



# CLIMATE ACTION PLAN REPORT



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## Emissions Report - 2019



Graph 1. Emissions report of 2019 – Carbon footprint update

USFQ's Climate Action Plan aims to unite our operational, academic and research departments to coordinate campus wide climate initiatives. The action plan is divided into the following topics: Energy and Carbon emissions, Operations, Procurement, Nature and Ecosystems, Community and Partnerships, Implementation, and Reporting. Each section describes our current efforts as well as our future commitments to advancing our sustainability strategy.

### 1. Energy and Carbon Emissions:

We quantified our greenhouse gas emissions (GHG) into 3 scopes. Scope 1 (direct emissions), scope 2 (electric consumption emissions) and scope 3 (indirect emissions). Our measurements include nitrogen oxides (NOx), carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>). The emissions were quantified by major stationary sources, area sources, mobile sources, commuting and off-site electricity production.

The baseline year was 2012 but in 2018 and 2019 new emission sources were included. University wide operations in 2020 were significantly reduced due to the pandemic; therefore, we are using the 2019 report for accurate interpretation and strategy. The contributions of each scope are described in the following graph:



Scope 3 Represents the biggest contribution and had various emission sources such as: transportation of employees and students (terrestrial or by air), management of waste and wastewater (including hazardous waste). We believe that staff and students commuting to campus is the most significant contributor. As a solution USFQ launched Pancho Bus, an institution sponsored free bus service available to the entire campus community. It serves as an alternative transportation method aimed at reducing individual car use. Further, the bus has various routes around the city which are available on its web page.

**Pancho Bus routes:**

<https://www.usfq.edu.ec/es/estudiantes/informacion-de-movilidad>

The follow values for electricity and water consumption at the Cumbayá campus in 2020 were reported:

Year	Energy consumption [kWh]	Water consumption [m3]
2019	3 578,380.00	32,731.6
2020	1 904,700.00	9,439.47

*Table 1. Summary of energy and water consumption*



*Graph 2. Summary of energy and water consumption*

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Since 2012, USFQ has been working on initiatives and pilot projects to achieve energy efficiency. For example, after studying energy consumption in various buildings, we took action to lower the high consumption of energy in the library and kitchen areas. The initiative included changing the incandescent light bulbs to LEDs in the library, studying the correct settings for air-conditioning temperatures in the library, and installing automatic locks in the cold room of the kitchen.

**Commitment:** Decrease direct emissions from electricity consumption by 50% by 2025. This includes the renovation of the energy infrastructure by incorporating generation plant and energy transformers; placement of photovoltaic system and investment in automatization and renewal of illumination, along with a continuous efficient energy monitoring at campus with the participation of professors and students. In order to reduce scope 3, we aim to create a compensation plan such as reforestation campaigns for carbon capture. We also aim to support the design of a water collection system in buildings with a large roof area and the capacity to hold such a system.





## 2. Operations

### a. Campus Growth and Retrofit

The University has grown and established goals to increase density use for the past five years, as well as prioritized efficiency operation within our science centers in the Galapagos and the Amazon.

**Commitment:** New construction at USFQ will be subjected to green building and efficiency standards.

### b. Waste Operations:

The USFQ Smart Campus initiative facilitates the implementation of research projects involving multiple fields of sustainability from different colleges. Each year three projects are chosen to undertake to advance our goal of a becoming a smart campus.

#### i. Zero Waste Campus:

This project aims to contextualize the current solid waste management of the principal campus in Cumbayá, to determine the waste generation baseline and develop an action plan to achieve a zero-waste campus. The methodology was defined in 5 steps which included: pre-evaluation, evaluation, post-evaluation, objective and indicator definition and selection of strategies for reduction and optimization. Along with the CHAT institute and food service, the characterization of waste was developed based on four categories of measurement for solid waste: comestible (waste destined to pigs), comestibles not suitable for consumption, not comestible, and caducated. And for liquids: oils.

The methodology includes the recompilation of information about management waste system and analysis of flux in relation with waste generation, to achieve the certification.

In relation to waste generation, the future steps are the characterization of ordinary waste. The university acquired an ultrasound sensor to measure in real-time the generation of ordinary waste.

#### ii. Sustainable Food Services “CHAT verde”:

The Hospitality and Gastronomy School has worked on processing waste management and treatment by using a biodigester.

**Commitment:** Our farm becomes zero waste by 2023.



## 3. Procurement:

The food and resources that are supplied to USFQ principally come from local suppliers. Currently, there are no policies that favor certain suppliers, but the goods are obtained within a 150 miles radius from campus.

**Commitment:** We are committed to developing a procurement policy which will prioritize environmentally friendly goods.

## 4. Nature & Ecosystems:

USFQ as an institution is committed to promote and advance sustainability education among its students. We have adopted more sustainability learning outcomes and have implemented specific focused programs for both undergraduate and graduate students, which can be taken off-campus or on-campus.



USFQ is privileged to be located in a megabiodiverse country which continues to inspire us to promote efficiency and sustainability in our researcher network and research projects. The unique location of our science stations in Ecuador allows us to undertake important climate change research. This research is focused on sustainability, the environment, corporate responsibility, climate change and equity. It is carried out by a multidisciplinary team of experts and students that are concerned with the healthy maintenance and development of society and the environment. 86.02% of academic departments at USFQ incorporate sustainability themes in their courses that have a link to the Sustainable Development Goals. These courses are offered at our principal campus and our two scientific stations in the Galápagos Islands and the Amazon Basin. Both science stations promote global research partnerships and constantly teach conservation and sustainable development to both the local communities and international students.



**a. Galápagos Institute for Arts and Science (GAIAS)**

The Galápagos Institute for Arts and Science (GAIAS) located in San Cristobal, is a world-class academic and research station which is accredited by Consejo de Evaluación, Acreditación y Aseguramiento de la Calidad de la Educación Superior (CEAACES). It offers academic courses for international and Ecuadorian students, in topics such as: Marine Ecology; Evolution, Ecology and Conservation; People Politics and the Environment; and Sustainable Tourism. This station also focuses much of its research on sustainable economic alternatives for local people, considering conservation, community wellbeing and environmental preservation.

*Link: <https://www.usfq.edu.ec/es/galapagos>*

**b. Galapagos Science Center (GSC)**

Galapagos Science Center (GSC) is an initiative created in 2011 between USFQ and The University of North Carolina at Chapel Hill (UNC). It is located at Puerto Baquerizo Moreno in San Cristobal. Its primary objective is to offer a coordinated and multidisciplinary space for the development of international and local projects that benefit the Galápagos Islands and science more broadly. It has three fundamental principles:

- Interdisciplinary scientific research
- Education through science
- Community outreach in the Galápagos islands.



*Graph 3. Galapagos Science Center*

*Link: <https://galapagossience.org/es/galapagos-science-center-2/>*



Graph 4. Tiputini Biodiversity Station (TBS)

### c. The Tiputini Biodiversity Station (TBS)

The Tiputini Biodiversity Station (TBS), established in 1994, is located in the north basin of the Tiputini River, the world's greatest biodiversity hotspot. The principal activities are research and education, with environmental conservation being a main focus. The station contributes to the proposal and the implementation of strategies for the sustainable use of resources or alternative sources compatible with nature. The station works alongside local villages, with whom they share their experience and information.

Link: <https://www.usfq.edu.ec/es/estacion-de-biodiversidad-tiputini-tbs>

### d. Institutes

Additionally, USFQ has various research institutes that produce scientific publications and projects in different disciplines relating to sustainable development. These are:

- Institute for the Development of Alternative Energies and Materials (IDEMA), aims to find new ways to use waste to generate innovative materials and chemical precursors that can be substitutes of traditional raw material such as oil, coal, or natural gas. Based on this concept, IDEMA develops technology to obtain in an economically profitable, socially responsible way and with positive environmental impact, innovative biomaterials, alternative energy sources and green chemical precursors.

<https://www.usfq.edu.ec/es/instituto/instituto-para-el-desarrollo-de-energias-y-materiales-alternativos-idema>

- Institute of Micro and Nanoelectronics (IMNE), research is carried out in relation to the physics of the solid state for the development of Nanoelectronics technologies (devices). The purpose of these devices is the development of microelectronic systems (integrated circuits) for applications



of logic (microprocessors), memory (RAM, DRAM, ReRAM), telecommunications system, detectors and sensors, and photovoltaic cells.

<https://www.usfq.edu.ec/es/instituto/instituto-de-micro-y-nanoelectronica-imne>

- Institute for Innovation in Productivity and Logistics (CATENA-USFQ), this institute was developed to promote applied research in areas of productivity, quality, logistics and supply chain, and its related areas in ergonomics, data, science, manufacturing, innovation in education, etc. It focuses on multidisciplinary collaboration at a departmental level, as well as, with external national and international institutes.

<https://www.usfq.edu.ec/es/instituto/instituto-de-innovacion-en-productividad-y-logistica-catena-usfq>

- Institute for Computational Simulation (ISC), aims to be the platform to promote the development of computational simulation in Ecuador, providing a broad and inclusive space where teachers and researchers, from USFQ and around the country are invited to participate.

<https://www.usfq.edu.ec/es/instituto/instituto-de-simulacion-computacional-isc>

- Institute of Atmospheric Research (IIA), is a scientific entity whose purpose is to investigate the local and regional atmosphere, integrating experimentation, computational modeling and statistical data analysis.

<https://www.usfq.edu.ec/es/instituto/instituto-de-investigaciones-atmosfericas-usfq-ia-usfq>

- Biósfera (Biological and Environmental Investigations USFQ), is an interdisciplinary institute that seeks to develop scientific research in a wide range of academic topics in different ecosystems of the biosphere at a national and international scale.

**Biósfera:** <https://www.usfq.edu.ec/es/instituto/instituto-biosfera>

- ECOLAP (Institute of Applied Ecology), develops projects and provide consulting services for research, monitoring, management, conservation, and sustainable use of natural resources.

**Ecolap:** <https://www.usfq.edu.ec/es/instituto/instituto-de-ecologia-aplicada-ecolap>

**Research institutes:** <https://www.usfq.edu.ec/es/investigacion>

**Commitment:** Continue to invest in research projects that prioritize environmental engineering, energy systems, science, biodiversity, conservationism, economic development, and community impact. As for the academics, USFQ is committed to providing students with co-curricular, international opportunities to build the skillset of the liberal art mindset and respond to world problems.



## 5. Community & Partnerships:

### a. Community outreach:

As a liberal arts university our curriculum promotes the development of creative, critical, curious, motivated and free-thinking individuals. Students are able to face constant changes and the complexity of contemporary society. They are also given the opportunity to be responsible citizens through social projects that involve innovation and sustainability. Our connection with society is an important part of our teaching and research activities.

USFQ seeks sustainable development through scientific research, quality education and community outreach. Its contributions to the Sustainable Development Goals (SDGs) are described in the next table. The impact of all these projects is in local Ecuadorean communities. Examples of our community outreach can be found here.





SDGs	Detail
Goal 2: Zero Hunger	The Agronomy career advises a group called “Mujeres emprendedoras de la ruta de Humbolt” (MERH), which is located in the center-west of Quito. It aims to provide theoretical and practical training for management urban gardens.
Goal 3: Good Health and Well-being	Telehealth Project in prevention of COVID 19 in rural sectors of Pichincha. It aims are the prevention and promotion of health, with implementation of different services to the vulnerable groups.
Goal 4: Quality Education	The School Fab Lab is a project in collaboration with the Shlumberger company and its SEEd project (Shlumberger Excellence in Educational Development), in which students and professors from various disciplines of USFQ develop educational projects.
Goal 5: Gender equality	Prevention of violence and strengthening of rights systems in the Galapagos Islands.
Goal 6: Clean water and sanitation	This project provides potable water to habitants and tourists on Santa Cruz Island. It is undertaken by the Environmental Engineering Department at USFQ, in collaboration with Emerson College and Fairfield University.
Goal 7: Affordable and clean energy	In collaboration with CEPTEL consultant company, the project supports small and medium scale business to reduce their electrical consumption.
Goal 8: Decent work and economic growth	This project focused on mitigating the pandemic's effects on growth. It established better practices and protocols of biosecurity to maintain the activities of business companies.
Goal 9: Industry, innovation and infrastructure	The Graphic Design career works together with COCIBA, CADE and POLITECNICO to create strategies that reinforce the Cumbayá Circuit proposal; a pedestrian and cyclable mobility alternative that uses existing opportunities and turns inaccessible natural areas into public space.
Goal 10: Reduced inequality	Current approaches to technology often overlook its relationship to the broader ecology of communities. This project seeks to promote interdisciplinary, methodological tools and best practices.
Goal 11: Sustainability cities and communities	The project seeks to mitigate the impacts generated by tourism in the area, with the cooperation of the Mindeña community. Three activities are planned: an environmental education program, a family harmony program and the promotion and recovery of native food sources.
Goal 12: Responsible consumption and production	The project currently incorporates other key aspects of responsible consumption, such as the creation of a portal to promote suppliers with sustainable practices and a gastronomy portal. The project has 10,000 beneficiaries and collaboration between the Biology, Digital Animation and Gastronomy majors.



SDGs	Detail
Goal 13: Climate action	The project consists of the construction of a methodology to quantify the carbon footprint of 9 secondary schools in the city of Quito and establish a reduction plan.
Goal 14: Life below water	The project has established the existence of a migratory corridor along the Coco mountain range, which links the Galapagos and Cocos marine reserves, along which species of sharks and turtles migrate.
Goal 15: Life and land	The project is developed by the Museum of Zoology & Terrestrial Zoology Laboratory of the Institute of Tropical Biological Diversity iBIOTROP of the USFQ, in collaboration with the careers of Biology, Graphic Design and Agronomy, the Aves-Quito Observers Club, the Pata de Gallo Collective, among others.
Goal 16: Peace and justice strong institutions	The project aims for students to develop skills such as negotiation, general culture and public speaking abilities, thereby promoting civic values, civic responsibility and raising awareness of future leaders of society on current issues of global significance.
Goal 17: Partnerships for the goals	The project that aims to facilitate first-level conversations about what is being developed in the framework of the 2030 Agenda, as well as the different challenges and opportunities that still persist.

Link: <https://estudusfq.edu.sharepoint.com/sites/OIS/Documentos%20compartidos/Forms/AllItems.aspx?id=%2Fsites%2FOIS%2FDocumentos%20compartidos%2FDocumentos%20Web%20OIS%2FMicro%20Sitio%20Desarrollo%20Sostenible%2FPublicaci%C3%B3n%20ODS%202021%2Epdf&parent=%2Fsites%2FOIS%2FDocumentos%20compartidos%2FDocumentos%20Web%20OIS%2FMicro%20Sitio%20Desarrollo%20Sostenible&p=true>

**Community Outreach:** approximate investment per year (en vez de approximately investment) y cambiar los valores a: 250,000 mil USD a 300,000 USD.

<https://www.usfq.edu.ec/en/community-outreach>

**Commitment:** Continue to invest in community projects from the last three years with the proposed budget.

Detail	Approximate investment per year
Community Outreach	\$25,000 mil USD a \$300,000 mil USD (last 3 years)



**b. Partnerships:**

USFQ seeks to collaborate with international networks that are focused on developing academic expertise and increase international understanding on society and global environmental change.

- APRU (Association of Pacific Rim Universities), is a network of leading Research Universities, which seeks to promote education and public policy on issues that generate viable solutions on Sustainable Development issues and come from 17 economies in the Pacific Region.
- HUC (Hemispheric University Consortium), is an alliance promoted by the University of Miami across America that seeks to discover and share knowledge focused on the problems in our region. The network specializes in encouraging innovation, entrepreneurship and promoting social initiatives.

**Networks:** <https://www.usfq.edu.ec/en/opi/networks>

**Commitment:** USFQ will invest in international collaborations to create local value.

One example of this is our partnership with the University of Edinburgh, signed under the COP26 framework. This project called Living Lab is focused primarily on studying Energy transition in the Galapagos Islands.

A second example is LDAS (Land Assimilation System): This tool improves the prediction of the climate of Ecuador and Latin America. In collaboration with Duke University and Johns Hopkins University and with support of NASA, we have installed an LDAS node in Quito to improve the prediction of meteorological parameters and create climate change scenarios anywhere in Latin America. It integrates terrestrial and atmospheric models of the climate from satellites with observations from meteorological stations on earth. The application framework will be led by researchers from USFQ, INAMHI, Universidad Peruana Cayetano Heredia and the Naval Medical Research Unit (NAMRU-6) of Peru.

## 6. Implementation and reporting:

The implementation of sustainability projects started in 2012 with the Office of Sustainability and Innovation. The office subsequently created a multistakeholder group to solve challenges both inside and outside of our campus. Through the Smart Campus group, we have taken concrete action towards more efficient operations while consulting a range of experts on carbon footprint, mobility, waste, energy, and sustainable development. This group meets once a year to decide which projects will be undertaken. The projects are presented by a panel of experts and then executed in conjunction with researchers, students and school decision makers.



**Smart campus:** <https://www.usfq.edu.ec/en/node/2390>

**a. Smart campus:**

**- Authorities:**

- President
- Chief Operating Officer
- Dean of Research

**- Panel of experts:**

- Environmental Engineering
- Business
- Mobility and Logistics
- Energy
- Biodiversity
- Sustainable food systems
- Student representatives

The Office of Sustainability is responsible for updating the sustainability report, which is voluntarily uploaded to ASSHE, a global sustainability standard created for higher education. USFQ achieved a Silver Rating in 2017 and is hoping that due to our strategic advancement in sustainability, we achieve Golden Standard by 2020. Sustainability reports have been published since 2012 and a measurement of the university’s carbon footprint has been reported since 2015. A resume of these activities is showed in the table below.

Report	Year
Sustainability Report	2012
Sustainability Report	2013
Sustainability Report	2018
Carbon Footprint upgrade	2015
Carbon Footprint upgrade	2017
Sustainability Report upgrade	2020

**Sustainability Report:**

<https://reports.aashe.org/institutions/universidad-san-francisco-de-quito/report/2018-12-26/>  
 Sustainability report update: <https://www.usfq.edu.ec/sites/default/files/inline-files/Actualizacion-Reporte-Sostenibilidad-2020.pdf>

**Carbon Footprint reports:** <https://www.usfq.edu.ec/es/node/2391>

**Sustainable development:** <https://www.usfq.edu.ec/es/node/2395>

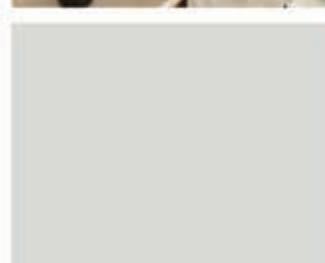
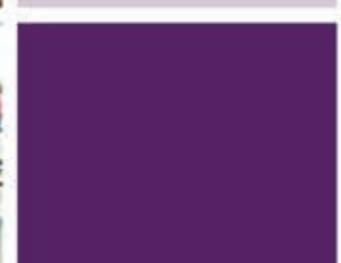
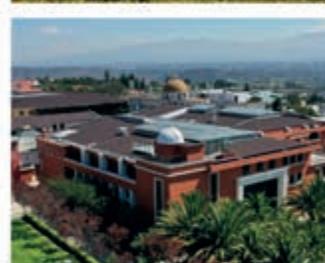


**Commitment:** Include the next information (links) required:

- Institution's sustainability strategy
- Institution's sustainable procurement/purchasing policy
- Institution's sustainability investment policy
- Institution's sustainability policy on donations and funding.



# Climate Action Plan Report





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