cities told CDP this year that they are taking actions to adapt to the impacts of climate change. At the same time, private sector firms are scaling up their efforts to help cities become more resilient.

In Peru, for example, an innovative collaboration between the city of Arequipa and a copper mining company called Cerro Verde is improving the resiliency of the city's water supply while simultaneously delivering an economic boost to the economy. Cerro Verde's new water treatment plant, called La Enzolada, represents an investment of \$334 million, funded entirely by the private sector. The city will benefit from improved regional water quality from the river Chilli, which currently supplies around 1 million people in Arequipa. The improved water quality will reduce waterborne illnesses and enhance the value of local agricultural products. The project is estimated to deliver \$3.4 billion to the economy of Arequipa.^{8,9}

All over Latin America, from Mexico to Argentina, cities are identifying and adapting to the serious, business-disrupting impacts of climate change.

Estadão on line, São Paulo 2014: http://sao-paulo.estadao.com.br/ noticias/geral,no-interior-seca-quebra-safras-para-industrias-e-encalhahidrovia,1542806

8 "Planta de tratamiento de aguas residuales Enlozada". BN Americas 2014 http://www.bnamericas.com/project-profile/es/planta-de-tratamiendo-de-aguas-residuales-cerro-verde-ptar-cerro-verde

9 "Ampliación Cerro Verde". Freeport 2014. http:// www.bvl.com.pe/hhii/CM0006/20140626170701/ EXPANSI211N32UNIDAD32PRODUCCI211N32CERRO32VERDE.PDF

Improving energy efficiency in the services sector in Mexico City



The amount of energy needed in modern life must consider direct energy consumption and the energy contained in goods and services.

On June 5, 2014, Mexico's City Government issued the 2014-2020 Climate Action Program (CAP) that outlined 73 actions for GHG emissions mitigation; climate risk reduction; adaptation and resilience to climate change; and environmental education. The CAP's strategy for the urban and rural energy transition promotes technological development and the use of renewable energy in the areas of housing, commerce, services, industry, mobility, and governmental facilities.

In particular, the action entitled "Promoting continuous improvement of energy efficiency in the services sector" aims to reduce the consumption of electric power per unit of area (kWh/m²) in the facilities of the services sector in Mexico City, thus reducing GHG emissions associated with the generation and consumption of energy. According to the 2012 emissions inventory, electric power consumption is the second most important category of emissions in Mexico City (after the transport sector) and represented 31% of GHG emissions (9,473,000 tCO₂e) in 2012.

Mexico City's Secretariat of the Environment is responsible for the implementation of this action in collaboration with the local Secretariat of Economic "The decrease of energy consumption, electric power and fossil fuels not only contribute to the reduction of GHG emissions; in terms of adaptation to climate change, they promote energy selfsufficiency."

Development and the Secretariat of Tourism, the federal Secretariat of the Environment and Natural Resources, as well as the Mexico City Chamber of Commerce, the Mexican Association of Hotels, the National Chamber of the Restaurant Industry and Mexico City's Chamber of Commerce of Services and Tourism.

This action includes the development of a diagnostic tool that will allow modification of existing energy standards and the inclusion of new requirements that could incorporate energy performance best practices. In particular this includes the design and the materials used in the building's envelope, lighting upgrade, cooling and air conditioning systems, as well as motors, pumps, boilers and other energy consuming devices in the building.

The goal of this mitigation action is to reduce 159,000 tonnes CO_2e accumulated by 2020 at the end of the current CAP, however, there may be additional mitigation after the energy diagnostics.

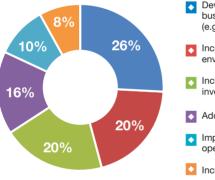
The involvement of the private sector in the development and implementation of this action will ensure that viable agreements and technical and economic commitments can be achieved. This will benefit the private sector through improved energy efficiency, greater competitiveness, and tangible economic savings.

Cities and businesses face similar economic opportunities

Climate risk is not the only area where city governments and their businesses are interconnected. Cities and their businesses also are presented with similar opportunities from climate change and they can work together to seize them. Collaboration can lead to new businesses, increased revenue, wider operations, and, eventually, the lowcarbon cities of the future.

According to CDP data, 67% of all reporting cities in Latin America report that they anticipate economic

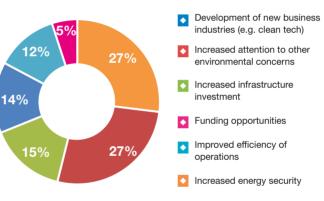
Fig 2: Economic opportunities reported by cities % opportunities reported by cities





A major area of joint collaboration is transportation. Mobility is an essential condition for urban residents. As cities around the world swell with people, demand for mobility options is increasing. This demand has encouraged growth in the number of private vehicles, especially in Latin America. In Brazil, while the population increased by 12.2% in a opportunities arising from climate change. The opportunities include green jobs and development of new business industries in their cities. This study also analyzed more than 80 companies that do business in Latin American cities. Nearly half of these companies report that they anticipate similar economic opportunities. This overlap suggests that businesses and the cities in which they operate could benefit from collaboration. In many cases, this collaboration is already occurring.

Fig 3: Economic opportunities reported by companies % opportunities reported by companies



decade, the number of motorized vehicles increased by 138.6%.¹⁰ Perhaps unsurprisingly, Latin American cities reported 134 activities designed to reduce greenhouse gas emissions from their cities, of which the most common activity was related to transportation (34%).

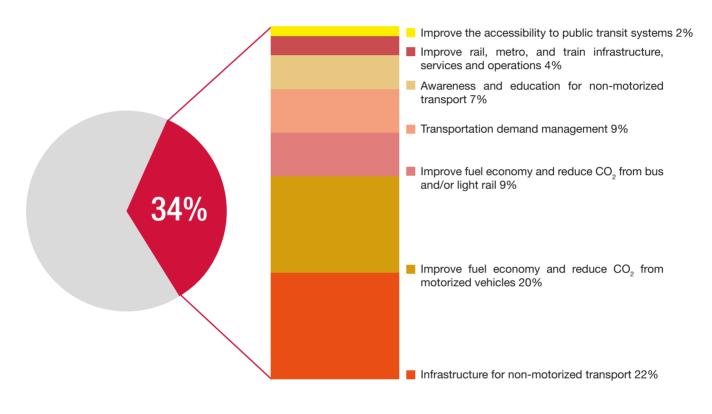


"The establishment of new companies in our city implies economic growth and more people employed." San Luis de Potosí

10 Brasil atinge marca de 50 milhões de automóveis. Observatório da metrópoles, 2013 http://www.observatoriodasmetropoles.net/index.php?option=com_ k2&view=item&id=671:crise-de-mobilidade-urbana-brasil-atinge-marca-de-50-milh%C3%B5es-de-ve%C3%ADculos&Itemid=164&Iang=pt "The municipality has initiated the implementation of exclusive lanes for public transport and deployed a system of light rail. The intention is that people prioritize public transport, which will promote increased revenue for the city." **Goiânia**



Fig 4: Transport related municipal emissions reduction actions % of actions



In Mexico, efforts by city governments to reduce traffic are good for businesses. CEMEX—a global leader in the building materials industry—built concrete Bus Rapid Transit (BRT) systems in six Mexican cities such as Mexico City and Puebla with an investment of \$295 million. The Puebla line is expected to reduce about 26,000 tonnes of CO₂ annually. Commuters will save between 35 and 45 minutes of their time¹¹.

In Brazil, CCR Group is capitalizing on a similar need in cities. The Group has invested about \$30 million on transportation activities like the subway system of Salvador, ferryboat and light rail in Rio de Janeiro. Light rail can save commuters up to 15 minutes in average travel time per passenger compared to buses, and deliver a reduction of approximately 0.135 tonnes of CO_2 per passenger annually. When all lines are in operation, the system capacity will reach 285,000 passengers per day¹². Reducing traffic in Brazil is good for the business of CCR and city governments.

11 "Addressing the urbanization challenge" Cemex Sustentability Report 2013: http://www.cemex.com/SustainableDevelopment/files/ CemexSustainableDevelopmentReport2013.pd 12 "VLT Carioca" Um sonho que virou realidade. Rio de Janeiro http://portomaravilha.com.br/materias/evento-dilma/e-d.aspx

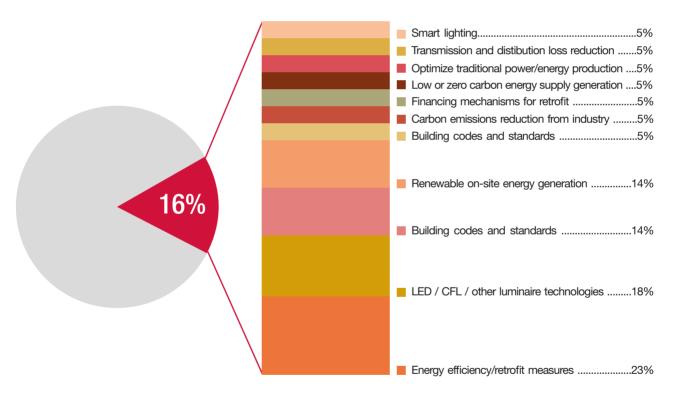


"Climate change can be an opportunity to generate an economy based on ecoefficiency and to exploit the opportunities for adaptation to climate change." **Arequipa**

Renewable energy is another sector in which a significant number of Latin American cities are taking action (figure 5). According to projections of the Wind Power Association of Brazil, the volume of wind power contracted in 2013 generated more than 70,000 jobs and \$8.5 billion in investments,

which should result in 8.5 million homes supplied with clean energy.¹³ One of the reasons for this growth is the demand presented by major population centers. Wind power now provides electricity for cities like Fortaleza and Natal, located in the northeast region of Brazil.





In Mexico, a similar story is unfolding. A new wind farm called Central Dominica II is currently being built in San Luis Potosí, with a planned investment of about \$150 million. The new wind farm will have an installed capacity of 100 MW avoiding the emission of over 157,000 tonnes of CO₂e into the

atmosphere¹⁴. The direct positive impacts for cities are the jobs resulting from the construction and maintenance of the wind farm and the reduction of CO₂e attributable to electricity generation by non-renewable sources.

13 "Contratação de energia eólica bate recorde e Tecsis amplia produção para atender mercado". Cruzeiro do Sul, 2014 http://www.cruzeirodosul. inf.br/materia/530453/contratacao-de-energia-eolica-bate-recorde-e-tecsis-amplia-producao-para-atender-mercado

14 "ENEL Green Power firma acuerdos para proveer energía eólica en México". Expox News Comunicación de RSE Y sustentabilidad 2014: http://www.expoknews.com/enel-green-power-firma-acuerdos-paraproveer-energia-eolica-en-mexico/

Collaboration projects between cities and businesses

City: Campinas

Company: CPFL is the largest electricity distributor in Brazil.

Action: Installation of solar energy and replacement of old equipment with more efficient models in low income homes.

Investment: about \$1.3 million.

Annual monetary savings: \$260,000.

Annual CO, avoided: 147 tonnes.

City: Rio de Janeiro

Company: Light Energy SA is responsible for generation, transmission and commercialization of renewable energy in the state of Rio de Janeiro.

Action: Exchange recyclable waste for a discount on the energy bill of low-income consumers. The material collected goes to a recycling plant.

Investment: about \$1 million.

Annual monetary savings: about \$885,000.

Annual CO, avoided: 742 tonnes.

City: Arequipa

Company: Cerro Verde, a subsidiary of the American mining company FreePort.

Action: Construction of a wastewater treatment plant. It will improve regional water quality, reduce waterborne illnesses and enhance the value of local agricultural products.

Investment: \$334 million.

City: Aparecida

Company: EDP Brasil operates in the generation, commercialization and distribution of electricity in Brazil.

Action: The installation of more than 13,400 smart meters and 208 LED luminaires.

Investment: \$662,400.

Annual monetary savings: \$279,000.

Annual CO, avoided: 378,563 tonnes.



Cities: Salvador and Recife

Company: Itaú Unibanco is the largest private financial institution in Brazil.

Action: Investment in bike sharing schemes in seven Brazilian Cities. Besides increasing mobility in the city, the initiative has positive impacts on citizens health and well-being.

*Investment: \$27 million.

*For the whole project including other cities in Brazil.

Conclusion

Managing climate change is a complex challenge, made even more complex in an urban context. In Latin American cities, city governments that collaborate effectively with local businesses will be better placed to reduce risk and seize opportunities.

Our analysis shows that cities are realizing research as the data improves. One of gains by identifying mitigation actions such as efficiency in transport and energy which can bring businesses investment to more closely together in working towards the local government.

This was the first specific study conducted by CDP on Latin American cities, and we hope to continue our

the aims of CDP Latin America is to bring local government and the private sector a low carbon economy. We will continue to encourage Latin American cities and companies to report on their progress through the CDP system every year.

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