



Green Angel Syndicate Portfolio Carbon Impact

Methodology Paper - September 2024

Introduction

This document complements Green Angel Ventures' Carbon Impact Report published in September 2024.

It aims to explain how we calculated the greenhouse gas impact from a sample of our portfolio companies. Whilst not divulging any confidential information regarding the commercial activity of specific companies, it details how each company's activity contributes to making a positive impact in the fight against climate change and, where relevant, how we have calculated the amount of greenhouse gas avoided and/or removed from the atmosphere as a result of the company's activity.

Our impact assessment methodology is developed and implemented in-house. However, Green Angel Ventures is a member of Project Frame (<https://projectframe.how/>), an initiative led by the non-profit organisation Prime Coalition, aimed at strengthening and standardising the methods used by impact venture capital and private equity investors specialising in the fight against climate change.

Although Project Frame's recommendations have so far mainly focused on pre-investment considerations, we are progressively applying these types of methods and consistent vocabulary to our realised impact calculations, on a company-per-company basis, post-investment.

The main key performance indicator (KPI) that we use to track the realised impact of our portfolio companies is the impact on GHG concentrations (GHG emissions avoided or GHG removed thanks to their activity).

For a 'direct solution' company, we assess the impact on GHG as the difference between (i) emissions in the business-as-usual scenario, using current factors and/or realistic expectations for these metrics at the time of investment; and (ii) emissions in the scenario where the company's solution is adopted, using the best available estimates for the carbon intensity of that solution. In making quantitative assessments, we endeavour to use the best quality data available from the relevant sources, including the companies, government resources, academic papers and, where necessary, relevant proxies linking monetary quantities to GHG emissions.

It is important to note that, given the early-stage nature of Green Angel Ventures investments, the climate impact of portfolio companies will take years to be fully realised - starting from zero at first (as companies develop their product and are not yet selling it at scale), growing over the 5-10 years holding period of the Fund (reflecting their progressive commercial development), and potentially being the greatest after a successful exit.

Publishing these methods is part of Green Angel Ventures' commitment to being transparent in our approach to our mission, which is to support early-stage companies fighting climate change. We welcome any feedback or suggestions on how we might improve our approach to impact assessment, as well as on the explanations provided in this document. Please do not hesitate to contact us if you have any questions.

antoine@greenangelventures.com
josh@greenangelventures.com

Carbogenics

The solution - Carbogenics produces sustainable carbon adsorbents, a type of biochar, from difficult-to-recycle organic waste, in particular paper waste. Their 'CreChar' product improves the efficiency of anaerobic digester plants by improving the microorganisms' working environment. Anaerobic digestion ("AD") plants generate energy from waste, as they produce electricity and fertiliser by degrading organic materials. Adding CreChar to an anaerobic digester leads to an uplift of 15% in biogas production which can be used to make electricity. Carbogenics' solution not only enhances the AD process but also avoids the burning of the paper waste which is instead used as useful input in their process.

Type of the solution - 'Direct Component' Solution, i.e. part of an overall solution that plays a critical role in delivering GHG impact.

Unit - When calculating the GHG impact of Carbogenics, the relevant unit is 1 tonne of CreChar sold.

System boundaries - The system that we consider starts with the input of paper waste to Carbogenics, and ends with the production of renewable electricity from biogas produced by AD operators. It includes the production of Crechar from paper waste by Carbogenics and the use of Crechar as an additive in the AD process. At this early stage in Carbogenics' development, we are using the methodology and parameters provided by an independent Validation Report produced for Carbogenics by Impact Forecast.

Effects of the solution - The Validation Report considers a number of GHG effects associated with Carbogenics' solution, the two most material ones being:

- the production of Crechar from paper waste, which avoids the incineration of such waste and the associated carbon emissions. This is a one-off CO₂e avoidance effect that can be measured based on the amount of paper waste used by Carbogenics in its production process;
- the use of Crechar by AD operators, mainly considering the 15% uplift in biogas production and the corresponding increase in electricity generation, which is expected to displace fossil-fuel-based electricity and the associated CO₂ emissions. This is also a one-off CO₂e avoidance effect that can be estimated based on the quantity of Crechar sold to AD operators, with two elements which need to be estimated rather than measured: (i) the actual electrical energy produced by the AD operators, and (ii) the carbon intensity of the displaced electricity.

Other effects considered in the Validation Report include the production of industrial heat and the transport of waste paper. These are included in the calculation but do not materially impact the result.

Base scenario - In the base/reference scenario, the paper waste is incinerated and the anaerobic digestion plants produce biogas without the 15% uplift from CreChar.

Unit impact - Overall, Impact Forecast estimates that the CO₂e impact reaches 15.5 tCO₂e per tonne of paper waste used by Carbogenics and therefore approximately 62 tCO₂e per tonne of Crechar sold.

SDGs - Beyond their carbon impact, Carbogenics also contributes to SDG 9.4 SDG 12.5. These SDGs focus on upgrading industries and infrastructures for sustainability and substantially reducing waste generation.

New Motion Labs

The solution - New Motion Labs have developed a chain drive and sprocket (Enduo) which generates less GHG emissions to produce and lasts five times longer than incumbent chain drive-and-sprocket products. The Enduo solution particularly targets the e-mobility market (e-cargo bikes, motorbikes) and the industrial market (e.g. conveyor belts in large plants).

Type of the solution - 'Direct Product' solution, i.e. a product that can be purchased as a whole and yields a direct impact in terms of GHG emissions.

Unit - The solution unit refers to 1 Enduo chain drive and sprocket.

System boundaries - The system that we consider starts with the extraction of the material required to make the chain drive and sprocket system, and the manufacturing of the system; it includes the use and, if required, the manufacturing of replacement systems during the considered time period; and it ends with the disposal and/or recycling of the system. The analysis compares the Enduo system with a conventional steel chain drive (incumbent product). Given the embedded GHG emissions of distribution and disposal of Enduo are expected to be very similar to the incumbent product, we have not included them in our calculation. We have based our analysis on New Motion Labs' detailed 'Impact Report' calculations.

Effects of the solution - The main GHG effects associated with NML's' solution are:

- A one-off reduction in the emissions associated with the manufacturing of the system, because NML uses steel manufactured in Europe using Electric Arc Furnace, a low carbon technology, compared to conventional chains, mainly made in China or other Asian countries from conventional, high emissions steel. NB. This is not linked to the technology itself, but to the place where the product is manufactured.
- A one-off reduction in emissions is associated with initial transport, as Enduo systems are manufactured closer to the point of utilisation in Europe.
- A one-off (per item) reduction in emissions associated with usage. Enduo systems last 5x longer and therefore one Enduo system is equivalent to 5x a conventional chain. For a given period of usage (e.g. 10 years), the GHG effect of adopting Enduo is therefore to require making 5x lower quantities of the chain system.

Base scenario - Including material extraction and manufacturing, a conventional steel-based chain drive and sprocket is estimated to require 2.86 kgCO₂e to produce.

Unit impact - Including material extraction and manufacturing, we estimate that the Enduo chain drive and sprocket system require 0.52 kgCO₂e to produce. Over five lifetimes of the incumbent product, this is still 0.52 kgCO₂e, whilst the incumbent product would require five times its carbon footprint of 2.86 kgCO₂e, hence a unit impact of the Enduo solution estimated at 13.8 kgCO₂e over its lifetime.

SDGs - New Motion Labs' technology has the potential to improve the efficiency of sustainable transport systems and production & manufacturing. It therefore contributes to the UN's Sustainable Development Goals 8.4 and 11.2.

Powervault

The solution - Powervault has developed a range of home energy storage units which store free solar energy or cheap energy from the grid, and provide flexibility services to the local and national grids. The product's positive climate impact stems from the fact that it allows customers some level of energy flexibility and reduces demand for fossil fuel-generated energy during periods of low levels of intermittent renewable energy generation. In other words, it enables an accelerated shift in electricity usage from fossil-based to renewable.

Type of the solution - 'Direct Component' solution, i.e. a product that is part of an overall solution (the transition to renewable energy) that plays a critical role in delivering GHG impact.

Unit - There are six models of the Powervault units, each with a different expected GHG impact depending on the storage capacity. We consider the impact per unit sold and installed and aggregate the impact of the installed park of units.

System boundaries - The system we are considering relates to the electricity consumption of a household, and the effect that the Powervault unit has on that consumption - either to make better use of the electricity generated by the household's solar panels, if they have them, or to shift their consumption at times when the grid electricity has a lower carbon intensity. The embedded GHG emissions in material extraction, manufacturing, distributing and disposing of the Powervault units have not been taken into account within the company's calculation yet.

Effects of the solution - The main GHG effects associated with Powervault's solution are:

- A recurring reduction in demand for electricity during periods when grid electricity is being generated from fossil fuels, in particular, peak times - hence a reduction in GHG emissions associated with the client's electricity usage.

Base scenario - The base scenario is the customer's electricity usage and demand from the grid without energy flexibility. The average UK household emits around 1.1 tonnes of CO₂e per year from domestic electricity consumption.

Unit impact - The GHG impact per unit has been calculated by the company. We are able to endorse the methodology but have not verified the specific calculations or sources used by Powervault. The GHG impact is estimated at 225 kgCO₂e per year per Powervault 1&2 unit, 300 kgCO₂e for Powervault 3, 800 kgCO₂e for Powervault 4, 500 kgCO₂e for Powervault 5 and 250 kgCO₂e for Powervault Compact.

SDGs - The UN's SDG that Powervault contributes to is SDG 7.3 - 'Double the improvement in energy efficiency'.

QLM

The solution - QLM produces cameras with innovative quantum-based imaging technology that detects, locates and quantifies emission rates of greenhouse gases, in particular methane, on industrial sites such as oil and gas infrastructure and wastewater treatment facilities.

Type of the solution - 'Facilitating Solution' i.e. QLM's camera advances customers' ability to reduce emissions by detecting gas leaks and therefore enabling them to fix these leaks, which ultimately delivers GHG impact.

Unit - When calculating the GHG impact of QLM, the solution unit refers to 1 Lidar camera sold.

System boundaries - The system considered is a camera installed on an industrial site of a certain perimeter (e.g. 100m) where a methane leak may be detected by a camera. The system includes the manufacturing and delivery of the camera hence it includes material extraction, manufacturing, distribution and disposal of the cameras.

Effects of the solution - The main GHG effects associated with QLM's solution are:

- A one-off increase in GHG emissions from the manufacturing and installation of the camera. However, at this early stage in its development, QLM has not provided details about the embedded GHG emissions associated with those. We believe that they are likely to be significant but much smaller than the GHG impact avoided through the detection and fixing of methane leaks (see below).
- A recurring reduction in GHG emissions is generated indirectly due to the detection and quantification of emission rates of methane by the camera once it is installed (and, potentially, at a later stage, other greenhouse gases including CO₂).

Base scenario - The base scenario in this instance would be that the customer does not detect and fix the gas leak and the methane (CH₄) leaks into the atmosphere. Different in-field test observations, and bottom-up and top-down calculations by QLM point to average leakage of 20-35 tonnes of CH₄ per year per site.

Unit impact - To calculate the expected GHG impact per camera, we multiply the expected mass of methane detected by a camera over one year (35 tonnes) by the probability that the camera is installed on a site that produces a leak. For now, we are assuming a 50% probability of such detection, as initial batches of cameras are likely to be deployed on sites where leaks are likely, but we expect this to decrease over time. Finally, we use the methane-to-CO₂e conversion factor of 28x.

SDGs - Beyond their carbon impact, QLM also contributes to SDG 9.4. This SDGs focuses on upgrading industries and infrastructures for sustainability.

Salvalco

The solution - Salvalco has developed innovative aerosol valves (Eco-Valve). The valve replaces traditional propellant gases used in domestic aerosols (LPG i.e. hydrocarbon gases) with air and nitrogen, which in turn reduces the aerosols' greenhouse effect potential.

Type of the solution - The Eco-Valve is a 'Direct Product' solution that can be purchased as a whole to yield direct GHG impact by displacing an incumbent product which emits greenhouse gases in the atmosphere.

Unit - When calculating the GHG impact of Salvalco, the solution unit refers to 1 Eco-Valve sold.

System boundaries - The system encompasses the manufacturing, usage and disposal of the aerosol valves, whether Salvalco's Eco-Valve or incumbent products. GHG emissions include the material extraction, manufacturing, distribution and disposal of the valves.

Effects of the solution - The GHG effects associated with the solution are:

- A one-off reduction in GHG emissions during the whole usage of the aerosol. Indeed, traditional aerosols using hydrocarbon gases emit volatile organic compounds, whilst Eco-Valve does not emit any GHG gases as they are used.
- A potential one-off increase or reduction in GHG emissions is associated with the manufacturing and disposal of the product. However, we expect that these emissions relating to the Eco-Valve will be very similar, at scale, to the emissions associated with the incumbent products - hence the GHG impact produced by the Eco-Valve solution in this respect is likely to be negligible either way.

Base scenario - The volatile organic compounds (VOC) propelled by aerosols are not greenhouse gases themselves, but they react in the atmosphere, leading to the creation of ozone. Ozone in the troposphere is a very potent greenhouse gas, despite being relatively short-lived - within a 20 year period one tonne of ozone has an actual warming effect equivalent of ~65 tCO₂e. Academic articles have concluded that each 250ml aerosol typically emits ~90g of VOC, which we estimate would lead to the formation of 73g of ozone and have a warming potential equivalent of 4.7 kgCO₂e in a baseline scenario.

Unit impact - The beneficial effect of Salvalco's activity is the entire removal of the baseline GHG emissions of 4.7 kgCO₂e, for each Eco-Valve sold.

SDGs - Salvalco's activity also contributes to UN's SDG 9.4 with its aim of retrofitting industries to make them sustainable, including the adoption of clean and environmentally sound technologies and industrial processes.

AirEx

In the UK and Europe, there are millions of draughty homes, and heating them during winter months uses much more energy compared to if they were properly insulated. This represents a massive waste in terms of GHG emissions. AirEx has developed an intelligent ventilation system, which significantly increases the thermal efficiency of homes, whilst maintaining high air quality throughout the year. Their system enables important savings in energy dedicated to heating, which in turn reduces CO₂e emissions that would have been produced by gas or electricity heating systems.

We have calculated Airex's GHG impact using the following independently verified energy savings per home:

- 349 kgCO₂e per year for a typical gas boiler heated house;
- 645 kgCO₂e for a typical electric heated house.

We have multiplied a weighted average figure of 393 kgCO₂e per home by the number of homes equipped with AirEx for each period.

AirEx is helping to make housing infrastructure and cities more sustainable and less environmentally impactful by reducing heat loss in homes. As such, AirEx also contributes to SDG 9.4 (upgrade all industries and infrastructures for sustainability) and SDG 11.6 (reduce the environmental impacts of cities).

Buy Me Once

Overconsumption is a key reason for large per capita GHG emissions, which is worsened by the abundance of products that break easily or age badly, as consumers need to buy them again and again. Buy Me Once addresses this issue by dedicating itself to selling only long-lasting, high-quality, durable goods. As such, Buy Me Once removes the need to produce a product multiple times for the same consumer, which in turn eliminates the additional emissions from resource extraction, manufacturing, packaging and transportation.

With the Buy Me Once team, we built a database that attributes an average carbon footprint to different types of products. Each product's calculation is different and depends on available information; for example, an iron pan's footprint is based upon the emissions from producing 1 kg of cast iron as a proportion to its weight, whilst a smartphone's emissions are based upon a Life Cycle Assessment of 11 phones by academics (excluding emissions from use). The database also lists the average lifetime of a product and the lifetime of a Buy Me Once product according to Buy Me Once's selection criteria. Their carbon impact attributed to Buy Me Once reflects the emissions saved from buying one product with a 20 year lifetime, rather than four of the same product with a five-year lifetime, multiplied by the units sold. Whilst this method may overestimate Buy Me Once's impact in the short term, it is an accurate reflection of the products' impact over their lifetime.

For H1 2024, due to a lack of detailed product-by-product data, we have estimated Buy Me Once's additional contribution in H1 2024 using the average CO₂e savings per £ of sales over the previous six quarters (a ratio which has proven to be relatively constant around 420 gCO₂e per £).

Buy Me Once's activity also contributes to SDG 12.5, which aims to substantially reduce waste generation. By selling long-lasting goods, they are decreasing both the number of products being thrown away and the extra resources (water, energy, materials) used to produce short-lived products.

Coda (ex. Shields Energy)

Coda's core goal is to increase energy efficiency in the built environment - one of the largest sources of emissions in the UK. The company enables owners of commercial real estate to cut their electricity consumption, and therefore carbon emissions, thanks to its IoT-based solution that provides smart analytics on energy use, smart building controls, and localised sensors.

Coda's smart platform tracks the energy savings enabled by its service for all the sites where its solution is installed. Based on these analytics, Coda estimates its carbon impact by multiplying these energy savings by the carbon intensity of the energy saved. We believe that the methodology is accurate, given the fact that Coda's core service includes measuring electricity consumption and savings, but we were not able to independently verify the calculations made by Coda.

Coda contributes to several UN Sustainable Development Goals, including SDG 9.4 (upgrade all industries and infrastructures for sustainability) and SDG 11.6 (reduce the environmental impacts of cities).

Naked Energy

Heating is one of the largest sources of GHG emissions globally, and Naked Energy has designed a very efficient solution to cut emissions from heating in the built environment (space and water heating). The company produces tubes called VirtuHOT and VirtuPTV that integrate solar collectors for electricity (PV) and heat, hence displacing not only fossil fuel-based electricity but also fossil fuel-based heating. Naked Energy targets large buildings, notably in commercial real estate.

The company has developed detailed calculations for the thermal and electric energy (kWh/year) generated by its different types of tubes depending on their country of installation. The carbon savings per tube installed are then estimated using current CO₂e intensity for the displaced heat and electricity in each country - typically leading to savings in the range of 30-60 kgCO₂e per year depending on the types of tubes and their location. Multiplying these figures by the relevant number of tubes installed leads to an estimate for the carbon savings enabled by installed tubes in a given period.

Naked Energy's technology has the potential to expand the adoption of renewable energy, notably for heat generation, and it therefore contributes to the UN's Sustainable Development Goal 7.2. Naked Energy also contributes to SDG 7.3 (double the improvement in energy efficiency), as their Virtu tubes provide superior energy efficiency (up to 80% conversion of solar energy, as they collect both heat and power).

Piclo

Electricity supply is shifting away from static fossil-fuel-based power plants to diverse renewable energy sources. However, current distribution networks are physically constrained and do not have the flexibility required to maximise the utilisation of intermittent renewable energy. To overcome this challenge, Piclo has developed a marketplace that enables power distribution companies to buy 'flexibility' from renewable energy suppliers, enabling a better matching of supply and demand in a context where renewable energy becomes a larger part of the mix. As such, Piclo saves emissions by facilitating the switch from fossil fuel-based energy to renewable energy - and Piclo comes under the category of 'facilitating' solutions rather than 'direct' ones.

Piclo has developed a model that links the value of transactions on its marketplace to the grid's ability to handle renewable energy supply. The model's output is that for every £1 transaction on their platform, the carbon saving reaches 0.12 kg CO₂e. We note that this is an estimate based on many assumptions and therefore, even if based on the best possible calculations and sources, it comes with a lot of uncertainties. Piclo reports the total value of transactions on their platform half-yearly, and we multiply this value by 0.012 kg CO₂e to determine the carbon impact facilitated by Piclo.

Beyond their carbon impact, Piclo's solution is also tightly connected to achieving SDG 7.2 and increasing the global percentage of renewable energy by making renewable energy viable. For renewable generation companies, their ability to bid for, and win flexibility contracts, enables them to incorporate an additional revenue stream into their business model at an early stage - increasing the financial viability of their investments.

Qualis Flow

In the UK, the construction industry represents 55% of raw materials consumed and 59% of total waste produced - it is a large contributor to GHG emissions. Qflow is a software-as-a-service company that enables the industry to measure and track materials delivered on construction sites, and therefore to cut down on the otherwise huge quantities of materials wasted, with massive economic and environmental benefits. Qflow's aim is to enable the construction industry to avoid 1 MtCO₂e by 2025.

Qflow estimates its impact in terms of avoided waste associated with the early identification of non-compliant materials enabled by its solution. The quantities of avoided waste are then multiplied by the relevant embodied carbon conversion factors. Qflow also estimates an average GHG impact per £ of revenue paid by clients for its software solution.

Qflow is a facilitating solution rather than a direct impact solution, but we are nevertheless using this methodology to obtain an estimate of Qflow's GHG impact, recognising that it is based on a number of assumptions that are difficult to verify at this point in Qflow's development. One element worth noting is that Qflow's calculation does not include the carbon avoidance associated with better decision-making on-site, such as the identification of a more localised supply chain.

The UN's SDG that Qflow contributes to are SDG 9.4 SDG 12.5. These SDGs focus on upgrading industries and infrastructures for sustainability, and substantially reducing waste generation.

Rovco

The global transition to renewable energy necessitates building and monitoring offshore energy infrastructure. Offshore infrastructure projects are currently informed by expensive fossil-fueled vessels that spend large periods of time at sea to map the undersea environment. Rovco has developed an autonomous robot and a data platform to map and monitor offshore renewable energy infrastructure. The robot uses artificial intelligence to develop hydrographic and environmental surveys, creating 3D models of undersea assets and of the seabed.

Rovco's technology replaces an incumbent product emitting less GHG emissions per unit because their robot shortens the amount of time vessels need to spend at sea. In the past, their carbon impact has been calculated by estimating the number of days at sea saved from using their technology in comparison to the industry standard for the same size project. The emissions avoided from vessels being at sea for these extra days were attributed to Rovco's carbon impact, calculated on a project-by-project basis. We are no longer able to obtain this data and as a result, we have used a proxy, namely a ratio of realised GHG impact per revenue, using the average from previous years.

Furthermore, Rovco is achieving SDG 7.2 (increase the global percentage of renewable energy), as they facilitate the adoption of offshore wind energy by providing survey data for new and existing offshore wind farms at a much lower cost than existing technologies. Rovco is also advancing SDG 14.a, as the company sources data that can accelerate our understanding of the underwater world, helping to sustainably manage and protect marine ecosystems.

Scottish Bee Company

Bees preserve nature's ecological balance by pollinating plants, which enables them to reproduce the next generation of trees, wildflowers and crops. As part of their mission to ensure that bees thrive in abundance, The Scottish Bee Company places conservation and regeneration at the forefront of producing and selling their organic honey products.

The Scottish Bee Company is making a positive climate impact by ensuring that their honey has a lower carbon footprint than 'average honey', and through the rewilding of areas that sequester carbon. We have estimated the company's contribution to cutting carbon emissions by comparing their activities to the [baseline emissions of traditional migratory honey production](#), and applying this to their sales of honey jars in the period. We have found that the Scottish Bee Company honey generates significantly less emissions thanks to the shorter distances travelled for beehive migration. In H1 2024, we were unable to obtain up-to-date sales figures and we have assumed similar sales numbers to 2023 for this report. We are unable to determine Scottish Bee Companies emission reductions through their rewilding projects, therefore our results are likely to be an underestimate of the company's actual positive impact.

Scottish Bee Company is also achieving multiple SDGs: their regenerative agriculture practices contribute to SDG 2.4. Bee hives are placed on wild heather moors to pollinate wildflowers and conserve the habitat, whilst simultaneously producing honey. The coexistence of bee hives and wild heather moors ensures that honey production does not deteriorate the environment, but protects it, and thus promotes SDG 15.5. But the Scottish Bee Company's commitment to SDG 15.5 goes beyond their agricultural processes. They have committed to increase bee pollination by 20% in the next 3 years by funding Repollinate projects and building wildflower spaces. Furthermore, their dedication to sustainable resource use aligns with SDG 12.2, as they recycle 100% of the material they use, and have cardboard, tin and glass packaging to reduce their material footprint.

Smile Plastics

The current linear take-make-dispose model that the plastic economy follows is polluting the globe. Plastic is typically produced to have very short, or single-use lives, which is commonly not recycled and ends up in landfill or the ocean. To transform the current system, Smile Plastics take low-value discarded plastics, such as food and medical packaging, and uses its micro-factory blueprint to produce durable decorative panels and furniture. Smile Plastics bends the current plastic linear model into a circular one, as their products are made from recycled materials that can be recycled again and again.

Plastics are 99% fossil fuel based; heat and pressure are applied to fossil fuels to break them into the building blocks of polymers that are used to make plastic. Smile Plastics is eliminating GHG emissions within this production process because their base material is plastic waste that has already been produced. We estimate Smile Plastics' GHG avoidance impact by comparing the carbon intensity of their process to the baseline carbon emissions of virgin plastic produced - 0.015 tCO₂e per tonne compared to 2.806 tCO₂e per tonne - and multiply the net gain by the company's production in the relevant period.

The company's focus on plastic waste and a circular economy model is contributing to SDG 8.4 and SDG 12.5, by improving resource efficiency within production, whilst simultaneously reducing waste generation. The use of their panels and furniture in restaurants, retail stores and homes is also upgrading spaces for sustainability, which aligns with SDG 9.4.

Swytch

Swytch makes and sells conversion kits, enabling any bicycle to be transformed into an electric bike. The company makes a positive GHG impact in two complementary ways, which we have integrated into Swytch's GHG impact calculations:

- Firstly, by accelerating the adoption of e-bikes in the population, they direct users away from car journeys to e-bike journeys, hence reducing the carbon impact of car journeys. We estimate this impact at 157 kgCO₂e per year for each Swytch user, assuming a reduction of car journeys by 805 km per year and an average carbon intensity of car journeys of 195 gCO₂e/km.
- Secondly, making conversion kits that transform existing bicycles into e-bikes utilises less materials and energy than manufacturing full new e-bikes. Each Swytch kit sold avoids the sale of a full e-bike and the associated carbon footprint - a one-off saving estimated by the company to be ~200 kgCO₂e per kit (which GAS has not independently verified).

Beyond these emissions savings, the main UN Sustainable Development Goal that Swytch contributes to is SDG 11.2, by providing safe, affordable, accessible, and sustainable transport systems.

Thrift+

In the UK, 360,000 tonnes of clothing are thrown away each year. A fashion industry that emphasises mass-producing clothing with fast-changing trends at a low cost is detrimental to the environment because it requires large amounts of water, energy and nonrenewable resources. Thrift+ is working to relieve the ceaseless manufacturing of new clothing. They run a platform that makes thrift shopping easy and accessible: fashion brands and retailers can send their clothes to Thrift+, who upload them on their website. Once an item is sold, Thrift+ splits the proceeds between themselves, the donor and a charity.

Thrift+ is reducing the fashion industry's GHG impact by facilitating a culture that reuses and recycles clothing. We estimate the company's GHG savings by multiplying the mass of clothing that they sell and therefore is not being produced, by the typical carbon intensity of new clothing in the UK. This figure is estimated to be 7.88 kgCO₂e per new item (source: [Thredup](#)) with an average weight of 0.300 kg.

Through their business model, they also contribute to SDG 12.5 and SDG 8.4 by reducing waste generation and improving resource efficiency in consumption.

Zedify

The increase in online purchases has resulted in more vans on the road delivering goods to consumers' homes, which not only releases more GHG emissions from fuel use but also increases pollution, traffic and noise. In response, Zedify is developing a network of local consolidation hubs to deliver goods via e-cargo bikes and tricycles. Zedify's zero-emissions delivery service is a win-win for the environment and customers - it drastically cuts CO₂e emissions by displacing vans and having shorter routes, whilst simultaneously shortening the delivery window for end users. Using Zedify's fleet for deliveries saves 206 gCO₂e per km travelled, therefore we have calculated the company's GHG avoidance impact by multiplying this number by the distance travelled by their cargo bikes over the relevant period.

Beyond reducing delivery fleet emissions to tackle climate change, Zedify also contributes to SDG 11.2 and SDG 12.6. They replace delivery vans and therefore increase the proportion of sustainable transport on the road in cities. They also encourage companies that outsource to delivery companies to choose a zero-emissions fleet, thus promoting sustainable business practices.

Zeigo

Large companies are increasingly using utility-scale renewable energy power purchase agreements (PPAs) to decarbonise. For most companies, the PPA procurement process can be time-consuming and complicated. Zeigo has developed a digital platform that reduces the PPA procurement and management burden by simplifying and accelerating the process. As such, Zeigo has a clear impact in facilitating the deployment of renewable energy assets, matching developers of such projects with corporations willing to buy the resulting power.

Historically, we have estimated Zeigo's impact on carbon emissions by looking at the renewable power generation that was enabled via its marketplace, and therefore the carbon emissions avoided by the corresponding displacement of traditional fossil-fuel-based power.

In early 2022, Zeigo was acquired by Schneider Electric, which has a large advisory activity working with corporations willing to procure renewable energy. Schneider said: "By adding the Zeigo technology and team to our existing portfolio of services and solutions, we will be able to provide even greater value to our clients worldwide". As such, this transaction is expected to amplify Zeigo's contribution to the fight against climate change. However, since Zeigo is now out of the GAV portfolio, it is unjustifiable to attribute Zeigo's ongoing activity to Green Angel Ventures. As such, we have decided to cap Zeigo's impact at the level it had reached at the time of the exit i.e. end 2021.