

## **Panama's Commitment to the Reduction of Greenhouse Gases (GHG)**

Nowadays Climate Change does not need introduction. This is a phenomenon being observed and felt by everybody and everywhere in this planet, from very high temperatures in summer, with melting ice sheets in the poles, to freezing winters in the northern hemisphere to the hurricanes, typhons, floods, droughts, and landslides in the tropics.

In the past, this climate unbalance happened following the Earth natural dynamics; however, a few decades ago, it started to increase their frequency, intensity, and magnitude causing material damage and the loss of lives in developed and developing countries around the globe. Certainly, we have not only entered the age of digital transformation, but we are also living in the age of climate deterioration, greatly produced by human activity.

As you may know, in the 1980s, we began to hear about the **depletion of the Ozone Layer**, the shield which protects Earth from the sun's ultraviolet rays and is located between 15 kms and 35 kms above Earth's surface. These rays can cause harm to humans such as skin cancer, cataract, and deterioration of the immune system. Indeed, it can damage all forms of life in our planet.

The depletion of Ozone ( $O_3$ ) happens when atoms of chlorine and bromine interact with molecules of Ozone, destroying the latter and thus weakening the Ozone shield. Chlorine and Bromine were found in commercially produced chemicals called **ChloroFluoroCarbons (CFCs)**, which were released into the atmosphere by means of aerosol or spray cans, refrigerators, air conditioners and pesticides such as methyl bromide.

As consequence of this atmospheric pollution, a hole was observed in the Ozone Layer over the Antarctica in 1985, prompting governments to negotiate and approve the **Montreal Protocol on Substances that Deplete the Ozone Layer (1985 Montreal Protocol)** to ban the use of CFCs and other ozone depleting substances. This is the fastest and more effective international environmental agreement ever negotiated in the history of the United Nations.

Thanks to the Ozone hole, governments all over the world started to pay more serious attention to atmospheric pollution, and especially to another pressing environmental problem: **Global Warming**. This means that Earth is getting increasingly hotter. According to the US National Oceanic and Atmospheric Administration (NOAA) the combined land and ocean temperature has increased at an average rate of  $0.13^\circ\text{F}$  ( $0.08^\circ\text{C}$ ) per decade since 1880; however, the average rate of increase since 1981 ( $0.32^\circ\text{F}/0.18^\circ\text{C}$ ) has been more than twice that rate. This has led to an overall  $3.6^\circ\text{F}$  ( $2^\circ\text{C}$ ) increase in global average temperature today compared to the preindustrial era.

In 2020, the average global temperature over land and ocean was  $1.76^\circ\text{F}$  ( $0.98^\circ\text{C}$ ) above the 20th-century average. That made 2020 the second hottest year on record, after the highest record in 2016. In the 1880-2020 record, the 10 warmest years on record have all occurred since 2005, and 7 of the 10 have occurred just since 2014. This rise in global heat is caused by the burning of fossil fuels (coal, crude oil, natural gas and other industrial processes ) that has released greenhouse gases (GHG) into the atmosphere, which trap warmth from the sun and drive up surface and air temperatures.

Despite this increasingly frequent rise in temperature which has been wreaking havoc all over the planet, it has taken a longer time to persuade governments to take a similar and faster action to tackle global warming as they had done it in the case of the Ozone Layer depletion.

However, an important step in addressing global warming was the creation of **the International Panel on Climate Change (IPCC) in 1988**, which came out of the cooperation efforts of the United Nation Environment Program and the World Meteorological Organization. It provided an excellent and sound platform to collect and assess all worldwide scientific research related to the climate system. So far, the IPCC has produced six Assessment Reports (AR) in 1990, 1995, 2001, 2007 and 2014, and the next one will be published in 2022.

IPCC assessment reports explains in a detailed manner the human-induced climate change, including risks, potential impacts, prevention, adaptation, and mitigation. IPCC also produces a Synthesis Report for policy makers and citizens so they can understand the climate situation in easier terms, but specially for policy makers to take proper measures to combat climate change. Due to the assessment reports, there is a great consensus in the international scientific community of the threat posed by global warming to all forms of life on Earth. In this regard, the **2014 IPCC Synthesis Report: Summary for Policymakers** stated that:

**“Anthropogenic greenhouse gas emissions have increased since the pre-industrial era, driven largely by economic and population growth, and are now higher than ever. This has led to atmospheric concentrations of carbon dioxide, methane and nitrous oxide that are unprecedented in at least the last 800,000 years. Their effects, together with those of other anthropogenic drivers, have been detected throughout the climate system and are *extremely likely* to have been the dominant cause of the observed warming since the mid-20th century. {1.2, 1.3.1}”**

The work of IPCC served as an important driver for the establishment of **United Nations Framework Convention on Climate Change (UNFCCC) in 1992**. In its Article 2, the UNFCCC states that **“the ultimate objective of the Convention... is... to achieve stabilization of greenhouse concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”**. Article 2 has been subjected to various interpretations by governments, yet it became instrumental in the discussion and implementation of measures to reduce GHG emissions. Since its inception, the UNFCCC has held **25 Conferences of the Parties (COP)** to assess advances in the fight against climate change, and the next one will take place this year in November in Scotland.

The next important effort to agree on measures to reduce GHG emissions was the **Kyoto Protocol signed in 1997** and which entered into force in 2005. The Kyoto Protocol incorporated the UNFCCC principles and became the first legal framework to contain mandatory reduction targets on developed countries listed on Annex B of the Protocol. Countries included in Annex B participated in two rounds of emissions reduction commitment in 2008-2012 and 2013-2020. It also provided flexible mechanisms to trade GHG emissions such as International Emissions Trading, Clean Development Mechanism and Joint Implementation. In addition, the Kyoto Protocol listed in Annex A the GHG causing global warming such as **Carbon dioxide (CO<sub>2</sub>)**

**Methane (CH<sub>4</sub>) Nitrous Oxide (N<sub>2</sub>O) Hydrofluorocarbons (HFCs) Perfluorocarbons (PFCs) and Sulphur hexafluoride (SF<sub>6</sub>).**

Even though the Kyoto Protocol made an important progress in operational terms under the UNFCCC, it placed the main responsibility for cutting GHG emissions on developed countries, while it was not binding for large countries such as China, India, Indonesia, Brazil, and Japan. Also, a main GHG emitter like the United States did not ratify the treaty, and Canada opted out in 2012 arguing that without the US and China (which together account near 40% of worldwide emissions), the Kyoto Protocol could not have much impact on GHG reduction.

The Kyoto Protocol was succeeded by the most ambitious and legally binding **Paris Agreement signed in 2015** by 196 countries also under the umbrella of the UNFCCC. Unlike the Kyoto Protocol, the Paris Agreement doesn't establish mandatory GHG reductions targets for industrialized countries; however, it sets the goal for every signatory country to **limit global warming** to well **below 2 degrees Celsius, preferably to 1.5 degrees Celsius**, compared to pre-industrial levels. This agreement is being implemented in cycles of five years from 2020, requiring all signatory countries to submit **Nationally Determined Contributions (NDCs)**, that is, an action plan detailing the commitments adopted to reduce GHG emissions in line with the goals of the Paris Agreement.

Under the Paris Agreement, countries will help each other through the provision of financial support, technology transfer and capacity building. It also creates a **transparency framework** through which every country Party will report about actions taken and progress in climate change mitigation, adaptation measures and support provided or received.

The Paris Agreement suffered a brief setback with the withdrawal of the United States in 2020 under the presidency of Donald J. Trump, but fortunately, the new US administration under President Joe Biden has reversed the climate change policy of Trump and rejoined the Paris Agreement from the beginning of 2021.

To express its determination to fight climate change, the US convened the Earth Day Summit on April 22, 2021, with leaders of 40 nations, which represent 80 percent of GHG emissions including China and India. The Biden administration pledged to reduce US GHG emissions by 50%-52% in 2030 below 2005 levels. The U.K. and European Union expressed their commitments to reduce emissions by 68% and 55%, respectively, by 2030. China reiterated her commitment to reach peak emissions by 2030 and be carbon neutral by 2060, while India announced an India-U.S. Climate and Clean Energy Agenda Partnership for 2030 and renewed the nation's vow to install 450 gigawatts of renewable energy by 2030.

Now let's review the contribution of the Republic of Panama to reduce GHG emissions.

As responsible member of the international community, Panama has adopted major international environment conventions related to GHG reductions such as the UNFCCC, the Kyoto Protocol, Doha Amendment (to extend the life of the Kyoto Protocol), and the Paris Agreement.

Internally, Panama enacted the Law 41 of July 1, 1998, known as the General Environment Law, which established the Panama Environment Authority as well as the principles and policies related to environment affairs. This law also included several provisions related to climate change in the Title V, Chapter 2. Panama also enacted the National Policy on Climate Change through Executive Decree 35 of February 26, 2007. In addition, it created in 2009 the Panama National Committee for Climate Change to support and follow up the implementation of policies of the Panama Environment Authority in compliance with international agreements as well as to coordinate those policies among various institutions of government.

Due to the increasing importance of environmental issues, Panama passed the Law 8 of March 25, 2015 whereby it elevated the status of the Panama Environment Authority, creating the Ministry of Environment, which in turn, established the National Bureau of Climate Change through the Executive Decree 36 of May 28, 2018. And, to ensure the proper implementation of the Paris Agreement, the current government issued the **Executive Decree 100 of October 20, 2020**, to specifically regulate climate change and put forward **the National Program Reduce Your Footprint**.

Up to now, Panama remains **carbon negative**, that is, Panama sinks capture more carbon than it is emitted by its own economic activities. However, Panama is fully committed to achieve the goals of the Paris Agreement and become a carbon-neutral country by 2050 through the implementation of the National Program Reduce Your Footprint, which consists of the following components: 1) National Sustainable System of GHG Inventories; 2) National Registry of GHG and Mitigation Actions; 3) National Registry of Means of Implementation; 4) National System to monitor and update the National Strategy for Low-Carbon Socio-Economic Development as well as the mitigation actions set up in the Nationally Determined Contributions (NDCs) of Panama.

Executive Decree 100 of October 20, 2020 included five areas in the national inventory of GHG, such as **Energy, Industrial Products, and Product Use (IPPU), Agriculture, Land Use, Land Use Changes and Forestry (LULUCF) and Residues (waste)**. It also established the National Platform for Climate Transparency for publication of all matters related to the management of climate change.

Panama's main GHG emissions includes **Carbon Dioxide (CO<sub>2</sub>), Methane (CH<sub>4</sub>), Nitrous Oxide (N<sub>2</sub>O), and HydroFluoroCarbons (HFCs)**. In the GHG emissions inventory of 2017, compiled in the 2020 Panama Biennial Update Report (BUR), **Carbon Dioxide represented 66.3% with 11,844.00 (Kt CO<sub>2</sub> eq), Methane 26.2% with 4,680.30 (Kt CO<sub>2</sub> eq), Nitrous Oxide 5.0% with 892.4 (Kt CO<sub>2</sub> eq), and Hydrofluorocarbons 2.5% with 454.1 (Kt CO<sub>2</sub> eq).**

As per economic area in 2017, the main GHG emitters were as follows: **Energy 62.9% with 11,245.90 (Kt CO<sub>2</sub> eq), Agriculture 19.4% with 3,463.20 (Kt CO<sub>2</sub> eq), Waste 10.7% with 1,904.90 (Kt CO<sub>2</sub> eq), and Industrial Product and Product Use (IPPU) 7.0% with 1,256.80 Kt CO<sub>2</sub> eq).**

As I mentioned before, Panama is carbon negative. In 2017, the total emission of GHG reached **17,870.90 (Kt CO<sub>2</sub> eq)** while our forests (sinks) had the capacity to absorb or capture **27,629.20**

(Kt CO<sub>2</sub> eq), that is, Panama's forests can capture more CO<sub>2</sub> than it is generated by anthropogenic activities in the country.

It is important to mention that in December 2020, Panama presented the first Nationally Determined Contribution (NDC) to the UNFCCC, showing 29 commitments in 10 sectors. As for mitigation purposes, priority has been given to those sectors with great impact on GHG emissions such as **Energy and Land Use-Land Use Change and Forestry (LULUCF)**.

In this regard, Panama is committed to achieve a reduction of total emissions from the country's **energy sector by at least 24% by 2050 and by at least 11.5% by 2030**. As for **LULUCF sector**, Panama is committed to the **forest restoration of 50,000 hectares** at the national level, which will contribute to the **carbon absorption of around 2.6 million tons of CO<sub>2</sub>** to 2050.

In the agricultural sector, the NDC seeks to promote the gradual transition towards climate-resilient agriculture and livestock through the Nationally Appropriated Mitigations Actions (NAMA) for the cultivation of Rice and for the Sustainable Livestock.

As for IPPU sector, the NDC established the Panama Cooling Plan with mitigation actions for the use of substitute products in refrigeration and air conditioning that avoid the ozone depletion and the National Strategy for the Progressive Elimination of HFCs.

For the waste sector, two actions were presented: The Zero Waste Program 2015-2035 of the Municipality of Panama and the National Plan for Comprehensive Waste Management 2017-2027 from the Urban and Household Cleaning Authority.

In 2016, the Panama Canal Authority also joined the efforts to reduce GHG through the implementation of the **Green Connection Environmental Recognition Program**, which recognizes vessels that comply with the highest environmental performance standards. Since the Panama Canal is a shorter maritime route, vessels have been able to reduce fuel consumption and therefore, GHG emissions. In this regard, it is estimated that the passage of vessels through the Panama Canal has contributed to the reduction of 800 million tons of GHG since the opening of the waterway in 1914.

Certainly, Panama has not only developed ambitious policies to move toward a low-carbon socio-economic development, but it has also been designated as one of the UNFCCC's Regional Collaboration Centers (RCC) to strengthen support given to Latin American countries to better implement the Paris Agreement.

Since 2017, Panama also became a member of World Bank's Partnership for Market Readiness, a mechanism designed to assist countries to develop and implement carbon pricing instruments to encourage CHG reductions and the emergence of new green technologies.

As we have entered a critical decade to fight climate change, it is important for citizens everywhere to transcend national borders and start to acquire a planetary consciousness to preserve all forms of life on Earth.

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Tokyo, April 30, 2021

Note:

After finishing this article, Panama issued Executive Decree No. 135 of April 30, 2021, to regulate Adaptation to Global Climate Change. This regulation establishes a new platform to manage, evaluate and monitor climate risks as well as the vulnerability of the Republic of Panama to Climate Change.

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