

Big Carbon Gains from NGC's Reforestation Project



After an extensive study of the large-scale reforestation project launched by The National Gas Company of Trinidad and Tobago Limited (NGC) 2005, it was found that, 2,885 tons of carbon have been sequestered, consisting of 2,290 tons above ground and an additional 595 tons below ground.

Significantly, the reforestation project contributes to the Government of Trinidad and Tobago's commitment to carbon sequestration through reforestation, which is part of the United Nations Framework Convention on Climate Change's (UNFCCC) 2018 Paris Agreement.

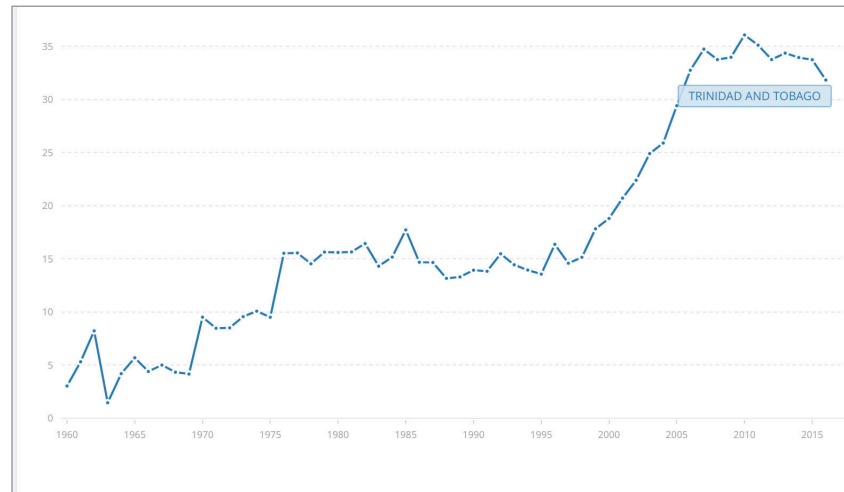
In what is considered the first project of its type in the Caribbean, the St. Augustine Centre for Innovation and Entrepreneurship (STACIE) at The University of the West Indies (The UWI), was tasked by NGC to estimate the below-ground carbon that has been sequestered by the reforestation efforts and to compare it to the above-ground carbon which was measured in 2018-2019 in Phase 1 of the project.

Specifically, the objectives of the 2021 Phase II Project were as follows: to determine how many tons of below-ground carbon has been sequestered by the trees planted by NGC at the various reforestation sites; the total tons of carbon projected to be sequestered by adding the below ground carbon to the above-ground carbon biomass; and the approximate monetary value of the tons of carbon sequestered based on current market prices.

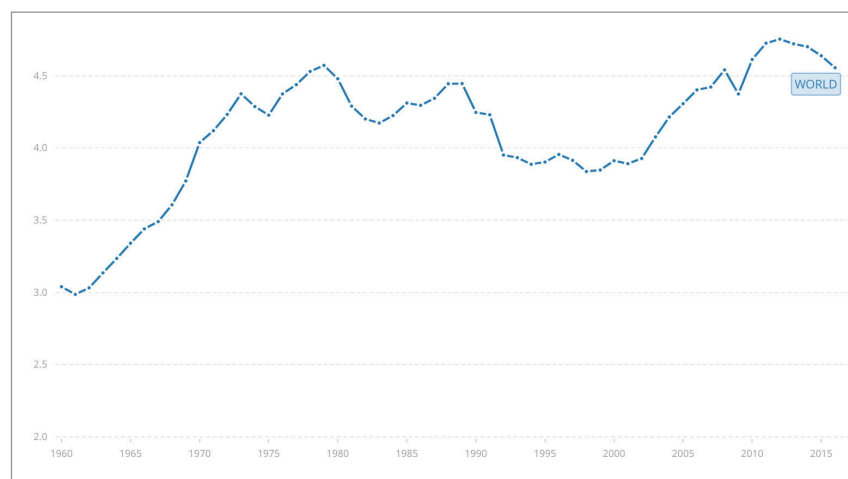
The STACIE report suggests that if the government measured the carbon sequestered by all of its forests and offset it against its emissions, the country's negative carbon footprint would be significantly reduced along with its reputation for having the world's second highest carbon dioxide emissions per capita.

In terms of monetary value, the 2,885 tons of pure carbon, equivalent to about 10,588 tons of carbon dioxide sequestered as wood, is worth approximately TT\$3,368,763. This is based on the European spot market price as at 10th February 2021 of €39.28 per ton of carbon dioxide.

NGC's President, Mark Loquan noted that when the Company began its reforestation exercise in 2005, its main objective was to replant an area of healthy and sustainable forest equal to what was cleared for the development



This chart shows CO₂ emissions (metric tons per capita) for T&T while the chart below outlines the emissions for the world from 1960 to 2016. Source: <https://data.worldbank.org>



of various pipeline and infrastructural projects to supply natural gas to its present and future customers.

"We've often heard the term 'plant trees to save the climate'. Planting over 100,000 trees through NGC's reforestation project has reaped significant environmental benefits for the country. We have made tremendous gains in terms of carbon sequestration in the forest ecosystem as well as the connectivity of our well-managed reforestation project with the global carbon cycle. It also has implications for climate change mitigation and long-term conservation of biodiversity."

The UWI's approach in the second phase was to complete the baseline assessment of carbon sequestered below ground by selecting a plot in one of the reforested sites in Rousillac to harvest seven trees and dig up the below ground roots to weigh them. Before the project began, NGC received the necessary licence from the Forestry Division to carry out the exercise.

In its report to NGC, STACIE said that this approach was used to establish whether it is true, as reported in the scientific literature, that there is an algorithm showing a consistent ratio of

above-ground carbon to below-ground carbon. If true, it means that below-ground carbon can be estimated from measuring above-ground carbon.

The project has also demonstrated that it is possible to determine the weight of the above-ground carbon in trees without cutting them down. The methodology demonstrates a side-scan laser technology that captures trees in three dimensions to scale, allowing their volume to be calculated and converted into weight.

"The project has also demonstrated that below-ground carbon can be estimated at about 0.26 of above-ground carbon as reported in the scientific literature. The implication is that future carbon sequestration can be done without cutting them down for sampling," according to STACIE.

Although a key objective of NGC's large-scale reforestation exercise was to replant an area of forest equivalent to what was degraded for development of its Cross-Island Pipeline, Beachfield Upstream Development and Union Industrial Estate projects, a secondary

purpose was to create a carbon sink to enhance the sequestration capacity of forest reserves in South Trinidad.

The reforestation project was also aligned to NGC's policy of achieving 'no net loss' from its business operations. The reforested sites where over 100,000 trees were planted on 315 hectares of forests with an estimated 85% survival rate, were in the Morne L'Enfer Forest Reserve near La Brea at Rousillac and Guapo, and the Victoria-Mayaro Forest Reserve in Moruga, as well as in Rio Claro and Mayaro.

Over the seven phases of reforestation, some 17 species of indigenous fruit and tropical hardwood trees including black heart, poui, wild chataigne, hog plum, mango and balata were planted. Some of this replanting was facilitated by residents in surrounding communities, hired by NGC and supervised by retired foresters from the Forestry Division.

Although the carbon benefit of trees was one of the reasons why reforestation was deemed necessary, it was not until 2018 that NGC became aware of the true carbon potential of the project when it contracted STACIE to carry out the Phase I above-ground carbon sequestration study.

Similarly, to the 2021 Phase II, the first study sought to determine the tons of carbon sequestered by NGC's reforestation sites from 2005-2018. The tons of carbon projected to be sequestered by the reforested sites from 2019-2030 and the approximate value of the tons of carbon sequestered based on market prices.

While NGC's Green Agenda focus is wide, its foundation reforestation programme and carbon sequestration projects are significant. Carbon stored above ground and below ground in the trees planted, can contribute to the aim of reducing the impact of climate change. Prof. John Agard, The UWI Principal Investigator & Project Manager, noted that NGC had taken an important and commendable step in reforestation which was an investment in a carbon sequestration project.

"Climate change continues to be at the forefront of the global discussions and many organizations are coming on board and becoming involved in climate mitigation. One such area where they are investing and developing projects is in forests as carbon sinks¹, which help to maintain a global carbon cycle and is critical in the fight against greenhouse gas emissions."

¹ A carbon sink refers to any natural environment that absorbs more carbon dioxide from the atmosphere than it releases.

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