Briefing - COVID-19 immediate impact on R&D-intensive businesses

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A knowledge economy remains the best strategy for future prosperity. Whatever happens in the coming months, R&D will have an important role to play in the UK's future, both in responding to upcoming challenges of the COVID-19 pandemic but also in driving the economic recovery and building back better. The pandemic has rapidly altered the business environment in which large engineering R&D intensive businesses operate. These businesses form a crucial part of the UK's R&D ecosystem.

In light of the COVID-19 pandemic the Academy conducted a rapid evidence gathering exercise at the end of April 2020 with 25 representatives from a range of sectors and large multinational engineering R&D-intensive businesses, including from electronics, automotive, aerospace, manufacturing, food and retail, energy and pharmaceuticals.[1] This note is a rapid summary of its findings. The ideas and suggestions included in this document have been gathered from discussion with stakeholders. It is not formal Academy guidance.

Business R&D is at immediate risk. Reducing or outright halting R&D activities is one of the first cost-saving measures businesses are taking amidst falling demand and cash flow difficulties. However, R&D is recognised by businesses as part of the solution for recovery. For many industries, recovery will not mean returning to pre-pandemic business as usual, instead they will require innovation to survive and adapt to the 'new normal' with different ways of working and dramatically changed consumer demand. To build back better and competitively, helping businesses continue R&D currently where they can is essential. The UK needs to ensure that businesses that halted their R&D activities as an initial crisis response have capacity and capability to progress R&D activities in the UK and reposition themselves in a reformed global market.

Severity of immediate impact depends on cash flow and sector

- The severity of impact depends on the cash flow of the company. Factors such as cash reserves and changes in market demand are key and impact will vary across sectors. For example, automotive and aerospace are seeing plummeting demand.
- Some companies have adapted relatively well to remote working and are currently adapting physical workspaces such as factories to enable socially distanced work, for example putting up plastic screens, introducing one-way systems and closing communal spaces. This is especially true of highly digitalised companies, including in manufacturing.
- However in engineering, only so much activity can be done remotely. In many cases, physical presence on site or collaborative work in person is necessary, for example support and service engineering visits or R&D in labs.

[1] A notable gap in the evidence base currently is representation from the construction sector.

- The pharmaceutical sector is in a very different position and is currently experiencing high demand. It is well placed to continue work with existing sterile facilities and common use of PPE. However, all non-COVID related work has stopped, especially any activity reliant on access to the NHS and hospitals.
- Many companies have furloughed a significant proportion of their staff, with redundancies thought inevitable in the future. This view was prevalent in sectors such as automotive and aerospace, where demand has plummeted, and staff conducting non-COVID related work have been furloughed to reduce costs as much as possible.

Business support measures are helpful but gaps remain that may slow the recovery

- The business support measures announced by the government are very welcome. The furlough scheme in particular was described as having huge impact on the immediate cash flow challenges facing businesses.
- Loans at this uncertain time are challenging and may raise difficult choices in the coming year.

Sectoral differences will influence the route to recovery

- Some sectors, especially transport, are expecting their market and world to look very different post-pandemic and are considering how to best adapt.
- The workforce demographics will also impact sectors' ability to restart. For example, in the energy sector, staff, especially experienced staff, are often older and may be required to shield for longer.
- For pharmaceutical and healthcare technologies the recovery of the NHS and healthcare systems and a rapid restart of clinical trials will be important, especially to those specialised companies focused on vaccines and therapeutics unrelated to COVID-19.

The resilience of supply chains and SMEs was viewed as crucial to restarting the economy

- The state of supply chains is an important element affecting companies now and when they restart activity. In some sectors, especially, but not only, automotive, construction and energy, there are concerns about the impacts of the pandemic on fragmented or complex supply chains of SMEs or imported materials, and potential knock-on effects.
- Companies faced with rebuilding their supply chain are likely to be delayed or impeded in their return to full operation and performance. SMEs often provide specialist services, which may not be straightforward to bring in-house or find another provider for.

"We do a significant amount of work with small and medium size enterprises and there is the potential for a number of these to be unable to survive a prolonged downturn, particularly if innovation and R&D budgets are cut in the medium term."

"I think the ecosystem of subcontractors in UK may not fully recover due to some older staff bringing forward retirements and closing their businesses. We are particularly dependent of subcontractors for very small batch work. Bringing this in house will require a little investment but additional space that we now do not have due to spacing out all activities for social distancing."

Immediate impacts on R&D and innovation activity

R&D and innovation activities have decreased

- R&D activity is a function of the current business environment, especially as it is often financed through the sales and profits of a company. Therefore, in the immediate crisis, R&D is not a priority unless in direct response to the pandemic, and in many cases has stopped. Company boards are focused on managing cash flow, where R&D budgets are at risk in cost-saving measures.
- There will be lost and delayed R&D outputs from the pause in work, as well as reprioritisation of work as cost-saving measures are brought in. The risk of continued downturn in R&D activity is high as companies develop recovery plans, especially in sectors where demand and sales may remain low.
- The appetite for more innovative projects will likely reduce significantly, as companies focus on short-term and safer return on investment.
- Looking at the R&D pipeline, from idea to commercial product, the projects most at risk are those in the middle of the pipeline (TRL3 to TRL6: from proof of concept through the prototype and demonstration stages). Early stage is more likely to continue (often in partnership with universities when reopened), as will projects nearer commercialisation. The middle of the pipeline, which is costly and high risk, is a prime candidate for budget savings. This could result in the loss of the expected benefits from investment in the earlier stages of R&D for those projects and a drop in innovative outputs and competitivity in the coming years as planned projects do not reach maturity.

Publicly funded R&D projects are at risk

- Publicly funded projects unable to continue due to lockdown measures are at risk of non- or partial completion.
- Some companies risk being unable to continue currently funded projects or start new projects due to match funding requirements. Cash flow may be further impacted in a year when loan repayments are due to start – some of the most difficult decisions may take place then.
- Competing globally: one company described being approached with offers of support from China to open manufacturing and R&D facilities. Singapore is offering to defer costs for a year. EU and Horizon 2020 funding is viewed as flexible on timescales and secure.

"Allowing companies to claim 100% of their costs for a period while keeping to the overall final budgets at the end of their projects as agreed at the outset. My understanding is that this could make a very significant difference in keeping R&D activity underway and supporting the necessary infrastructures and people until we get back to a situation where normal business practices can resume. In my view, this is the most important single action that could be taken to ensure we continue to execute R&D in the UK."

University-industry collaboration

- The sustainability and success of UK universities is crucial to industry R&D and innovation activities. Extended closure or risk of failure of universities will result in both lost R&D capability in the UK and negative impact on hiring. Industry sponsored R&D in universities is often not replicated within the business.
- Many R&D intensive companies have spent years building close and strategic partnerships with universities. They are particularly keen to find the skilled people they work with still in place when the pandemic is over and CR&D picks back up. However, the prevalence of short-term contracts in academia and financial challenges facing universities and companies are increasing the risk of erosion of talent as these people will no longer be in university posts after their current contracts end.
- One company described halting their R&D activity, including pausing collaborative projects with universities. Even if the university team is able to continue work, this is still creating a resource gap and barriers for knowledge transfer.
- Studentships may be at risk of industry partners withdrawing. Individual studentships are not costly, but funding hundreds is.
- Some companies have increased collaboration with universities, either on work responding to the pandemic or assisting universities with cost savings, for example energy efficiency.
- Industry financial contributions to university research may become increasingly challenging to leverage, however it will be important to continue getting industry steer, support, and knowledge exchange regardless.

"Studentships are at risk of industry partners withdrawing funding and not being able to complete – universities are unlikely to have bridging funding on the scale needed with their other revenue also at risk, UKRI support is so far limited to final year students and only those directly funded by UKRI."

"We are aware of public announcement regarding the difficulties being faced by universities in the UK, and hope and trust that the UK government will not allow these capabilities to be damaged."

R&D can deliver a better and faster recovery

"The other history lesson I have learned is that dramatic changes can help opportunists. And I mean 'opportunists' in the nicest way. It's a time for taking some risks in a changing world."

"Next year is where deferred and delayed work may really cause difficult decisions to be made, because this cost will be in addition to the planned costs. A range of government incentives will be required for business to prioritise R&D over survival."

- The downtime, for those companies who can afford it, is an opportunity to develop ideas for innovation. One company, for example, described running internal innovation challenges during the current downtime and proposal scoping for upcoming funding calls. It was noted that companies who have continued R&D activity during economic downturns in the past have then been much better placed to recover.