

Pioneering the Decarbonization of the shipping industry

Category: Climate and Energy

Introduction

The Panama Canal Authority (ACP) is an autonomous legal entity of the Republic of Panama in charge of the operation, administration, management, preservation, maintenance, and modernization of the Panama Canal, as well as its related activities and services, so that the Canal may operate in a safe, continuous, efficient, and profitable manner. Throughout our history, we have embraced the **sustainable development model**, focused on creating **economic, social, and environmental value** not only for Panama but also for the international community. This is evident in actions that go beyond regulatory compliance with these matters, contributing comprehensively to the progress and well-being of our country and the planet.

Despite the rapidly changing panorama in which we are living, the Panama Canal has continued to grow to adapt to technological advances, changes in global trade patterns, competitiveness through the emergence of new logistics systems and even the impacts of **climate change** and the effects on customers: always reaffirming its commitment to guarantee continuous, safe and efficient transits.

The globalization of markets encourages business strategies to manage constant change and the management of uncertainty and risks, which is why the Panama Canal is currently working on its **strategic planning process**, under an organizational alignment vision where **sustainability plays a key role**. The corporate objectives and goals are aligned with the dimensions of sustainability, stakeholders' expectations, and the seventeen Sustainable Development Goals (SDG).

In line with the Panama Canal's commitment to environmental conservation, the organization has set ambitious goals for the future regarding its greenhouse gas (GHG) emissions. With the firm objective of moving towards **net-zero emissions by 2050**, the Canal is focused on proactively addressing its emissions and contributing to the **mitigation of climate change globally**.

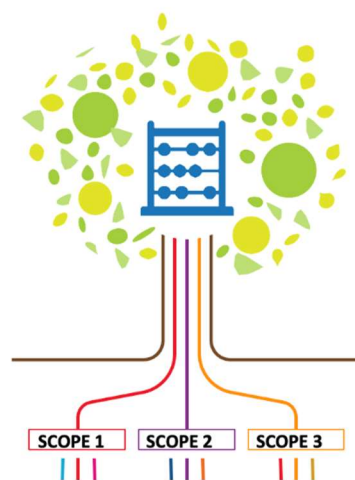
This document presents an overview of the Canal's corporate leadership, the highly ambitious GHG inventory, climate adaptation and mitigation efforts, and next steps and timeline to deliver a **positive impact** in the shipping industry, the community, and the well-being of the planet.

Corporate leadership

The Panama Canal intends to lead a new era of **social, environmental, and economic sustainability** as part of the business, operations, maritime value chain, and watershed, creating the conditions for the Canal to thrive in a new climate economy. The Canal has designed and implemented an ambitious and feasible decarbonization strategy, based on:

- A robust and dynamic greenhouse gas inventory using **industry best practices** including the ISO standards¹, the Global Logistics Emissions Council Framework (GLEC, V3), and the Greenhouse Gas Protocol (GHGP), notably principles of relevance, completeness, transparency, consistency, and accuracy.
- The Canal is further committing to **enhanced transparency** on its GHG accounting approach, carbon foot printing approach and **external disclosure on climate action**, including reporting through CDP starting next year 2025. Disclosure will provide information to enable external comparability.
- For the first time, the Canal's GHG footprint includes a materially complete assessment of **Scope 3 GHG emissions**, ensuring its total Scope 1, 2 and 3 GHG emissions inventory spans both own operations and the maritime value chain – including, but not limited to, **well-to-wake emissions from the full shipping journey of transits through the Canal**; an estimation for emissions from short-term financial investments; and the emissions from terminal operators adjacent to the Canal.
- ACP's GHG inventory has been developed to serve as a **tool for strategy development and decarbonization tracking and accountability**. The inclusion of emissions for the full journey and transit of shipping traffic is the considered approach to ensure the GHG Inventory is an effective tool for transition risk identification and helps us direct our attention to the pursuit of opportunities to support the future greening of the maritime sector.

The ACP's GHG inventory enables scenario modeling to support continuous **performance tracking, forecasting, and business planning**; ensures an annual and accurate reporting of emissions in public documentation; and commits to verification by third-party verification of the greenhouse gas footprint.

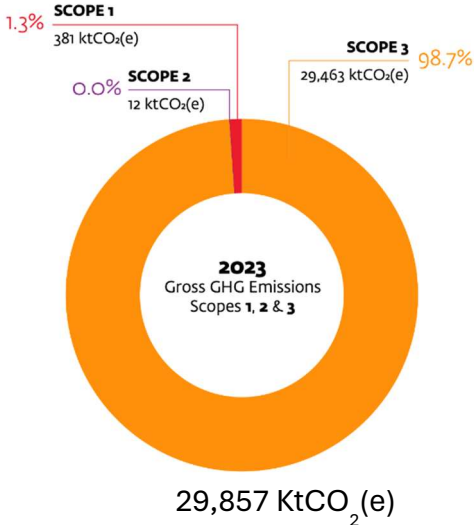
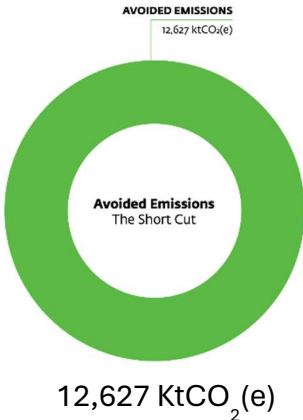
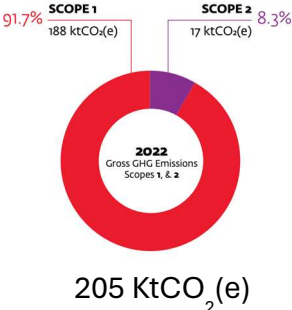


¹ ISO 14083:2023 Greenhouse Gases Quantification and reporting of greenhouse gas emissions arising from transport chain operations

- For the first time, ACP has quantified **all material GHG emissions**, including an estimate for black carbon from Scope 1 fuel combustion activities and from full shipping journey of transits through the canal, as well as nitrous oxide, methane and other relevant Kyoto Protocol gases, expressing these in their respective emissions where possible and in the form of carbon dioxide equivalent CO₂(e) applying the latest global warming potentials provided by IPCC 6th Assessment Report (AR6) when converting from respective emissions factors.
- **Science-based targets with trajectories consistent with the global targets of no more than 1.5°C; a net-zero commitment** that encompasses all upstream and end stream emissions and all greenhouse gases.

The GHG Inventory

A “best-in-class” calculation



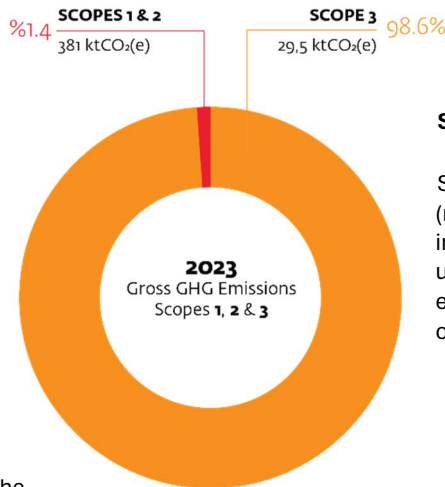
FY2023 results

SCOPE 1 EMISSIONS

Scope 1 are direct GHG emissions that occur from sources that are controlled or owned by ACP (e.g., floating equipment, mobile and stationary land fleet, thermo-electric power generation, LPG emissions, and refrigerants).

SCOPE 2 EMISSIONS (Locations based)

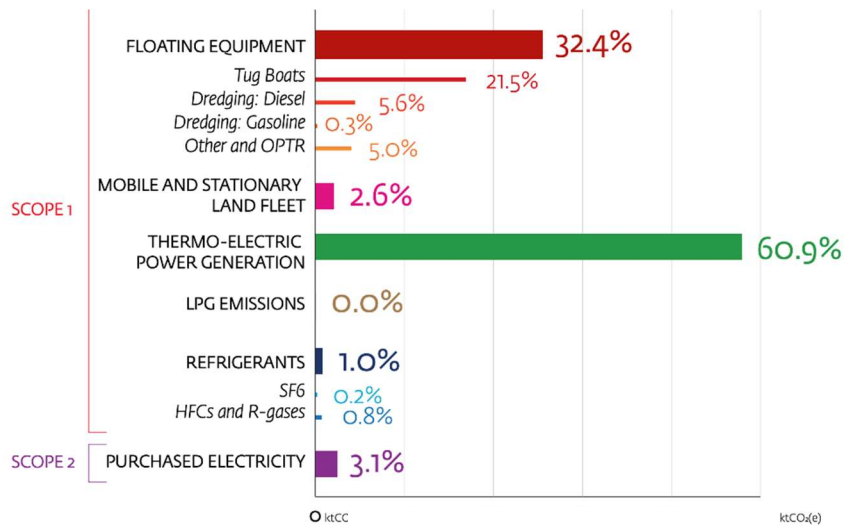
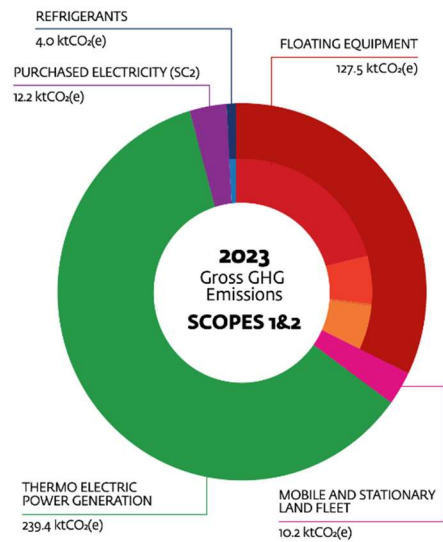
Scope 2 are indirect GHG emissions associated with the purchase of electricity, steam, heat, or cooling and are a result of the organization's energy use.



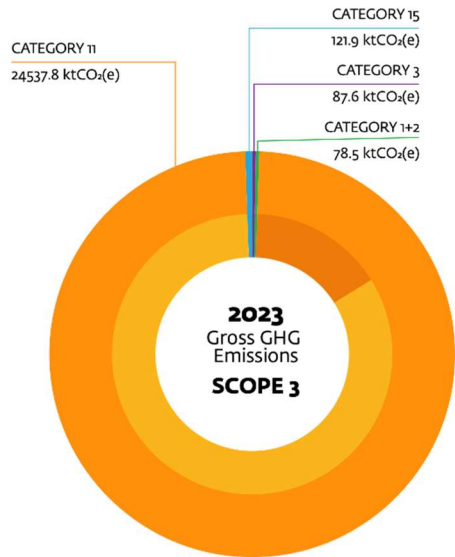
SCOPE 3 EMISSIONS

Scope 3 are all indirect emissions (not included in Scope 2) that occur in ACP's value chain, including both upstream and downstream emissions. There are 15 categories of Scope 3 emissions.

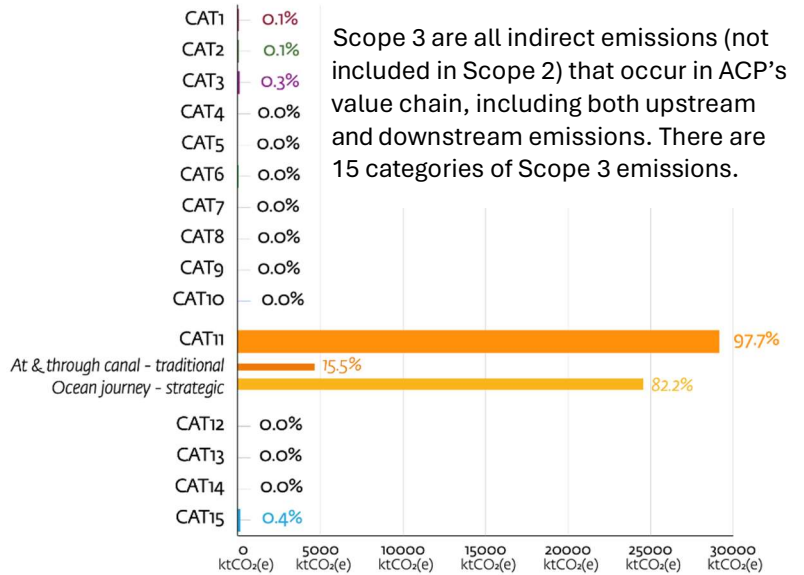
Scopes 1 and 2 emissions



Scope 3 emissions



SCOPE 3 EMISSIONS

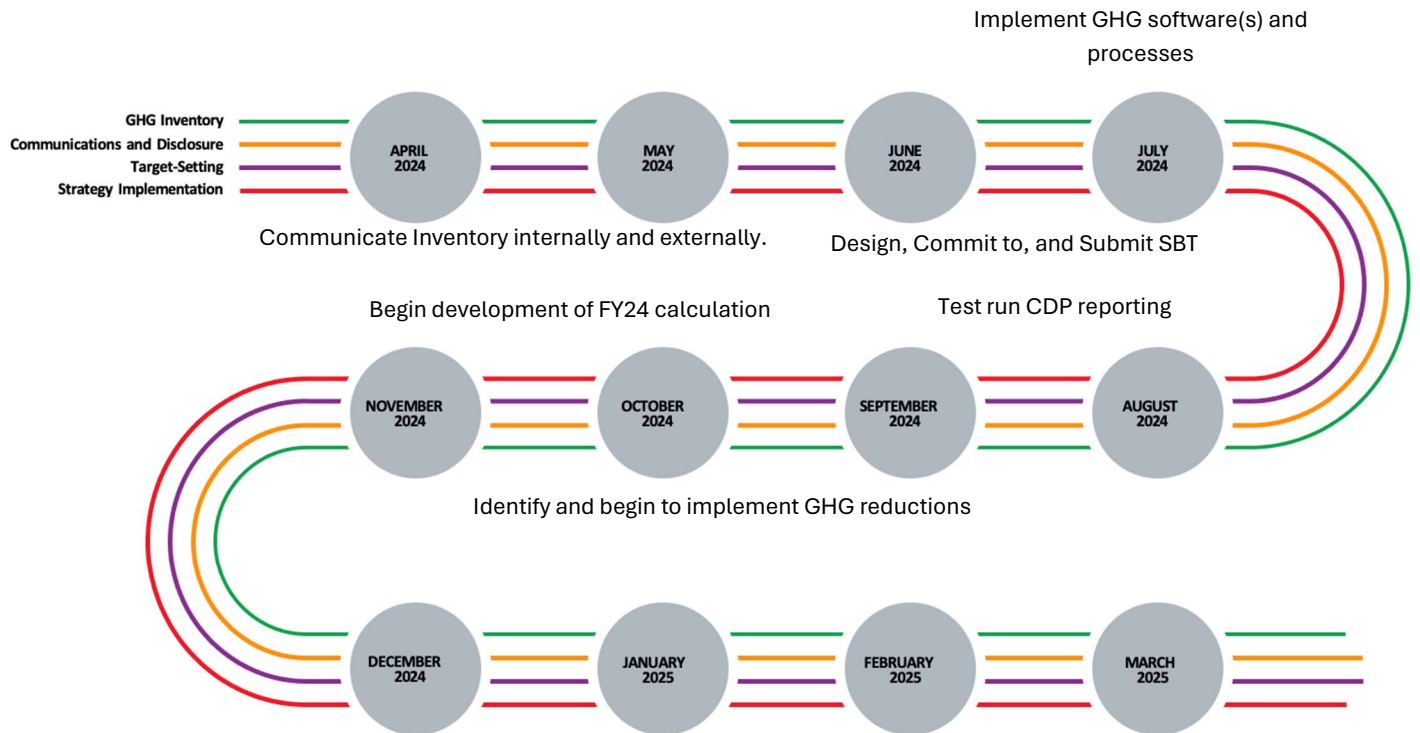


Scope 3 emissions

Emissions by Type	Type	FY2023 Gross GHG Emissions (Scope 1, 2 and 3)			FY2022 Gross GHG Emissions (Scope 1, 2 and 3)		FY2023 Avoided Emissions (Scope 4)
		Absolute emissions (ktCO ₂ e)	% Total Scope 1, 2 & 3 emissions	% Scope 1 & 2 emissions	Absolute emissions (ktCO ₂ e)	% Scope 1 & 2 emissions	Absolute avoided emissions (ktCO ₂ e)
3	Scope						
4							
5	Scope 1						
6	Floating equipment	127.5	0.4%	32.4%	97.3	1.5%	
7	Tug boats	86.4	0.3%	22.3%	0.0	0.0%	
8	Dredging: Diesel	22.2	0.1%	5.6%	0.0	0.0%	
9	Dredging: Gasoline	1.1	0.0%	0.3%	0.0	0.0%	
10	Other and OPR	19.9	0.1%	5.0%	0.0	0.0%	
11	Mobile and stationary land fleet	10.2	0.0%	2.6%	6.8	0.1%	
12	Thermo-electric power generation	239.4	0.8%	60.9%	84.0	1.1%	
13	LPG Emissions	0.0	0.0%	0.0%	0.0	0.0%	
14	Refrigerants	4.0	0.0%	1.0%	0.0	0.0%	
15	SF6	0.0	0.0%	0.0%	0.0	0.0%	
16	HFC and PFCs	3.2	0.0%	0.8%	0.0	0.0%	
17	Scope 2						
18	Location based	12.2	0.0%	3.1%	16.8	0.2%	
19	Category 1	40.0	0.1%	0.0%	0.0	0.0%	
20	Category 2	38.5	0.1%	0.0%	0.0	0.0%	
21	Category 3	87.6	0.3%	0.0%	0.0	0.0%	
22	Category 5	0.2	0.0%	0.0%	0.0	0.0%	
23	Category 6	11.9	0.0%	0.0%	0.0	0.0%	
24	Category 7	5.1	0.0%	0.0%	0.0	0.0%	
25	Category 11	24,537.8	77.2%	0.0%	0.0	0.0%	
26	At & through canal (N/TW) ("traditional")	4,620.9	14.5%	0.0%	0.0	0.0%	
27	Ocean journey (N/TW) ("strategic")	24,537.8	77.2%	0.0%	0.0	0.0%	
28	Category 15	121.9	0.4%	0.0%	0.0	0.0%	
29	Total Scope 1	381			388		
30	Total Scope 2 (location based)	12			17		
31	Total Scope 3	29,463			-		
32	Total Scope 1 & 2 (location based)	393			205		
33	Total Scope 1, 2 & 3	29,857			205		12,627

Topline GHG calculation

Next Steps and Timeline



Targets



We have contracted ARUP to work with us on the development of Science-based Targets.



Over the coming 12 weeks we will...

- ✓ Screen ACP against SBTi standards (eligibility and risks)
- ✓ Model near-term and long-term GHG targets
- ✓ Model forward-looking emissions
- ✓ Draft SBTi Commitment & support ACP to submit to SBTi

Climate adaptation

In addition, the Canal maintains a focus on socio-ecological management (adaptation), based on a commitment to watershed management and addressing issues as diverse as hydrology, human rights, gender empowerment, and economic development. A vital element has been the comprehensive assessment of climate risk and its considerable impacts on communities, biodiversity, and ecosystem services, encompassing exposure to a wide range of climate hazards, as well as socio-ecological vulnerabilities.

The development of climate adaptation targets focused on water resources and the identification of solutions adapted to the six capital assets that are pillars of climate adaptation (human, social, natural, physical, financial, and political capital).

The Canal works in collaboration with internal and external facilitators, and strengthens the strategic objectives, formalizes the incorporation of sustainability through the Canal in terms of governance, related performance indicators for all Vice Presidency and Senior Management, training of Human Capital in the areas of Renewable Energy and alternative fuels, in line with IMO's decarbonization vision for the maritime industry; circular economy, taking into account sustainability criteria; Sustainable Technological Solutions and Projects, analyzing activities that can be harmful to the company and transforming them into more sustainable solutions, among others.

The ACP established Market-Based Mechanisms (MBMs) to use markets to protect the environment and reduce environmental damage. Ultimately, it is about incentivizing behavior compatible with sustainability and discouraging activities that increase the climate crisis including management in the Canal watershed.

To address the major challenges surrounding water availability and sustainable development in the Canal basin, in 2021, the Panama Canal developed, with the support of the Inter-American Development Bank (IDB), a process of diagnosis, prospecting, and territorial scenarios, including the development of the Sustainable Development and Decarbonization Strategy in the watershed based on climate change projections. This process resulted in an Indicative Plan for Environmental Territorial Planning (PIOTA), whose objective is to guide sustainable development, conservation, and environmental control actions in the basin, in addition to defining guidelines according to the scenarios and carrying capacity of the territory, aimed at an integrated management of water resources.

With environmental management under the Canal in coordination with governmental and non-governmental entities with responsibility in the territory, the establishment of various projects is sought, including reforestation, environmental restoration, sustainable




agricultural activities, environmental education, surveillance and control, strengthening of participatory platforms, monitoring of natural resources, green enterprises, agribusiness, among others, generating both environmental and social benefits, which contribute directly to conserving the quality of water resources, biodiversity, reducing soil degradation, conserving existing forest resources and contributing to the economic improvement of communities through the creation of socioeconomic, environmental and cultural development models that allow the generation of added value, to promote the competitiveness of productive initiatives carried out in the watershed.



Recently, the ACP initiated activities focused on the construction of training and sustainable development centers. These centers will have a positive impact on the inhabitants of the territories in the watershed and will strengthen alliances with existing community structures.


The Panama Canal Watershed, duly delimited and with an updated territorial planning and ordering instrument, is reinforced in the short, medium, and long term as a key territory for the development of the country due to its importance as the area where the water resource necessary for human consumption and the economic growth of the country is produced and managed, allowing the sustainable operation of the Panama Canal.


Sustainable Development Goals:

This Program fulfils 7 of the sustainable development (SD) goals, which are the following:

SD goals:	ACP's projects and initiatives
 <p>1 NO POVERTY</p>	<p>The Panama Canal carries out a land registry and titling program that has reached more than 10,000 families in the Canal watershed. This program is developed in close coordination with the National Land Administration Authority (ANATI), the Ministry of the Environment (MiAMBIENTE) and the Public Registry, with the administrative management of the United Nations Development Program (UNDP).</p> <p>The beneficiaries declare that they have achieved a significant change in the quality of life of their families after they regulated the legal status of the lands that they had worked for years.</p> <p>The project offers the advantage of titling your lands free, transparent, and expeditious. In addition to the benefit of having a title, this adds indirect positive impacts such as the possibility of presenting the land as collateral for loans, accessing social housing plans promoted by the National Government, and participating in the Environmental Economic Incentives Program (PIEA) that executes the Panama Canal for titled properties.</p>
 <p>2 ZERO HUNGER</p>	<p>The Project of Familiar Sustainable Agriculture seeks to provide food and nutritional security to participating families in the watershed, through the establishment of agricultural production centers that facilitate access to bananas, roots and tubers, basic grains, vegetables and sources of protein of animal origin such as broilers and laying hens.</p>
 <p>6 CLEAN WATER AND SANITATION</p>	<p>The Canal advances the program “Impulse the Socioeconomic Development of the Panama Canal Hydrographic Watershed”, and its objective is to identify and characterize the rural aqueducts of communities within the Canal watershed, and the applicability of successful aqueduct operation models. Furthermore, the purpose includes being able to advance on-site works for improving such systems in the selected communities. This aiming to improve the living conditions of the communities, add water</p>

SD goals:	ACP's projects and initiatives
	<p>security for the people, prevent waterborne diseases, and promote the sustainable development of the region.</p> <p>In addition, the Panama Canal is responsible for the administration, maintenance, use and conservation of the water resources of the watershed, essential for the supply of drinking water for more than 2 million people and for the continuous and efficient operation of the Canal. The efficient administration of water resources implies close work with the community, through permanent actions of environmental education, community strengthening, and better production practices. In terms of sanitation, the Canal has 5 wastewater treatment plants in operation, which are necessary to preserve the quality of the water resource. The plants comply with the environmental standards in force in Panama which regulate wastewater discharges into bodies of water</p>
 <p>8 DECENT WORK AND ECONOMIC GROWTH</p>	<p>The Panama Canal supports the production of coffee under shade in the Canal watershed, with the objective of establishing protective land cover crops and promoting the socioeconomic development of the region, given the high commercial value of the coffee activity.</p> <p>As part of the Environmental Economic Incentives Program (PIEA), which the Canal has promoted in the watershed, the formation and strengthening of the Association of Coffee Growers of the Cirí and Trinidad Rivers of the Panama Canal Subbasin (ACACPA) has been supported. This group of small coffee growers now has its own coffee brand, Cuencafé, and the impact of its work contributes directly to the protection of water resources and support community resilience. As a result of these activities, many new job positions have been created, contributing to economic development and decent work for the population.</p>
 <p>13 CLIMATE ACTION</p>	<p>More than five million trees have been planted in areas belonging to the watershed. This figure is of great meaning and symbolism because it represents one tree for each Panamanian, mainly with the purpose of protecting the environment and, consequently, the water resource. This program is possible thanks to the support and passion that the residents of the communities provide and transmit, and the great work and commitment of the canal specialists who advise them.</p>

SD goals:	ACP's projects and initiatives
	<p>Recognizing that sustainable development is based on three pillars: social, economic and environmental, these areas seek to improve productive systems, transmit new knowledge and enhance the socioeconomic conditions of the beneficiaries, while protecting soils and water resources. In this sense, the PIEA has allowed the reforestation of 10,846 hectares.</p> <p>Of the total hectares reforested, 3,650 correspond to agroforestry (coffee, cocoa and fruit trees) and 4,776 to silvopastoral (livestock farms). The remaining 2,420 hectares have included reforestation modalities for conservation and commercial purposes, as well as enrichment of scrublands to establish new forest plantations, mainly within national parks, river courses, heritage areas of the Canal and strategic zones.</p> <p>Community participation has been key, the organized communities have produced more than 367,000 seedlings for the PIEA, which translates into an income generation.</p> <p>The programs that are implemented include community participation and involvement and have the primary objective of promoting the sustainable development of the Canal basin and protecting the water resource, through the appropriate use of the land, the improvement of agricultural techniques and the improvement of the beneficiaries' income, through support for the improvement of post-harvest processes and support for the marketing of agricultural products.</p> <p>For the Panama Canal, the communities of the watershed are a fundamental actor in water conservation because, as allies, they share the task of caring for the environment where the water resource is located to guarantee water for local uses in their communities and their availability for consumption by more than half of the country's population and the operation of the canal.</p>
 <p>14 LIFE BELOW WATER</p>	<p>In accordance with IMO recommendations, ships transiting the waters of the Panama Canal during certain periods of the year must remain within designated navigation areas, which are known as traffic separation schemes, to reduce the risk of crossing paths with these migratory species. During this time, ships must limit their navigation speed through the established areas to 10 knots, as mentioned in the standard.</p>

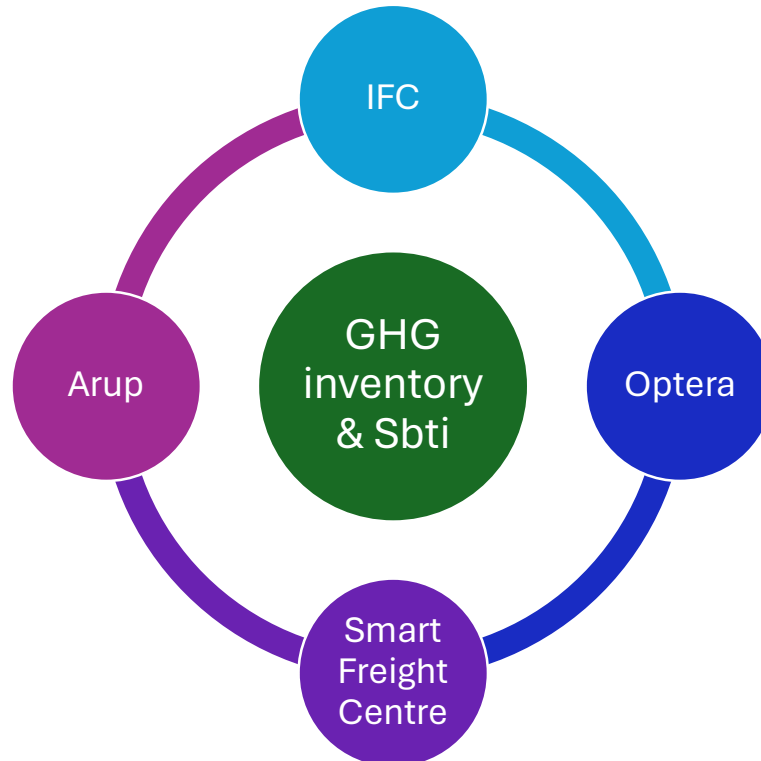
SD goals:	ACP's projects and initiatives
	<p>These measures implemented and promoted by the Panama Canal have significantly reduced the likelihood of serious interactions and incidents involving whales and other cetaceans, while ensuring maritime safety and control of vessels transiting through waters of the interoceanic waterway. Enforcement has proven critical, as the Gulf of Panama is an important wintering location for migratory humpback whales.</p>
 <p>17 PARTNERSHIPS FOR THE GOALS</p>	<p>To drive the strategic success of the climate goals, the Panama Canal has been working together with internal and external facilitators such as IFC, Optera, and the Smart Freight Centre to develop the GHG inventory. Also, Arup is helping the Canal with the actions needed to commit to the Science-Based Target Initiative (SBTi).</p> <p>Given 98% of the emissions are associated with ships transiting the Canal, the ACP is unleashing the power of collaboration to develop green corridors and JIT initiatives through a network of stakeholders that includes the public and private sectors.</p>

Cooperation and engagement with stakeholders:

- International Finance Corporation (IFC)
- Optera
- Smart Freight Centre
- Arup
- U.S. Department of State
- The Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping
- Lloyd's Register Maritime Decarbonisation Hub
- Blue Visby Project
- International Maritime Organisation

GHG inventory and sbti

To drive the strategic success of the climate goals, the Panama Canal has been working together with **internal** and **external facilitators** such as **IFC**, **Optera** and the **Smart Freight Centre** to develop the GHG inventory. Also, **Arup** is helping the Canal with the actions needed to commit to the Science-Based Target Initiative (SBTi).



This best-in-class and peer-reviewed GHG inventory provides essential insights to the GHG emissions hotspots in its value chain and invaluable insight to move towards decarbonization. Given 98% of the emissions are associated with ships transiting the Canal, the ACP is unleashing the power of **collaboration** to develop green corridors and JIT initiatives through a network of stakeholders that include public and private sector.

The Canal is working with the **U.S. Department of State** and the **Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping** for the development of the **pre-feasibility study** of a **green corridor** to catalyze zero-emission needed to achieve the 2023 IMO’s Strategy on Reduction of GHG Emissions from ships. Also, the Canal is starting a technical support collaboration with the **Lloyd’s Register’s Maritime Decarbonization Hub** to develop a fuel sourcing analysis. The production of green fuels such as green ammonia and green methanol will require the production of green hydrogen which is been planned by the **Secretary of Energy of Panama**, through the National Strategy of Green Hydrogen of Panama. The Canal is also in close communication with the **International Maritime Organization** to collaborate in initiatives to reduce emissions such as **Just In Time**. In this regards, we are starting communications with solutions providers such as the Blue Visby Project.

