**Background for Maracanaú**

In December 2015, 197 countries agreed on the first global legally binding climate agreement, at the 21st Conference of the Parties to the UN Framework Convention on Climate Change (UNFCCC), the called Paris Agreement. Its aims is to respond to the threat of climate change by limiting global warming to below 2°C, increasing the ability of parties to adapt to adverse impacts of climate change and ensure climate finance flows consistent with a low carbon climate-resilient development pathway. The Paris Agreement entered into force on 4 November 2016, and as of May 2017 145 parties have ratified, including Brazil. The Paris Agreement requires all Parties to put forward their best efforts through “nationally determined contributions” (NDCs) and to strengthen these efforts in the years ahead.

Brazil is a global player on climate change issues. The country has decreased 71% in deforestation rate since 2004, and has committed to cutting emissions 37% by 2025 with an intended reduction of 43% by 2030. Green growth will need to be a reality for Brazil to implement Paris commitments. The country has started to draft the implementation plan to deliver its commitments, which has ambitious targets across different economic sectors. For instance, for the transport sector Brazil will need to develop infrastructure to further promote efficiency measures, and improve infrastructure for transport and public transportation in urban areas. Although Brazilian municipalities have not yet started to draft their on implementation plans, every new development will need to be aligned with Brazil’s commitments, which was ratified and became a law in September 2016.

Increased infrastructure investment is imperative for Brazil to fulfil its economic potential. Econometric studies of Brazilian states found a positive and statistically significant effect of investment in transport infrastructure on per capita income in the period 1986-2007, controlling for other factors.[[1]](#footnote-1) Economic modelling suggests the effects of a 1% increase in public investment as a % of GDP in infrastructure has **a 0.58% effect on GDP growth in the short term, and a 1.8% effect in the medium and long term.**[[2]](#footnote-2) Brazil’s GDP growth lags behind its comparators partly because of its underinvestment in infrastructure. A 2007 quantitative study found that the infrastructure gap is able to explain 34.6% of difference in Brazilian GDP growth compared to most East Asian countries.[[3]](#footnote-3) Empirical evidence also suggests that investment in infrastructure – particularly access to treated water and sewerage collection and treatment – can reduce income inequality and make growth more inclusive.[[4]](#footnote-4)

In addition to build resilient infrastructure to fulfil the economic development needs, Brazil is extremely vulnerable to climate change – studies, such as “Economics of Climate Change in Brazil” and “Climate Risks; Limits to Adaptation in Brazil”, demonstrated that the country’s population and economy will be highly affected by weather extremes and temperature increase, causing poverty and social inequality to escalate substantially. In addition, Brazil relies on natural resources and commodities for economic growth, which intensifies the impacts of climate change on its population, ecosystems and economy. Brazil is aware that global efforts and urgent action are needed to fight climate change and sustain economic growth.

The cost of inaction could cause an annual average loss up to USD 905 per Brazilian citizens in 2050. The reduction in consumption accrued by 2050 could account for 60% to 180% of the current annual per capita consumption. (Source: PF project “[The Economics of Climate Change in Brazil](http://www.usp.br/mudarfuturo/PDF/Estudo_do_Clima-Ingles-14-04-2011.pdf)”). This disproportionately impacts upon the most vulnerable and poor populations (where women represent 40% of primary income providers). Decisions to build climate resilient infrastructure will not only directly impact these people, but their livelihoods by ensuring energy, food and water security. This will create a safer and more stable environment for these families.

This programme will deliver sustainable infrastructure to improve the traffic flows in Maracanau, one of the 13 municipalities around Fortaleza – Ceara´s capital. Maracanau holds the biggest industrial district in Ceara, thus being really important for the state’s economy. According to the Brazilian System to Estimate Emissions (SEEG in Portuguese)[[5]](#footnote-5) the state of Ceara has increased its GHG emissions in 10% in the last 5 years, with the energy sector being responsible for 48% of the state’s total emissions in 2016; with freight transport at 314,460,006 tons of equivalent CO2 emissions and passenger transport with 499,896,808 tons of equivalent CO2 emissions.

Globally, cities consume about 75% of total energy generated and account for a large percentage of greenhouse gas emissions. The municipality of Maracanau has 326.419 inhabitants according to the Brazilian Institute of Geography and Statistics (IBGE in Portuguese)[[6]](#footnote-6), with 93% of its population living in its urban area[[7]](#footnote-7). The effects of climate change, coupled with rapid urbanization, inadequate infrastructure, deforestation, soil erosion, and agglutination of people are strongly felt by the population, causing negative impacts on health (increase in seasonal diseases, like Zika), the urban micro climate leading to increased heat and threatening food, water and energy security.

Maracanau has grown really fast as it became the most important industrial district in the state. The rapid urbanization and lack of adequate infrastructure policies have fail to provide Maracanau urban population with the minimum requirements for life quality. For instance: it presents 54.1% of its households with adequate sewage treatment, 47.5% of households are located in roads with planted trees and only 4.3% of the households have adequate urbanization (presence of manhole, sidewalk, paving and curb).[[8]](#footnote-8) This project will address some of the city’s constrains, mainly through better urban mobility. For instance, creating other roads for cargo transportation, thus, ensuring that cargo outflow routes are taken away from the city center. By alleviating the traffic, the city will improve sound pollution and air quality, as well as mitigate emissions. This project will also map Maracanau’s climate risk vulnerability, including economic analyses of the impact of natural disasters, to certify that all infrastructure developments undertaken in Maracanau are climate resilient and improve the quality of life of the population.

A new plan to improve the adaptive capacity and resilience of Maracanau's transport system to changing climate conditions will be developed, building upon a map to assess the climate vulnerabilities of the city, as mentioned above. The Plan will be aligned with Brazil’s NDC and climate policies, such as the Climate Change Adaptation National Plan.

To avoid climate risks and ensure the infrastructure is resilient to climate change the project shall develop the following outputs:

* A Climate Risk Analysis to map the major climate risks in Maracanau and its potential impacts on local transport infrastructure, including an economic assessment of natural disasters.
* Climate Change Vulnerability to identify environmental and social indicators and adaptive capacity, as well as providing guidance for the development of adaptation policies.
* Adaptation Plan. This Plan will include a management approach to sustainable transport and logistics infrastructure and the potential for mitigation of emissions in the sector.

The TC BR-L1445 (Maracanau´s Urban Logistic and Transport) **will spend 32.51%** of its budget to mitigate GHG emissions and adapt to climate change, while ensuring the infrastructure built by this project is climate resilient. This calculation was done using the guidance and methodologies of the “2015 Joint Report on Multilateral’s Development Bank Climate Finance”.

For instance, by (i) creating infrastructure for cargo transportation to take cargo outflow routes away from the city center; (ii) improving the municipality's urban mobility plan, (iii) building capacity to operationalize the urban mobility plan;  and (iv) creating bus lanes, to improve mass transportation and alleviate the traffic it will mitigate emissions as well as improve air pollution. This project will also map Maracanau’s climate risk vulnerability, including economic analyses of the impact of natural disasters, to certify that all infrastructure developments undertaken in Maracanau are climate resilient.

1. 1 http://www.scielo.br/pdf/jtl/v6n4/v6n4a06.pdf [↑](#footnote-ref-1)
2. 2 <http://periodicos.ufpb.br/ojs2/index.php/economia/article/view/3849/3061> [↑](#footnote-ref-2)
3. 3 http://www.fgv.br/professor/ferreira/InfraAmeLatCepal.pdf [↑](#footnote-ref-3)
4. 4 [https://publications.iadb.org](https://publications.iadb.org/bitstream/handle/11319/6087/Volume%20and%20Quality%20of%20Infrastructure%20and%20the%20Distribution%20of%20Income%3a%20An%20Empirical%20Investigation.pdf;jsessionid=A316B4493BDFBD1DDB253134E4F9894C?sequence=1)

   [↑](#footnote-ref-4)
5. <http://plataforma.seeg.eco.br/territories/ceara/card?year=2016> [↑](#footnote-ref-5)
6. <http://cidades.ibge.gov.br/v4/brasil/rr/boa-vista/panorama> [↑](#footnote-ref-6)
7. <https://noticias.uol.com.br/censo-2010/populacao-urbana-e-rural/ce/> [↑](#footnote-ref-7)
8. <http://cidades.ibge.gov.br/v4/brasil/rr/boa-vista/panorama> [↑](#footnote-ref-8)