

## Estimate Robert Gordon University's Scope Three Emissions by Nearest Neighbor Analysis

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**Abstract :** The Scottish Higher Education Institutes must report their scope 1 & 2 emissions, whereas reporting scope 3 is optional. Scope 3 is indirect emissions which embodies a significant component of total carbon footprint and therefore it is important to record, measure and report it accurately. Robert Gordon University (RGU) reported only business travel, grid transmission and distribution, water supply and transport, and recycling scope 3 emissions. This study estimates the RGUs total scope 3 emissions by comparing it with a similar HEI in scale. The scope 3 emission reporting of sixteen Scottish HEI was studied. Glasgow Caledonian University was identified as the nearest neighbour by comparing its students' full time equivalent, staff full time equivalent, research-teaching split, budget, and foundation year. Apart from the peer, data was also collected from the Higher Education Statistics Agency database. RGU reported emissions from business travel, grid transmission and distribution, water supply, and transport and recycling. This study estimated RGUs scope 3 emissions from procurement, student-staff commute, and international student trip. The result showed that RGU covered only 11% of the scope 3 emissions. The major contributor to scope 3 emissions were procurement (48%), student commute (21%), international student trip (16%), and staff commute (4%). The estimated scope 3 emission was more than 14 times the reported emissions. This study has shown the relative importance of each scope 3 emissions source, which gives a guideline for the HEIs, on where to focus their attention to capture maximum scope 3 emissions. Moreover, it has demonstrated that it is possible to estimate the scope 3 emissions with limited data.

**Keywords :** HEI, university, emission calculations, scope 3 emissions, emissions reporting

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