



TOSHIBA CARBON ZERO SCHEME IMPACT REPORT

2009 TO 2019

*An impact report on the carbon offset work of Toshiba TEC from June
2009 to December 2019*



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Background

Toshiba TEC have been running their CarbonZero Scheme since 2009, calculating and offsetting the carbon dioxide emissions created from the manufacture, distribution and operation of its MFP products supplied to the European market – to achieve CarbonZero status.

Working with leading carbon management company CO2balance they have – from June 2009 to December 2019 - offset 635,232.92 tonnes of CO₂e. During this period several verified, high impact, carbon reduction projects in developing countries have been supported.

MILESTONES

During 2019 the Toshiba Carbon Zero Scheme achieved the milestone of offsetting 600,000 tonnes of CO₂. Toshiba German Imaging Systems are close to passing the milestone of 100,000, ending 2019 with a figure of 99,922 tonnes of CO₂. Likewise, Toshiba France Imaging Systems is getting close the landmark of 250,000 tonnes of CO₂; it is on course to achieve this by the end of 2020.

Toshiba TEC have been long time supporters of the Borehole Rehabilitation Project in Uganda. During 2019 this project became the very first programme to be certified under the Gold Standard's Gender Equality methodology. Toshiba become one of the first companies to support this project.



In order to achieve this additional certification a comprehensive gender analysis was carried out to establish a gender baseline, identifying three key themes and areas for positive impact:

1. Time poverty – Thanks to this project, women and children save more than 2 hours a day on water collection. The project promotes the principle of “shared domestic responsibilities” – instilling the idea that time saved should be spent on empowerment focused activities – with 40% reporting that time saved is used for income-generation,

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leisure, religious and empowerment focused activities within the community.

2. The project is approaching gender parity within its Water Resource Committees with 46% female to 54% male. And group dynamics training is provided to ensure the viewpoints of all members are heard equally.
3. Exposure to gender-based violence in water collection – The project raises awareness of the harms of gender-based violence, promoting open dialogue within the communities to ensure that it is understood and dispelled from the level of community leaders. Since the project started, no women have reported incidents of domestic violence related to water collection, compared to 35% prior to the project. And borehole users have reported an 85% reduction in incidents of bullying, intimidation and assault during water collection since the borehole was rehabilitated.

RECOGNITION

As reported in 2017, the Toshiba Carbon Zero Scheme has been recognized by the United Nations as an “Sustainable Development Goals Partner”, due the many wider impacts that the scheme brings to the community and environment in addition to carbon saving and reduction. In 2019 the Toshiba Carbon Zero Scheme successfully renewed this recognition by the UN. ([Appendix 1](#)).

CARBON EQUIVALENTS

To put the 635,232.92 tonnes of CO₂e into context, this volume has some surprising comparisons; it is the carbon equivalent to:

- 177,637 return flights from Düsseldorf to Tokyo
- Driving the circumference of the earth 82,877 times
- The annual emissions from 141,513 European homes
- Lighting 14,769,368 million energy saving light bulbs for a year
- In terms of size it equates to 353,316,550 metres cubed of CO₂
- 15.94 billion cups of coffee

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This first section of the impact report explains the additional community and environmental benefits, over and above simple carbon saving, of the investment in the CO2balance Kenyan Energy Efficient Stove Project. This project has received 219,310.82 tCO₂e or 35% of the total support to date. The funds are used to sponsor the distribution of stoves to poor households and the maintenance of those stoves for the first seven years.

In addition to the Stove Project, a total of 133,699.08 tCO₂e has been offset through the Uganda Borehole Project, which rehabilitates broken boreholes to provide families with clean water, removing the necessity to boil the water to purify it.

Alongside these two projects in Africa was the Brazilian Forestry project, which replaced the Indian Wind Power Project in 2016.

In addition to the offsetting of MFP's, selected Operating Countries have also offset their BCS units to make them CarbonZero, which have been included in the figures shown within this report.

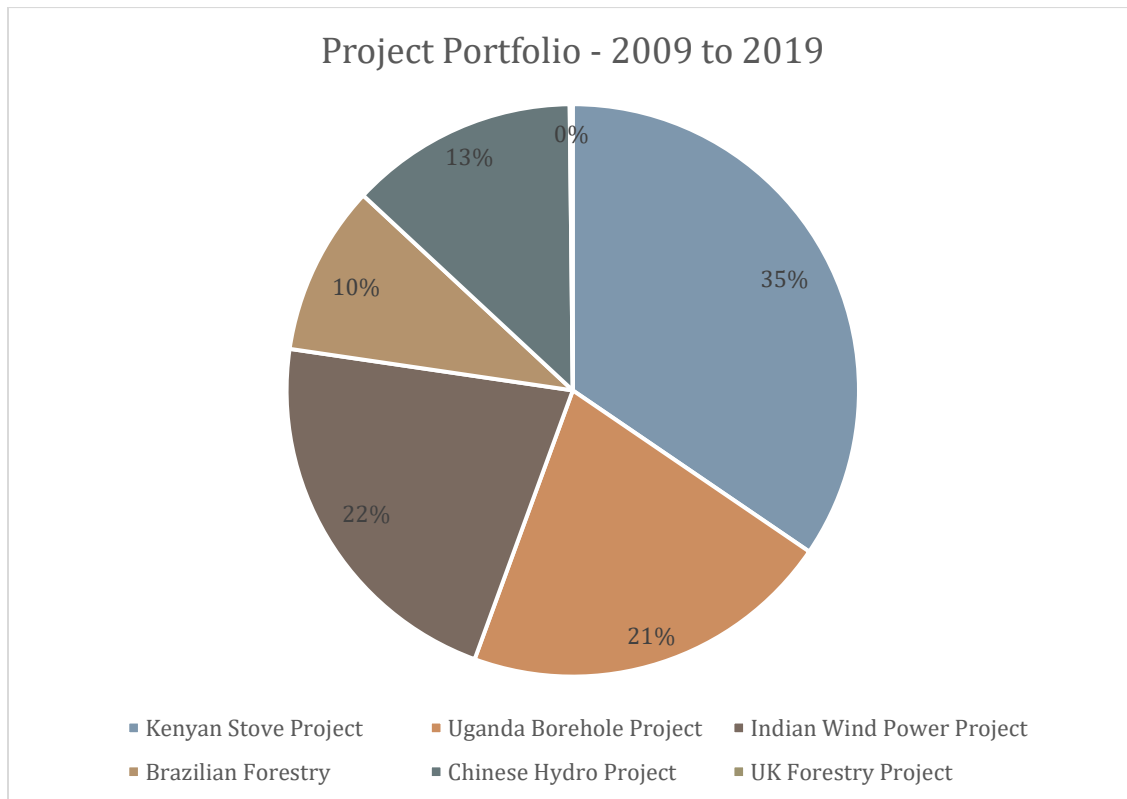
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Summary

The tables below show a summary the total tonnes of CO_{2e} offset per project since the project began in 2009, along with the figures for the last reporting year of 2019:

June 2009 to December 2019

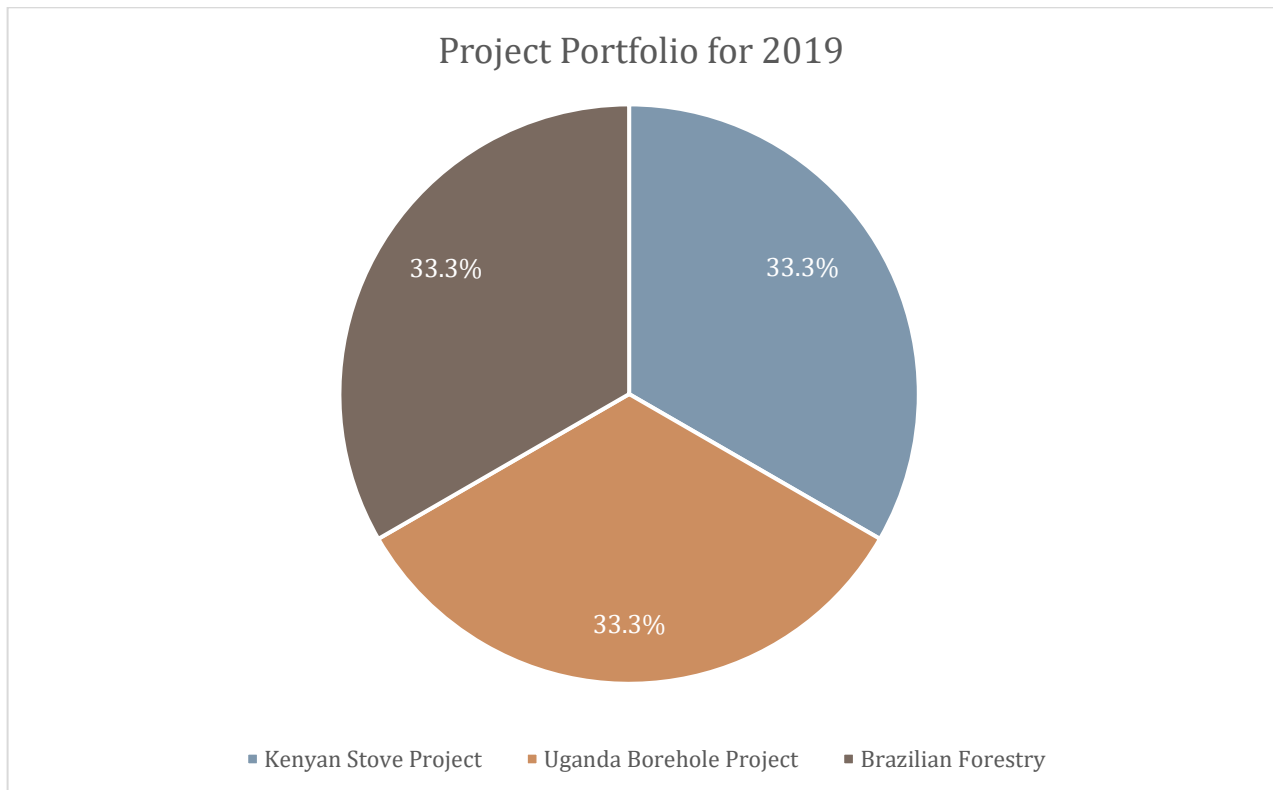
Project	Tonne of CO _{2e}
Kenyan Stove Project	219,310.82
Uganda Borehole Project	133,699.08
Indian Wind Power Project	138,146.37
Brazilian Forestry	61,025.02
Chinese Hydro Project	81,949.69
UK Forestry Project	1,101.94
Total	635,232.92



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January 2019 to December 2019

Project	Tonnes CO ₂ e
Kenyan Stove Project	14,211.45
Uganda Borehole Project	14,211.45
Brazilian Forestry Project	14,211.45
Total	42,634.35



Kenya Energy Efficient Stove Project

The Kenyan Energy Efficient Stove Project builds energy saving cooking stoves for villages in Kenya. These brick stoves result in 50% reduction in the need for firewood and thereby prevent carbon from being emitted.

In addition to carbon prevention it also provides families with a cost and time effective method to cook with. The reduced need for firewood helps to prevent deforestation, creating knock on benefits to the wildlife in terms of habitat, biodiversity and flood prevention.

It is also a healthier method of cooking as it reduces in-door smoke by half. In-door smoke is a serious problem in Africa and the World Health Organisation dubbed it the “kitchen killer”, as it is responsible for nearly 2 million deaths in Africa every year.

Other co-benefits of the project include:


- Reduced deforestation and degradation of surrounding forests
- Reduced soil erosion, nutrient loss and risk of flooding
- Reduced cooking and wood collection time; householders can spend more time on other household tasks, as well as schooling and supervising children
- Reduced exposure of firewood collectors (mainly women) to hazards in remote areas
- Reduced burns and injuries from exposure to an open fire



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KENYAN COOK STOVE PROJECT LOCATION


There are numerous project locations within the Kenyan Energy Efficient Stove Project run by CO2balance; the project locations for Toshiba's offsetting work are the "Aberdares", "Shimba Hills" and "Kisumu" projects".

 The Aberdares Range is a 160 km long mountain range of upland, north of Kenya's capital Nairobi and just south of the Equator with an average elevation of 3,500 meters.

It forms a section of the eastern rim of the Great Rift Valley. The lower slopes are lush fertile farmed, whilst higher areas are known for their wildlife. This rich habitat is home to numerous species of plants and animals including the rare Black Rhino.



 The Shimba Hills is an area of coastal rainforest, woodland and grassland. It is an important area for plant biodiversity – over 50 % of the 159 rare plants in Kenya are found in the Shimba Hills, including some endangered species. It is also a nationally important site for birds and butterflies. The communities that live there are amongst the poorest rural people in Kenya. Surviving on less than a dollar a day they rely on the dwindling forest resources to sustain daily life. This project eases their workload and protects vital natural resources from over exploitation.

 The project is located in and around Kisumu, which is Kenya's third largest city and the principal city of western Kenya. This is an administrative district of Nyanza Province, Kenya. It is one of the poorest areas in Kenya characterized by high incidences of maternal and infant mortality, with most of its people suffering from unemployment, poor health and poverty.

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Kenya Cook Stoves – Impacts

The offsetting commitment made by Toshiba TEC between 2009 and 2019 has resulted in numerous impacts to the local communities within the project areas of Kenya. The table below provides a summary of these impacts related to the Kenyan Energy Efficient Stove Project:

IMPACT SECTOR	IMPACT	QUANTITATIVE DATA ¹
Environment	CO ₂ e prevented	219,310.82 tonnes
	Wood saved	190,800 tonnes
	Area protected	548.28 hectares
Social	No. of stoves built	10,443
	No. of stove years ²	73,104
	Time saved	125,320 days
	Young people impacted	19,533
	Elderly people impacted	10,443
	Total people impacted	39,685
Economic	Working time saved	1,002,564 hours p.a.
	Working days equivalent	125,320 days p.a.
	Money saved per household	21 days wages p.a.
Health Impacts		Quantitative Data³
Condition		Likely reduced cases from project support
Respiratory illness (Lower Chest /Lung)		13,890
Asthma		14,621
Serious Ear Nose and Throat irritation		10,966
Total reduced instances of serious illness attributable to indoor smoke		39,476

¹ The data from the impacts are based on the field work carried out by CO₂balance within the project locations in Kenya. The data that is gathered is in line with the requirements of the Gold Standards as part of the annual Monitoring Surveys. These Monitoring reports are available on the Gold Standard Registry. Data is then cross compared against national averages in Kenya to ensure accuracy. Assumptions and extrapolations have been used where relevant.

² Based on the provision of a stove for a family for one year, hence the phrase “stove year”.

³ The Health Data is derived from the following sources R. Perez-Padilla et al, 2010. ‘Respiratory health effects of indoor air pollution’ in International Journal of Tuberculosis and Lung Disease, vol. 14 no. 9, pp1079-1086 . Kenya National Bureau of Statistics. (2008). Kenya Integrated Household Budget Survey. Ministry of Planning and National Development, p. 1-300.

Uganda Borehole Project

The project is based around the rehabilitation of boreholes in Northern Uganda, supplying families with fresh clean water. As well as the natural health benefits it means that families no longer have to boil the water, saving firewood and thereby preventing carbon emissions from being released.

Access to safe drinking water is a serious issue in Africa effecting the health and well-being of local communities. A survey by the International Institute for Environment and Development (2009) revealed that there are an estimated 50,000 defective water supply installations (IIED 2009). In addition, it was estimated that 40-50% of hand pumps in sub-Saharan Africa were not working (Diwi Consult & BIDR, 1994).

In addition to funding the borehole rehabilitation, the carbon credits that this project produces creates a funding mechanism to deliver a long-term maintenance programme for the boreholes.



Uganda Borehole Project – Location

CO2balance runs the borehole rehabilitation project in the Lango sub-region in the districts of Alebtong, Dokolo, Kole and Otuke. The districts have a combined population of just over 700,000.

In the last 30 years, these districts have been particularly vulnerable to violent conflicts originating in the neighbouring sub-regions of Karamoja and Acholi, which have severely impacted household food security. The twenty-year rebellion of the Lord's Resistance Army (LRA) began in the Acholi sub-region in 1987 but had an increasing impact on the neighbouring Lango areas.

The insurgency destroyed much of the water infrastructure, leaving hundreds of boreholes in disrepair and residents without access to safe water. The Acholi sub-region received huge support from donors following the war, but the Lango sub-region has been largely overlooked despite being heavily affected.

Over the past three decades sustained periods of conflict have led to the displacement of around 2 million people in Northern Uganda and the area now suffers from some of the highest poverty rates in Uganda with over 60% of the population living below the poverty line. This highlights that there is an urgent need for development assistance and aid initiatives in the region.



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Uganda Borehole Project - Impacts

The impacts to the community and wider environment as a result of Toshiba TEC's support for the borehole project in Uganda are as follows:

IMPACT SECTOR	IMPACT	QUANTITATIVE DATA
Environment	CO ₂ e prevented	133,699.08 tonnes ⁴
	Wood saved	94,458.40 tonnes
Social	Infants (< 5) impacted	16,772 ⁵
	Children impacted	25,921
	Adults impacted	33,544
	Total people impacted	76,237
Health	Clean water supplied	208,699,802 litres
	Likely cases of Diarrhoea avoided	1,304 ⁶
	Likely fatalities avoided	104

⁴ Wood saved and clean water supplied - Calculations based on field measurements conducted by staff contracted to CO2balance and are conducted according to the requirements defined by the Gold Standard. Monitoring data is available on the Gold Standard registry.

⁵ People Impacts – Calculations based on field measurements conducted by staff contracted to CO2balance and survey data from the Uganda Bureau of Statistics.

⁶ Health Impacts – Calculations based on number of diarrhoea incidences per 1000 people recorded in Northern Uganda reported by Barungi & Kasirye, 2011 and the reductions in diarrhoea and diarrhoea fatalities expected after installing a borehole reported by the World Health Organisation.

External Project Verification

The Kenyan Energy Efficient Stove Project and Ugandan Borehole Project are externally accredited through the Gold Standard. An internationally respected standard that assesses the social and community benefits to the region in addition to carbon saving. The Gold Standard Foundation is a Swiss based, non-profit organization providing certification of premium quality carbon credits in both the voluntary and compliance markets.

The thorough and extensive methodology and approval process of the Gold Standard is designed to certify the highest quality energy efficient and renewable energy carbon reduction projects. All Gold Standard certified projects demonstrate real and permanent emissions and sustainable development for the local communities that are measured, reported and verified.

The Gold Standard was initiated by the World Wildlife Fund and its quality benchmark is derived from the actions of the Kyoto Protocol and its methodology is currently endorsed by over 80 non-governmental environmental and development organizations worldwide.



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Brazilian Forest Project

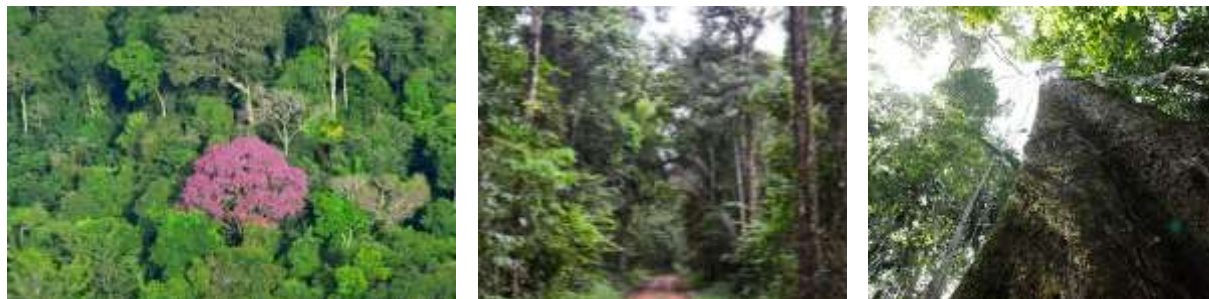


This project takes place under the Verified Carbon Standard

The project is located within the Amazon Rainforest of Brazil and is based around the protection of the forest through avoided deforestation and sustainable forestry management. The protection of the rainforest avoids the release of carbon emissions, with the trees acting as a natural sponge, absorbing carbon dioxide emissions as they grow. As well as carbon savings it supports the Amazon's rich biodiversity of plants and wildlife.

This region is part of the Brazilian Amazon and known as Deforestation Arch, due to the intense deforestation pressure. The deforestation pressure in the Amazonas Municipality became then mostly the result of illegal land-grabbing by invasion of private lands, using to such objective logging, slash-and-burning and cattle-ranching.

The project aims to combat this through the sustainable forestry management of 71,714 ha. of native forest. The project has developed technical forestry schools targeting education of local youngsters as well as working with the neighboring State Park to develop initiatives to create local forest fire brigades.



Impact Sector	Impact	Quantitative Data
Environment	Carbon Reduction Forest & habitat protection	61,025.02 tonnes CO ₂
Environment	Brazilian Rainforest Protected	51.20 hectares

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Previously Support Projects

WIND FARM GENERATION – INDIA

This project takes place under the Verified Carbon Standard



The selection of projects are classed “bundled projects”, in that it is based around the construction of numerous wind turbines in different areas of India, including the Tamil Nadu region where turbines are installed in different passes (Aralvaimozhi, Senkottah and Palghat passes), where wind speeds is constant.

The Project generates electricity using renewable energy based on wind power which is supplied to the state grid. It hence displaces the electricity which would have otherwise been generated from fossil fuel fired power plants connected to the grid.

Impact Sector	Impact	Quantitative Data
Environment	Carbon Reduction	138,146.37 tonnes

SMALL SCALE HYDRO GENERATION, CHINA

This project takes place under the Verified Carbon Standard



Hydro Power: The electricity generated by the hydropower units displaces the electricity on the country’s national Power Grid, which is primarily supplied with fossil fuel generated power ensuring that genuine greenhouse gas emissions reductions are made.

Small scale projects typically consist of several 8MW hydro units; run-of-river projects are based around the diversion of water through a hydropower tunnel and then re-joining the river, reducing the need for a dam.

Impact Sector	Impact	Quantitative Data
Environment	Carbon Reduction	81,949.70 tonnes

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UK FORESTRY PROJECT, SOMERCOMBE WOOD



Somercombe Wood is located in the Blackdown Hills Area of Outstanding Natural Beauty (AONB) on the Somerset/Devon border in the West of England. The trees that have been planted at the woodland will naturally absorb carbon as they grow, and are a mix of broadleaf native trees, including English Oak, Ash, Silver Birch and Alder. The land is owned by CO2balance, to ensure complete control over the long-term future of the trees.

Impact Sector	Impact	Quantitative Data
Environment	Carbon Reduction	1,101.94 tonnes

Case Studies

Feedback from people that live within the project areas in Uganda:

Gloria

Gloria is 39 and married with 5 children. She lives in Lango in Northern Uganda. She serves the role of the borehole caretaker on the water user committee and is responsible for the hygiene and use of the borehole by other water users. She lives approximately 100 meters away from the borehole and takes about 30 minutes to collect water adequate to meet their daily domestic water demand. Due to the proximity of the borehole to her household, she collects water 2-3 times a day which serves her entire household for all their basic needs.

“Before CO2balance rehabilitated our borehole, my children and I used to travel over 4 kilometers to a seasonal open well and would spend a lot of time collecting water, leaving other home duties unattended to. Due to the distance to the only water source we had, we would only make one trip to collect water which was not enough for our family needs”, narrates Gloria.

“I am using the time saved to offer my labor to farm owners who will pay me as I plan on starting a poultry business with the money saved so that I can generate more income for my family needs. I am also happy with my position as a caretaker of the borehole because it has earned me respect in society and among my friends. With the time saved I am also able to attend water user committee meetings and contribute ideas towards the maintenance of our borehole” concludes Gloria.



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Jasper and Susan

Jasper Opio lives in a village called Agengi in Dokolo District. He and his wife Susan have two children and 5 dependents. Susan and the family collect water from Aminimalucu Borehole which is 250 meters away from their household.

According to Jasper, before CO2balance intervention, people around his village used to collect water from very unsafe source. Villagers would spend lot time collecting water and fuel for purification. The main source at that time was an open well which had become a health hazard due to poor water quality and drowning risk.

'I am a proud owner of a nursery tree seedling business which I started two years ago which has increased my household income from 2,500,000 to 5,000,000 Uganda Shillings per season' says Jasper. 'I employ 5 workers, 2 males and 3 females who also use the borehole. My female employees live close to the borehole and say that they are now able to work at the tree seedling nursery because they no longer spend long hours in search of water'.

Jasper's wife Susan, together with their adult children help him at the nursery which initially was not possible because they spent hours traveling long distances in search of water. Susan is so happy with the time saved in collecting water from far off sources because she's able to use it to support their family businesses and contribute to the household income.

Currently his nursery bed is capable of raising 30,000 to 40,000 seedling of Eucalyptus trees whose potential average total sales is 24,000,000 UGX per year (around £5,000). Jasper intends to invest this income in expanding his boda boda (motorcycle transport) business and also start a free-range poultry system which will be managed entirely by his wife.



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UN Sustainable Development Goals

In 2016 the UN launched their Sustainable Development Goals, a set of 17 measurable Sustainable Development Goals (SDGs), ranging from ending world poverty to achieving gender equality and empowering women and girls by 2030 - <https://sustainabledevelopment.un.org/>

Through their Carbon Zero Scheme, Toshiba TEC are supporting 14 of these 17 Goals; 10 are direct impact (shown below with a green tick), with four indirect impacts.



Contact Information

For more information about the Toshiba Carbon Zero Scheme please visit www.toshibacarbonzero.eu or contact your local Toshiba Dealer.

TOSHIBA

ABOUT CO2BALANCE

Established in 2003, CO2balance UK Ltd is a leading, UK based, carbon management provider offering carbon calculation, management and reduction services to leading blue chip companies including, BSKyB, Toshiba TEC and Gaz De France. As a project developer CO2balance UK Ltd creates African Gold Standard and CDM projects that focus on social, health and community benefits to the families within the project area, in addition to carbon savings.

For more information about CO2balance please visit www.co2balance.com

ABOUT TOSHIBA TEC

Toshiba Tec Germany Imaging Systems GmbH is part of the globally operating Toshiba Tec Corporation, active in various high-tech industrial sectors. Toshiba Tec Corporation is a leading provider of information technology, operating across multiple industries - ranging from retail, education and business services to hospitality and manufacturing. With headquarters in Japan and over 80 subsidiaries worldwide, Toshiba Tec Corporation helps organisations transform the way they create, record, share, manage and display information. Toshiba TEC Germany Imaging Systems GmbH is headquartered in Neuss, Germany, where all European business activities are managed and coordinated.

For more information about Toshiba TEC please visit www.toshiba-europe.com/tec

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Appendix 1 - UN Partnership for Sustainable Development

The impacts that the Toshiba Carbon Zero Scheme has achieved has been recognized under the UN's Partnerships for Sustainable Development Goals (SDG) programme, giving ratification that the Carbon Zero Scheme is helping to meet the UN's SDGs. The Toshiba Carbon Zero Scheme has a dedicated page on this Partnership platform.

A screen grab of Toshiba TEC's recognition on the UN's registry is show below and the direct link is: <https://sustainabledevelopment.un.org/partnership/?p=13456>

