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## STEM FOR BRITAIN 2023



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John Deehan Photography

### 3) Empower local authorities

- Establish long-term policy objectives and instruments, and devolve statutory powers and resources.
- Build capacity through investing in local authority skills and expertise.
- Embed net-zero and equity principles into evaluation of all local and regional public expenditure.

### 4) Build the industry

- Support people getting into the industry and the industry in growing, e.g., funding for training, incentives for employers, develop peer networks.

- Professionalise vocational education and maintain continuous education capacity, and formalise regulation to make specific qualifications a required prerequisite.
- Provide long term, evidence backed, and non-competitive funding to develop long-term markets and incentivise industry development.

#### References

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- 3 <https://eciu.net/media/press-releases/2022/poland-estonia-among-states-beating-uk-at-heat-pumps-leaving-us-20-more-dependent-on-gas-imports>
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# THE OTHER PROBLEM WITH TECH TRANSFER



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There has been increasing discussion around problems with the transfer of technology from universities, and in particular with the spin-out process. The process is often very slow, with negotiations around terms such as the equity stake taken by the university sometimes causing investors to walk away, founders to get frustrated, and companies struggle to get off of the ground.

This process will be looked at in the review recently commissioned by the Treasury, and headed up by Professor Irene Tracey and Dr Andrew Williamson. This is the bit everyone talks about.

But this is a downstream problem of a potentially more impactful upstream bottle-neck – capturing much more of the innovation from the labs in our universities for wider societal benefit.

The current academic mind-set focuses on a drive to publish research to meet targets/career goals, rather than thinking “*what does my research mean in a wider context? What could we (society) actually do with it?*” i.e. thinking *inventively*. If we can shift this mindset and back it up with better education around what it actually takes to get that idea to have a real-world impact I’m confident we will find we have so much more in our universities that our world desperately needs and that will push our science-superpower status.

## WHAT’S THE PROBLEM? WE ARE GREAT AT RESEARCH!

We all know that the UK is great at research. After all, we have three universities ranked in the top 10 across the entire world<sup>1</sup>.

But what does that mean?

This means that we are good at getting research into scientific journals, and are good at getting those articles cited by others.

Doing good science and disseminating it to the scientific community is a good thing. Tick.

What it does **not** mean is that we are good at doing something with that research.

What impact does publishing research in an obscure journal have on the lives of people in the UK, or for net zero and the planet?

Very little. The main impact it has is to increase some academic’s publication record.

There is, in most cases, no real, meaningful impact that comes from simply publishing research – a real-world dead end. Which is a shame, since I believe most people go into research to



“make a difference”. But because many academic researchers have known nothing but academia, there is a general lack of understanding as to how that difference gets made.

I was in a similar position, having been in academic research until I was 33. I used to think that if I publish my work perhaps someone will one day read it and turn it into a cure for cancer, or the like. I’m not sure who I thought these people would be, or what their motivation would be. It was only until I left academia and stepped into the real world – the world where products do get made and things do get done – that I realised how naïve that notion was.

The way we do get real-world impact is by thinking about this research in commercial terms – something very alien and even abhorrent to the vast majority of academics – but something I believe we need to put much more emphasis on if we are to really make the most of our “research excellence”.

But where do you start? There is little perceived benefit to most academics (particularly those with an established presence) to think about approaching the technology transfer office with their idea. The entire academic career path is built around publishing in the highest impact factor journal you can, getting the next grant, and doing (or getting your PhD students and postdocs to do) the research you said you were going to do.

We don’t want to stop our academics from publishing their research, but if we want to capture innovations for society we do need to make sure they think of any commercial uses before they do publish. This is because, simply put, you can’t protect something with a patent if you’ve published it before you

file a patent application. You can publish the day after you file a patent application – but not the other way round. I have seen many instances of people getting this the wrong way round, scuppering what could be promising technologies for UK PLC to exploit.

## WHY DOES THIS MATTER?

Simply put – money makes the world go round. For a lot of technology sectors, particularly in biotechnology and the life sciences, a huge amount of time, money and effort is needed to develop an idea from basic research into a marketable product. That money needs to come from somewhere – typically, at some stage, from investors, and investors need a return to provide to their own investors in due course.

The key to all of this working is *exclusivity*. For a spin-out/start-up to secure that investment to turn the research into a real-world product or service, they will essentially need to be able to show investors that they can stop people copying them. Investors are not going to give you cash to perfect the development of a product, or new drug, only to have someone else copy it and likely undercut you. And to get this exclusivity you generally need a patent.

This simple fact is not something that academics tend to pick up on the degree/PhD/postdoc treadmill. With heads down, focussed on the research, there is often a scornful view of those that do think about patenting their research – it doesn’t “fit” with the academic ethos. Those leaving the academic system can be seen as failed-academics (and those of us leaving the system truly feel that way, until we are able to shake it off).

This needs to be widely challenged and a dose of reality injected into the system. Most researchers do want their work to make an impact and I would suggest that there should be an obligation on researchers to consider the potential impact of their work – particularly since the academic system is largely funded using public money.

There has been public uproar around aspects of the COVID vaccines being funded by public money turning a profit for commercial entities – but where is the uproar around publicly funded research just quietly finding a dead-end in the pages of a scientific journal?

## SO, WHAT DO WE DO?

We need to improve education around the benefits of commercialising research, and we need to target this to the PhD students and postdocs. Established academics, who already have their own labs are, in my experience, less inclined to change their ways. If there is hope, it lies in the early career researchers – not least because spinning out their own company is a likely more viable career option that to keep running on the academic treadmill.

We also need to fund the TTOs properly so that they can take a more proactive approach in identifying commercial opportunities that are hiding in the labs. In my experience, most TTOs are doing an amazing job, with not enough staff and not enough funds. This means that they generally aren’t able to go out into the different laboratories in the universities and spend time with the scientists, discuss their research and try to “invention spot”. At present, the few spin-outs we do see have typically come from the academic themselves realising they may have something useful. As we’ve just

covered, those are few and far between – what else can we unearth if we actually go and look? Anecdotally, the one instance I know of where a TTO approached a lab directly, resulted in a spin-out.

So - increasing education of the academics, with a focus on early career researchers, and a proactive approach from the TTO can help in that first step of realising that there may be something really useful coming out of a particular bit of research. Then we need to work on the bit that everyone talks about!

The current academic system does not work – for many reasons outside of the scope of this article.

We can’t afford to be precious about this. We can’t afford to pander to established but outdated ideals.

A recent quote in the Sunday Times from Steve Bates, CEO of the UK Bioindustry Association sums it up “We will fulfil our potential when having a failed biotech company on your CV is as valued in an academic career as a paper in Nature”.<sup>2</sup>

## References

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