



MacArthur  
Green

## ADVICE NOTE

# Carbon Foot-printing, Carbon Offsetting & Tree Planting

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MacArthur Green is helping to combat the climate crisis through working within a carbon negative business model. Read more at [www.macarthurgreen.com](http://www.macarthurgreen.com).



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## 1 MEASURING OUR CARBON FOOTPRINT

A carbon footprint is the total greenhouse gas (GHG) emissions caused directly and indirectly by an individual, organisation, event or product, and is expressed as a carbon dioxide equivalent (CO<sub>2</sub>e). A carbon footprint accounts for all six Kyoto greenhouse gases. An organisational carbon footprint measures the GHG emissions from all the activities across the organisation, including energy used in buildings, industrial processes and company vehicles.

The Greenhouse Gas Protocol Standard<sup>1</sup> is a widely used standard that sets out how to account for GHG emissions. It categorises emissions into three ‘scopes’:

- Scope 1: Direct emissions such as on-site fuel combustion, company vehicles, manufacturing. Activities which are within the organisations control.
- Scope 2: Indirect emissions from electricity and heat purchased and used.
- Scope 3: Other indirect emissions such as purchased goods and services, employee commuting and business travel, waste disposal.

MacArthur Green had the company’s carbon emissions independently assessed for 1<sup>st</sup> February 2018 to 31<sup>st</sup> January 2019. During this period, the organisation released 52.89 tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e). We are continuing to assess and reduce our carbon emissions year on year – with our 2020 assessment currently underway.

It is possible to calculate carbon footprint for small and medium-sized enterprises (SMEs) using a [calculator from the Carbon Trust](#). This has been designed to help UK based SMEs measure their corporate emission footprint following GHG Protocol Guidance, including direct emissions from fuel and processes (Scope 1 emissions) and those emissions from purchased electricity (or Scope 2 emissions) for the assets they operate. The tool is not a complete evaluation of an organisational footprint as it only includes selected emission sources which are common to the majority of SMEs using an operational control approach.

There are several companies who offer a carbon footprint calculation, verification and offsetting service:

- Carbon Footprint [www.carbonfootprint.com](http://www.carbonfootprint.com) (used by MacArthur Green)
- Carbon Trust [www.carbontrust.com](http://www.carbontrust.com)
- Carbon Neutral [www.carbonneutral.com/how/measure](http://www.carbonneutral.com/how/measure)
- Lucideon [www.lucideon.com](http://www.lucideon.com)
- Atmosfair [www.atmosfair.de/en](http://www.atmosfair.de/en)
- CLevel [www.clevel.co.uk](http://www.clevel.co.uk)
- Myclimate [www.myclimate.org](http://www.myclimate.org)

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<sup>1</sup> <https://ghgprotocol.org/corporate-standard>

## 2 OFFSETTING

You can offset your carbon footprint by purchasing carbon credits equal to your footprint. The companies listed above offer this service.

MacArthur Green opted to go further to become a ‘carbon neutral plus’ organisation by offsetting the equivalent of twice our carbon footprint - 106 tCO<sub>2</sub>e in 2018/19. We achieved this through supporting the following projects:

- Borehole Rehabilitation Project in Uganda (34 tCO<sub>2</sub>e)
- Efficient Cookstove Programme in Kenya (20 tCO<sub>2</sub>e)
- Portel-Pará Deforestation (REDD) Project in Brazil (38 tCO<sub>2</sub>e)
- Wind Based Power Generation by Panama Wind in India (14 tCO<sub>2</sub>e)

Individual carbon offset projects are rigorously inspected and audited regularly to assure that they are generating the carbon reductions. Carbon credits are only issued once these savings have been made. The carbon credits are verified through the following schemes:

- [Clean Development Mechanism - Certified Emission Reductions \(CERs\)](#)
- [Clean Energy - Verified Carbon Standard \(VCS\)](#)

Full details of quality assurance are here:

- <https://www.carbonfootprint.com/qasqualityassuranceschemecarbonoffsetting.html>

MacArthur Green is a ‘Carbon Neutral Plus’ organisation. This information is shown on the certificate:

- <https://www.macarthurgreen.com/files/2019-carbon-footprint-offset-certificate.pdf>



### 3 CARBON REDUCTION PLAN

As soon as we had measured the carbon footprint, we began a carbon reduction plan which can be viewed on our website. Ultimately, we need to reduce the amount of CO<sub>2</sub> that we are emitting into the atmosphere as part of our business operations. Two trillion metric tons of greenhouse gases have been emitted into the Earth's atmosphere since the start of the First Industrial Revolution in the mid-1700s, with most of this carbon emitted since the mid-1950s. In addition to this, it is estimated that 36 billion metric tons of additional greenhouse gases is emitted every year. This is vastly more carbon than nature can re-absorb and once excess carbon enters the atmosphere it can take thousands of years to dissipate.

89% of our carbon emissions were from vehicle travel. This includes company vehicles, subcontractor vehicles and employee business vehicle mileage. We are investigating lower emission vehicles and fuel monitoring systems and have already purchased our first hybrid and plan to upgrade all vehicles to hybrids or pure electric by 2021.

4% was from flights. We have a target of zero flights for 2019-2020. We have used one return flight (Glasgow to Dublin) this year to date.

Electricity use in our office in Glasgow accounted for 7% of the carbon footprint. We are considering replacing fluorescent bulbs with LED.

There are several online resources full of helpful information on carbon reduction measures:

- Carbon trust – advice and information & Green Business Fund  
<https://www.carbontrust.com/small-to-medium-enterprises/>
- EV Charge Point funding  
<https://energysavingtrust.org.uk/scotland/grants-loans/business-charge-point-funding>
- Resource Efficient Scotland – advice and grants  
<https://www.resourceefficientscotland.com/>

## 4 WOODLAND PLANTING – GOING BEYOND OFFSETTING

MacArthur Green purchased the land for native broadleaved tree planting in December 2016.

We undertook ecological and environmental surveys and applied to Scottish Forestry for a Forestry Grant Scheme.

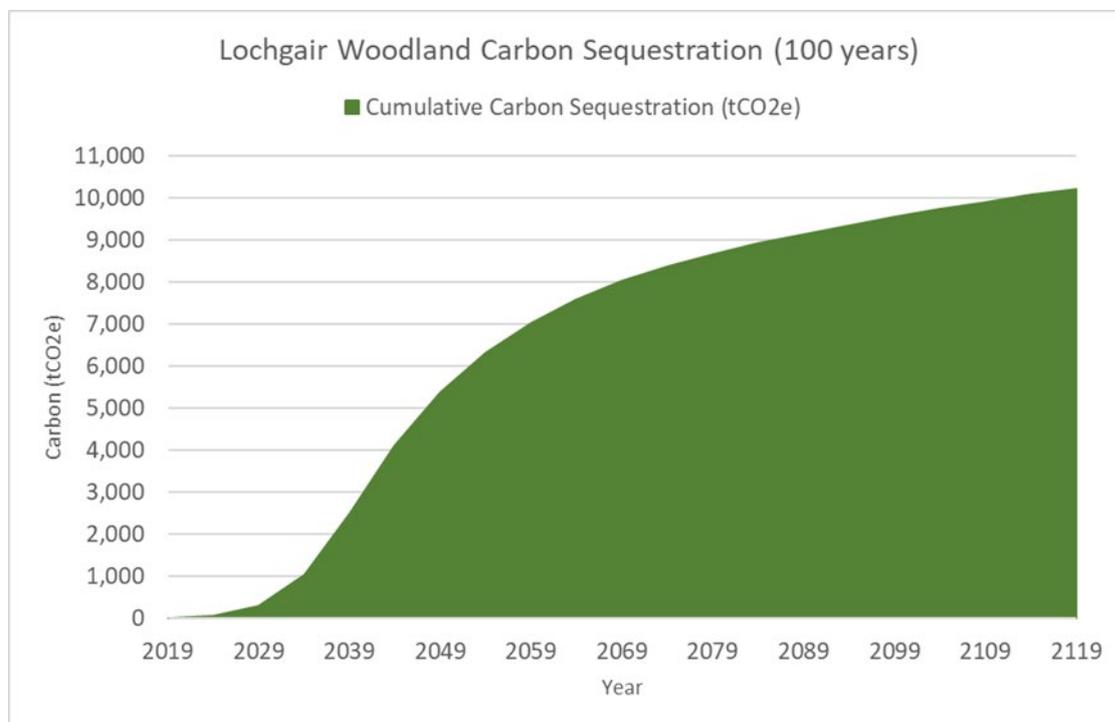
Our woodland Grant Scheme was approved by the Forestry Commission Scotland (now Scottish Forestry) in December 2018 and planted in spring 2019.

We completed the application process for the Woodland Carbon Code and received full verification in September 2019. The Woodland Carbon Code is a Government backed scheme. It is the UK’s voluntary carbon standard for woodland creation projects, and it provides reassurance about the carbon savings that woodland projects may realistically achieve.

We are managing the scheme to enhance its biodiversity as detailed within our Natural and Historic Heritage Reserve Plan which can be viewed on our web site.



Our woodland creation project in Argyllshire will more than compensate for our company’s emissions. By 2030 the woodland is projected to sequester 232 tonnes of CO<sub>2</sub> and over 10,000 tonnes in the next 100 years (Figure A).



**Figure A. Cumulative carbon sequestration of the woodland at Lochgair over 100 years, adjusted for baseline leakage and contribution to buffer.**

Our project has now been verified and Potential Issuance Units (PIUs) will be converted into Woodland Carbon Units (WCUs) when site monitoring verifies them after five years initially and then every 10 years. These can be used to compensate against emissions and then 'retired' in the Markit registry<sup>2</sup>.

Our project can be viewed on the Markit registry through this link:

- [https://mer.markit.com/br-reg/public/index.jsp?name=lochgair&entity=project&entity\\_domain=Markit,GoldStandard](https://mer.markit.com/br-reg/public/index.jsp?name=lochgair&entity=project&entity_domain=Markit,GoldStandard)

A WCU is one tonne of CO<sub>2</sub> which has been sequestered in a Woodland Carbon Code-verified woodland. It has been independently verified, is guaranteed to be there, and can be used to report against emissions as soon as it is purchased.

Once we have the verified WCUs, these can be retired against our actual emissions for each future year.

You don't need to plant your own woodland if you want to buy WCU to compensate for your carbon footprint. If you want to purchase WCU you can do this via some of the companies listed above or through purchasing on the Markit registry. More details are provided at:

- <https://www.woodlandcarboncode.org.uk/buy-carbon/a-buyers-guide-to-woodland-carbon-units>

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<sup>2</sup> <https://ihsmarkit.com/products/environmental-registry.html>

## 5 HOW MUCH HAS OUR INVESTMENT COST?

We believe that our clients will value and therefore support our carbon negative business model. We therefore see this as an investment and not a cost. We have provided details of the cost of our investment below, and the potential value of the WCUs, so that other businesses can understand the level financial commitment involved.

**Table 5-1 Offsetting**

Item	Cost
Calculating our carbon footprint	£1,025
Offsetting our Carbon footprint (52.89 tCO <sub>2e</sub> ) by two times.	£605.80
Carbon Reduction Plan	£500.00
<b>TOTAL</b>	<b>£2,130.80</b>

**Table 5-2 Land Purchase**

Item	Cost
Solicitor Fees	£4,822.00
Land	£190,000 (this is the total land area – area subject to woodland planting would be approximately £130,000).
<b>TOTAL</b>	<b>£194,822.00</b>

**Table 5-3 Tree Planting**

Item	Cost
Project Management	£3000.00 (estimate - internal time)
Forest Management Consultancy Fees	£14,392.20
Planting works (subcontractors)	£69,086.72
Grant (Forestry Land Scotland)	-£74,886.29
Woodland Insurance	£543.71
<b>TOTAL</b>	<b>£12,136.34</b>

**Table 5-4 Woodland Carbon Code Application and Validation**

Item	Cost
Application	£2000.00 (estimate internal time)
Validation Fee	£1,118.00
IHS Markit Registry Fee	£620.40
<b>TOTAL</b>	<b>£3,738.00</b>

**Table 5-5 Woodland Carbon Units**

Item	Value
Woodland Carbon Units (10,340 at £10 per Unit)	<b>£103,400.00</b>

**Table 5-6 Wildlife Boxes Installation**

Item	Cost
Wildlife boxes	£589.08
Installation	£800.00 (estimate internal time)
<b>TOTAL</b>	<b>£1,389.08</b>

## 6 ABBREVIATIONS & REFERENCES

CO<sub>2</sub>e Carbon dioxide equivalent

tCO<sub>2</sub>e Tonnes of carbon dioxide equivalent

PIU Potential Issuance Unit

WCC Woodland Carbon Code

WCU Woodland Carbon Unit

The government's Environmental Reporting Guidelines show how a company should report their emissions: <https://www.gov.uk/government/publications/environmental-reporting-guidelines-including-mandatory-greenhouse-gas-emissions-reporting-guidance>

Carbon statements: <https://www.woodlandcarboncode.org.uk/standard-and-guidance/2-project-governance/2-7-carbon-statements-and-reporting>