Environmental Impact Report 2021

Marvellous Maps and the Environment

Marvellous Maps is an independent British business, founded in 2014, whose fun, comprehensively-researched paper maps entertain and inspire people to discover and enjoy Britain's best bits. We strive to be a 'good' business by considering the impact of our activities on people and the planet (not just on profit), with a particular focus on minimising our environmental impact.

Summary

This report covers the period July 2020 - June 2021. We've always aimed to be an environmentally responsible business, and in order to live up to that claim, the first requirement for any business is to measure and disclose its environmental impact. Last year, we published our first environmental impact report, something we plan to do now every year. Our environmental policy is available on our website alongside this and our previous impact reports.

We strive to be completely transparent and honest in our impact report. That should not need stating, but even some of the 'better' businesses out there omit information that might make them look bad. We also try to keep our reporting short and sweet, but with such complex subject-matter that can be a challenge! If you feel like something is missing, if you have any questions or if you have any suggestions for how we can improve the report or for future initiatives, please don;t hesitate to get in touch at ***hello@marvellousmaps.com***.

Version Control

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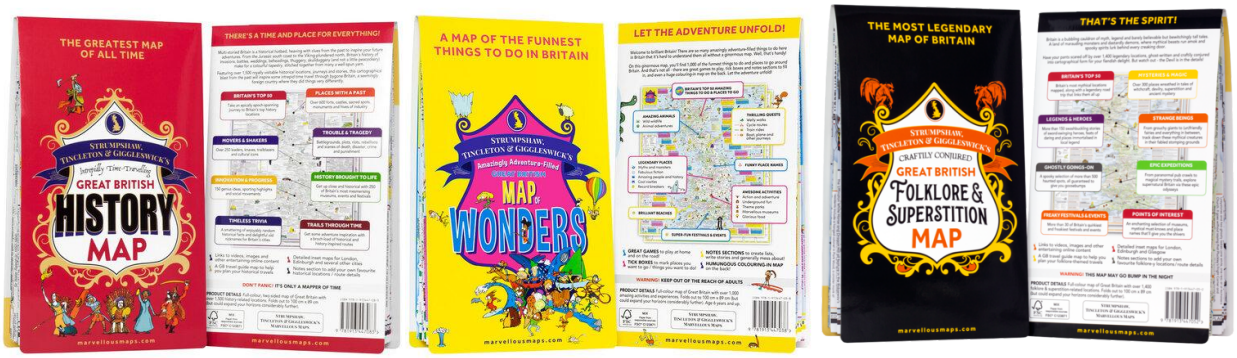
Next report due: September / October 2022

Marvellous Maps in 2020 / 21

During a year of unfortunate global goings-on, there have been some positive changes here at Marvellous Maps. Our little business has grown, both in terms of team size and product range.



This growth has come at the cost of higher total CO2 emissions, but in 2020 / 21 we took the step of properly offsetting our emissions through verified removals, not only for the year but for the entire lifetime of the business.

Key achievements in 2020 / 21

- Purchase of 500 units (tonnes) of verified 100-year carbon removals, making us carbon neutral by properly offsetting significantly more than our estimated lifetime carbon footprint.
- In the second half of 2020, we initiated a three-party project with our largest client and main supplier, collaborating to understand, and set out options for minimising, our collective environmental footprint, and sharing knowledge to accelerate the process.
- We also stepped up our efforts to embed environmental responsibility into our business practices through:
    - The appointment of an ‘environmental lead’ (part-time role) within the team, and
    - Educating team members through knowledge sharing sessions and external courses.
- This year we also started working with a specialist external consultancy to validate and improve our approach, particularly on calculating and mitigating our carbon footprint.
- In December, we also submitted our B Corporation impact assessment, with the aim of becoming a certified B Corporation as soon as possible (as a great global benchmark for being a socially and environmentally responsible business). Unfortunately, certification timelines increased hugely as demand for certification exploded, but at the time of publication (October 2021), we have completed most of the certification process and are on track for becoming certified before the end of 2021.

Progress on all fronts has been positive and we look forward to communicating further progress and achievements when we report in 2022.

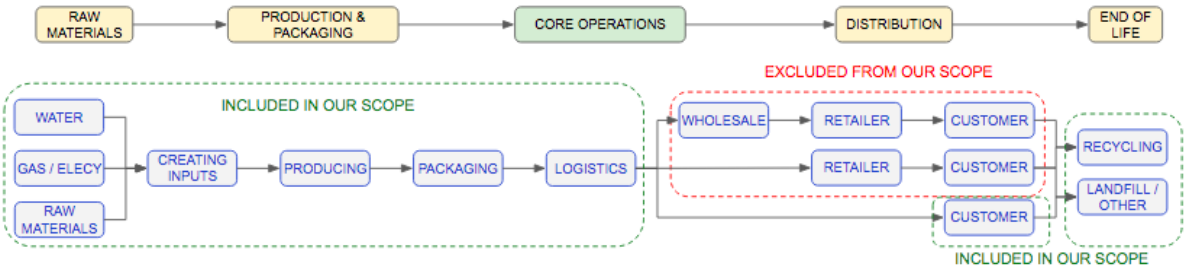
Approach - General

We're a small, remote-working (no office) business that outsources production and logistics. Our products have a relatively low environmental impact, using environmentally-certified (FSC) paper, being produced and (mostly) sold locally within Britain, and being recyclable. Nonetheless, we take responsibility for understanding, disclosing and minimising our environmental impact. To achieve that, we look at our full environmental impact, covering:

1. **Inputs** - all resources used by, or as a result of, our business.
2. **Outputs** - all the bad things put into the environment by, or as a result of, our business.
3. **Positive impact** - anything we do to deliver benefits for the environment.

Approach - Carbon Footprint Calculation & Mitigation

Our carbon footprint calculations include the entire value chain of our products, as shown in the image below. The inputs include everything from raw materials to energy, water and gas used in the production and packaging process, logistics, storage, core business operations and end-of-life processes. The outputs include waste created in the production process, and the carbon emissions associated with all activities previously described. You'll notice that emissions relating to distribution to wholesale / retailer channels (basically any downstream steps involving other businesses, rather than individual customers) are excluded from our scope, reflecting standard practice - the other businesses involved in effect are responsible for the emissions arising from their transport, storage, etc.



Reports like this rely on estimates, so we take a conservative approach in calculating our environmental impact. We do that by using the latest available benchmarks, multipliers and other guidance from the UK government, our consultants and other sources, and then adding buffers to counter the potential effect of any inaccuracy or oversight. Our external consultants have validated (and suggested improvements for) our carbon footprint calculations. This has also helped us improve upon last year's methodology, so we have restated some of last year's figures (more conservatively) in this year's report as a result. The key methodology changes are set out in the appendix.

On offsetting, it's important to note that offsets are a last resort after reducing emissions as much as possible (and even high-quality, verified, long-term offsets like ours are not permanent). We believe we have reduced our emissions as much as possible within the constraints of the markets we operate in and products we sell, but we also accept that in the long term, true minimisation of emissions requires smart, bold thinking on all fronts including product strategy. We're not there yet. We describe ourselves as 'carbon neutral' as it's pretty much the best we can currently be without closing down the business.

Our Environmental Impact - Key Figures

See appendix below for an explanation of scope and key terms. Figures cover the period July 2020 - June 2021. CO2 equivalent (or CO2e) is a consistent unit of measure for all greenhouse gases, including carbon dioxide.

1. INPUTS		
Measure	**2020 / 21 Figures**	**2019 / 20 Figures**
% of all items produced that are from recycled or environmentally certified raw materials	Everything we had made: Over 98% of our products / marketing materials came from environmentally certified (FSC) materials. Everything else we bought: 88% of our packaging came from recycled materials	Everything we had made: Over 96% of our products / marketing materials came from environmentally certified (FSC) materials. Everything else we bought: Over 91% of our packaging came from recycled materials.
% of all items produced that are sourced locally	100% of all items purchased are sourced from within the UK. The majority of raw materials used by our suppliers come from abroad, almost exclusively from Europe.	100% of all items purchased are sourced from within the UK. The majority of raw materials used by our suppliers come from abroad, almost exclusively from Europe.
Energy use ('total operational')	298.11 gigajoules	51 gigajoules
Energy use - renewable ('total operational')	20.22 gigajoules	4.3 gigajoules
Raw materials	An estimated 163 trees were used in the production of our maps and packaging this year. Other raw material use is minimal, including small batches of our mugs as well as some (currently unavoidable) plastic used in <5% of our packaging by value.	An estimated 5 - 10 trees were used in the production of our maps and marketing materials. Other raw material use is minimal, including small batches of our mugs as well as some (currently unavoidable) plastic used in <5% of our packaging by value.
Water	93.70 cubic meters	Restated figure, following improved methodology used in 2020 / 21: 35.4 cubic meters. (Original figure: 73 cubic meters)

2. OUTPUTS		
Measure	**2020 / 21 Figures**	**2019 / 20 Figures**
Carbon footprint: greenhouse gas emissions (all scopes)	249.96 tonnes CO2e	Restated figure, following improved methodology used in 2020 / 21: 58.8 tonnes CO2e. (Original figure: 40 tonnes CO2e).
Carbon footprint: greenhouse gas emissions ('total operational')	14.99 tonnes CO2e	Restated figure, following improved methodology used in 2020 / 21: 3.23 tonnes CO2e. (Original figure: 3.1 tonnes CO2e)
Carbon intensity: carbon footprint / team member ('total operational')	2.11 tonnes CO2e / team member	Restated figure, following improved methodology used in 2020 / 21: 0.89 tonnes CO2e. (Original figure: 0.85 tonnes CO2e)
Carbon intensity: carbon footprint / map	0.92 Kg CO2e / map	0.92 Kg CO2e / map
Waste - recycled	13.5 tonnes	5 tonnes
Waste - to landfill	1.9 tonnes	0.8 tonne
Waste - water	36 cubic meters	Restated figure, following improved methodology used in 2020 / 21: 13.55 cubic meters. (Original figure: 533 cubic meters)
Product 'end of life' impact - % of all items produced that are recyclable	Over 90% by volume or by value	Over 90% by volume or by value

3. POSITIVE IMPACT
500 tonnes CO2e offset with verified carbon credits purchased from ***Carbon Neutral***. Full explanation and details of the project (Yarra Yarra Biodiversity Corridor, Western Australia) in the ***appendix***.
Donations made to our 3 fantastic British environmental charity partners: ***Surfers Against Sewage*** ('250 Club' membership and contributions to separate campaigns), ***John Muir Trust*** ('Gold' partner) and ***Trees for Life*** ('Silver' partner).

465 trees committed for planting with ***Trees for Life***, Scotland (saplings bought for planting within 12 months), contributing to reforestation / rewilding, increasing biodiversity and (over the lifetime of the trees) capturing additional CO2e over and above the verified carbon credits we've purchased. See our 'corporate grove' ***here***.

APPENDIX

Scope, Key Terms & Methodology

Our full environmental impact isn't just the result of the resources / activities we own. It covers both owned and third-party resources / activities across the entire 'value chain', from raw materials to delivering our products to customers, through 'end of life' disposal / recycling. We don't own the printing facilities that produce our finished maps or the warehouses and delivery vehicles that get our maps to our customers, but these resources and activities all have an environmental impact, and to the best of our knowledge and abilities, these are included in the assessment of our impact.

Definition of Scopes

The table below sets out some terms typically found in reports like this and what they mean (and where opportunities for misunderstanding or not quite telling the full truth arise). Note that Scopes 1, 2 and 3 are generally used in relation to energy use / greenhouse gas emissions, but the concept of scope is relevant across all areas of environmental impact.

Owned resources / activities		**Third-party resources / activities**	
Total Operational			**Scope 3 "Everything else"**
Direct / Scope 1	**Indirect / Scope 2**	**Scope 3 "Operational"**	
Activities involving assets owned / controlled by the business, e.g. combustion of fuels in owned / controlled factories, fleets and office buildings.	Generation of electricity purchased for owned / controlled factories and office buildings.	Team remote working & business travel.	All other activities across the entire value chain, covering suppliers and the products / services we buy from them and getting our products to our customers and end-of-life product disposal.

As a remote-working (no office) business that outsources production and logistics, Marvellous Maps has virtually no 'owned' environmental impact.

Methodology updates:

Methodology Updates	
Advertising and online services	This year's calculations are based on the *spend-based method (* money spend x secondary emission factors). Last year's methodology used the number of impressions and pages loaded to determine the carbon emissions of our online activities.
Team Member Related Energy Use	Compared to last year, we assumed no team member is on a 100% renewable energy tariff. This decision was based on the lack of

	transparency in the UK regarding the contents of the renewable tariffs. You can read more about it here and here.
Supplier related emissions	This year, the producer of maps we work with has provided us with more precise emission calculations, which contributed to a more accurate calculation of our total carbon footprint.
End-of-life treatment of sold products	We are now including in our calculations the disposal of all products sold: since the beginning of the company and from all sales channels (our website, as well as through our partners and other retailers).
Reduction of buffer	Last year, we added a 10% buffer to the total emissions, to account for anything we may have missed. This year we reduced the buffer to 2.5%, due to the improvement of our calculations.

Lifetime Carbon Footprint

Here we show our estimated CO2e emissions over the lifetime of the business, based on previous years' revenue figures multiplied by our CO2e intensity from 2020 / 21's calculations (the most accurate and conservative methodology we've used, and externally validated). The 'rolling bank' of CO2e reflects total emissions, including interest (see assumptions below), minus total reductions. The figure of -125.9 tonnes means we have removed more than the total of our lifetime CO2e emissions.

	CO2 EMISSIONS		CO2 REMOVALS		
Year	**Tonnes CO2 emitted in year**	**Total tonnes CO2e emitted life to date**	**CO2 removed in year**	**Total CO2 removed life to date**	**Rolling CO2 Bank (total emitted + interest - removed)**
2014-15	11.2	11.2	0.00	0.00	11.7
2015-16	3.2	14.4	0.00	0.00	15.7
2016-17	12.1	26.5	0.00	0.00	29.1
2017-18	7.9	34.4	0.00	0.00	38.9
2018-19	17.7	52.0	0.00	0.00	59.4
2019-20	58.8	110.8	0.00	0.00	124.1
2020-21	250.0	360.8	500.00	500.00	-125.9

Assumptions:

- We charge ourselves annual 'interest' for CO2e emissions not yet removed (for every year those emissions are not removed from the atmosphere) at 5% per year, to reflect the greater warming impact of greenhouse gases the longer they've been in the atmosphere. So 1 tonne of CO2e emitted last year would equate to 1.05 tonnes in the current year if not removed in the year of emission.

- Offsets are counted only if they are long-term removals. Therefore, as our 2019 / 20 (‘emissions reduction’) offset of 40 tonnes CO2e is not considered as a carbon removal, it is not reflected in our latest figures.

Carbon Removals Explainer - FY 2020 / 21

Marvellous Maps' Carbon Neutral Claim
Marvellous Maps (trading name of Squeaky Wheels Limited), purchased 500 verified units (tonnes) of CO2 removal from ***Carbon Neutral*** (an Australia-based for-profit business) on 1st July 2021. The lifetime total CO2 emissions of the business (across its full value chain / all 'scopes') are estimated to be in the region of 360 tonnes CO2e, so this purchase makes the business 'carbon neutral'.

CO2 Offsetting vs Removals
CO2 removals are one form of CO2 offsetting. For an overview of the different types of offsetting, and their relative merits, please refer to the ***Oxford Offsetting Principles***. The only form of offsetting that we wish to engage in involves removing CO2 from the atmosphere, and in consultation with our independent advisors, we feel the best available option for removing CO2 from the atmosphere is through forestry projects (afforestation or reforestation).

The Project
The units we have purchased are part of a reforestation project in Western Australia. The project, the ***Yarra Yarra Biodiversity Corridor***, was developed and is managed by Carbon Neutral and consists of planting native tree and shrub species indigenous to the region on degraded, semi-arid agricultural land that no longer supports viable farming practices. This supplier and project were selected following a shortlisting process involving suppliers and projects in the UK and abroad, and validated in consultation with our independent advisors. Although our preference would be to support projects in the UK, comparable units are in very short supply and currently much more expensive in the UK than abroad.

Assurance
All this means that as of 1st July 2021, Marvellous Maps can correctly claim to be carbon-neutral by removing 500 tonnes of CO2 from the atmosphere, and this removal is proven as being:

- Real (the stated amount of CO2 has actually been removed from the atmosphere),
- Ours to claim (not double-counted or claimed by other parties),
- Additional (the CO2 would otherwise not have been removed had the project not happened),
- Long-lasting* (the locking away of CO2 is guaranteed for 100 years, under the ***100 Year Carbon Covenant***, an 'encumbrance on title' enshrined in Western Australia state law), and
- At very low risk of CO2 removals / storage being reversed or not happening (there is sufficient recourse / insurance in place**).

Notes
* It's important to note that for CO2 removals to be effective and allow a business to claim carbon neutrality, ideally they'd need to be permanent, otherwise the CO2 just goes back into the atmosphere at a later date. Permanent CO2 removal technology is not yet a readily available solution, so the validity of reforestation projects like this one is based on the assumption that by the time the project timeline expires, feasible permanent CO2 removal technology will be in place at sufficient scale. For the avoidance of doubt, this means the best solutions available today may not actually be solutions, merely a bridging mechanism to a longer-term solution that is as yet non-existent and not paid for. Because of this rather important fact, it is vital that businesses focus on reducing their emissions in parallel with seeking to remove their emissions in the 'most permanent' way possible. Following consultation with specialists, we believe that long-lasting forestry projects are currently among the best options for CO2 removal.

** Trees could potentially be damaged and the CO2 released back into the atmosphere, or for some other reason the expected CO2 might not be removed, which is why recourse in the form of insurance is in place. Insurance for tree loss covers defined events (fire, lightning, hail, malicious damage, windstorm) but not disease. The likelihood of disease in a natural forest is extremely low and would be mitigated by geographic diversity. Fire risk is additionally mitigated by geographic diversification and fire management planning. As a last resort, there is mitigation for damage in the form of the ***20% buffer required by Gold Standard***.

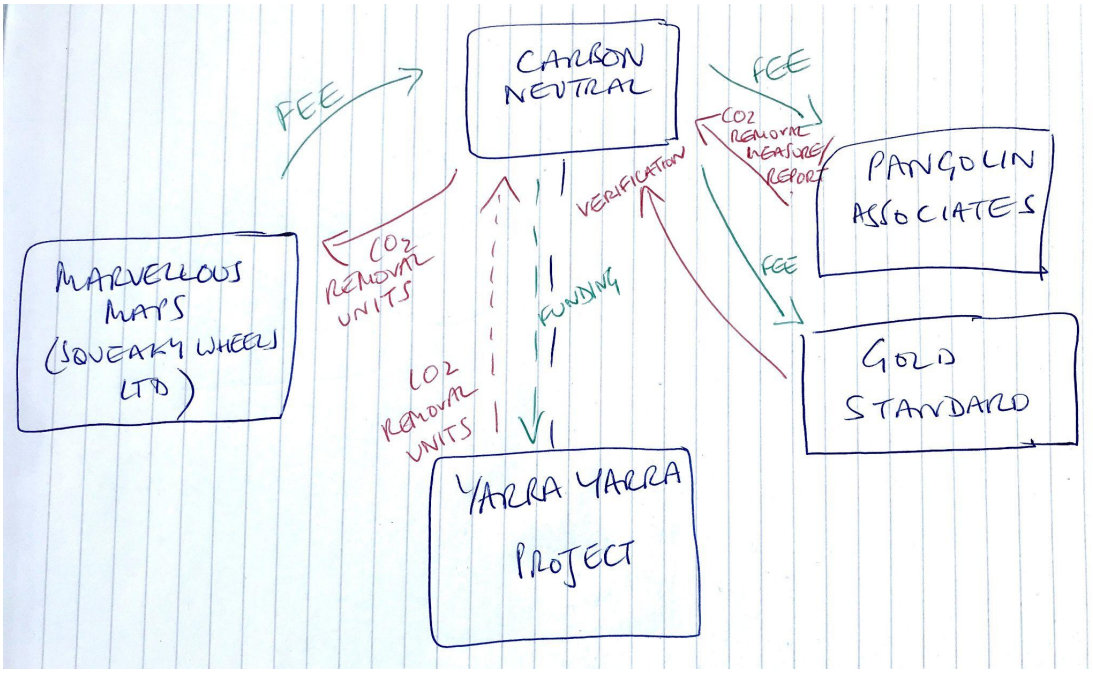
Independent Verification

The project is independently verified as meeting the ***Gold Standard*** (published and administered by the Gold Standard Foundation, a non-profit foundation based in Switzerland). Gold Standard is one of two leading independent standards / standard-setting organisations in relation to the voluntary carbon market (the other being VCS, published and administered by Verra). It's important to note that 'best practice' is still evolving and there may still be some risk associated with this purchase of CO2 removal units, even with such verification in place. A third-party auditor, ***Pangolin Associates*** (appointed by Gold Standard), measures the project's CO2 sequestration at various intervals, which the Gold Standard Foundation then verifies. If the sequestration measurements and growth projections satisfy Gold Standard's verification criteria, they are "issued" to Carbon Neutral as verified units, which are then sold to us and other emitters. Further audits take place at least every 5 years to issue more units and to confirm the expected CO2 sequestration of the existing units actually occurred, or variances reported and addressed.

Documentation

Gold Standard verification is proven via documentation and entries on Gold Standard's registry, where the 500 units are shown as "retired":

- Project documentation ***Australian Yarra Yarra Biodiversity Project (GS3039)***
- The unit reference numbers are:
    - ***GS1-1-AU-GS3039-21-2017-6153-4417-4419*** (3 units)
    - ***GS1-1-AU-GS3039-21-2017-4982-29461-29957*** (497 units)



Offsetting Certificate

This is to certify that

Marvellous Maps

has permanently surrendered

500 tonnes

of

Australian Native Reforestation - Gold Standard VERs
from the *Yarra Yarra Biodiversity Corridor*

Thank you for choosing to make a difference by combating climate change

Ray Wilson | Chief Executive Officer

Issue Date: 8 July 2021 | **Period:** 2014 - 2022 (estimated)

carbonneutral
Turn Emissions into Trees

Encouraging positive social, environmental and economic change with solutions that help overcome the effects of the climate crisis.

Carbon Neutral Pty Ltd is regulated by the Australian Securities and Investments Commission and holds Australian Financial Services Licence Number 451004