



## as a default search engine for UoE

### What is Ecosia?

Ecosia.org is known as a ‘sustainable’ search engine. The profits generated from every search using Ecosia go towards funding 20 tree planting projects across 15 countries. Use of Ecosia has dramatically increased since 2017, with 7 million active users currently. Since they launched in 2009, Ecosia has been responsible for the planting of over 55,000,000 trees, storing approximately 2.5 million tonnes of CO<sub>2</sub>e [1]. The University of Edinburgh (UoE) has set targets for carbon neutrality by 2040 (‘Zero by 2040’), which may be aided by switching to a carbon negative search engine as its default choice.

### Why is it different?

UoE currently has 2 search engine defaults across all internet browsers – Google and Bing. Every search on a search engine can generate revenue from displaying adverts on search results pages. Search engines use this revenue to fund the parent company and their projects. The energy used to power these searches generates CO<sub>2</sub> emissions.

#### Carbon

Both Google and Microsoft (parent company of Bing and Yahoo!) invest in carbon offsets (carbon negative projects to compensate for carbon positive actions) to limit the environmental impact of their businesses, whereas Ecosia invest 80% of their profits into tree planting projects, effectively making Ecosia carbon negative (see **Box 1** below).

#### Box 1 – Carbon emissions

	Annual emissions (tonnes CO <sub>2</sub> e)	Emissions per search (grams CO <sub>2</sub> e)
Google*	+ 6,086,962 (gross) + 3,294,905 (net)	+ 2.64 (gross) + 1.43 (net)
Microsoft**	+ 2,908,411 (gross) 0 (net)	+ 6.30 (gross) 0 (net)
Ecosia***	No data	- 1,042 (gross) - 1,111 (net)

Gross refers to total emissions. Net refers to emissions after carbon offsetting. CO<sub>2</sub>e refers to carbon dioxide equivalent.

\*self-reported data from Google, 2017 [2]

\*\*carbon neutrality was self-reported by Microsoft, 2016 [3] and total emissions reported in [4]

\*\*\*calculated from Microsoft’s emissions and Ecosia’s self-reported carbon storage estimations for emissions per search [1,3,4]

#### Environmental & social

Ecosia’s projects help limit desertification in the

### Key points:

Ecosia is an alternative search engine that uses ad revenue from searches to fund tree planting projects that contribute to the storage of approx. 2.5 million tonnes of CO<sub>2</sub>e.

The UoE could:

- Replace Bing with Ecosia as the default search engine on the browser, Edge
- Trial Ecosia as the default search engine on all browsers
- Offset current search engine emissions with an independent tree planting project

Sahel region; limit the lowering of the water table in Kenya, Uganda, Ghana and Spain; reduce rural poverty in local communities; increase biodiversity by allowing passage of animals along tree corridors through human territories in Madagascar, Brazil and Uganda, and; help educate local communities about the benefits of tree planting [5].

#### Search results

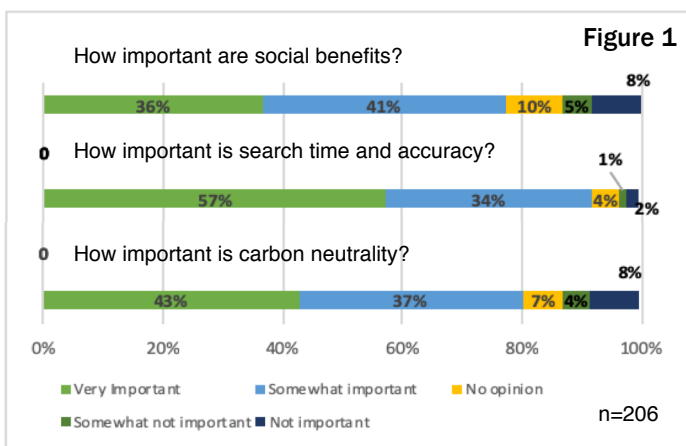
Search engines use machine learning to optimise search results, so the more a search engine is used, the better it becomes. Google processes approx. 73,000 searches every second [2]; Microsoft search engines (Bing and Yahoo!) process 14,000 searches a second [2]; Ecosia processes 47 [1]. Whilst Ecosia uses the same servers as Microsoft - meaning the search results from Ecosia are largely similar to that from a Microsoft search engine - the results are not optimised to the same extent as Bing, Yahoo! or Google. This means it may take longer to find the desired result when using Ecosia compared to its competitors.

#### Survey results

A survey was distributed across staff (18%) and students (82%) at the UoE for 10 days in April 2019. Preferences regarding search engine choice were ranked:

- 88% found search time and accuracy to be ‘somewhat’ or ‘very important’,
- 80% found carbon neutrality at least ‘somewhat important’, and
- 77% found social benefits at least ‘somewhat important’ (see **Figure 1**).





Respondents were also asked to what extent they agreed with the statement ‘Ecosia should be UoEs default search engine’ before and after information about the search engine’s social benefits, carbon neutrality, and search time and accuracy were stated. An 11% reduction in agreement with the statement was seen, suggesting there is a lack of knowledge about Ecosia at UoE and support for making Ecosia the default search engine may change with its usage.

## Policy Recommendations

### 1. Use Ecosia as the default search engine on Edge.

The University of Sussex established the same policy at their campus in September 2018 (see Box 2). There are approximately 10,700 managed Windows 10 PCs across UoE that could use Ecosia as the default search engine in Edge. One search every day on each of these PCs using Ecosia would be responsible for storing more than 4 tonnes of CO<sub>2</sub>e every year. This could help UoE achieve their ‘Zero by 2040’ targets.

Students and staff that wish to use Google, or any other preferred search engine, could still do so by searching within Edge or by using other browsers such as Chrome and Mozilla Firefox, where Google would remain the default search engine.

### 2. Trial Ecosia as the default search engine on all browsers.

The level of disruption to students and staff with a switch to Ecosia across all browsers, replacing Bing and Google, is currently unknown. A trial of Ecosia across all browsers could allow disruptions to be monitored, as well as provide an opportunity to raise awareness of Ecosia’s work. The trial could be initially run in the College of Science and Engineering as 75% of respondents from the College at least ‘agreed’ that Ecosia should be UoEs default search engine by the end

of the survey.

If there is consensus support for Ecosia as the default search engine across all browsers, the trial could be extended indefinitely. If there is a high level of disruption and dissatisfaction reported, the trial can be terminated. The latter would still increase student and staff awareness of Ecosia and could increase personal use of Ecosia.

### Box 2 – University of Sussex

In 2017, students at the University of Sussex (UoS) ran a successful ‘Ecosia on Campus’ campaign. In response to the student-led campaign, UoS set Ecosia as the default search engine in Edge, the default browser on university-managed desktop PCs operating on Windows 10 only, in September 2018. In addition, UoS decided against making Ecosia the default search engine across all browsers as their IT department did not investigate the possible disruptions to study and research at the university with such a change. Since Ecosia was made the default search engine in Edge, UoS have been responsible for the planting of over 8,000 trees (March 2019) [6].

### 3. Offset current emissions with an independent tree planting project.

UoE could explore their own tree planting project to offset emissions from searches using Bing and Google on University-managed PCs. It is not currently possible to accurately quantify these emissions as the number of searches on managed PCs is not measured. Instead, estimations can be made using the average number of searches done on PCs, the ratio of Google users compared to Bing users, and the length of time PCs are in use. The number of trees needed to offset such estimated emissions could be planted in Scotland by collaborating with organisations such as Edinburgh Living Landscape, The Greenspace Trust or The Orchard Project.

### References

- [1] Ecosia Blog, 2018. *What’s the CO<sub>2</sub> impact of an Ecosia search?* Available from: <https://blog.ecosia.org/co2-neutral-search-engine-ecosia-solar-plant/> [Accessed 18/04/2019]
- [2] Google Environmental Report, 2018. Available from: [https://storage.googleapis.com/gweb-sustainability.appspot.com/pdf/Google\\_2018-Environmental-Report.pdf](https://storage.googleapis.com/gweb-sustainability.appspot.com/pdf/Google_2018-Environmental-Report.pdf) [Accessed 12/03/2019]
- [3] Microsoft, 2017. Microsoft pledges to cut carbon emissions by 75 percent by 2030. Available from: <https://blogs.microsoft.com/on-the-issues/2017/11/14/microsoft-pledges-cut-carbon-emissions-75-percent-2030/> [Accessed 12/03/2019]
- [4] Statista, 2017. Greenhouse gas emissions released by Microsoft in FY 2016, by scope. Available from: <https://www.statista.com/statistics/579993/greenhouse-gas-emissions-of-microsoft-by-type/> [Accessed 12/03/2019]
- [5] Ecosia Blog, 2019. *Where, why and how does Ecosia plant trees?* Available from: <https://blog.ecosia.org/where-why-how-does-ecosia-plant-trees/> [Accessed 19/04/2019]
- [6] University of Sussex, 2019. Facebook post. Available from: <https://www.facebook.com/uniofsussex/posts/10158152581766754> [Accessed 19/04/2019]

