



TOSHIBA CARBON ZERO SCHEME IMPACT REPORT

2009 TO JUNE 2022

An impact report on the carbon offset work of Toshiba TEC from June 2009 to June 2022



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TOSHIBA CARBON ZERO IMPACT REPORT

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 the end of June 2022 - offset 690,929.92 tonnes of CO₂e. During this period several verified, high impact, carbon reduction projects in developing countries have been supported.

FUTURE DEVELOPMENT

CO2balance are in the process of developing new cook stove projects in Kenya. One of these projects partner with a small stove manufacturer in Kenya call Wisdom Stoves. We are working with them to run a cookstove project in the Aberdare Highlands Region of Kenya, where households struggle with scarce wood supply and high wood fuel prices. The cold climate demands a stove for both heating and cooking, and the Wisdom Jiko stove is specifically manufactured to meet the needs of the rural population through increased efficiency and significant reduction in harmful emissions. Smoke from the burnt fuel is converted into a flammable gas which produces a clean, smokeless flame, and bio-char is created from the original fuel which burns for longer and can also be used for organic farming after use.

Demonstrations and sales at tea plantations and women's groups have supported rural women to improve their livelihoods through purchasing this high-quality cookstove. The project uses carbon finance to subsidise the stove and enable its affordability for people most at need.



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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 2021 the Toshiba Carbon Zero Scheme successfully renewed this recognition by the UN. ([Appendix 1](#)).

CARBON EQUIVALENTS

To put the 690,929.92 tonnes of CO₂e into context, this volume has some surprising comparisons; it is the carbon equivalent to:

- 193,212 return flights from Düsseldorf to Tokyo
- Driving the circumference of the earth 90,143 times
- The annual emissions from 153,291 European homes
- Lighting 16,064,341 million energy saving light bulbs for a year
- In terms of size, it equates to 384,295,222 metres cubed of CO₂
- 17.34 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 236,797.74 tCO₂e or 34% 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 151,186.00 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.

In 2021 a new Uganda Solar Borehole Project was included in the project portfolio, with 3,236.22 tCO₂e offset through this project.

Alongside these three 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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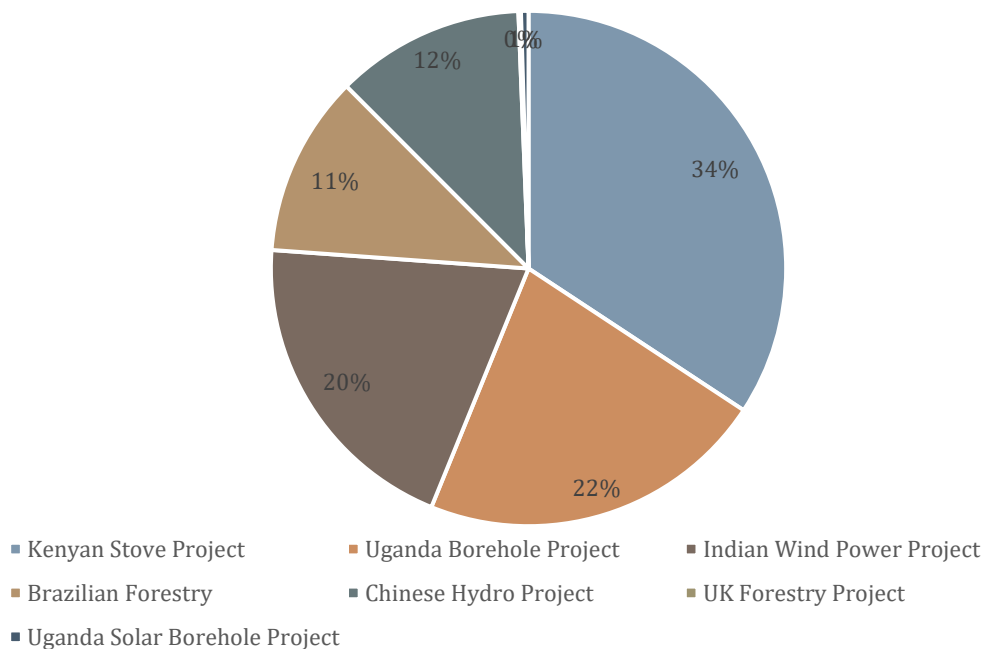
Summary

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 up to June 2022:

June 2009 to June 2022

Project	Tonne of CO _{2e}
Kenyan Stove Project	236,797.74
Uganda Borehole Project	151,186.00
Indian Wind Power Project	138,146.37
Brazilian Forestry	78,511.95
Chinese Hydro Project	81,949.69
UK Forestry Project	1,101.94
Uganda Solar Borehole Project	3,236.22
Total	690,929.92

Project Portfolio - 2009 to June 2022

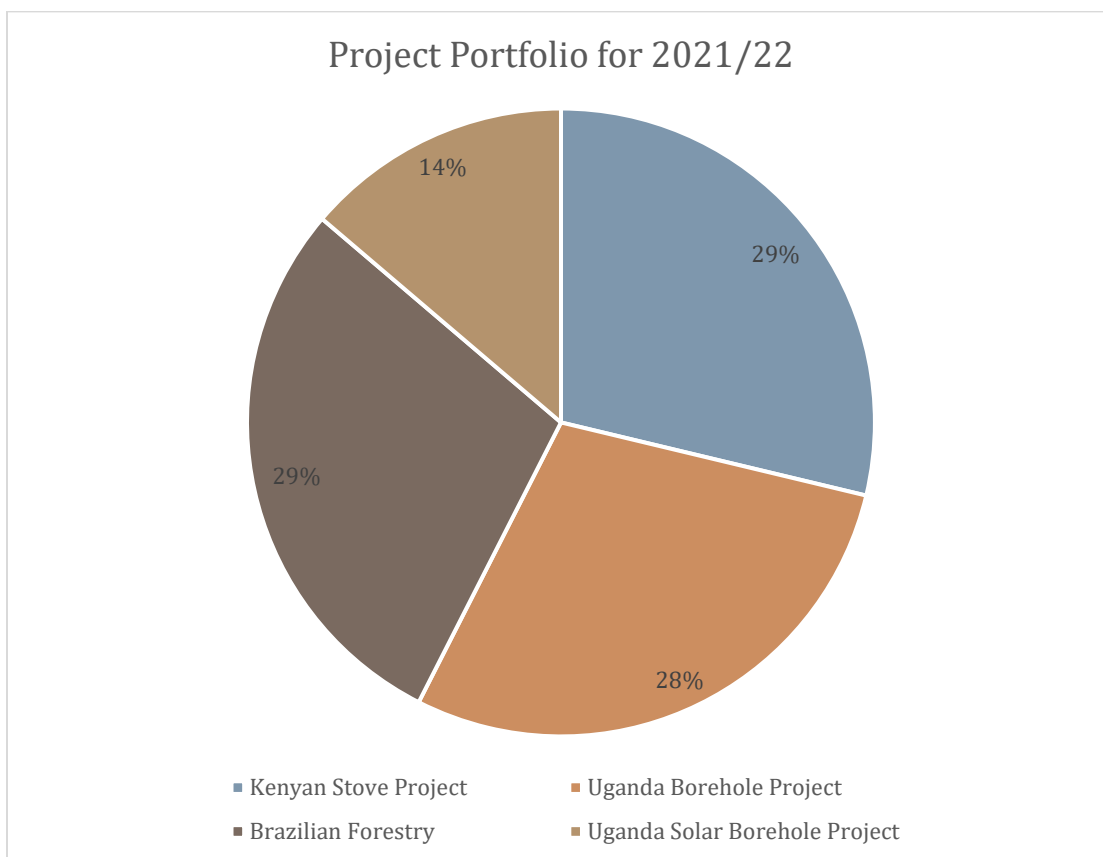


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The previous report covered carbon offsetting activities up to the end of March 2021. The table below shows the carbon offsetting activities between the period of April 2021 and June 2022

April 2021 to June 2022

Project	Tonnes CO ₂ e
Kenyan Stove Project	6,757.34
Uganda Borehole Project	6,757.34
Brazilian Forestry Project	6,757.34
Uganda Solar Borehole Project	3,236.22
Total	23,508.25



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 2020 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	236,797.74 tonnes
	Wood saved	206,014 tonnes
	Area protected	591.99 hectares
Social	No. of stoves built	11,276
	No. of stove years ²	78,933
	Time saved	135,313 days
	Young people impacted	22,552
	Elderly people impacted	11,276
	Total people impacted	42,849
Economic	Working time saved	1,082,504 hours
	Working days equivalent	135,313 days
	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)		14,997
Asthma		15,787
Serious Ear Nose and Throat irritation		11,840
Total reduced instances of serious illness attributable to indoor smoke		42,624

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 phase “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	151,186 tonnes ⁴
	Wood saved	106,812.91 tonnes
Social	Infants (< 5) impacted	18,966 ⁵
	Children impacted	29,311
	Adults impacted	37,932
	Total people impacted	86,209
Health	Clean water supplied	235,996,304 litres
	Likely cases of Diarrhoea avoided	1,4746
	Likely fatalities avoided	118

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.

Uganda Solar Borehole Project

In 2021 CO2balance's Uganda Solar Borehole Project was added to the project portfolio. The project is based around the rehabilitation and long-term maintenance of a solar powered borehole that had been broken for over 10 years in Omoro Sub-County, in northern Uganda. The repaired borehole now provides safe clean water to 1,971 people across the subcounty. The scheme has storage pump tanks with a capacity of up to 32,000 liters. They feed 5 distribution points which ensure a constant supply of water to the people of Omoro. The pioneering technology enables water from a single borehole to reach 5 distribution points, limiting the distance that users have to travel to access safe water.



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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

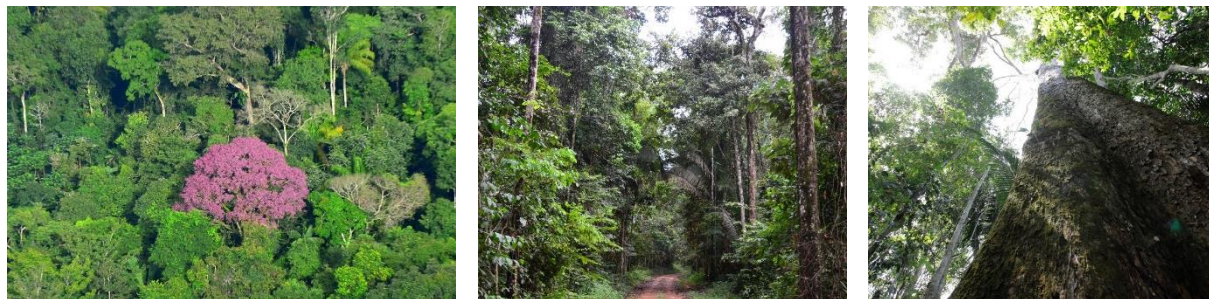


This project takes place under the Verified Carbon Standard

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	71,754.64 tonnes CO ₂
Environment	Brazilian Rainforest Protected	65.87 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

CO2balance work closely with government officials throughout safe water projects, from determining which boreholes require rehabilitation to engaging with communities and encouraging them to maintain the functionality of the borehole.

To date, CO2balance have rehabilitated 70 boreholes in Kaliro in Uganda and continue to successfully work with government officials to deliver project activities. As a government official in a developing country, we are interested to hear the Environment Officer's attitudes and thoughts about climate change.



CO2balance colleague engages with community members to monitor the functionality of the borehole in Muhira

Have you seen any effects of climate change over your lifetime? If yes, what are these effects?

Yes, over my lifetime I have seen the effects of climate change including crop failures and longer dry spells.

How has climate change affected your livelihood?

Climate change has resulted in poor nutrition, poor productivity, and reduced incomes.

What are your attitudes towards climate change?

Climate change is an area which requires attention in regards to mitigation and adaption strategies.

Have you taken any action to adapt to changes in climate? If yes, what have you taken?

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Yes. These adaptations include planting more trees, restoring wetlands, promoting efficient energy use technologies, and diversifying livelihood options.

What are your concerns for future generations?

A key concern is to integrate climate change issues in their routine planning for development and education.



Community members gather around the borehole in Buhoya to collect safe clean water

|| ————— ||

Over my lifetime I have seen the effects of climate change, including crop failures and longer dry spells. Climate change is an area which requires attention in regards to mitigation and adapation strategies.

————— ||

*Senior Environment Officer
Kaliro District, Uganda*



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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>

