Tier 2 review

Response to the Migration Advisory Committee by the Campaign for Science and Engineering (CaSE). 24 September 2015

Summary of key points

- Science and engineering is a central pillar of the UK economy and delivers great social, cultural, and health benefits. The Government has put science and investment at the heart of its long-term economic plan to rebalance the economy and raise productivity but to realise this potential the UK's immigration policies must complement the wider Government's strategy.
- Science and engineering are international endeavours and immigration brings great benefits to both academic and industry sectors, such as increasing collaboration and knowledge exchange, providing new perspectives in problem solving, and opening up new business opportunities. Immigration is therefore an integral and essential part of UK science and engineering excellence.
- Immigration is inherently necessary in science and engineering but skills shortages also create further need for the freedom to bring in skilled workers from abroad. The UK has a long-standing Science, Technology, Engineering, and Maths (STEM) skills shortage and although progress is being made to fill the pipeline of new workers, the shortage will take many years to be solved. Skilled immigrants will contribute to a longer-term up-skilling of the UK population as they pass on their skills and knowledge to students, trainees, and other workers.
- Current immigration policies, including the Government's anti-immigration rhetoric, are actively discouraging talented scientists and engineers from coming to the UK; this is undermining the UK's world-leading research base, restricting business and discouraging investment, and risking economic growth. As a result, the current immigration policies and those proposed in the Tier 2 review are at odds with wider Government policy.
- The Government must better align immigration policy with its wider economic strategies and promote the UK as a welcoming place to learn, earn, and contribute to our world-leading science and engineering base.
- The visa system requires refinement to support the academic and industry science and engineering sectors. Improvements include abolishing the Tier 2 cap, increasing the flexibility of the RLMT, accounting for the relative low salaries of scientists and engineers, bi-monthly awards of Certificates of Sponsorship, and recognition of the international work requirements of researchers. A full list of

Introduction

CaSE is the UK's leading independent advocacy group for science and engineering, funded by over 800 individual and over 100 organisational members. We are a non-partisan, united voice for the sector into Government and Parliament bringing together industry, research charities, universities, professional bodies, and individual scientists and engineers. Collectively our members employ 350,000 people in the UK, and our industry and charity members invest around £19.3 billion a year in R&D globally[1].

CaSE welcomes the opportunity to feed into this inquiry to reflect the views of the science and engineering community covering academia and industry. Our community relies on immigration to stay at the cutting edge of global research and innovation. In June 2015, CaSE embarked on a major project to assess the impact of immigration and the Government's immigration policies on UK science and engineering. The project involved a comprehensive review of the published literature, one-to-one interviews with science and engineering organisations from the public, private, and charity sectors, a call for evidence which attracted over 100 responses from organisations and individuals, and two stakeholder opinion forums. This submission represents an interim report of the project's findings, conclusions, and recommendations. A final report will be published by the end of the year.

CaSE's work is examining the whole immigration system, however, this response will focus on areas relevant to Tier 2. It provides background on why skilled immigration is essential to UK science and engineering excellence, details some of the current concerns of our community in relation to Tier 2, and makes policy recommendations that will better align immigration policy with the Government's wider priorities to raise productivity and grow the economy.

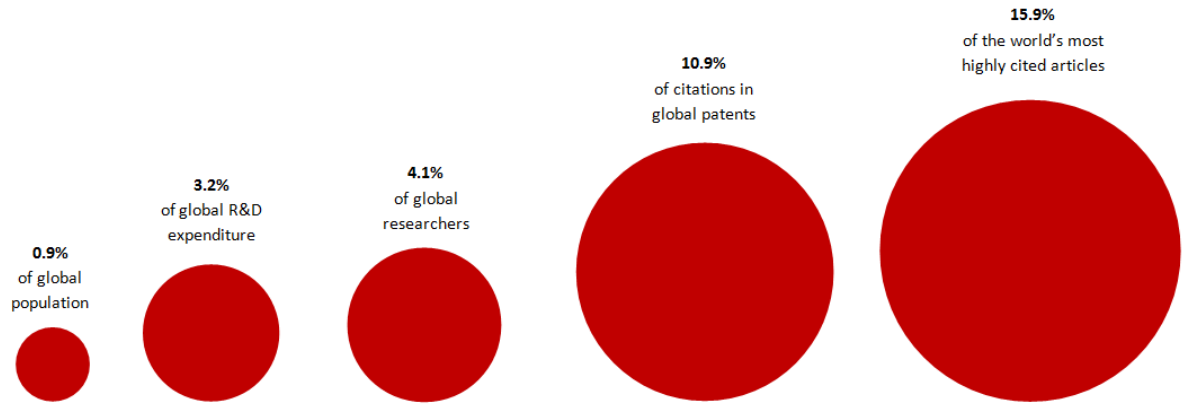
The importance of immigration to the UK economy

The UK is a world-leader in science and engineering

The UK has a long and proud history in science and engineering excellence. We invented the steam engine, created the first vaccine, and discovered graphene. Science and engineering have transformed the way we live and underpinned our fastest period of economic growth in recorded history.

With only 3% of global R&D funding and 4% of the world's researchers, the UK research base is responsible for 11% of citations in patents worldwide and 16% of the most highly-cited academic papers[2]. The UK is also ranked 2nd globally for the quality of its scientific institutions[3].

[1] Calculated using data from the latest year available from CaSE members. This is likely to be an under-estimate as data was not available for all members.
[2] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/263729/bis-13-1297-international-comparative-performance-of-the-UK-research-base-2013.pdf
[3] http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2014-15.pdf



Today, the UK's world-leading science and engineering base makes an irreplaceable contribution to our economic, social, and cultural well-being and our health. Working together across the full spectrum of disciplines, UK researchers in academia and industry address the major national and global challenges of our time – from sustainable economic development to healthy ageing, from space travel to climate change. Beyond research, scientists and engineers manufacture high-value products and build essential infrastructure. This international excellence brings financial rewards for the UK. The R&D-intensive aerospace and pharmaceutical industries, for example, generated a trade surplus of over £5 billion and £3 billion respectively in 2013[4,5]. And the higher education sector, where a large proportion of publically-funded basic research is performed, generated over £73 billion of output and contributed 2.8% of UK GDP in 2011/12[6].

In an increasingly competitive global economy, R&D will be the driver of future innovation, productivity gains, and high-value job creation. Analysis by the Department for Business Innovation and Skills shows that Germany and the United States, which both have high-levels of R&D intensity as shown by investment, have higher labour productivity levels and their businesses have a higher proportion of turnover based on new-to-market innovations[7]. Furthermore, British firms that conduct R&D are 13% more productive than those that do not perform R&D[8].

For these reasons the Coalition Government of the 2010-15 Parliament put science at the heart of its long-term economic plan[9]. It is now also a central strand to the current Government's Productivity Plan[10]. But for the potential of UK science and engineering to be realised, policies across all departments must be coordinated to support the overarching mission of nurturing and growing the

[4] http://www.ons.gov.uk/ons/rel/uncategorised/summary/changing-shape-of-uk-manufacturing---aerospace/sty-uk-aerospace-industry.html
[5] http://www.abpi.org.uk/our-work/library/industry/Pages/310114.aspx
[6] http://www.universitiesuk.ac.uk/highereducation/Documents/2014/TheImpactOfUniversitiesOnTheUkEconomy.pdf
[7] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/277043/bis-14-544an-insights-from-international-benchmarking-of-the-UK-science-and-innovation-system-annexes-bis-analysis-paper-03.pdf
[8] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/293635/bis-14-p188-innovation-report-2014-revised.pdf
[9] https://www.gov.uk/government/publications/our-plan-for-growth-science-and-innovation
[10] https://www.gov.uk/government/publications/fixing-the-foundations-creating-a-more-prosperous-nation

science and engineering base. Nowhere is this more obvious than workforce skills, a policy area where there is major overlap between the Department for Business Innovation and Skills, the Department for Education, and the Home Office. Synergy is required to ensure that the UK has the most competitive science and engineering workforce in the world to create the UK's future prosperity through R&D and high-value manufacturing. Unfortunately, economic growth policy and immigration policy appear not to be aligned as well as they could be. In fact, immigration policy is actively discouraging the talented scientists and engineers that our economy needs from coming to the UK. This review by the Migration Advisory Committee is an opportunity to improve on this position.

International migration is integral to science and engineering

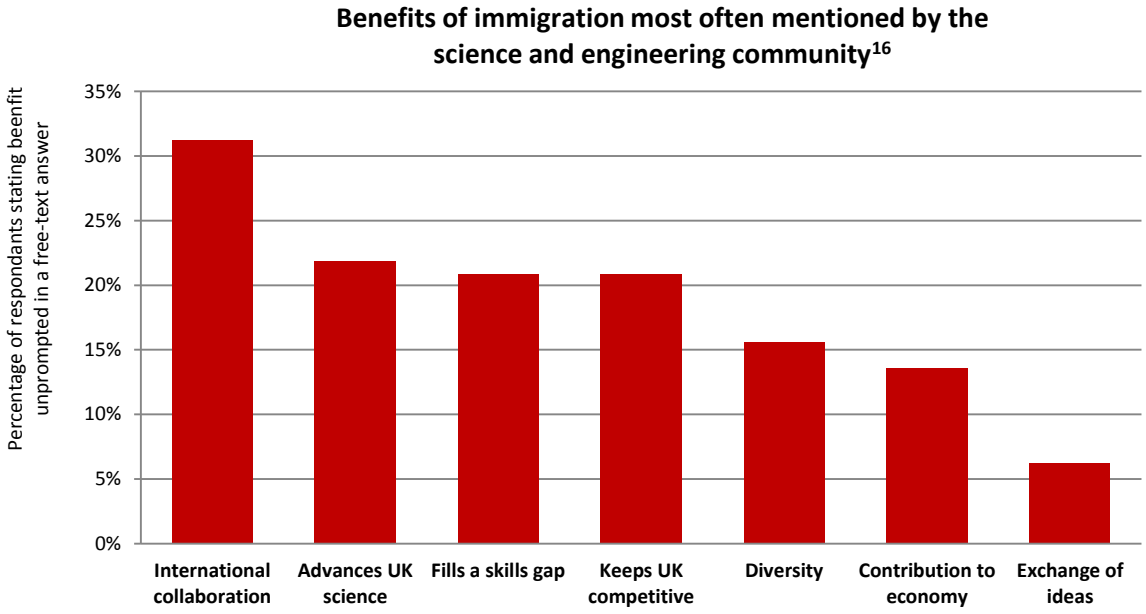
Science and engineering are international endeavours. With its long-standing strength in science and engineering, its liberal society, and its prestigious institutions, the UK has always attracted the world's best scientists and engineers. Indeed, 40% of all living British Nobel Prize winners were born overseas[11].

The majority of researchers in the UK have been internationally mobile during their career. Almost 72% of UK-based researchers (including those that are not UK citizens) spent time at non-UK institutions between 1996 and 2012[12]. Furthermore, almost a third (29.8%) of academic staff in UK universities are non-UK nationals[13]. And the UK's new flagship £650 million Francis Crick Institute in London currently has 65 different nationalities in its 1,500 strong workforce[14]. This international mobility is not because scientists and engineers are particularly fickle about where they live or with whom they work. It is because it is integral to their line of work; internationalism brings huge benefits to their own research and the productivity of science and engineering as a whole in academia and industry[15,16,17].

In a survey of scientists and engineers conducted by CaSE, the most highly cited benefit of immigration was supporting international collaboration, with almost a third (31%) of respondents stating this in a free-text answer[18]. This collaboration yields better science: almost half of UK publications are co-authored with international collaborators and such papers are on average more scientifically significant, receiving a greater number of citations by other authors[19,20,21]. Furthermore,

[11] https://royalsociety.org/~/media/policy/Publications/2015/building-a-stronger-future-research-innovation-growth.pdf (Based on affiliation at the time of award and country of birth as taken from http://www.nobelprize.org/ . Excludes prizes in literature and peace.)
[12] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/263729/bis-13-1297-international-comparative-performance-of-the-UK-research-base-2013.pdf. Researchers are defined as in the Frascati manual: *"Researchers are professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the management of the projects concerned."* In the study cited, only published researchers were able to be analysed.
[13] Engineering Professors' Council analysis of HESA data from the Higher Education Database for Institutions (HEIDI), September 2015
[14] Figures provided by Cancer Research UK
[15] http://www.demos.co.uk/publications/knowledgenomads
[16] http://www.nber.org/chapters/c13405
[17] http://www.nature.com/nature/journal/v497/n7451/full/497557a.html
[18] CaSE survey conducted between 14 July and 14 August, 2015. 96 responses were received, 86 were from individuals and 7 were official responses on behalf of companies or universities.
[19] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/310544/bis-performance-indicators-uk-share-highly-cited-academic-articles-april-2014.pdf
[20] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/263729/bis-13-1297-international-comparative-performance-of-the-UK-research-base-2013.pdf
[21] http://www.pnas.org/content/early/2015/08/05/1501444112

UK papers with international co-authorship are associated with 61% greater citation impact when compared to institutional co-authorship[22]. Other benefits of immigration include team diversity, which brings new approaches to problem solving, and increased exchange of ideas, both of which are essential to research and innovation[23,24].



The importance of immigration to innovation and business growth has been evidenced by the higher involvement of migrants in patent applications and new products to market[25,26,27]. In agreement with the published literature, our survey identified examples where foreign workers have opened up new markets for the companies they worked for, either through their links back home or language skills. Employers also believe that the different experiences and perspectives of migrants create teams with wider strengths and make workplaces more dynamic.

> *"Working for a Chinese customer is especially difficult when it comes to communication and communication is key when it comes to Mechanical Engineering. Our direct customers generally don't speak any English and most of the aircraft standards are written in Chinese. We recruited five top quality Mechanical Engineering graduates from Sheffield University using Tier 2 visas who were all born, raised and educated in China to help us with this $25 million Chinese contract. These graduates were integrated into our design teams and have been a key part of the project. I would go so far to say that it would have been impossible to complete the project to any high standard without their help... It also makes it more likely for us to get*

[22] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/263729/bis-13-1297-international-comparative-performance-of-the-UK-research-base-2013.pdf
[23] http://www.niesr.ac.uk/sites/default/files/publications/NATHAN%20-%20WIDER%20IMPACTS%20OF%20HIGH-SKILLED%20MIGRANTS%20-%20NIESR%20DP%20-%202013_0.pdf
[24] http://www.niesr.ac.uk/sites/default/files/publications/Migration%20productivity%20final.pdf
[25] http://eprints.lse.ac.uk/58329/
[26] http://eprints.lse.ac.uk/52363/
[27] http://charlesleadbeater.net/wp-content/uploads/2008/01/The-Difference-Dividend.pdf

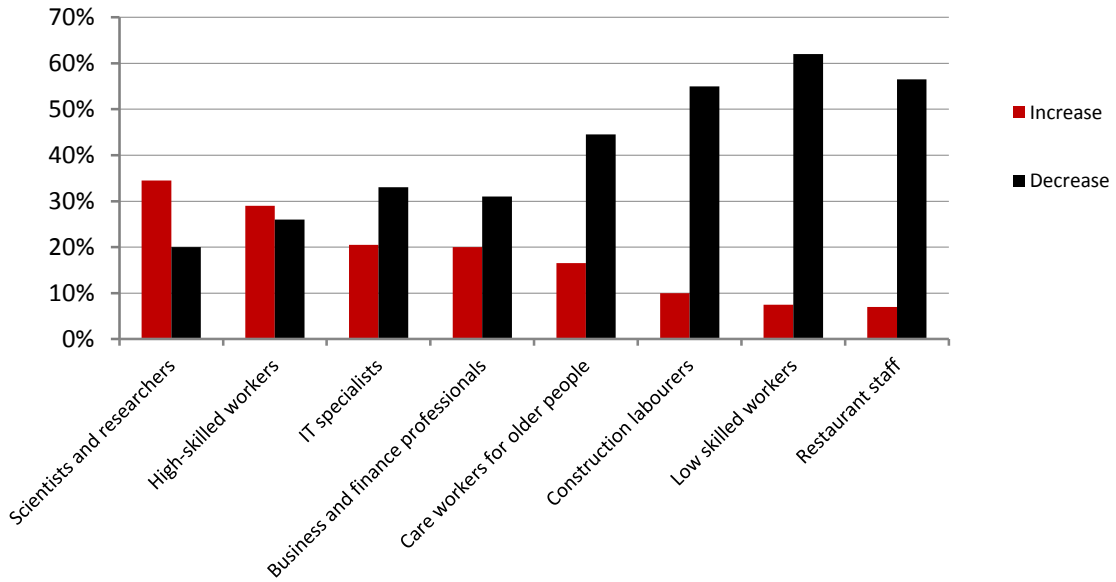
future work in China as we develop an important commercial relationship with a new Chinese customer and start an Electroimpact 'China Office'."

Barry Richards, Chief Engineer, Electroimpact

The contribution of scientists and engineers to productivity and job creation has been more widely studied in America[28]. According to a 2011 study by the American Enterprise Institute for Public Policy, every foreign-born student who graduates from a US university with an advanced degree and stays to work in a STEM career creates on average 2.62 jobs for American workers[29]. Far from crowding out native workers, immigrants created more jobs not only for highly-skilled Americans but for lower-skilled ones too.

The CaSE survey found overwhelming support for immigration within the science and engineering workforce, with only one respondent (out of 96) saying that immigration of scientists and engineers should be reduced. This positive view is also prominent among the wider public; a YouGov survey in 2013 found that scientists and researchers are the most favoured skilled migrants in the minds of the British public, with almost 35% of respondents saying they support greater numbers of scientists and engineers coming to the UK against 20% opposing[30]. This is likely due to the high intrinsic value placed on science by the British public; research by Ipsos MORI found that over 80% of those asked agree that science will make people's lives easier, and around 90% believe that scientists and engineers make a valuable contribution to society[31].

Proportion of public saying they would favour increasing/decreasing immigration of worker types



[28] http://object.cato.org/sites/cato.org/files/serials/files/cato-papers-public-policy/2014/6/cppp-3-3.pdf
[29] http://www.renewoureconomy.org/sites/all/themes/pnae/stem-report.pdf
[30] http://cdn.yougov.com/cumulus_uploads/document/5vbhf8v5ik/YG-Archive-131127-Migration-Observatory-EngWales-Scot.pdf
[31] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/348830/bis-14-p111-public-attitudes-to-science-2014-main.pdf

In general, immigrants make a net contribution to the UK economy. Between 2001 and 2011, conservative estimates predict that European Economic Area (EEA) immigrants paid in 34% more than they took out, with a net fiscal contribution of about £22.1 billion[32]. CaSE is not aware of studies of the fiscal contribution specifically made by immigrant scientists and engineers to the UK economy but as they are more likely to be higher-skilled and employed in an above-average wage job, it can be assumed that their net contribution is higher than the average immigrant.

> *"The Government should encourage qualified, experienced foreign professionals to move to the UK, not restrict it. As a group, we make a major net contribution to the economy. That's how the US built its dynamic economy. Anything else is a recipe for stagnation."*
>
> Dr Alan Reid, Geophysical Consultant, private business owner, and immigrant since 1987

International migration is therefore an integral part of science and engineering due to the benefits it brings for research and the opportunities it presents to businesses. Regardless of skills shortages, immigration of skilled scientists and engineers to the UK is inheriantly necessary if the UK is to remain a world-leader in research and innovation and benefit from the economic and societal advantage that science and engineering delivers.

This was recognised in core Government policy when the 2014 *Plan for Growth: Science and Innovation Strategy* stated "We must continue to encourage the interchange of UK scientists with their counterparts from around the world"[33]. The plan also highlighted the benefits of the global movement of researchers for wider national interests: "The shared values of science can be important in diplomacy and keep doors ajar even at times of the greatest divisions between nations."

Science and engineering skills shortages create further need for immigration

Immigration is inherently necessary in science and engineering but skills shortages also create further need for the freedom to bring in skilled workers from abroad. The UK has a long-standing Science, Technology, Engineering, and Maths (STEM) skills shortage. Echoing findings of countless past surveys, the 2015 CBI/Pearson skills survey found that among engineering, science, and hi-tech firms, nearly half (44%) report difficulties in finding experienced recruits with the right STEM skills, particularly high-level STEM skills[34]. This is reflected in the Shortage Occupation List where 75% of roles are in STEM[35].

For the purposes of this review, CaSE refers the MAC to individual sector responses for detailed data on STEM skills shortages, but the overall picture is profound and concerning. The Royal Academy of Engineering and the Big Innovation Centre estimate that demand for new workers will average 104,000 STEM graduates and 56,000 STEM technicians with NQF Level 3 and above skills in each year between now and 2020[36]. Based on this prediction, the Social Market Foundation (SMF) estimates

[32] http://www.cream-migration.org/publ_uploads/CDP_22_13.pdf
[33] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/387780/PU1719_HMT_Science_.pdf
[34] http://news.cbi.org.uk/reports/education-and-skills-survey-2015/education-and-skills-survey-2015/
[35] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/423800/shortage_occupation_list_april_2015.pdf
[36] http://smf.jynk.net/wp-content/uploads/2013/03/Publication-In-The-Balance-The-STEM-human-capital-crunch.pdf

that there is an annual shortfall in domestic supply of around 40,000 STEM graduates[37]. To close this shortfall with domestic employees, the number of UK STEM graduates would have to increase by around a half. The SMF also points out that this shortfall does not take into account the expected increases in demand for STEM skills that will arise from the Government's mission to promote science and engineering as a strategy to rebalance the economy. The Government also plans to invest £100 billion in infrastructure over the next five years. Projects like HS2 and Cross Rail will require specialist engineers and the world's best minds to be delivered efficiently.

This skills shortage is a major impediment to economic growth. Failure to meet demand for engineering skills alone is estimated to cost the UK £27 billion a year from 2022[38]. In its international benchmarking study, the Department for Business Innovation and Skills found that the UK's science and innovation system is hampered by weaknesses in its STEM talent base[39].

The science and engineering community is working, alongside the Government, to address the skills shortage but the training pipeline is long and cannot be solved overnight. The training period for a PhD-qualified scientist or engineer is around 10 years, and the acquisition of specialist and highly technical skills can take even longer. And to truly tackle the chronic skills shortage, children must be engaged in their early school years to encourage them to pursue STEM careers. All of this means significantly greater numbers of scientists and engineers entering the workplace are decades away. Indeed the current shortage is the result of past low investment and low priority given to STEM education in the past 20 years or more.

Conclusion

The UK's world-leading science and engineering base makes an irreplaceable contribution to our economic, social, and cultural well-being and our health. There is clear need for an immigration policy that ensures UK employers in all sectors have access to skilled STEM workers through the visa system. The knowledge, skills (including language skills), and different ways of thinking that they bring to the workplace are essential assets in academia and industry. Immigrants are also needed to fill skills shortages in the short-term, but they will contribute to a longer-term up-skilling of the UK population as they pass on their skills and knowledge to students, trainees, and other workers.

Restricting skilled migration will therefore severely impact on the academic and industry science and engineering sectors in the short, medium, and long-term. As these sectors are key components of the UK economy and large contributors to GDP, the consequences for the UK could be significant and hugely damaging. Immigration policies that reduce these sectors' access to international talent, either intentionally or through negative international publicity, will be at odds with the Government's wider economic policies and will ultimately make the Government's long-term economic plan less likely to succeed.

[37] http://smf.jynk.net/wp-content/uploads/2013/03/Publication-In-The-Balance-The-STEM-human-capital-crunch.pdf
[38] http://www.engineeringuk.com/Research/Engineering_UK_Report_2015/
[39] https://www.gov.uk/government/publications/science-and-innovation-system-international-benchmarking

The impact of current immigration policy on science and engineering

Immigration policy must support science and engineering

The CaSE survey of the science and engineering community found widespread dissatisfaction with current Government policy on immigration. The main concern raised was the negative perception of the UK being fostered around the world as a result of the previous and current Government's immigration policies and rhetoric. 22% of respondents said the UK was perceived as unfriendly to immigration and all organisations interviewed by CaSE agree that it is a major concern.

Since June 2015, 66 engineers have been refused a Certificate of Sponsorship due to the monthly Tier 2 (General) limit[40]. No scientists have so far been affected. However, the existence of the Tier 2 cap, and the publicity of it being reached, is highly likely to be putting-off talented scientists and engineers from coming to the UK to work and contribute to our research base and economy. As demand for visas continue to increase, the minimum salary will also rise, shutting out more engineers, and potentially scientists.

As employers must demonstrate that they cannot find suitable workers in the EEA in order to use Tier 2, refusal of these visas due to the cap leaves employers with little option but to leave the position vacant or recruit someone with a skills mismatch, which harms productivity[41]. Neither will the cap significantly reduce net migration as less-suitable workers will be recruited from within the EU and not necessarily the UK.

The Resident Labour Market Test – The test provides sufficient evidence that no domestic labour is available to meet the employer's needs; however, it could be improved to better support science and engineering sectors.

UK science and engineering is best supported by allowing it to access the world's top talent. The premise of the RLMT policy is not aligned with this need and as a result it runs contrary to wider Government policy to nurture science and engineering.

Whilst there is obvious need in many jobs and sectors to ensure employers are not preferentially hiring non-EEA workers to undermine the resident labour market, there is minimal danger of this occurring in science and engineering. Skills and experience are much more important than the relatively-small financial savings that *might* be possible from undercutting wages. (It is worth noting that the MAC has twice concluded that skilled migration does not negatively impact on UK wages[42,43]). Moreover, the costs and bureaucracy of obtaining visas, and supporting the worker to move countries, pose further disincentives to use the visa system.

[40] http://www.parliament.uk/business/publications/written-questions-answers-statements/written-question/Commons/2015-09-07/9220/
[41] http://www.oecd-ilibrary.org/economics/labour-market-mismatch-and-labour-productivity_5js1pzx1r2kb-en
[42] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/257235/analysis-of-the-impacts.pdf
[43] https://www.gov.uk/government/publications/review-of-tier-2-analysis-of-salary-thresholds

"It is cumbersome to employ people outside the EU to work in a scientific UK company. There is a lot of paperwork even when it is demonstrable that hiring a certain non-EU candidate is the best option."

Albert Vilella, Bioinformatics Scientist, Cambridge Epigenetix

The requirement to conduct an RLMT for jobs that are not on the Shortage Occupation List poses a burden on employers. In many cases, the rarity of skills in science and engineering roles means that RLMTs only serve to prolong the search period and thus the time research laboratories and businesses are without the skills they need. It is welcome that PhD-level roles are exempt from the requirement to advertise the role in Jobcentre Plus; other similarly high-skilled roles should also have this exemption (such as engineers with chartered status, for example). If maintained, the RLMT should also be evolved to reflect recruitment practices and technologies, such as online recruitment platforms and the bespoke talent searches many science and engineering employers use to find the highly-specialised individuals they require.

The Points Based System - An immigration policy that recognises the specialist and economically-important skills of the science and engineering workforce is essential. The current system goes some way to achieving this through the use of the Shortage Occupation List and the prioritisation of PhD-level roles. It is important that the principle of these concessions is upheld if the Tier 2 cap remains or if the PBS is changed. Efforts should also be taken to take a broader view of the occupations that the system prioritises.

Salary is not a good proxy for skill level in science and engineering, especially the academic sectors, nor does it recognise skill specialisation. Scientists and engineers are relatively low paid for their skill level when compared to other professionals, such as lawyers and bankers. This puts both public and private science and engineering employers at risk as the salary requirements to obtain visas under the cap rise. The PBS could be improved by using a more granular salary scale to prevent excessive rejections each month[44] and using occupation-specific salaries to award points. This will go some way to level the playing field with other professional sectors.

The monthly decision making process to award CoS can also result in delays if the recruitment timescale is not aligned with the deadline of the 6th day of the month. Decisions used to be made twice a month providing welcome flexibility for employers. This should be reinstated.

Skills shortages and genuine highly specialist experts – Restricting Tier 2 (General) recruitment to only shortage occupations and highly specialist experts poses serious risks to the UK economy and the excellence of UK science and engineering.

The reasons for this are two-fold: first, the method of specifying those permitted will always be imperfect and result in unintended recruitment problems, particularly if it continues to be inflexible and undynamic (discussed below); secondly, further restrictions will exacerbate the appearance of the UK as an unwelcoming country for the world's top talent.

[44] We note that the Home Office is already consulting with sponsors about this.

The science and engineering community relies on immigration not only to fill skills shortages but also to bring together people with different perspectives, new ideas, and different skills. Placing draconian restrictions therefore runs contrary to this need.

Bringing in foreign skilled workers also allows the native workforce to gain those skills, which can be especially unique in science and engineering. The diverse range and rapid development of science and engineering skills means the UK can never expect to have the full complement of all the skills it needs in its native population. Thus immigration will always be valuable for up-skilling the UK workforce. Current immigration policy predicated on skills shortages therefore does not reflect the reality of science and engineering working and education practices. The system of identifying skills shortages through an exclusive list also creates vulnerabilities for science and engineering sectors as to an extent it involves "picking winners" and is open to political whim.

The current system for identifying skills shortages is unresponsive to the rapidly-changing needs of science and engineering employers. It requires employers and organisations representing them to engage in a resource-intensive process of data collection to make the case for the inclusion of occupations on the Shortage Occupation List. This is often very difficult for smaller employers to engage with and favours the large and resource-rich sectors. And, whilst there is an appreciation that the MAC is quick to make a decision, it takes a considerable time (over a year in many cases) to collate the required data before it can be put to the MAC.

The MAC has long recognised that salary is an imperfect method of recognising skill level, especially in the public sector. CaSE also believes this to be true based on our consultation with employers and workers. Qualifications such as PhDs and professional registrations provide another means to ascertain skill level for many science and engineering professionals but this could not be considered a water-tight method of prioritising every occupation needed by our economy. Specialisation and combinations of skills (including language skills) are essential to modern-day science and engineering and would need to be recognised in any new system that might result from this review.

CaSE would consider anyone working in science and engineering to be a highly specialist expert, even those early in their careers. These individuals are much more likely to internationally mobile; a number of studies show that scientists at the top of their field moved to their country of residence earlier in their career, before becoming world-renowned[45,46]. It is therefore important to have policies that attract and retain promising talent and not just the already-elite.

The issues and problems raised above also apply to migrants switching from Tier 4 and other in-country applications.

Tier 4 includes PhD students, who are already highly-specialist experts. By their very nature, PhD projects are extremely specific and thus the student highly specialised. Furthermore, they may have developed a new technique as part of their research project that only they are expert in. Students educated by the UK higher education system are considered some of the best in the world. We need an immigration policy that allows the UK to capitalise on the talent nurtured in our universities,

[45] http://link.springer.com/article/10.1023%2FA%3A1010682017950#page-1
[46] http://link.springer.com/article/10.1007%2Fs11024-005-2474-7#page-1

whether they are undergraduates or post-graduates. It should support individuals that are already highly-specialist experts or have the potential to become one. Anything else is a missed opportunity for our economy.

Sunsetting – As stated above, immigration is not only vital to UK science and engineering because of skills shortages; it also supports innovation and scientific progress. A Shortage Occupation List can therefore only be one component of an effective immigration policy.

Due to the difficulty in getting occupations onto the Shortage Occupation List (discussed above), a "Sunset Clause", which would automatically remove jobs from the list after a set period of time, would likely create further problems for employers dependent on the list. 75% of the occupations on the current list are STEM fields; it is difficult to imagine these shortages being addressed in a matter of years due to the training pipeline (discussed above in the skills shortage section). Regular review, taking into account the training pipelines of the various occupations on the list, is a preferable way to ensure it remains valid and up to date. A reasonable maximum duration could be five years between reviews but an automatic removal from the list would not be helpful.

The Inter-Company Transfer route – The ICT route serves a useful purpose for the private science and engineering sectors. Its economic and societal benefits are similar to those of immigration more widely, presented in the first section of this submission.

Many companies in science and engineering sectors are international and have the need to move their staff around the world. For example, an immunology expert working for a pharmaceutical company in its American laboratory may be required to move for a short period to the company's UK R&D facility to support a research team that has recently isolated a novel antibody from a patient. Or a Japanese car manufacturer may be building a new factory in Britain that requires its specialist Japanese engineers to install machinery and advise British workers.

There are valid reasons for less-specialised workers to use the ICT route as well. International companies wish to develop and train their employees and as part of this may offer opportunities for them to gain experience in the UK. Being able to do this makes the UK an attractive place to site company headquarters and R&D facilities.

> *"Many of the UK's leading engineering firms are not British and have no allegiance to the UK. They are here because of our engineering excellence but if they can no longer find the skills they need they will move overseas"*
>
> David Brown, Chief Executive, Institute of Chemical Engineers

Due to the high use of the route, restrictions to ICT have the potential to impact other routes severely, especially the Tier 2 (General) route. Given the cap presently on that route the Government should be very mindful not to put any more pressure on it through restriction of the ICT route.

Skills levy – The STEM skills shortage suggests an obvious need for more apprenticeships to provide the skilled workers that employers require. However, of the 440,400 apprenticeships started in 2013/14, only 65,190 (14.8%) were in STEM and there has been a decrease in the overall numbers people starting STEM apprenticeships, down from 70,100 in 2011/12[47].

The Government's ambition to create 3 million apprenticeships is laudable but they must be in subjects required by employers and deliver greater numbers of workers trained to higher levels than is currently being achieved. In 2013/14, over 60% of STEM apprenticeship starts were at the "intermediate level", equivalent to GCSEs, and over 39% were at the "advanced level", equivalent to A-levels. That leaves less than 1% (270) at the "higher level", where they are similar to a university foundation degree (NQF4). The numbers of people going on to finish and qualify with a higher apprenticeship is much lower again, with only 30 in 2013/14.

As apprenticeships do not currently train workers to a skill level of NQF6, which is the minimum for most individuals recruited through Tier 2, it is hard to see how funding more apprenticeships through a levy would reduce the demand for immigration, at least in the short to medium-term.

A more systematic approach is required to genuinely address the UK's STEM skills shortage. As described previously, training scientists and engineers takes tens of years and increasing the numbers of young people training requires inspiring children at an early age. One major car manufacturer told CaSE that it offers many high-level apprenticeships but cannot find the appropriate applicants to fill them. The science and engineering community is working to improve the uptake of STEM education by people of all ages but there will be a significant time before the skills shortage is significantly improved.

The levy is also of particular concern for universities, which, as world-leading centres of research and teaching, recruit heavily from outside the EEA (around 10% on average[48]). With their already sizeable contribution to the training of the UK population, it would be perverse to expect them to contribute to a skills levy.

Tier 2 dependents – Skilled scientists and engineers expect to be able to bring their family with them when they move to the UK. Their partners may wish to work and so preventing them from doing so could put unnecessary stress on relationships. The family may also need the second income; this is especially true for lower-paid scientists and engineers whose single salaries may not be able to support a family.

Restricting dependent's right to work would therefore be a powerful disincentive for skilled scientists and engineers when choosing where to work. This could severely impact on science and engineering employers' ability to recruit the talent that they need and this would have knock-on negative effects on the economy.

[47] CaSE analysis of the FE data library: https://www.gov.uk/government/statistical-data-sets/fe-data-library-apprenticeships (accessed August 2015)
[48] Engineering Professors' Council analysis of HESA data from the Higher Education Database for Institutions (HEIDI), September 2015

Other comments on Tier 2 design – The current system has welcome dispensations for scientists and engineers in recognition of the conditions of their employment and skills shortages. These must be maintained and there are further refinements that would ensure scientists and engineers are not discriminated by the system.

In 2011, the Government introduced new requirements for Indefinite Leave to Remain (ILR) applications, including that the applicant must not have spent any more than 180 days out of the UK in any one year of the previous five. This rule was applied retrospectively, over-ruling conditions on visas issued before 2011. For scientists and engineers who regularly have to travel, often for prolonged periods, as part of their research, this can be an almost-insurmountable barrier to obtaining ILR, and a major disruption to their work and career.

> *"I moved to the UK in 2006 to take up a research position in particle physics at Oxford University but my work regularly required me to travel to the Fermi accelerator laboratory in the US, and to CERN in Geneva. Under the initial rules of my visa, I could apply for indefinite leave to remain after five years as long as I had spent a combined total of four years in the UK. When I eventually applied for ILR in 2013 the rules had been changed and my application was rejected because I had been out of the UK on work for 7 months in 2008*
>
> *"From the time I applied in Jan 2013 until the successful appeal in March 2014, my whole family's passports were confiscated. I therefore could not travel for work for 15 months, and my wife and I could not visit our families in the US. I was offered a team leadership position at CERN, only to have it rescinded when I told the group organizers that I was not allowed to travel. This has held back my career as I was turned down for a professorship at Oxford due to lacking this experience. My appeal for indefinite leave was finally granted after I hired a barrister. I am glad to be able to stay and continue my work in the UK but the whole process has been very difficult for my family and has cost me over £5000 and the department more than £2000, as it has covered my recurring visa costs."*
>
> Dr Chris Hayes, Lecturer, Particle Physics sub-Department, University of Oxford

Dr Hays' experience is not unique[49]. Travel is an essential part of researchers' work. Visa requirements do not allow for this sufficiently, unfairly penalising scientists and engineers. Furthermore, the confiscation of passports and taking the case to court shows that the Home Office is not taking a proportionate approach to highly-skilled migration and is at odds with other Government policies aiming to promote international collaboration and science and innovation.

A further problem is encountered by non-EEA researchers employed by UK institutions but based overseas. Dr Meenakshi Gautham is employed by the London School of Hygiene and Tropical

[49] In a well-publicised case, Dr Miwa Hirono, an expert in China's foreign peacekeeping operations at Nottingham University, was refused ILR after the retrospective application of the 180 day rule to her visa application. After losing a lengthy court case Dr Hirono moved to Japan where she continues her academic research. https://www.timeshighereducation.co.uk/news/visa-refusal-for-china-expert-miwa-hirono-is-pure-madness/2019182.article

Medicine (LSHTM) but based in India as Country Coordinator for the Gates Foundation-funded IDEAS maternal and newborn health project.

> *"Strangely, there is no visa category at present that allows me a proper legal route to travel to the UK for any work related purpose as an employee of a UK based organisation. The business visitor visa works only for those who receive their salaries from overseas (non-UK) companies.*
>
> *This is a very frustrating situation for me as well as the School because it affects a lot of the School's global overseas staff. The LSHTM has a diverse and multi-country employee profile which in many ways enables the School to maintain its position as a global institute for excellence in health research and learning.*
>
> *In simple words, my overseas colleagues and I are not looking to migrate to the UK as we are quite happy in our own countries. We do not need a Tier 2 visa but a valid visa to travel to the UK occasionally for short periods of work and meetings. Why is this not possible?"*
>
> Dr Meenakshi Gautham, Country Coordinator (India), IDEAS project, London School of Hygiene and Tropical Medicine

Dr Gautham was previously on a Tier 2 visa despite working abroad as this allowed her to travel freely to the UK. However this was not a permanent solution as her visa could not be extended beyond six years and she could not apply for ILR (due to her time spent out of the country).

These examples demonstrate how the current visa rules are not compatible with the essential international mobility of researchers.

Conclusions and recommendations

The benefits of science and engineering are economic, social, and cultural; and these are felt across the UK by the public, academia, and industry. As a result, the Government has put science and engineering at the heart of its long-term economic plan to rebalance the economy and raise productivity.

The science and engineering sectors rely on immigration to catalyse innovation through new ways of working and collaboration, to increase international business, and to fill skills shortages. Yet despite these benefits, and despite science and engineering being at the heart of the Government's economic plan, immigration policy is making it harder to recruit skilled scientists and engineers and is limiting the potential of the sector.

The following are policy recommendations relevant to the Committee's review based on the current findings and conclusions of CaSE's immigration work. CaSE will continue to work with our partners to develop these and will keep the MAC informed of our progress.

1. **Actively promote the UK as a place to learn, earn, and contribute –** The Government's *Britain is GREAT* campaign promotes the UK as a destination for business "investment, tourism, and study"[i]. And Ministers, including the Prime Minister, have been proactive in promoting UK business on overseas trips. The Government should also be promoting the UK as a welcoming destination for the world's best science and engineering talent. Ministers must also talk more positively about migration when addressing the British public, recognising the benefits that skilled migrants bring.
2. **The Tier 2 (General) visa system must be agile and reflect the needs of employers –** A visa system operating on the principle that immigration is only beneficial to fill skills shortages does not reflect the reality of science and engineering working practises. The impact of such a system also runs contrary to wider Government policy objectives. Current dispensations should be evolved to recognise all the professions and skills that will strengthen UK science and engineering and support economic growth. This policy should be developed with the involvement of employers from the public, private, and charity sectors to identify the professions and skills needed for our economy.
3. **Abolish the Tier 2 (General) cap –** The arbitrary Tier 2 (General) cap of 20,700 target sends a negative message to global science and engineering talent and business and poses a threat to the recruitment of the skilled workers needed to support growth. It should be abolished.
4. **Increase flexibility in the RLMT – E**mployers use a range of methods to search for potential job candidates, especially when rare and highly-specialised skills are required. Rules for the RLMT should reflect this to allow the employer to demonstrate that suitable candidates are not available in the UK in a more efficient way over a shorter timescale (employers must currently advertise in traditional media for 28 days).
5. **Adjust for low relative salaries in the PBS –** the low pay of scientists and engineers occupations relative to other professions puts their visa applications at a disadvantage in the PBS. A more granular salary scale[50] and using occupation-specific salaries to award points will go some way to level the playing field with other professional sectors.
6. **Award Certificates of Sponsorship twice a month** – employers must currently wait up to a month to gain a CoS code to obtain a visa, which adds unnecessary delays to recruitment. This negatively impacts research and business. The cap has made this situation worse for unsuccessful applicants who must wait a further month. The awarding process should occur twice a month, as used to be the case, rather than once.
7. **Change the rules of Tier 2 visas to allow researchers to work for prolonged periods abroad –** the Government is keen to promote international collaboration in research but current rules restrict the ability of UK-employed researchers to work for prolonged periods in other countries. This is likely an unintended consequence of rules that did not consider the needs of the science and engineering community, which could now be amended.
8. **Support talented foreign graduates** – The UK should benefit from the education of foreign graduates by encouraging them to stay in the UK where they can continue to contribute to our economy through skilled work. This could be done through the re-introduction of the Post-Study Work visa or extending the time they are allowed to stay in the UK to find a job

[50] We note that the Home Office is already consulting with sponsors about this.

after graduation, for example. Suggestions that graduates should return to their home country before applying for a work visa should also be strongly resisted.

CaSE would be happy to discuss this work and the recommendations in more detail with the Committee.

For further information please contact the CaSE team.

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