



# **Socio-Economic Evaluation of Diamond Light Source**

2024 update

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## About Diamond

Diamond Light Source is the UK's national synchrotron serving scientists and researchers from around the world. Diamond provides academic and industry researchers access to facilities that enable world-changing science.

Diamond operates a particle accelerator 561.6m in circumference with highly specialised scientific instruments including 35 beamlines, 9<sup>1</sup> electron microscopes and a range of offline facilities.

Over 820 staff are employed by Diamond and each year around 3,600 academic researchers actively investigate some of the most challenging scientific questions of our time.

In total, the Diamond user community is around 18,000 strong<sup>2</sup>.

250 companies have used Diamond for their research and development since the start of operation – via the proprietary access routes.

Since 2020, more than 27,500 people have participated in or attended one of over 440 events and visits hosted by Diamond.

Diamond ran over 110 training events and conferences between 2020 and 2024<sup>3</sup> and hosted engineering apprenticeships, summer placement students, as well as year in industry students.

Diamond has part-funded over 310 PhD students to date.

## Outputs

Around 14,000 research articles have been published in peer reviewed journals from 2007 until November 2024 and almost 79% of the articles in the Diamond publications database are open access.

More than 1 in 10 Diamond publications has been cited by a patent, with a total patent citation count of 8,759.

As of November 2024, over 15,510 structures have been deposited into the worldwide Protein Data Bank since 2007.

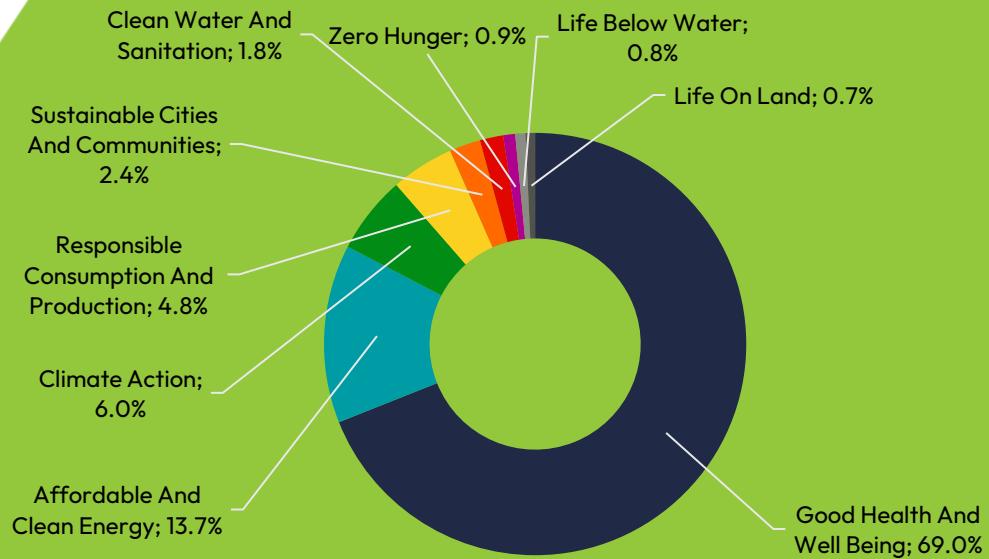
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<sup>1</sup> 11 in total when counting EM dedicated to industry and sample preparation

<sup>2</sup> User community is defined as individuals who have used or been interested in using the infrastructure in the past 10 years

<sup>3</sup> Between financial years 2020/21 and 2023/24

## Diamond research output by SDG



UN sustainability goals classification for 9,464 journal articles, according to Web of Science. A paper may be tagged with more than one goal. The other 4,220 papers are not classified.

## Outcomes and Impacts

The publications output is estimated to be worth £985m based on opportunity cost of time spent on the research. The Protein Data Bank depositions are estimated to be worth £1.1bn based on the cost to replicate the entries.

The direct benefits to the users are estimated to be worth £867m, based on the fees that users are willing to pay for time and services provided via the proprietary access route.

Other monetised benefits from 2007 to 2024<sup>4</sup> include:

- value of training and workshops (£8.8m),
- value of software produced (£51m), industrial income (£31m),
- contribution to the value of patents (£103m) and
- direct net economic impact from expenditure (£63.1m).

## The cumulative monetised impact of Diamond is estimated to be at least £3.2bn

<sup>4</sup> up to financial year 2023/24

## Case Studies

### Academic

Professor Alberto Saiani's (University of Manchester) research focuses on the characterisation of molecular materials across length scales with his particular interest being the study of the correlations between chemical architecture, structure/morphology and physical properties in complex polymeric systems. The Diamond-based research included examining the self-assembly of short peptides into fibres and their subsequent hydrogelation. Diamond has helped in developing the fundamental knowledge allowing the precise design of these materials that resulted in the establishment of Manchester BIOGEL™, a start-up company that offers engineered, self-assembling peptide hydrogels for use in biomedical applications.

The Mary Rose was a Tudor warship that sank in the waters of the Solent in 1545. In 1982, archaeologists raised the wreckage from the seabed and since then, there have been considerable efforts to conserve both the ship and artefacts from it. Diamond has hosted several research projects centred on determining the effectiveness of various conservation efforts, and their suitability for continued use, both in relation to the Mary Rose and its study of the corrosion profiles of cannon balls and with other UK heritage assets.

### Industry

Johnson Matthey is a multinational company, headquartered in the UK, that specialises in chemicals and sustainable technologies. As part of their materials characterisation activities, Johnson Matthey utilised a range of different methods and techniques at Diamond, including the imaging facilities. The company used Diamond as a key part of their characterisation capabilities, particularly for energy materials and catalysts, providing unique capabilities they cannot access anywhere else. Diamond's value for Johnson Matthey is visibly reflected by the signing of a new collaboration agreement signed in December 2023 which will continue to strengthen links between Diamond and industry, building technical capability to support sustainable technology development.

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