Briefing: Science policy in the 2015 General Election

The UK is a scientific powerhouse, but the system is creaking and faces severe challenges. With political support, science and engineering can continue to equip young people for a high tech future, overcome global challenges, create great jobs, and build a prosperous Britain. In this briefing we look at what each party has been saying on science and engineering research policy, in their manifestos, speeches, and out on the election trail.

Our policy analysis is divided into three categories:

1. Investment in science and engineering research
2. Education and skills for science and engineering
3. Use of science and engineering in government

Ahead of the election CaSE published three briefings and produced a list of ten top actions on what we think is required from the next government to ensure the UK remains a world-leading powerhouse of science and engineering.

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For further information please contact the CaSE team.

Email: info@sciencecampaign.org.uk Phone: 020 7679 4994

27 April 2015

The Conservative manifesto

On investment in science and engineering

- Will continue with the measures in the Science and Innovation Strategy, including investing £1.1 billion in science capital each year, rising with inflation up to 2020/21 (p21)
- Will direct further resources towards the Eight Great Technologies – among them robotics and nanotechnology (p21)
- Will seek to ensure that the UK continues to support world-leading science, and invests public money in the best possible way through the Nurse Review of the Research Councils (p35)
- Will put the "NHS at the frontier of science" (p37) and prioritise funding for dementia research in the NHS (p67)

On science and engineering education and skills

- Will train 17,500 more maths and physics teachers (p34)
- Will prevent Ofsted awarding top marks to schools that do not provide GCSE science (p34)
- Will require Job Centre advisers to supplement school and college careers advice (p18), create 3m more apprenticeships, and maintain no cap on university places (p33)
- Will abolish the student cap for universities (p35)
- Will introduce a national postgraduate loan system for taught masters courses and PhD study (the latter of which was not in the Science and Innovation Strategy but is currently being consulted on by the government) (p35)
- Will ensure there is a University Technical College in every city (p35)
- Will require those regularly utilising the Shortage Occupation List to provide long-term plans for training British workers (p31)
- Will reform the student visa system with new measures to tackle abuse, including reviewing the highly-trusted sponsor system, and reduce the numbers of students overstaying once their visas expire (p30)
- Will maintain the skilled workers immigration cap at 20,700 during the next Parliament (p30)

On the use of science and engineering in government

- Will implement the findings of "our Innovative Medicines and Medical Technology Review" (p39)
- Will work to accelerate the global development and take-up of alternatives to animal testing where appropriate (p55)
- Do not see reforming the House of Lords to create an elected second chamber as a priority (p49).
- Are in favour of Britain staying in the EU with reforms and will hold an in/out referendum by the end of 2017 (p30)

The wider view from CaSE

The Conservative manifesto is all about finishing their "long-term economic plan" to eliminate the deficit and reduce national debt. Unlike the other parties, the Conservatives say they are committed to balancing the overall budget by 2018, not just everyday spending, which leaves them less room to borrow for investment. David Cameron and George Osborne have repeatedly stated that science is at the heart of their plan and have spared science and innovation from the worst of the cuts in the past five years. In his letter to CaSE, Cameron told us that we could be "assured that a Conservative government will be committed to investing in science and engineering" but their manifesto contains no new money for science and no commitment to continue the Science Budget ring-fence, which is very concerning. We know from the blogs written for us by Tory candidates that there is a strong recognition within the party that investing in science and engineering brings great returns. Why not put it in the manifesto then?

The Conservative Science Minister, Greg Clark, has repeatedly said that his party does not want to put off talented scientists and students coming to this country who contribute to our science base and our economy. But, in continuation of the trend we've seen over this term of parliament, the Conservative immigration policy proposals seem to be at odds with their science policy aims. Many will be disappointed not to see policies targeted at attracting skilled and productive workers to the UK in the manifesto. Next year, visa applications from skilled workers are expected to exceed the cap that the Tories have tied themselves to. This, along with conditions around the use of the shortage occupation list, could be a real concern for companies looking to bring in scientists and engineers from abroad. There are a number of welcome measures to nurture home-grown talent however, such as more maths and physics teachers, commitments on vocational training,, and loans to allow more people to do post-graduate degrees (although these were in the Coalition's Science and Innovation Strategy).

Cameron wishes the UK to stay in a reformed EU but has promised a referendum by the end of 2017. A possible exit from the EU is of great concern to businesses and universities and even the referendum itself will create a lot of unwelcome anxiety among investors and EU students. UK researchers are affected by EU regulation (in good and bad ways), the UK also makes an overall net profit in R&D funding from the EU, and movement of people and free trade is so important for the many multinational science and engineering companies based here so exit would have knock-on effects for science and engineering.

There's a lot of positive talk on science in the Conservative manifesto - science and innovation is the 11th most popular theme according to NESTA's Political Futures Tracker, receiving over 50 mentions. The Tories say that they should be judged on their past record on science. This will provide some reassurance to the science and engineering community but falls short of providing solid investment policies we can all hold on to should they regain power.

What Conservative parliamentary candidates told CaSE

In their blogs for the CaSE website, Conservative candidates endorsed policies instituted by the current government, including the plans put forward in the Science and Innovation Strategy and the Year of Coding initiative. They were also eager to mention the "Your Life" initiative which aims to increase the number of young people, and particularly girls, taking STEM A-Levels, highlighting the party's commitment to STEM education and diversity. More apprenticeships and other means of vocational training will be provided, the candidates said, in order to generate a greater uptake of STEM careers.

The Catapult Centres for promoting innovation were discussed positively, with Mark Isherwood (Delyn) saying they allow "scientists and engineers [to] work side by side turning ideas into new products and services." Some also highlighted the "Eight Great Technologies" established by the Coalition government as areas selected for research focus.

Conservative candidates were also likely to write from a local perspective, from highlighting a history of engineering in their regions to promoting new technological strengths coming from the area. Rebecca Coulson (City of Durham) highlighted the North East in terms of renewable energy developments including wind farms, geothermal energy research and the manufacturing of low-carbon technologies such as hybrid cars.

Image 1. Wordle based on responses from all Conservative PPCs

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The Labour manifesto

Labour have published their main manifesto but there is also more detail on their policies affecting science and engineering in their separate business, education and women's manifestos.

On investment in science and engineering

- Will introduce a new long term funding and policy framework for science and innovation (p12) (p20)
- Will establish a National Infrastructure Commission that will have making the UK the best place in the world to do scientific research as one of its ten goals (p12)

On science and engineering education and skills

- Will ensure that all young people study English and maths to 18 and introduce a new Technical Baccalaureate for 16-18 year olds (p18) (p21)
- Will guarantee all young people face-to-face careers advice (p21) (p14)
- Will make teacher Continuous Professional Development training mandatory and support plans for a College of Teaching (p38)
- Will create a new Apprenticeship Guarantee, so that all those that get the grades at 18 are able to access a new high quality apprenticeship and provide greater control over apprenticeships and new Technical Degrees to businesses (p18)
- Will reduce tuition fees to £6,000 (p27)
- Will remove university students from the Government's net migration target (p8)

On the use of science and engineering in government

- Will strengthen the public interest test to "protect the UK's science and research base" (p13)
- Will repeal the Health and Social Care Act 2012 (the Act places a duty on the Secretary of State and the NHS to promote research, it's not clear what would replace the Act) (p34)
- Will create an elected "Senate of Nations and Regions" to replace the House of Lords (p63)
- Will work to reform the EU but keep Britain as a member (p11)

The wider view from CaSE

The Labour Party will produce a long term policy and investment framework for science and innovation but only once they have conducted a "Zero-Based review" after the election. They therefore haven't made any science investment commitments but their fiscal rules do allow for borrowing for investment, which could allow them to invest in science and engineering.

One of the major policy announcements in the Labour manifesto is a National Infrastructure Commission that will have making the UK the best place in the world to do scientific research as one of its ten goals. In his letter to CaSE, Ed Miliband told us that science and engineering has a central role to play in their plan for "working families and business to succeed together". But out and about, Ed Miliband and Ed Balls have barely mentioned the importance of science and engineering to

economic growth - we could only find 3 set speeches between them that make this link in the past year. When asked whether Labour would increase the Science Budget at a recent Q&A in Bristol, Miliband said that what was most crucial in this area was stability of funding. And referring to Innovate UK, he said that Labour would build on what was working and would not "upset the apple cart" for the sake of it.

Labour has a number of education and skills commitments that will benefit science and engineering, but which aren't targeted specifically at STEM subjects. Vocational education features heavily, with a "new gold standard" promised. This could provide many young people with a non-degree route into a science career. Education was the most popular theme talked about by Labour candidates blogging for us, showing that Tony Blair's mantra of "education, education, education" hasn't left the party faithful. This is perhaps what is behind Labour's much-talked about pledge to reduce tuition fees to £6,000, which has angered university Vice-Chancellors. The new fees would be well below the cost for lab-based subjects of around £10,000 per student. Treasury money will be needed to ensure quality degree courses can still be delivered. Responding to a question from CaSE Acting Director, Naomi Weir, at the Times Higher Education hustings in February, Liam Byrne said that Labour would provide £2.7 billion to cover the fees reduction and that the policy would allow targeting of the money to high cost subjects.

Replacing the House of Lords with an elected Senate of Nations and Regions could reduce the number of scientists and engineers serving in Parliament as many of the distinguished peers would not run for election. Labour hopes that its stance on Europe will be welcomed by business and the pledge to remove students from migration figures could help reassure foreign students that the UK is a welcoming place to study.

Science and innovation is the 16th most popular theme in the Labour manifesto according to NESTA's Political Futures Tracker. It is touched upon in the main manifesto but there is more meat for policy wonks in the companion manifestos, particularly the business one. Overall there are some very positive commitments for science and engineering but there will be a long wait to see if Labour's investment priorities mean boom or bust for UK science.

What Labour parliamentary candidates told CaSE

In their blogs for the CaSE website, two Labour candidates referenced Harold Wilson's 1963 speech in which he called for a new Britain to be forged in the "white heat" of scientific revolution. This appeal to the enduring support for science from the Labour Party was backed up by calls to consolidate Britain's global prospects at the forefront of science and technology through STEM training and governmental support.

Candidates told us that Labour would bring "improvements" to STEM education and better working between universities and industry. Many were keen to also mention their commitment to high-level apprenticeships and vocational training to address the need for STEM-skilled workers, giving an alternative route into careers to the traditional university degree. Tim Roca (Macclesfield) describes

their “Technical Baccalaureate” and partnerships with industry as giving “a clear pathway from school to the workplace”, helping to address the shortage of technicians and engineers.

There were calls to improve access to this country for skilled migrants, claiming current restrictions “stifle innovation and progress” according to Darren Price (Congleton). Similarly, foreign students should be encouraged to study in the UK, especially now large scientific research projects are commonly multinational.

Image 2. Wordle based on responses from all Labour PPCs

The Liberal Democrats manifesto

On investment in science and engineering

- Will continue to ring-fence the science budget and ensure that, by 2020, both capital and revenue spending have increased at least in line with inflation (p26)
- Will double innovation investment (p25) and "aim to double innovation and research spending across the economy", supported by greater public funding on a longer timescale and more catapult centres (p26)
- Will invest in research to develop new treatments (p74), double dementia research spend by 2020 (p74), and establish a world-leading mental health research fund, investing £50m (p71)

On science and engineering education and skills

- Will promote STEM uptake in schools and retain computer coding on the National Curriculum (p36)
- Will encourage schools to have at least one science specialist among the staff, and at secondary level work to maximise the number of teachers who have degree qualifications in the subjects they teach (p59)
- Will provide a major expansion of high-quality and advanced apprenticeships, offering vocational education on a par with academic qualifications through National Colleges (p26)
- Will ensure the UK is an attractive destination for overseas students, "not least those who wish to study STEM subjects". Will reinstate post-study work visas for STEM graduates who find graduate-level employment within six months of completing their degree (p36)
- Will continue to allow high-skill immigration to support key sectors of the economy (p36)
- Will provide support, including placements, for young people to get work in the science sector, with tailored support for those with disabilities, mental health problems, or parental responsibilities (p44)

On the use of science and engineering in government

- Will continue and expand the What Works Network to promote evidence-based policy making (p51)
- Will introduce effective, science-led ways of controlling bovine TB, including by investing to produce workable vaccines, in line with the TB Eradication Strategy. Will only support extending the existing cull pilots if they are shown to be effective, humane and safe (p84)
- Require the highest standards of data protection by public service providers, including requiring that where data is used for research purposes it must be anonymised wherever possible, and impose a moratorium on the creation of new government databases without Parliamentary authority (p51)
- Will support, including through rules on public funding and research, moves towards ensuring all clinical trials are registered, with their methods and summary results reported in public (p76)

- Will minimise the use of animals in scientific experimentation, including by funding research into alternatives. Remain committed to the three Rs of humane animal research: Replace, Reduce, Refine (p82)
- Will reform the House of Lords with a proper democratic mandate, starting from the proposals in the 2012 Bill (p132)
- Are in favour of Britain staying in Europe (p142)

The wider view from CaSE

The Liberal Democrats are the only party to have committed to ring-fencing the Science Budget in their manifesto. They have also committed to ensuring both capital and current science spending have increased in line with inflation by 2020 (for capital investment this is already Coalition government policy) and to have doubled innovation investment. However, they will not increase current spending until they have eliminated the structural current budget deficit and have national debt falling as a proportion of GDP, which they intend to have achieved by 2018. Assuming a baseline for the Science Budget of £4.6 billion in 2015, this would put the Science Budget at £4.9 billion and the capital budget at £1.2 billion in 2020.

STEM features heavily in the Liberal Democrats' education and skills policies and we're pleased to see them pledging to encourage every school to have a science specialist. Their immigration policies, which specifically favour STEM, presumably due to the shortage occupations list, will also please many businesses and universities.

The Liberal Democrats pride themselves on their commitment to evidence in policy making and their parliamentary candidates blogging for us were keen to highlight this. So it is not terribly surprising to see a number of policies with that flavour. They could have gone further with policies to require departments to provide all the evidence used in developing policies to parliamentary select committees ahead of hearings, or strengthening the role of departmental Chief Scientific Advisers, as CaSE has called for.

In February 2015, Business Secretary Vince Cable told the Commons Science and Technology Committee "it would be a travesty if innovation and science in particular were to be cut". It's less clear how the party's arguably more powerful operators, Nick Clegg and Danny Alexander, feel about science's value. Strong emphasis on science policy in the manifesto suggests they do support it, but NESTA's Political Futures Tracker finds that science and innovation is only the 18th most popular theme overall. The party is in favour of borrowing for investment to stimulate growth – where science and engineering has a strong role – and has proved keen to consider science and engineering when developing policies. It's also worth remembering that there were a number of specific pro-science policies in the 2010 Coalition Agreement. This should provide some reassurance to the research community should the Liberal Democrats be king-makers come the 8th of May.

What Liberal Democrat parliamentary candidates told CaSE

Liberal Democrat candidates mentioned fewer coalition policies than Conservatives in their blogs for CaSE, but were proud of their Pupil Premium and the analysis of evidence suggesting its success. Lucy Care (Derby North) pointed to the efforts of Vince Cable in his time as Secretary of State for Business, Innovation and Skills in increasing the prestige of the science and engineering sectors with the aim of attracting people to these careers.

The Liberal Democrats' education policy was not put forward with great detail by their candidates. There was a call for more investment in university-level STEM teaching and generally improving STEM teaching at all levels to improve the skills of the general populace. Also, more effective careers advice was called for in order to inform people of what skills they will need for the career they want to pursue.

Though there is cross-party support for evidence-based policymaking, this is most vocally championed by the Liberal Democrats, who hope for the presence in Parliament of much better skills in statistics, probability and use of evidence. Layla Moran (Oxford West and Abingdon) said "There is very little policy that cannot be improved by an understanding of data, uncertainty, and knowing the difference between correlation and causality." Robin Long (Lancaster and Fleetwood) echoed this call and also backed CaSE's action point for a chief scientific advisor in every government department, noting that this was helpful for both science-for-policy and policy-for-science.

Image 3. Wordle based on responses from all Liberal Democrat PPCs

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The Green Party manifesto

On investment in science and engineering

- Will increase government funding on research from 0.5% to 1% of GDP over ten years (p18)
- Will focus on basic research, particularly environmental issues, and spend less on military research (p18)

On science and engineering education and skills

- Will make higher education free and end the student loan system and in the longer term will consider scrapping tuition fees for academic postgraduate courses (p40)
- Increase funding for apprenticeships by 30% (p38)
- Will reintroduce the block grant to universities (p40)
- Will allow foreign graduates to work in the UK for two years after university (p72)

On the use of science and engineering in government

- Will ban non-medical animal experimentation and government funding of animal experimentation and stop the breeding and use of genetically altered animals (p17)
- Will publish freely the results of all government-funded research (p18)
- Will ensure research is conducted ethically and prevent patenting of genes and living organisms (p18)
- Are in favour of an elected House of Lords (p58)
- Are in favour of Britain staying in the EU but also reforming it and holding an in/out referendum (p71)

The wider view from CaSE

The Green Party declare that they are the "only real party of science" in their manifesto. And in her letter to CaSE, leader Natalie Bennett points out that she is a science graduate, the only one out of all the party leaders. Standing for election in Holborn and St Pancras, Bennett will have the UK's brand new biomedical research institute, The Crick, in her constituency if she manages to overturn a sizable Labour majority.

The Green Party go beyond CaSE's call on government R&D investment, pledging to double it from 0.5% to 1% gradually over a ten year period. (We have said the UK should aim for levels similar to Germany and America – about 0.8%). They say they would focus on basic research but make no references to specific budgets. With their intended shift away from military R&D, one would expect the Research Councils to benefit and it's clear that environmental research would see large increases in funding. Energy and climate change both feature as major areas of interest among Green parliamentary candidates in their blogs for us.

The party wants to see an end to austerity, with free undergraduate university education being one of the most significant – and costly – areas for increased spending. They say they will bring back

block grants to fund universities but do not provide any indication of what level of funding this would represent to compensate for the loss of fees. The need for extra funding would be especially acute in lab-based subjects. The Green Party also wants to encourage foreign students to come to the UK to study and stay on for two years afterwards. Their wider migration policies could also be read as intended to make it easier for skilled workers to come to the UK, which could benefit science and engineering businesses and universities. 30% more funding for apprenticeships would also be a boon if targeted at science careers.

The science community will largely cheer the pledge to make all government-funded research publicly available, but as David Willets found as Universities and Science Minister, the detail of how this can be achieved is tricky. No-one could argue with the commitment to ensuring research is conducted ethically either, but another pledge to end government funding of animal research and ban the breeding of genetically altered animals (currently about half of the animals used in experiments each year) could drastically affect valuable research underway in a number of fields. Banning the patenting of genes and living organisms would also be problematic and require changes in EU law. Along with all the parties on the Left, the Greens want the UK to remain part of the EU and wish to create an elected House of Lords, meaning potentially less scientists in parliament.

Science and innovation does not appear in the top 20 themes of the Green manifesto but when it is mentioned, it tends to be in a positive way, according to NESTA's Political Futures Tracker. The Party is not short of science policy and is keen to spend on it. Out of all the parties, their policies, if enacted, could have the most profound effect on the shape and focus of UK science and engineering.

What Green parliamentary candidates told CaSE

A number of Green Party candidates brought up the image of the party as "anti-science" in their blogs for CaSE, and took pains to say this is not the case, merely that they do not support some technologies such as nuclear power and GM foods. James Abbot (Witham) describes Green policy as "founded in an evidence-based approach, balanced within an ethical framework". Indeed, many Green candidates talked supportively of new technologies in sustainable agriculture and renewable energy, among other fields.

The Greens were also united in their support for the effective use of evidence in policymaking. Charlotte George (Hackney South and Shoreditch) said "testing policies and changing our minds as new evidence emerges should be assumed political process" and supported the call for randomised controlled trials to be applied to political policies. A number of candidates also affirmed the continuation of the Haldane Principle, stating that Research Councils should remain independent of government in deciding what research to fund.

Image 4. Wordle based on responses from all Green Party PPCs.

The UKIP manifesto

On investment in science and engineering

- Will invest an extra £130 million a year into researching and treating dementia by 2017 (p16)

On science and engineering education and skills

- Will "follow the recommendations of the Campaign for Science and Engineering and require every primary school to nominate (and train, if necessary) a science leader" (p29)
- Will abolish tuition fees for UK students taking approved degrees in Science, Technology, Engineering, Mathematics and Medicine (STEMM) on condition that they work in their discipline in the UK for five years (p31)
- Will increase the number of STEMM subjects funded to allow for a greater uptake of these subjects (p31)
- Will introduce an Australian-style points based system to manage the number and skills of people coming into the country and cap the number of these workers entering the country at 50,000 per year (p12)
- Will categorise students differently in immigration figures. All overseas students will be required to have health insurance (p11)

On the use of science and engineering in government

- Support research into GM foods, including research on the benefits and risks involved to the public. Will allow a free vote in Parliament on commercial cultivation (p47)
- Will tightly regulate animal testing and challenge companies using animals for testing medical treatments on the necessity for this instead of alternatives (p47)
- Will repeal the Climate Change Act (p39)
- Are in favour of Britain leaving the EU (p70)

The wider view from CaSE

Science and engineering is not a big theme in the UKIP manifesto: it does not feature as a top 20 theme, according to NESTA's Political Futures Tracker. There is little in the manifesto or in the letter from Nigel Farage to CaSE that hints at how his party might treat the Science Budget and other science and engineering investment.

UKIP does however show a strong interest in promoting science and engineering through its education policies. This includes adopting a CaSE call for all primary schools to nominate and train a science leader to inspire the next generation of scientists, and they also commit to abolishing tuition fees for students taking STEM degrees as long as they stay in the UK to work in a relevant field for five years. To support this they would increase the number of STEM degrees offered at universities. We have heard from Farage in the TV debates that they do not want to restrict skilled people coming to the UK to contribute to the economy and in the manifesto they propose an Australian-style

points-based system. Many of the UKIP candidates told us this policy would favour scientists and engineers in their blogs for our website.

UKIP points to excessive and burdensome regulation imposed by Brussels stifling British research and advocates leaving the EU. They say £9 billion could be saved each year by 2020 if the UK were to leave but unfortunately do not say whether any of that money would be put to good use in science and engineering research. The UK currently attracts over £1 billion each year in European research funding that could be lost were the UK to leave. A possible exit from the EU is of great concern to businesses and universities and even the referendum itself will create a lot of unwelcome anxiety among investors and EU students. Farage is likely to push for a referendum as soon as possible and many commentators say that this could be preferable in many ways as it would get it over and done with, rather than prolonging uncertainty.

UKIP supports research into genetically modified organisms for food production, promising a free vote in parliament on cultivation, and suggests a robust approach to animal research. Their pledges to repeal the Climate Change Act, scrap the Department of Energy and Climate Change (DECC) and roll back emissions regulations for power plants have been described as a "climate sceptic wish-list".

Their education policies suggest that UKIP gets the importance of science and engineering. Farage and his candidates have also told us that they do. But in areas away from education, their policies provide few words of encouragement for the science and engineering community. CaSE would have liked to have seen more talk of investment and commitments to use science advice more prominently in government and policy making.

What UKIP parliamentary candidates told CaSE

All UKIP candidates who blogged for the CaSE website highlighted the party's policy to abolish fees for STEM degrees. Education was by far the most-discussed topic by UKIP candidates with other changes planned concerning the creation of more grammar schools complemented by skills training to boost engineering as a career choice in the UK, as explained by Adrianne Smyth (North East Bedfordshire).

A number of UKIP candidates stressed that they were not anti-immigration and welcomed skilled migrants under Tier 2 visas, along with international students wanting to study STEM courses. The points-based immigration controls proposed by the party would reduce bias over EU immigration and allow skilled workers from around the world to come to the UK candidates told us.

Candidates sounded a more cautionary note than those of most parties on renewable energy, calling for ending subsidies for renewable generation and focusing energy provision on "security and affordability".

Image 5. Wordle based on responses from all UKIP PPCs

The SNP manifesto

On investment in science and engineering

- Will establish a new Ministerial-led Innovation Forum and support the network of Innovation Centres to ensure effective knowledge and innovation transfer from our academic research base into the wider business community. This approach includes a £1 million Innovation Challenge Fund to help address major societal and industrial challenges (p27)
- Supports calls to double research funding across the UK to find a cure for motorneurone disease (p30)
- Will use business tax allowances to encourage R&D investment (p36)

On science and engineering education and skills

- Will guarantee the continuation of free university education in Scotland and support the reduction of tuition fees across the UK (p9)
- Will support an increase in apprenticeships (p10)
- Will seek the reintroduction of the post-study work visa (p11)

On the use of science and engineering in government

- Are in favour of an elected House of Lords (p22)
- Are in favour of Britain staying in the EU and would propose a "double majority" rule for an in/out referendum whereby England, Scotland, Wales and Northern Ireland must each vote to leave the EU before the UK can leave as a whole (p18)

The wider view from CaSE

The Scottish National Party says in its manifesto that it will "foster a culture of innovation" and believes in borrowing for investment for economic growth but does not provide many details on plans for science and engineering investment. Scotland attracts 13% of Research Council funding despite having 8% of the UK's population so it is surprising to not see the SNP wanting that pot of money to increase.

There is a similar lack of focus on science and engineering in their education and skills policies. They will guarantee the continuation of free university education in Scotland and support the reduction of tuition fees across the UK. So Labour can presumably count on their support on bringing tuition fees down to £6,000, as well as increasing the number of apprenticeships.

The SNP is the governing party in the Scottish Parliament, where it has powers over education and university policy. The response we received from the Office of the Scottish Chief Scientific Adviser when we wrote to Nicola Sturgeon chose to highlight the past record of the SNP in Scottish science policy. Like the manifesto, there was a strong focus on policies to encourage innovation and a wish to attract talented people to Scotland through immigration policy (although that is not a devolved power).

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There has been much talk in this election of the power of the SNP to put Labour into government so it is a shame we have not been given a stronger indication of its attitudes to science from the manifesto and letters. The party's objection to austerity could mean less pressure on departmental budgets but it is impossible to tell if the SNP would support increased funding for science over other areas of government spending.

What SNP parliamentary candidates told CaSE

In their blogs for CaSE, SNP candidates were proud to highlight the current position of science within the Scottish economy, and the number of research institutions based in Scotland. Backing this up was a commitment to STEM education in order to provide a source of skilled workers and researchers. However, they also welcomed immigration of skilled workers in order to improve the Scottish skills base. Roger Mullin (Kirkcaldy and Cowdenbeath) said the SNP would "seek to significantly increase immigration of skilled people."

Roger Mullin's blog gave an interesting perspective to his views on science. He lamented the lack of engineering opportunities available in the UK and called for investment and education to strengthen STEM industries.

Image 6. Wordle based on responses from all SNP PPCs

The Plaid Cymru manifesto

On investment in science and engineering

- Will work to ensure Welsh universities get a fair share of UK-based research funding and get the best investment from European Union's Horizon2020 research funding programme (p25)

On science and engineering education and skills

- Will abolish tuition fees in Wales for science, engineering and technology degrees (p25)
- Will re-introduce a post-study work visa for students qualifying from Welsh universities (p39)
- Will ensure that migration meets Welsh needs in areas of skills shortages like health and technology (p39)
- Will work to increase women's access to careers in science, technology, engineering, and maths (p58)

On the use of science and engineering in government

- Support the All Trials campaign for publication of all clinical trials (p19)
- Are against the growth of Genetically Modified Organisms (p47)
- Are in favour of an elected House of Lords (p43)
- Are in favour of Britain staying in Europe (p38)

The wider view from CaSE

In their letter to CaSE, Plaid Cymru told us that "science and technology is key in developing the Welsh economy" and that this is reflected in their policies across the board and they will "press for these in any post-election agreements". The letter goes on to say "we believe more investment is needed, through our higher education establishments, in scientific and technological research". Despite this, there are few mentions of science-specific policies and no solid commitments for investment in science and engineering research in the manifesto.

The manifesto does however say Plaid Cymru will work to ensure Welsh universities get a "fair share" of UK-based research funding and get "the best" investment from the European Union's Horizon2020 funding programme. But it does not say how they would go about doing so. The party opposes austerity so may be expected to support increased funding for science and engineering at a UK level through the Research Councils.

The manifesto states that it is "vital children understand the technology that surrounds them, through coding and advanced computer technology development lessons, such as the Raspberry Pi device". Education is a devolved issue but, as with other areas of public spending, Plaid Cymru could be expected to support increasing education budgets across the UK. Though there is little mention of science and engineering in Plaid Cymru's education policies, there are welcome words on the need to increase the number of women in science and engineering careers.

27 April 2015

Acknowledging that Wales needs more scientists and engineers, Plaid Cymru pledge to abolish tuition fees in Wales for science, engineering, and technology degrees and re-introduce post-study work visas in Wales to help retain talent.

The AllTrials campaign, led by Ben Goldacre and Sense About Science, for all clinical trials to be registered and reported gets a specific mention in the manifesto. And the party passionately supports environmental issues. Less welcome perhaps to the scientific community, is a strong anti-GM stance, although the party views it from an agricultural perspective and does not mention research.

Science and innovation does not appear in the top 20 themes of the Plaid Cymru manifesto, according to NESTA's Political Futures Tracker and, despite positive mentions, the party has few science policies to judge them on. Plaid Cymru only contests Welsh seats for the House of Commons so it is not surprising to see a strong Welsh focus and perhaps for this reason they focus on issues such as agriculture and the environment. Nonetheless, it is clear the party understands the value of science and engineering to the Welsh economy so one could expect them to support investment and other pro-science policies in Westminster despite lacking specific policies in their own manifesto.

What Plaid Cymru parliamentary candidates told CaSE

In their blogs for the CaSE website, Plaid Cymru candidates complained of a brain-drain from Wales and said the party would encourage students to stay by abolishing STEM tuition fees for Welsh students studying in Wales. According to Tim Thomas (Ogmore), the current situation of Research Councils allocating funding centrally, rather than a devolved body, causes a loss of funding for Welsh universities compared to what they should be allocated by the Barnett Formula. He also promoted the party's commitment to recruiting 1000 more doctors in Wales to reverse the loss of NHS services at various Welsh hospitals.

Liz Saville Roberts (Dwyfor Meirionnydd) discussed the suitability of Wales for clean electricity generation through hydroelectric, wind and nuclear schemes. These have historically been important in Wales and Plaid Cymru want to build on expertise in the region, she said, enabled by infrastructure investment and better STEM education.

Image 7. Wordle based on responses from all Plaid Cymru PPCs.

The Alliance Party of Northern Ireland

On investment in science and engineering

- Will increase investment in science and research through the UK Research Councils (p15)
- Will support Northern Ireland's universities in drawing down greater levels of science and research funding from both the Research Councils and the European Union (p15)
- Will audit how scientific infrastructure is lacking in the UK and ensure this is considered as part of the UK's scientific investment programmes (p15). This would include supporting a National Infrastructure Commission (p14) and specifically identifying where gaps exist in both funding and infrastructure for science in Northern Ireland. (p15)

On science and engineering education and skills

- Will invest in a wide range of programmes to assist young people in gaining appropriate skills and by working with specific industries where appropriate (p15)
- Will provide accessible, informed and independent careers advice (p22)
- Will remove the cap on non-EU migrants as this has been detrimental to attracting high-skilled workers and students and make the visa system simpler and easier for legitimate sponsors to fulfil their role (p16)

On the use of science and engineering in government

- Will work to reduce and better regulate necessary animal testing and invest in developing alternative scientific methods and practices (p28)
- Will support the development and use of new and cutting-edge medical processes such as the use of Mitochondrial Replacement Therapy (p20)
- Are in favour of an elected House of Lords (p11)
- Are in favour of Britain staying in the EU but wish to see reforms (p28)

The wider view from CaSE

The Alliance party have a significant focus on science policies, many of which have a UK-wide angle. The manifesto says Alliance MPs in Westminster will support the increased investment in science through the Research Councils, noting that "there is a clear link globally between state investment in science and economic prosperity". They go on to say they will support Northern Ireland's universities to attract more funding from the Research Councils and EU programmes.

Another stand-out commitment, which featured in the letter to CaSE from the party's leader, David Ford, and in the manifesto, was to audit how the UK's scientific infrastructure is lacking and to support a National Infrastructure Commission, presumably referring to Labour's proposal to establish one.

The manifesto acknowledges the important role of science and engineering in Northern Ireland's economy and in creating highly-skilled jobs. Whilst not having any education and skills policies that

specifically reference science, a number focus on supporting economically important industries that rely on science and engineering. These include greater industry involvement in training young people and improved careers advice. Alongside the SNP and Plaid Cymru, the Alliance party see immigration as a positive contributor to their regional economies and have policies to attract and retain students and workers.

In his letter to CaSE, Ford said "Alliance has long ensured that they support evidence-based decision-making. However, we are increasingly concerned that on some issues, particularly in the health service, priority is not being given to medical evidence in the decision-making process". The manifesto supports this, specifically mentioning mitochondrial replacement therapy, which was recently made legal in a controversial parliamentary vote.

The strong focus on investment in science and the role of science in the economy in the Alliance manifesto is very positive. The party however only won one seat in the 2010 election so are unlikely to have a deciding say in decisions in Westminster.

Other parties

The following parties, which had MPs in the 2010-15 Parliament, did not have a significant focus on science policies so have been summarised briefly below.

DUP

The DUP manifesto does not mention science or engineering, but does call for Innovate UK to establish a presence in Northern Ireland. In the party's letter to CasE, DUP Spokesperson on Economic & Finance matters and Education, Science and Technology , Sammy Wilson, said "I fully understand the importance of investment in these areas of the economy. It is something which as a Party we have given priority to through the Northern Ireland Executive".

SDLP

The SDLP says in its manifesto "We must encourage children to take up STEM subjects (science, technology, engineering and maths) at all levels of ability in order to provide our children and subsequently, our businesses, with the necessary skills base to prosper". This view was echoed in the party's letter to CaSE.

Candidates to watch

The following parliamentary candidates were featured on CaSE's "MPs to watch" list for the 2010-15 Parliament and are standing for re-election in the 2015 General Election. They have an interest or background in science, technology, engineering or maths (STEM).

Name	Party	STEM Interest/Background
Adam Afriyie	Conservative	Chairman of POST
David Amess	Conservative	Technology HE
Steve Baker	Conservative	Computer Science HE
Gavin Barwell	Conservative	Former S&T Committee
Margaret Beckett	Labour	Technology HE
Anne Begg	Labour	Interest in genetics
Andrew Bingham	Conservative	Engineering industry
Nicola Blackwood	Conservative	Interests include science, universities and the environment
Crispin Blunt	Conservative	Technology HE
Karen Bradley	Conservative	Maths HE
Tom Brake	Liberal Democrat	Physics HE
Angie Bray	Conservative	Genetics HE
Julian Brazier	Conservative	Maths HE
Kevin Brennan	Labour	Shadow Schools Minister
Therese Coffey	Conservative	POST Board member. Chemistry PhD
Michael Connarty	Labour	POST Board member
Stella Creasy	Labour	Psychology HE
Jim Cunningham	Labour	Interests include innovation and skills, industrial relations
David Davis	Conservative	Molecular/Computer Science HE

Caroline Dinenage	Conservative	All Party Parliamentary Group for Maths and Numeracy (Co-Chair)
Brian Donohoe	Labour	Engineering HE
Jim Dowd	Labour	S&T Committee & former engineer
Tobias Ellwood	Conservative	Technology HE
Charles Elphicke	Conservative	Career in Pharmaceutical Research
Bill Esterton	Labour	Maths and Philosophy HE
Graham Evans	Conservative	Worked for STEM companies
Robert Flello	Labour	Chemistry HE
Paul Flynn	Labour	Former Chemist
Don Foster	Liberal Democrat	Physics HE
Andrew Gwynne	Labour	Technology HE
Alan Haselhurst	Conservative	Head of Pharmacy Firm
John Hemming	Liberal Democrat	Physics HE
Mark Hendrick	Labour	Computer Science HE
Julie Hilling	Labour	Chemistry HE
Jim Hood	Labour	Mechanical Engineering background
Kelvin Hopkins	Labour	Maths HE
George Howarth	Labour	Trained as an engineer
Julian Huppert	Liberal Democrat	POST Board member. Chemistry PhD and former researcher
Naomi Long	Alliance Party of Northern Ireland	Civil Engineering HE
Angus MacNeil	SNP	Engineering HE
Khalid Mahmood	Labour	Engineering HE
Gordon Marsden	Labour	Former S&T Committee
Gregg McClymont	Labour	Former S&T Committee
Alasdair McDonnell	SDLP	Interests include urban renewal, information technology and biotechnology
Stephen McPartland	Conservative	POST Board member
Stephen Metcalfe	Conservative	S&T Committee
David Morris	Conservative	S&T Committee
Stephen Mosley	Conservative	S&T Committee
David Mowat	Conservative	POST Board member. Engineering background
Ian Murray	Labour	Shadow Trade and Investment Minister
Pamela Nash	Labour	S&T Committee
Sarah Newton	Conservative	S&T Committee. POST Board member.
Chi Onwurah	Labour	POST Board member. Engineering HE
Alan Reid	Liberal Democrat	Maths HE
Jonathan Reynolds	Labour	Former S&T Committee
John Robertson	Labour	Former Engineer
Barry Sheerman	Labour	All Party Parliamentary Group for Maths and Numeracy (Co-Chair)
Alec Shelbrooke	Conservative	Mechanical Engineer career
Graham Stringer	Labour	S&T Committee

Stephen Timms	Labour	Maths HE
David Tredinnick	Conservative	S&T Committee
Valerie Vaz	Labour	Biochemistry HE
Alan Whitehead	Labour	Energy & Climate Change Select Committee
Hywel Williams	Plaid Cymru	S&T Committee
Roger Williams	Liberal Democrat	Former S&T Committee
Stephen Williams	Liberal Democrat	Interests include education and skills
Simon Wright	Liberal Democrat	Former maths teacher
Nadim Zahawi	Conservative	Chemical Engineering HE

The following are parliamentary candidates standing for election in the 2015 General Election who have an interest or background in STEM and either hold a strong majority or are in a marginal constituency (seats with majorities of 10% or less that require a swing of 5% for the incumbent party to lose)

Debbie Abrahams	Labour (Re-standing)	Public health consultant
Dave Anderson	Labour (Re-standing)	Has served on ECC & EFRA Commons select committees
Gavin Barwell	Conservative	Natural sciences HE
Richard Burden	Labour	Motorsport and engineering enthusiast
Paul Burstow	Liberal Democrat (Re-standing)	Former Health Minister
Lucy Care	Liberal Democrat	Engineer, Liberal Democrat Team Science member, blogged for CaSE
Tony Cox	Conservative	Engineer, blogged for CaSE
Brian Donohoe	Labour (Re-standing)	Has served on Transport & Environment select committees
David Drew	Labour (Re-standing)	Background in education
Spencer Drury	Conservative	Teacher, blogged for CaSE
David Ellesmere	Labour	Software developer
Graham Evans	Conservative (Re-standing)	Vice-chair of Chemical Industry APPG
Luke Evans	Conservative	GP
Mary Galbraith	Labour	Economist for scientific organisations, blogged for CaSE
Mike Gapes	Labour (Re-standing)	
Rachel Gilmour	Liberal Democrat	Previously Head of Strategy at the Environment Agency
Christopher Green	Conservative	Scientific instrument engineer and STEM school supporter
Nigel Huddleston	Conservative	Google employee, background in the tech sector, blogged for CaSE
Mark Isherwood	Conservative	Welsh Assembly Member who has served on ACPGs on neurosciences, autism, and science and technology, blogged for CaSE

Amanjit Jhund	Labour	GP
Justin Madders	Labour	Strong science industry presence the constituency, blogged for CaSE
Penny Mills	UKIP	Blogged for CaSE
Layla Moran	Liberal Democrat	Maths and physics teacher, Liberal Democrat Team Science member, blogged for CaSE
Michael Mullaney	Liberal Democrat	Constituency science & engineering firms, blogged for CaSE
Roger Mullin	SNP	Education consultant, blogged for CaSE
Mike O'Brian	Labour	Former Minister for Energy, Health, Trade & Industry
Sarah Owen	Labour	Strong high-tech industry presence in the constituency
Nick Palmer	Labour	Maths PhD and computer scientist
Alun Pugh	Labour	Computer science HE
Amber Rudd	Conservative	Minister at the Department for Energy and Climate Change
Liz Saville Roberts	Plaid Cymru	Education background, blogged for CaSE
Royston Smith	Conservative	Former RAF aircraft engineer
Pramod Subbarraman	Liberal Democrat	Dentist
Julia Tickridge	Labour	Previously worked for ICI
Paul Uppal	Conservative	Former PPS to David Willetts
Hywel Williams	Plaid Cymru (Re-standing)	Plaid Cymru science spokesman, ex-member of the Commons Science and Technology Committee
Corri Wilson	SNP	Constituency engineering firms, blogged for CaSE
Simon Wright	Liberal Democrat (Re-standing)	Former maths teacher