

## TC Abstract

### I. Basic project data

• Country/Region :	REGIONAL/IDB
• TC Name :	Empirical Analysis of Air Pollution and Climate Change Mitigation Actions in LAC
• TC Number :	RG-T2761
• Team Leader/Members :	HOFFMANN, BRIDGET LYNN - Team Leader RIOS GALVEZ, ANA R. - Alternate Team Leader MILLER ASTETE, SEBASTIAN JOSE - Team Member GUANAIS DE AGUIAR, FREDERICO CAMPOS - Team Member HOFMANN, MICHAEL - Team Member MELENDEZ APARICIO, SOFIA TERESA - Project Assistant
• Indicate if : Operational Support, Client Support, or Research & Dissemination.	Research and Dissemination
• If Operational Support TC, give number and name of Operation Supported by the TC:	
• Reference to Request :(IDB docs #)	
• Date of TC Abstract :	09 May 2016
• Beneficiary (countries or entities which are the recipient of the technical assistance):	Policymakers in LAC, in particular in Mexico and Chile
• Executing Agency and contact name (Organization or entity responsible for executing the TC Program) {if Bank: Contracting entity} { if the same as Beneficiary, please indicate}	US-IDB - Bridget Hoffmann
• IDB Funding Requested :	\$ 450,000.00
• Local counterpart funding, if any :	\$ 112,500.00
• Disbursement period (which includes execution period):	36 months
• Required start date :	
• Types of consultants (firm or individual consultants):	Individuals Firms
• Prepared by Unit :	Research & Chief Economist Department
• Unit of Disbursement Responsibility :	RESEARCH DEPARTMENT
• Included in Country Strategy (y/n): TC included in CPD (y/n):	Yes No
• GCI-9 Sector Priority	Addressing climate change, renewable energy, environmental sustainability and food security

### II. Objective and Justification

The main objective of this TC is to assist decision makers in the design of climate change mitigation and air pollution policies and programs by providing information regarding: (i) the effect of distributing salient and readily-assessable air pollution information, and (ii) the valuation of health co-benefits of climate change mitigation actions.

Through information collected and analyzed from two innovative randomized controlled trials, this TC will contribute to the decision-making process on several dimensions. First, we will be able to determine whether this type of policy is self-sustainable from a cost perspective. Second, we will be able to determine whether air pollution information programs reduce households' exposure to air pollution, and therefore, reduce the health and economic costs of air pollution to households. Third, we will be able to

shed light on the optimal type of information to provide in order to induce changes in household behavior. Fourth, by estimating the change in air pollution exposure and its associated health cost, a proxy for climate change health co-benefits will be available.

Air pollution and climate change are closely related: air pollutants such as ozone and particle pollution – i.e. black carbon– contribute to global warming and similarly climate change could have negative impacts on national air quality (EPA, nd). Climate change mitigation actions could hence contribute to improving air quality and a decrease in ozone and/or black carbon emissions could help in reducing climate change impacts in the near-term as these particles stay in the atmosphere for a few days or weeks.

Climate change and air pollution are also associated with negative health impacts. High air pollution has been causally linked to infant mortality, lost income for poor households, and lower educational outcomes (Arceo, Hanna, and Oliva, 2016; Hanna and Oliva, 2014; Miller and Ruiz-Tagle, 2015; Miller and Vela, 2013). In Latin America and the Caribbean, more than 50 percent of the population from developing countries is exposed to air pollution above the levels recommended by the World Health Organization (<http://data.worldbank.org/indicator/EN.ATM.PM25.MC.ZS/countries/MX-XJ-CL?display=graph>). Providing households with salient air pollution information will therefore allow them to make informed decisions regarding their avoidance and prevention behavior. For instance, the United States –among other governments– issues smog alerts, and people adjust their short-term behavior in response to these alerts (Zivin and Neidell, 2009).

On the other hand, some climate change mitigation actions provide –besides direct climate benefits– health co-benefits including a reduction of respiratory and cardiovascular illnesses and their associated costs in terms of treatment and labor productivity losses (Vergara et al., 2013; Younger et al., 2008). These co-benefits are often excluded from the economic analysis of projects due to difficulties in data availability (for more details see Climate Change Sector Framework).

This technical cooperation focuses on climate vulnerability, climate and environmental risk, and actions to manage, adapt, and mitigate the impacts of climate change and pollution. This TC is aligned with the “Institutional Strategy 2010-2020”, in which climate change is an overarching issue that affects the three main development challenges in LAC. This TC is framed within the “Integrated Strategy for Climate Change Adaptation and Mitigation, and Sustainable and Renewable Energy” (GN-2609-1) and the “Climate Change Sector Framework” (OP-2018). In addition, this TC is aligned with the country strategies of Mexico and Chile. (Page 19 of the country strategy for Mexico states that “The Government of Mexico will therefore aim to strengthen national climate change policy and minimize the vulnerability of urban and rural areas of the effects of climate change”. Page 9 of the country strategy for Chile states that “The Bank, in turn, can facilitate the development and execution of energy projects in a crosscutting manner, by (i) contributing to the strengthening of the Ministry of Energy and to dialogue within a participatory planning process to set an energy policy; (ii) providing support in issues of land-use planning (including indigenous community territories), facilitating development of energy projects and decisions regarding the most suitable location for them; and (iii) providing support on climate change issues”.)

### **III. Description of activities and outputs**

Component 1. Implementation of programs. This component will finance two interventions. The intervention in Mexico will provide households with real-time outdoor air pollution information mostly caused by the transportation sector through an SMS messaging system. The intervention in Chile will provide households with household-level information on the level of indoor air pollution and information on household emissions driven by the use of wood burning cooking stoves. Both interventions will include comprehensive household surveys to collect the data necessary for the evaluation of the programs. The interventions will be implemented as randomized controlled trials, which are considered the gold standard in experimental methods.

Component 2. Analysis of the programs. This component will support the writing of two working papers that include an empirical evaluation of the interventions implemented. The working papers will be submitted to the IDB working paper series. It will also support the writing of a technical note that discusses and summarizes the quantitative and qualitative findings of both the intervention in Mexico and the intervention in Chile.

Component 3. Dissemination of results. This component will finance the dissemination of results from the interventions. Activities include: i) meetings with government agencies to present the results of the interventions, to discuss any potential improvements recommended before adoption of similar policies, and to summarize lessons learned that will be important for scale up; and ii) seminars to present the results of the analysis to government agencies, academics, and other interested stakeholders.

## Outcomes

Name:

## Components

Name: Component 1

Description: Implementation of Programs through Randomized Controlled Trials

Intervention in Mexico, which will provide households with real-time outdoor air pollution information mostly caused by the transportation sector through an SMS messaging system  
Intervention in Chile, which will provide households with household-level information on the level of indoor air pollution and information on household emissions driven by the use of wood burning cooking stoves

Name: Component 2

Description: Analysis of the Programs

Writing of two IDB working papers that include an empirical evaluation the interventions implemented  
Writing of a technical note that discusses and summarizes the quantitative and qualitative findings of both the intervention in Mexico and the intervention in Chile

Name: Component 3

Description: Dissemination of Results

Meetings with government agencies to present the results of interventions, to discuss potential improvements before adaption of similar policies, and summarize lessons learned that will be important for scale up  
Seminars to present results to government agencies, academics and other interested stakeholders

## IV. Budget

### Indicative Budget

Activity/Component	IDB/Fund Funding	Counterpart Funding	Total Funding
Component 1	\$ 420,000.00	\$ 102,500.00	\$ 522,500.00
Component 2	\$ 20,000.00	\$ 0.00	\$ 20,000.00
Component 3	\$ 10,000.00	\$ 10,000.00	\$ 20,000.00

## V. Executing agency and execution structure

The executing agency for this proposed TC will be the IDB given the regional coverage of the project.

The IDB, as executing agency, will be able to coordinate activities among projects and create synergies, as well as facilitate the dialogue and discussion between key actors. The in-kind local counterpart financing will be provided by the Mexican Instituto Nacional de Ecología y Cambio Climático. This TC has letters of support from the Mexican Instituto Nacional de Ecología y Cambio Climático and the Ministerio de Energía in Chile.

## **VI. Project Risks and issues**

The main risks in the successful and timely execution of the project are the availability and quality of information as well as qualified consultants that might be able to perform the analysis and work required for the study. To address and minimize these risks, advances have been made in the identification of information sources and pool of candidates that might perform the required tasks. Moreover, local involvement and support have been secured. In addition, we will complete an external IRB approval process for both projects and use informed consent when surveying households.

## **VII. Environmental and Social Classification**

The ESG classification for this operation is [ C ]