

Powering industry innovation

Our impact
Highlights from the Hartree Centre Phase 1 & 2 baseline impact evaluation



To access the full public impact evaluation report detailing the findings and methodology visit www.hartree.stfc.ac.uk/impact or call 01925 603708

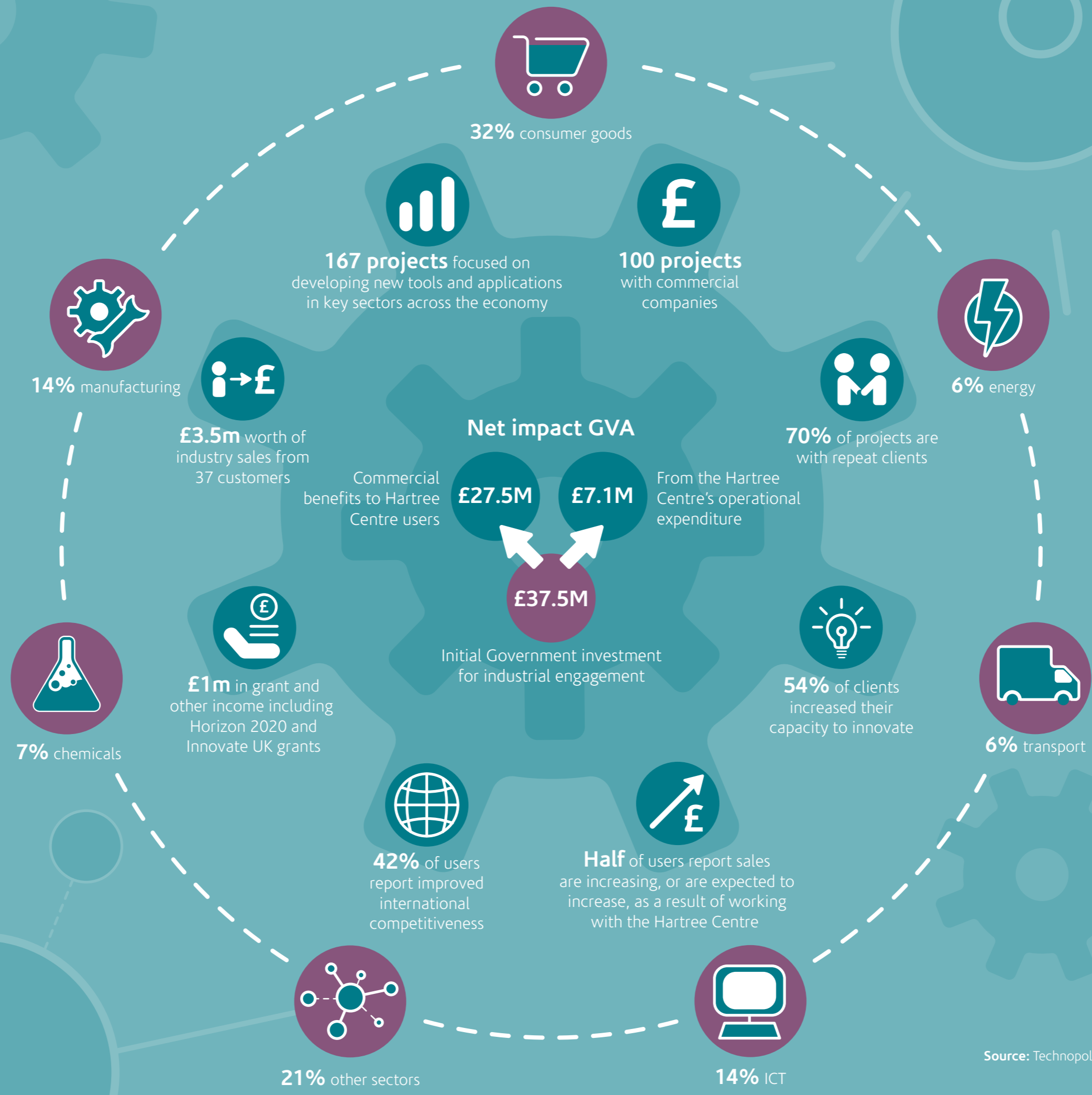
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Hartree Centre – Impact from phase 1 & 2



Source: Technopolis, 2018

Training & skills

Cutting-edge training and skills development

93% of users increased understanding of the value of HPC

85% of users reported an increased use of HPC capabilities in their organisation

In our first four years we organised, hosted or contributed expertise to:

130

training courses and skills development activities

In 2016:

30

We held 30 events

950

With around 950 attendees

3,760

Totalling 3,760 training days

£1m+

With an estimated market value equivalent of £1m+

Our mission:

To transform the competitiveness of UK industry by accelerating the adoption of high performance computing (HPC), big data and cognitive technologies.

At the Hartree Centre, we combine world-class facilities and technologies with specialist technical expertise which go far beyond anything the market will provide.

With our primary role being industrial engagement, we are enabling businesses to take advantage of the innovative opportunities provided by emerging digital technologies - supporting the realisation of the Government's Industrial Strategy.



Digital transformation through collaboration

At the Hartree Centre, we use HPC, big data and cognitive technologies to transform UK industry.

It has been an exhilarating first few years for us. We have grown quickly and delivered an exciting array of projects thanks to Government investment, our excellent people and strong partnerships with industry and academia.

In 2017, we commissioned the Technopolis Group to carry out an independent baseline impact evaluation of our first four years of operation (2013-2017) to explore the early benefits to UK industry and the economy.

This document summarises some findings from this report, focusing on our impact before the start of our cognitive programmes in partnership with IBM Research; Innovation Return on Investment (IROR) and the Cognitive Accelerator.



Powering productivity for the UK economy

In the first four years of our operations we **delivered over 160 research projects with more than 60 collaborators.**

These projects spanned most sectors of the economy in areas such as FMCGs, manufacturing, chemicals and transport.

Around **100** of these were with **commercial organisations** including SMEs such as Global-365 and Zenotech, as well as some of the largest UK companies such as Unilever, Dyson, GlaxoSmithKline (GSK) and Rolls-Royce.

It is estimated that our direct work with industry will generate a total net impact (GVA) of up to **£27.5M in commercial benefits** to our users, in addition to a **£7.1M** net impact from our **operational expenditure** during our first four years.

This impact to industry is a conservative estimate, and with more partners able to value the contribution of the centre in the future, we expect this to increase.

With total economic impact already close to £37.5M initial investment in the Centre, the report states that these are "strong results for what is a young and relatively small centre of excellence."

The full benefits of early projects are still working their way through the system and "as interactions with businesses mature, with more joint projects and more time elapsed, we expect an even greater proportion to report positive commercial results."

This will increase again as our IROR programme gathers pace and those projects also start producing commercial impact.

Case study

Rolls-Royce worked with us to update its in-house engineering design software, accelerating run-times and bringing it a step closer to virtual 'whole-engine design'.



An innovation boost for UK industry

We are the only UK facility dedicated to boosting industry capabilities through HPC, big data and cognitive computing.

We provide access to emerging technologies, internationally renowned expertise, training and skills programmes and consultancy services to help our clients gain an edge over their competitors.

Half of those consulted have seen or expect to see an **increase in their sales** as a result of working with us. We are also making strong positive contributions to the **innovative capacity, reputation** and **international competitiveness** of our clients and users.

From healthcare apps to monitoring systems for road and rail bridges, we have enabled clients to develop or **improve products** and services, bringing their innovations to **market quicker.**

Case study

An SME in the HPC services sector estimates that its work with us has added around £150K to its bottom line

Case study

Unilever's packaging team estimates that digital product design has the potential to cut innovation process costs by up to 65% and reduce the time to market by up to 50%.

By slashing run-times for even the most complex simulations from weeks to days or hours, we are helping Unilever to optimise the whole packaging design process. This accelerates decision making and improves sustainability by reducing the need for physical testing.

Case study

Working with us as part of the Sci-Tech Daresbury campus eco-system, SME WaveReach has sped-up prototype development through access to collaborative opportunities and equipment that would otherwise have been unaffordable.



From research to revolution

Our clients include leading industry players and start-ups working on the 'next big thing' as well as members of the UK and international research community.

The impact evaluation revealed that a high majority of academics considered partnering with the Hartree Centre as positive. The reported beneficial effects included **improved analytical techniques, domain knowledge** and **research quality.**

We have collaborated with partners to **win additional funding** for research projects from the EU Horizon 2020 programme, Innovate UK and UK Research and Innovation councils.

We also carry out in-house research projects into the **development of next-generation HPC and digital tools**, to equip our staff with emerging skills, improve our services to industry and contribute to the HPC sector.

Case study

University College London has collaborated with us in implementing a high-throughput molecular simulation system, using the power of HPC to accurately determine biochemical properties within clinically relevant timescales

Supporting society as well as business

Although our mission is focused on industrial competitiveness, we also carry out **important work** with **public agencies** and institutions on projects that have **wider benefits to society.** We have also recycled and repurposed our older machines to benefit wider UK research in other areas.

Case study

We helped Atkins to optimise their road traffic simulation modelling software. This enables it to run simulations and provide the results to their clients in a few minutes instead of days.

This work has enabled Highways England to gain insights into the economic impact of their infrastructure investments.

Case study

In collaboration with the Met Office and NERC, we are supporting the design and build of a next-generation weather and climate prediction model which will aid advanced preparation and contingency planning in the UK.

Championing HPC skills and capabilities

We believe organisations thrive by **bridging skills gaps** and **overcoming innovation challenges.**

Through our collaborative projects and services we deliver substantial **knowledge transfer** and **skills development** opportunities.

We share our knowledge and expertise with clients to **build in-house capabilities**, for example by hosting post docs or providing one-to-one training. Clients find this invaluable, with the majority reporting that working with us increases knowledge of advanced data science techniques and improves modelling and simulation capabilities.

As part of our wider commitment to **raise awareness about the potential of HPC** and to **build technical competencies** by training the next generation of computing specialists, we host or contribute to a wide range of courses, events and workshops.

In our first four years we contributed to **130+ specialist training courses and skills development opportunities.** In 2016, around **950 people benefitted from 30+ in-house events**, resulting in an estimated training benefit to attendees of **£1M+.**

Case study

Infineum has paid for a post-doc at the Hartree Centre for 18 months to develop and internalise modelling capability and expertise within their own company.

Leading the big data and cognitive revolution

The future global competitiveness of UK industry and research relies on **applying transformative digital tools** such as cognitive computing or artificial intelligence to complex business and societal challenges.

Our IROR and Cognitive Accelerator programmes are applying and developing these tools, and associated enabling technologies, across life sciences, engineering, manufacturing and chemistry and materials.

Delivered in partnership as part of a **strategic collaboration with IBM** Research – and backed by £115.5M of Government funding – a range of exciting projects are underway and are set to deliver even more productivity benefits to UK industry.

Case study

Our Cognitive Accelerator programme is working with Alder Hey Children's Hospital to develop a new app and chatbot service. We are using the latest cognitive computing technologies to predict and answer questions from patients and families. This reduces stress for parents and children and frees up essential clinician time. We are hoping to roll out the service to other hospitals in the future.

Watch this space!