

UK Industry Strategy Green Paper- PLG Analysis

March 2017



Summary

The UK government’s [industry strategy green paper](#) was published 23 Jan 2017.

To save you having to plough through the complete 130 pages the key points are summarised below, along with potential photonics context.

There are 2 key opportunities for us

1. Negotiate a ‘Sector Deal’ for photonics
2. Put forward key photonics strategic challenges.

These will be the focus of the next PLG meeting, proposed for 4 May 2017 or 9 May. Please indicate which is your preferred date. Location London.

The first £270m of funding through the industry strategy challenge fund was announced in budget on 8/3/2017 (the exact funding for each challenge is unclear)for:-

- **leading the world in the development, design and manufacture of batteries that will power the next generation of electric vehicles, helping to tackle air pollution**
- **developing cutting-edge artificial intelligence and robotics systems that will operate in extreme and hazardous environments, including off-shore energy, nuclear energy, space and deep mining**
- **accelerating patient access to new drugs and treatments through developing brand new medicine manufacturing technologies, helping to improve public health.**

We also encourage industry to [respond to the strategy](#) – all 38 questions follow the table below by of key new opportunities relevant to photonics and is also open for consultation responses until 17 April.

Potentially action in italic

Industry Strategy topics	Page	Photonics context
The strategy majors on building on Britain’s Strength, extend excellence into future. <ul style="list-style-type: none"> • Excellence in key technologies and research provide us with competitive advantage • Closing gap between best performing companies / regions and less productive. • Skills especially tech/ vocational training “to support, strengthen and develop our different industries, and to get all parts of the country firing on all cylinders”	2,5-6	Photonics is a geographically distributed industry. There are number of leading users of photonics, but much of broader industry remains unaware of photonics impact. Extensive excellence in photonics research for >30 years Many photonics companies note difficulty in fiding shop floor skills in clean high tech manufacturing exemplified by photonics
Good practice quoted- “Government has long worked collaboratively with the aerospace industry....but this relationship is less well developed with other industries... no established coherent framework”		Previously there has been no coherent plan for making the most of enabling technologies such as photonics. <i>UK photonics industry will work with Gov to create a coherent framework for industry strategy for enabling digital/photonic technologies.....</i>

<p>Ten pillars identified to drive strategy forward, further detailed below. R&D and skills are the biggest</p>	11	
<p>1-Investing in science, research and innovation plus commercialisation, Extra £4.7bn by 2020. Focus on expanding investment outside Oxford-Cambridge-London triangle. Aim drive up private sector R&D Options, subject to input, to invest in local science innovation strengths (see Science and innovation audits), commercialisation (Innovate), research talent (PhDs – see budget) and industrial strategy challenge fund.</p> <p>Views sort on priorities for increased investment (oft reiterated in other pillars), e.g</p> <ul style="list-style-type: none"> • improve commercialisation, more University patents, more KTPs • New capital investment fund led by business including for local research institutes • More funded PhDs in STEM (confirmed in budget) • Attracting international talent in research (confirmed in budget) • Capital spending roadmap for fundamental research • Sector specific innovation funds matched by industry, cf ATI • Expanded SBRI scheme • Industrial strategy challenge fund (ISCF) and UKRI to support new tech outside <u>trad silos</u>. <p>New look at best practice in Uni licensing and spin-out practise ie University equity stakes</p>	15, 25-33	<p>Strong, geographical diverse, photonics base Sustained EPSRC investment in photonics gives strong base to commercialise from. Multiple photonics spin-outs as case studies. <i>Prioritises? - datacentres, multiband imaging / sensing, laser materials processing, healthcare photonics</i></p> <p>Some note that it is difficult to find quality applicants for current number PhD places. <i>Expansion of PhD numbers will increase competition for best undergrads and require focused collaborative promotion to get them into photonics PhDs</i></p> <p><i>Photonics specific innovation fund part of sector deal where industry contribution guaranteed by collective industry cf P21 PPP.</i></p> <p><i>Need fit photonics to the ISCF areas that already appear fixed at outset or identify new more inclusive challenges, e.g demonstrator of next generation low latency secure datacentre</i></p>
<p>2 -Developing skills – how to create a new system of technical education.</p> <ul style="list-style-type: none"> • Regional variation in tech education cited as big cause of productivity variations. • Too much focus on low level qualifications • Shortage of high-skilled technician below graduate level. • More needed to empower people to make informed career choices <p>New institutes of technology for higher level tech education. Simpler set of qualifications with clear progress route through tech education</p> <p>Urgent skills shortages cited in nuclear and other</p> <p>NB evidence cited that uptake of STEM subjects at Unis is increasing.</p>	16, 37-49	<p>Tech vocation skills shortage in clean hi tech manufacturing prime problem for photonics.</p> <p>Photonics a classic hidden technology where career options unknown. Urgent skills shortages apparent in laser processing.</p> <p><i>Photonics industry happy work to with employer panels to define new qualification requirements (see tech skills survey previously undertaken)</i></p> <p>Is increasing uptake of STEM translating to more people going into photonics careers?</p>

		Need photonics companies to provide more workplace experience.
3- Upgrade infrastructure – digital, energy transport, water. £740m for local fibre broadband rollout, 5G and fibre projects. Need for physical and digital infrastructure. . £1.9bn National cyber security strategy	17, 50-60	Photonics is digital infrastructure Alongside growth in rural broadband need strength UK’s core Fibre backbone network, clear now this is covered in Fibre Network’ role out
4- Support business to start and grow. Focus on scale-up of start-ups to mid sized firms. Need for increasing access to equity finance and management skills outside South East. Improving investment in long term assets that drive productivity Ensuring uptake of new tech and digital processes that support growth. £13 million support for productivity council for B2B engagement to improve productivity ‘including practical advice for individual businesses’	18, 61-70	Photonics is an industry of SME’s many seeking funding to grow. Photonics investments help productivity e.g laser processing, optical comms. Support to increase investment by broader manufacturing in high productivity photonics welcome. <i>Photonics can provide case studies to peer-to-peer business networks and productivity council</i>
5- Improving Gov. procurement Review / extension of SBRI scheme in UK. Defence industry policy refresh published shortly to improve support to growth Defence and security accelerator to match suppliers with D&S customers. InSight (IRIS) unit being established to identify implications of emerging tech to defence and security. Health an accelerated access pathway to streamline access for innovations promised. NHS Engalnd commercial unit to develop commercial models for supplying NHS. Greater capacity in AHSNs	18, 71-80	Procurement in defence, digital hardware & health continues to be prime opportunity for photonics Access Healthcare market notoriously difficult, esp for med equipment Lighting offers saving for councils but opex / capex balance a hurdle.
6- Encouraging trade and inward investment. Support for consortia bidding for large overseas contracts. More strategic approach to inward investment. Doubling export finance capacity Increasing defence exports New great.gov.uk export portal Review of how to maximise opportunities from UK presence at international trade fairs	19, 81-88	Photonics heavily export focused industry. Photonics attracts lots inward investment due to global leadership of UK capability <i>Review photonics opportunities on great.gov.uk</i> Small number of International trade fairs where UK support key (Pwest, Laser world of photonics- <i>potential to expand to china?</i> <i>Increase support to others.</i>
7- Delivering affordable energy and clean growth. More £ for energy innovation. Making most of areas UK has strength e.g nuclear decommissioning, Offshore Oil & Gas	20, 89-95	Photonics can be instrumental in delivering cleaner more efficient manufacturing Specific photonics opportunities in decommissioning
8- Cultivating world leading sectors with sector deals.	20, 97-	UK Photonics is a world leading sector with good leadership.

<p>Gov welcome proposals from Industry with strong leadership to transform their sector by</p> <ul style="list-style-type: none"> • Policy alignment on e.g. skills, De/Regulation, competition, diffusion best practice / new tech, reduction market barriers, efficient use of funding, new institutions in innovation / skills. • With result of upgrading productivity, promoting competition / innovation, facilitating long term investment, increasing exports, accelerating growth, commercialisation, boosting skills. <p>Driven by business to meet priorities of business. Sector councils can be that conduit but need be open to SMEs. ‘Sector deals not about providing additional gov funding’. Will need to show how companies can transform industry’s strategic prospects and impact of gov support.</p> <p>Role of vibrant SME supply chain recognised. Support sectors including helping them innovate Aerospace and automotive given as lead examples.</p> <p>Challenger Business Programme to support emerging sectors (e.g Quantum)</p>	106	<p><i>What should be in a photonics sector deal proposal</i></p> <p><i>- what are the priorities that should be addressed:-</i></p> <p><i>-one big deal or multiple for different areas of photonics</i></p> <p>PLG take lead in photonics sector deal development.</p> <p>PLG always been open to contributions SMEs</p>
<p>9-Driving growth across whole country. Resolving dipartites in regional skill levels and productivity. Backing for regional innovation strengths via expanding Uni commercialisation and support for local strengths</p> <p>“encouraging investment in new technologies as well as in research that creates new technologies”</p> <p>Raising skills levels in areas where low. Regional Measures to increase take-up of apprenticeships and attract and retain graduates.</p>	21, 107-118	<p>Photonics has globally leading industry and research institutes around country supporting regional growth. Greater support for commercialisation welcomed</p> <p><i>Beware of excessive regionalisation in globally orientated business like photonics</i></p> <p><i>Accelerate profiling of Uk photonics and availability of regional data.</i></p>
<p>10-Creating the right institutions to bring together sectors and places. “right institutions with right powers”</p> <p>Creation / support industry clusters / networks / trade associations (p22). Leverage research labs/ universities for local growth. Focus on local / regional groups.</p>	22, 119-126	<p>Photonics awareness in many existing institutions low.</p> <p>Strengthening of business networks around photonics needed, but need to match with the localisation focus of strategy.</p> <p><i>Is there a role for support micro / town based photonics clusters?</i></p>
<p>New research institute in battery technology proposed (confirmed in budget under ISCF</p>	16	<p>Photonics key processing technology</p>

Ministerial forums on industry strategy with the devolved administrations	23	Critical given strength of photonics in Scotland and Wales. Unclear which element of strategy apply only to England. (Request APPG to clarify)
UK measurement strategy to capitalise on National measurement system (in summary bullets only)	34	Photonics key metrology tool

Response / Questions in industry strategy

Responses by 17/4/2017 to all or some of following questions

To <https://beis.gov.uk/citizenspace.com/strategy/industrial-strategy/consultation/intro/>

1. Does this document identify the right areas of focus: extending our strengths; closing the gaps; and making the UK one of the most competitive places to start or grow a business?
2. Are the 10 pillars suggested the right ones to tackle low productivity and unbalanced growth? If not, which areas are missing?
3. Are the right central government and local institutions in place to deliver an effective industrial strategy? If not, how should they be reformed? Are the types of measures to strengthen local institutions set out here and below the right ones?
 - a. Is role of national associations in highly disruption sectors missing?
4. Are there important lessons we can learn from the industrial policies of other countries which are not reflected in these ten pillars?

Science and Innovation

5. **What should be the priority areas for science, research and innovation investment?**
 - a. Photonics obviously – but which areas?
 - i. Datacomm
 - ii. Integration
 - iii.
6. **Which challenge areas should the Industrial Challenge Strategy Fund focus on to drive maximum economic impact?**
 - a. Enabling technology e.g. photonics
 - b. Demonstrator for next ge datcentres
 - c.
7. **What else can the UK do to create an environment that supports the commercialisation of ideas?**
 - a. Enable space for major equity stake for the entrepreneurs
8. **How can we best support the next generation of research leaders and entrepreneurs?**
 - a. Spin out model that support equity stake of entrepreneurs.
9. **How can we best support research and innovation strengths in local areas?**
 - a. Question how localised anything really is

Skills

10. What more can we do to improve basic skills? How can we make a success of the new transition year? Should we change the way that those resitting basic qualifications study, to focus more on basic skills excellence?

11. Do you agree with the different elements of the vision for the new technical education system set out here? Are there further lessons from other countries' systems?
12. How can we make the application process for further education colleges and apprenticeships clearer and simpler, drawing lessons from the higher education sector?
13. What skills shortages do we have or expect to have, in particular sectors or local areas, and how can we link the skills needs of industry to skills provision by educational institutions in local areas?
14. How can we enable and encourage people to retrain and upskill throughout their working lives, particularly in places where industries are changing or declining? Are there particular sectors where this could be appropriate?

Infrastructure

15. Are there further actions we could take to support private investment in infrastructure?
16. How can local infrastructure needs be incorporated within national UK infrastructure policy most effectively?
17. What further actions can we take to improve the performance of infrastructure towards international benchmarks? How can government work with industry to ensure we have the skills and supply chain needed to deliver strategic infrastructure in the UK?

Growth support

18. What are the most important causes of lower rates of fixed capital investment in the UK compared to other countries, and how can they be addressed?
19. What are the most important factors which constrain quoted companies and fund managers from making longer term investment decisions, and how can we best address these factors?
20. Given public sector investment already accounts for a large share of equity deals in some regions, how can we best catalyse uptake of equity capital outside the South East?
21. How can we drive the adoption of new funding opportunities like crowdfunding across the country?
22. What are the barriers faced by those businesses that have the potential to scale-up and achieve greater growth, and how can we address these barriers? Where are the outstanding examples of business networks for fast growing firms which we could learn from or spread?

Procurement

23. Are there further steps that the Government can take to support innovation through public procurement?
24. What further steps can be taken to use public procurement to drive the industrial strategy in areas where government is the main client, such as healthcare and defence? Do we have the right institutions and policies in place in these sectors to exploit government's purchasing power to drive economic growth?

Trade and investment

25. What can the Government do to improve our support for firms wanting to start exporting? What can the Government do to improve support for firms in increasing their exports?
26. What can we learn from other countries to improve our support for inward investment and how we measure its success? Should we put more emphasis on measuring the impact of Foreign Direct Investment (FDI) on growth?

Energy

27. What are the most important steps the Government should take to limit energy costs over the long term?

28. How can we move towards a position in which energy is supplied by competitive markets without the requirement for ongoing subsidy?
29. How can the Government, business and researchers work together to develop the competitive opportunities from innovation in energy and our existing industrial strengths?
30. How can the Government support businesses in realising cost savings through greater resource and energy efficiency?
 - a. Laser processing and industrial imaging key....
Sector support
- 31. How can the Government and industry help sectors come together to identify the opportunities for a 'sector deal' to address – especially where industries are fragmented or not well defined?**
 - a. Pragmatic in expectations of what a sector looks like not all major dominant company
- 32. How can the Government ensure that 'sector deals' promote competition and incorporate the interests of new entrants?**
 - a. Open membership and inclusive models, beware fixed vertical pillar, look to enabling techs as well as established vertical sectors.
- 33. How can the Government and industry collaborate to enable growth in new sectors of the future that emerge around new technologies and new business models**

Regions

34. Do you agree the principles set out above are the right ones? If not what is missing?
35. What are the most important new approaches to raising skill levels in areas where they are lower? Where could investments in connectivity or innovation do most to help encourage growth across the country?

Institutions

36. Recognising the need for local initiative and leadership, how should we best work with local areas to create and strengthen key local institutions?
37. What are the most important institutions which we need to upgrade or support to back growth in particular areas?
38. Are there institutions missing in certain areas which we could help create or strengthen to support local growth?