



# Improving regional support for photonics in the UK



PHOTONICS<sup>21</sup>



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 732695

**Innovate UK**  
Knowledge Transfer Network





# EPIC Centre in Paignton

Dan Newman and Murray Reed,  
Torbay Development Agency



PHOTONICS<sup>21</sup>



This project has received funding from  
the European Union's Horizon 2020  
research and innovation programme  
under grant agreement No 732695

**Innovate UK**  
Knowledge Transfer Network





# Improving regional support for Photonics in the UK

Electronics & Photonics Innovation Centre (EPIC)

December 2017



# Introduction

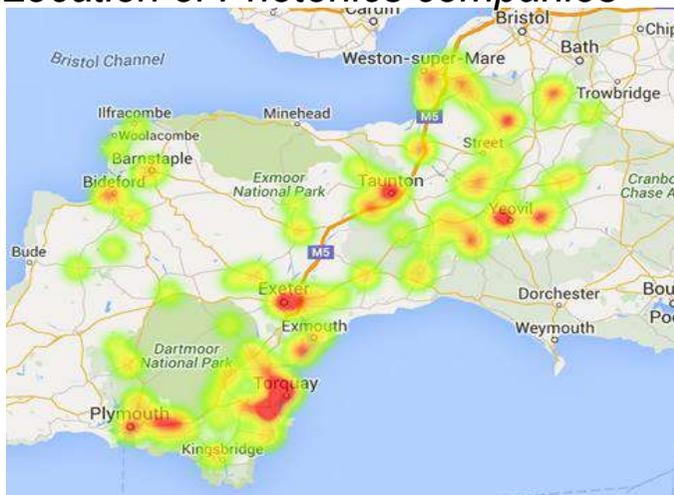
1. About TDA
2. Regional Context
3. Torbay Hi-tech Forum
4. EPIC



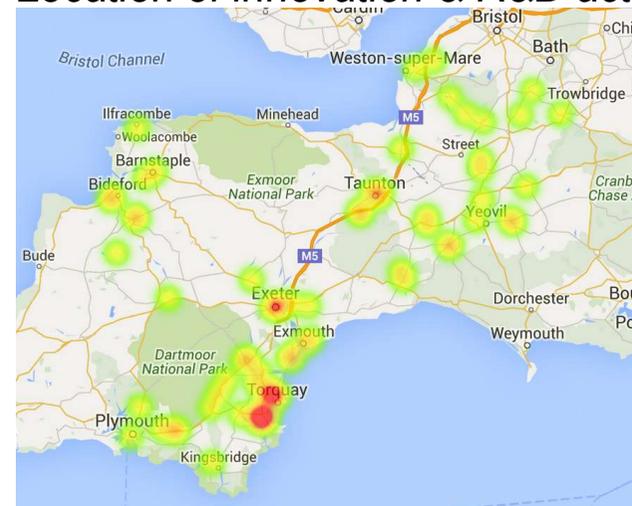
# Regional Context

- 3,125 people employed
- 174 companies
- £516M pa in output

*Location of Photonics companies*



*Location of innovation & R&D activity*



# Torbay Hi-tech Forum

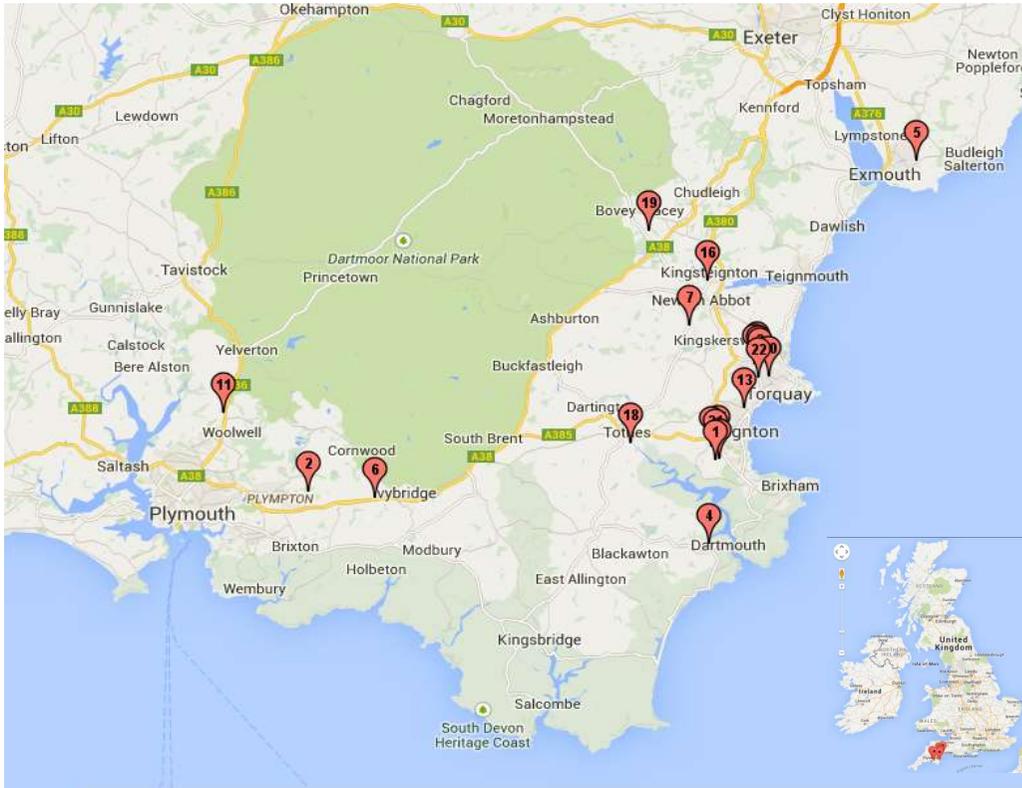


- Established in 2010
- Over 28 member companies
- Plymouth, Exeter, Bath and Cambridge Universities
- Innovate UK
- South Devon College



# Torbay Hi-tech Forum

TORBAY



[www.torbaydevelopmentagency.co.uk](http://www.torbaydevelopmentagency.co.uk)

# EPIC – The Objective

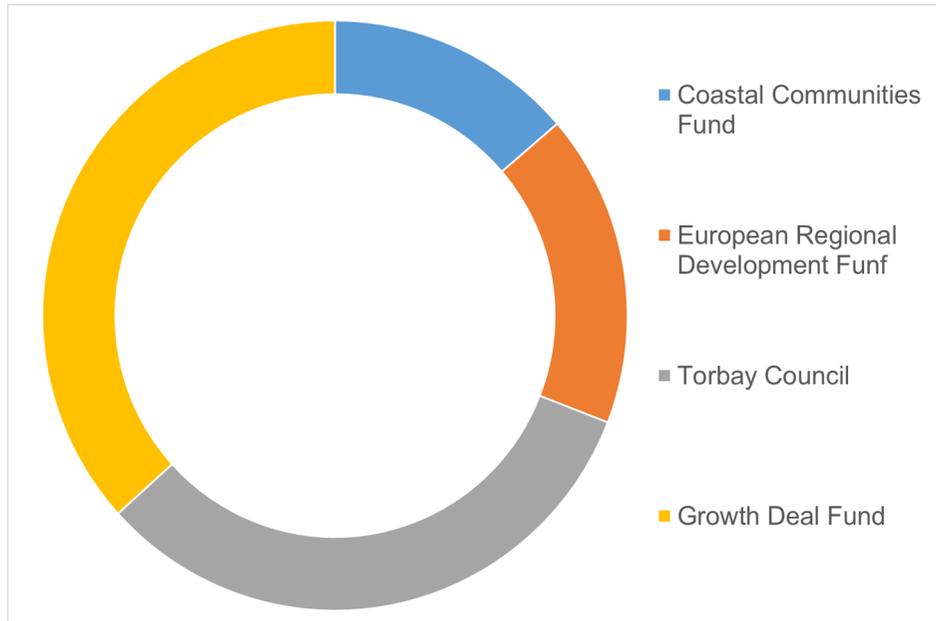


- Form a focal point/ epicentre of local hi-tech sector
- A leading Centre of Excellence
- Support and grow the cluster of hi-tech companies
- Attract inward investment
- Encourage new start-ups
- Accelerate the introduction of new technology to market
- Greater engagement with universities
- Offer neutral space for joint collaborative projects





# Funding



£8.015M

Project

£7.14M

Build

£600K

Equipment

£275K

Revenue



# External Designs



# EPIC's Focus



- Accelerate innovation of new technology
- Support commercialisation of R&D
- Knowledge transfer
- Support design, prototyping, and testing and validation
- Developing partnerships and networks



# Building Offer

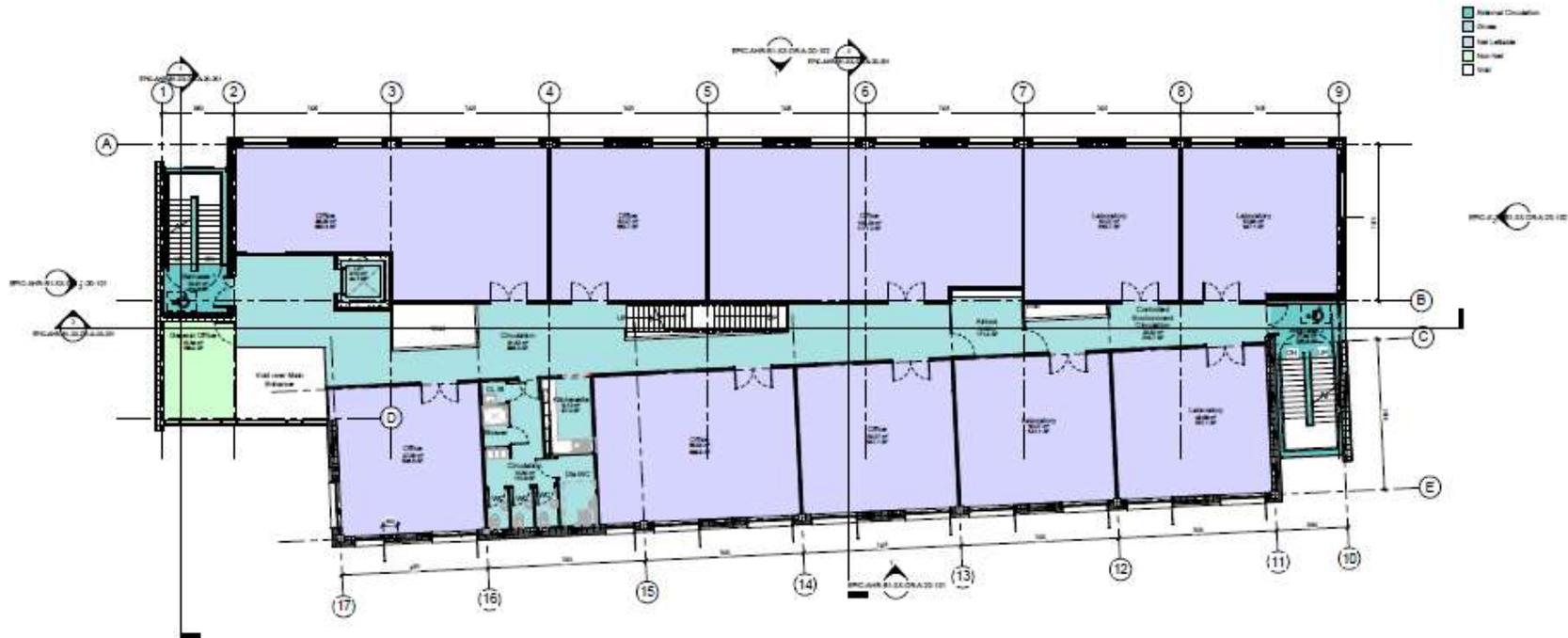


- Open market access to dedicated and specialist facilities:
  - Laboratory Space
  - Cleanrooms
  - Office
  - Collaboration
  - Meeting rooms
- Serviced space inclusive of costs
- 24/7 access
- Access to specialist equipment
- Dedicated support team – specialist Hi-tech Business Advisor, IA&G, brokering relationships and collaborations
- Benefit from clustering of other companies and transfer of knowledge
- Growth Accelerator Programme





# First/ Second/ Third Floor Layout



# Construction Programme

## To date:

- Appointment of Contractor 24<sup>th</sup> January 2017
- Inception Meeting 8<sup>th</sup> February 2017
- Design and VE Workshop 22<sup>nd</sup> February 2017
- Review of Design Options 30<sup>th</sup> March 2017
- Submit Planning 4<sup>th</sup> July 2017
- Planning Decision 11<sup>th</sup> September 2017

## Forward Plan:

- Mobilisation Works January 2018
- Start on Site February 2018
- Completion of building Q1 2019
- Building operational Q1 2019

## Photonic Device Packaging and Test

- Fibre optic alignment, assembly and test including SM & PM
- Semiconductor chip alignment, assembly and test
- Hermetic, plastic and windowed packaging and test
- Microelectronic IC test
- Photonic IC integration and test
- Manual and automated  
photonic equipment build and test



# EPIC's Market Foci



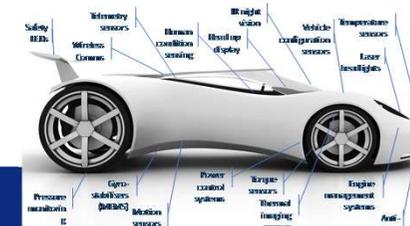
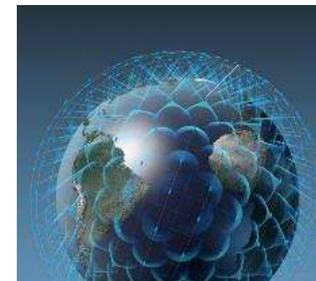
Bespoke packaging design services and pilot scale production for new photonics devices

- Communication
- Imaging
- Sensors



Expanding mass markets

- data centres for the cloud
- satellite constellations
- smartphone & smartcar components
- healthcare portables
- many more to come

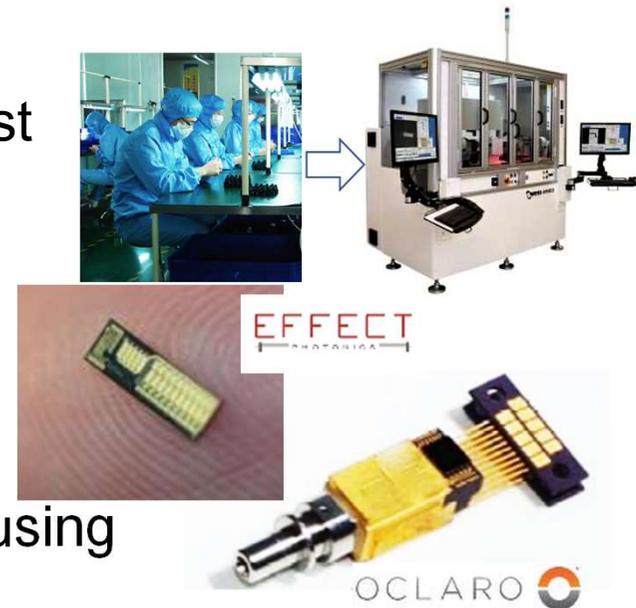


# EPIC's Technology Opportunities



Advances for low cost, high quality photonic components in high volume

- automated package assembly & test
- photonic integrated circuits (PICs)
- wafer scale packaging processes
- photonic crystal fibres
- standardised packaging platforms using validated building blocks





# LEP perspective and support for the National Centre for Healthcare Photonics in Sedgefield

Tom Harvey, CPI



PHOTONICS<sup>21</sup>



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 732695

**Innovate UK**  
Knowledge Transfer Network





# North East Strategic Economic Plan:

*Supporting Regional Growth*

December 2017

[Richard.Baker@nelep.co.uk](mailto:Richard.Baker@nelep.co.uk)



# About the North East Local Enterprise Partnership



## What is the North East Local Enterprise Partnership (LEP)?

The North East LEP is a public, private and education partnership that works together to improve the North East economy.

The North East LEP works across an area which is home to 1.9 million people and covers County Durham, Gateshead, Newcastle, Northumberland, North Tyneside, South Tyneside and Sunderland local authority areas.

## What is the LEP's role in delivering the SEP?

Our role is to provide strategic economic leadership for the region, working with partners and leading, facilitating and supporting delivery of the SEP. We aim to secure maximum investment and resources for the region, raise the national profile of the North East and work with partners on initiatives that will have the greatest economic impact for the area.

## What is the North East Strategic Economic Plan (SEP)?

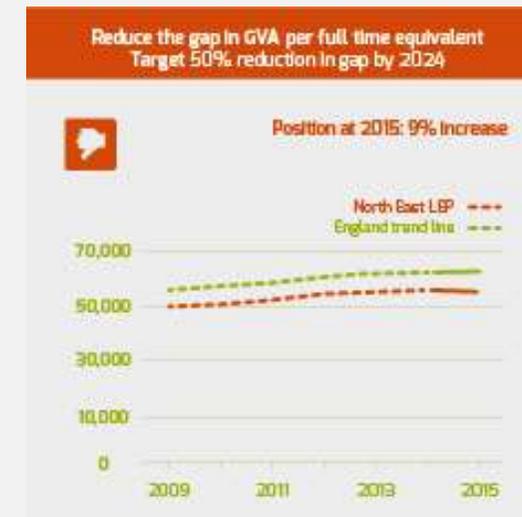
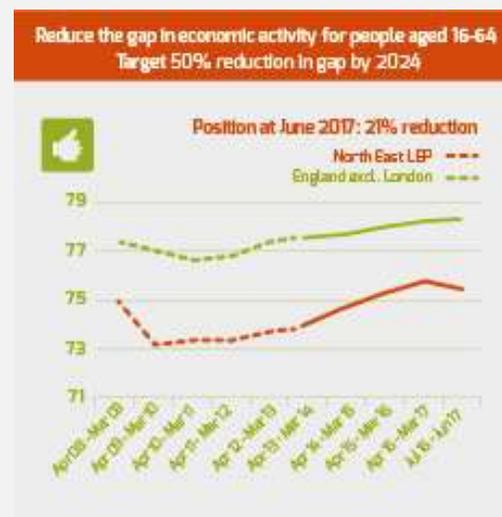
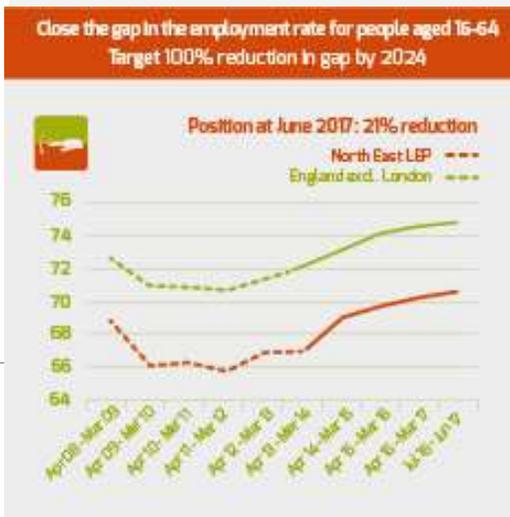
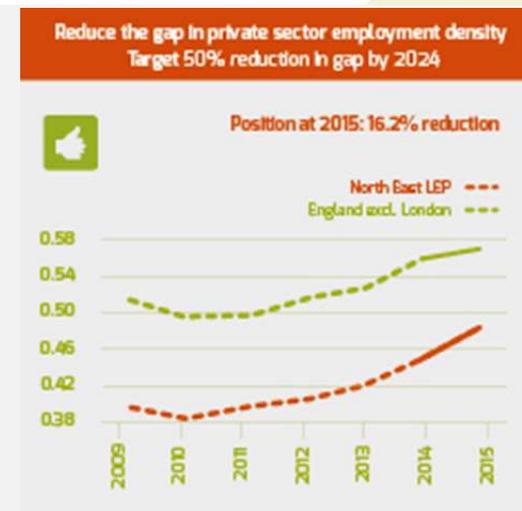
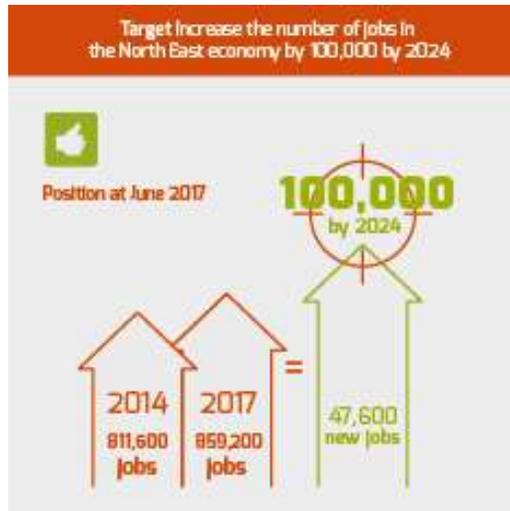
The SEP is our plan for economic growth and development in the North East, and covers the period 2014-2024. It sets out what we are good at, our targets to create more and better jobs and improve the fundamentals of our economy, and details how we are going to deliver them.

## Why is it important to have a SEP?

The SEP is recognised by government as the North East's principal economic policy document that sets a strategic direction for our regional economy. It outlines our medium term economic plan and helps identify interventions and investments to support economic growth and to create more and better jobs for our economy. It is the plan which is shared and owned by the North East to grow the economy.

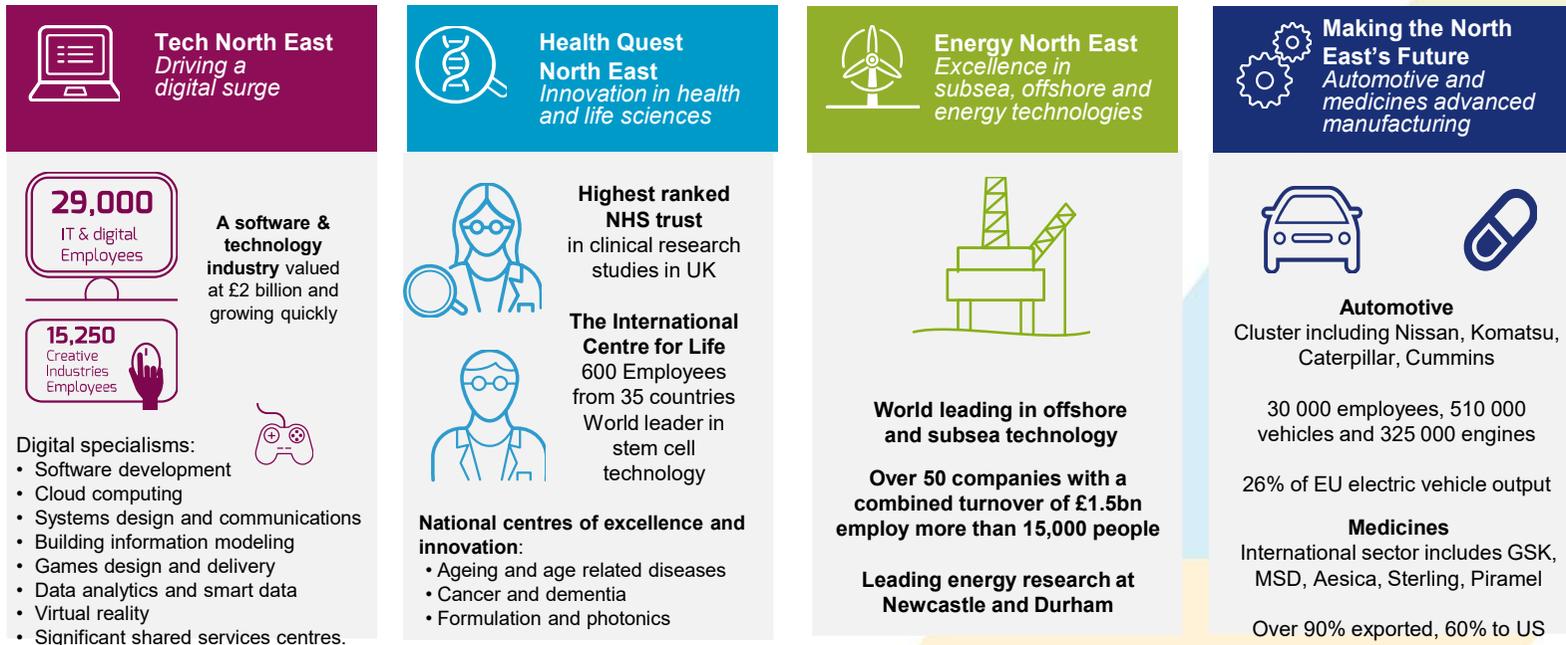
# North East Strategic Economic Plan: More and Better Jobs

## Key economic indicators for 2014 - 2024



# Focusing on areas of opportunity:

## Industrial and innovation strengths, High productivity enabling services





## Areas of Opportunity: Key enabling services

### Education

We have a highly diverse education system including four universities providing a significant research base and educating 100,000 students each year.

Based on its share of employment, the education sector is estimated to account for nearly 7% of total North East LEP GVA and has seen growth over the last 10 years of around £700 million.

The further education (FE) system includes ten colleges and a range of other providers including sixth forms and private bodies. There are around 900 schools in the North East.

### Financial, professional and business services

The North East hosts key segments of the UK's £180 billion financial technology, banking, insurance, securities dealing, fund management, management consultancy, legal services, and accounting services sectors.

There are 17,645 financial, professional and business services companies in the region.

### Transport and logistics

Around 4,000 additional jobs have been created in the transport and logistics sector since 2014.

This comprises about 4% of the business base plus a range of public providers.

# Shaping our region for growth, inclusion and innovation

- Strengthened spatial plans
- Delivery of key sites to support clustering
  - Enterprise Zones
  - Development sites
  - Innovation campuses
- Enhanced transport and digital connectivity
- Innovation in place – developing collaborative place based and test-bed opportunities
- Distinctiveness through culture and tourism



# The North East Strategic Economic Plan: *Priorities for supporting regional growth*



## Innovation

- An open innovation ecosystem - innovation leadership and brand, building networks and the supernetwork, skills and finance
- Investment in our innovation infrastructure – hubs, incubators, facilities, places, catapult centres
- Smart specialisation and grand challenges – building on strengths and addressing issues



## Employability and inclusion

- Supporting people with health conditions to find work
- Pathways for the most vulnerable and the over 50's
- Community level support for economic engagement
- Promotion of social innovation



## Business growth and access to finance

- Scale Up North East: Increased density of high growth businesses through access to support and finance through the Growth Hub
- Strengthening inward investment and trade flows
- Leadership ensuring the North East can respond to economic change.



## Economic assets and infrastructure

- Growth focused Local Plans in our 7 local authority areas delivering sites for jobs, investment and housing
- A pipeline of key projects for investment
- Working together on key projects and developing the duty to co-operate
- A successful enterprise zone programme.



## Skills

- North East Ambition – UK demonstrator of outstanding career guidance
- Excellent technical and professional education
- Strengthening partnerships between education and business to match graduates and quality jobs
- Improving schools and maintaining the over 50's



## Connectivity

- Developing and implementing the regional transport plan
- Improving local transport and digital connectivity to ensure mobility of people, services and goods
- Continuing to build national and international connectivity
- Underpinning innovation through our transport and digital systems – eg 5G Test bed, Mobility as a service, low carbon and autonomous transport.



# Health Quest North East

Driving Health, Life Sciences and  
Pharmaceuticals



# Driving life sciences as an area of smart specialisation

## Why Life Sciences as an area of focus for the NE?

- Large GVA and employment footprint
- Major manufacturing and local research and development capabilities
- Extensive NHS footprint with excellent research record
- Economic and employment growth potential
- Competitive nationally and globally so need to focus on our USPs

### Leadership Group

Peter Simpson, NELEP Innovation Board & N8

Geoff Davison, Bionow

Emma Banks, Datatrial

Nicola Wesley, NENC AHSN

Sarah Hart, RTC

Arun Harish, CPI

Tim Hammond, Durham University

Ben Fisher, Newcastle University

Richard Baker, NELEP

Philip Aldridge, NEPIC

Morag Burton, NIHR CRN NENC

bionow.

N8  
Research Partnership

cpi

repic

Datatrial

North East  
Local Enterprise Partnership

Newcastle  
University

Durham  
University

RTC  
NORTH

ACADEMIC HEALTH  
SCIENCE NETWORK  
NORTH EAST AND NORTH YORKSHIRE

North East  
Enterprise Partnership

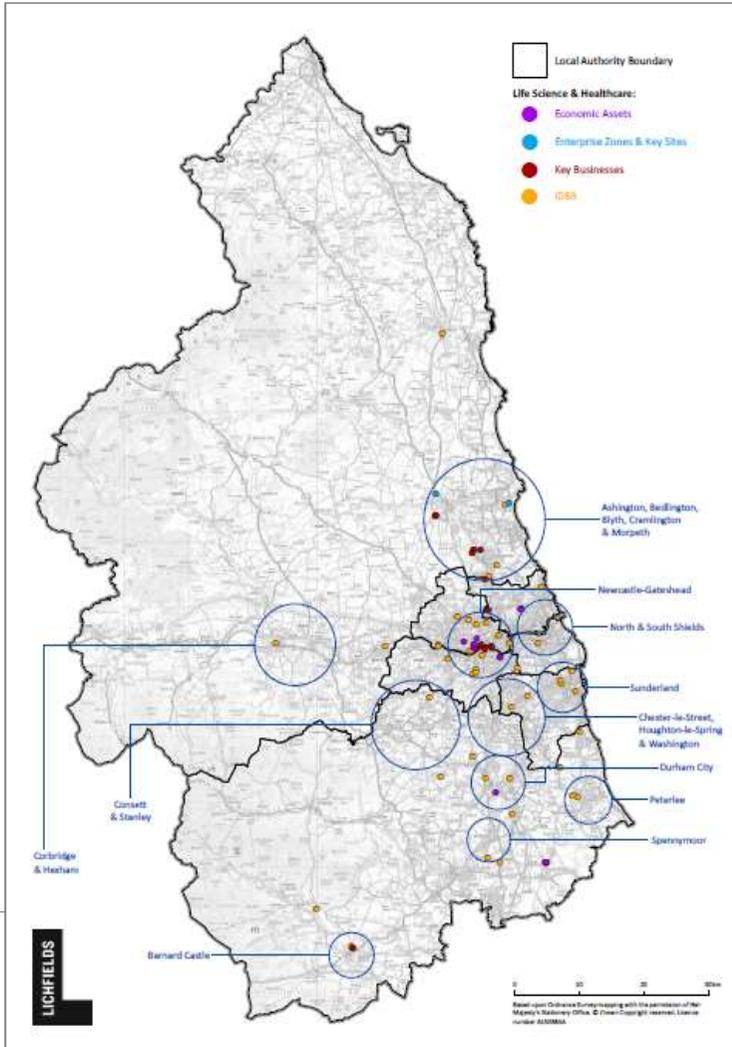
## Engagement to determine focus and priorities

- Assessed current capabilities and capacities
- Identified NE strengths, and gaps
- Consulted regionally and extensively
- Identified opportunities to advance the sector

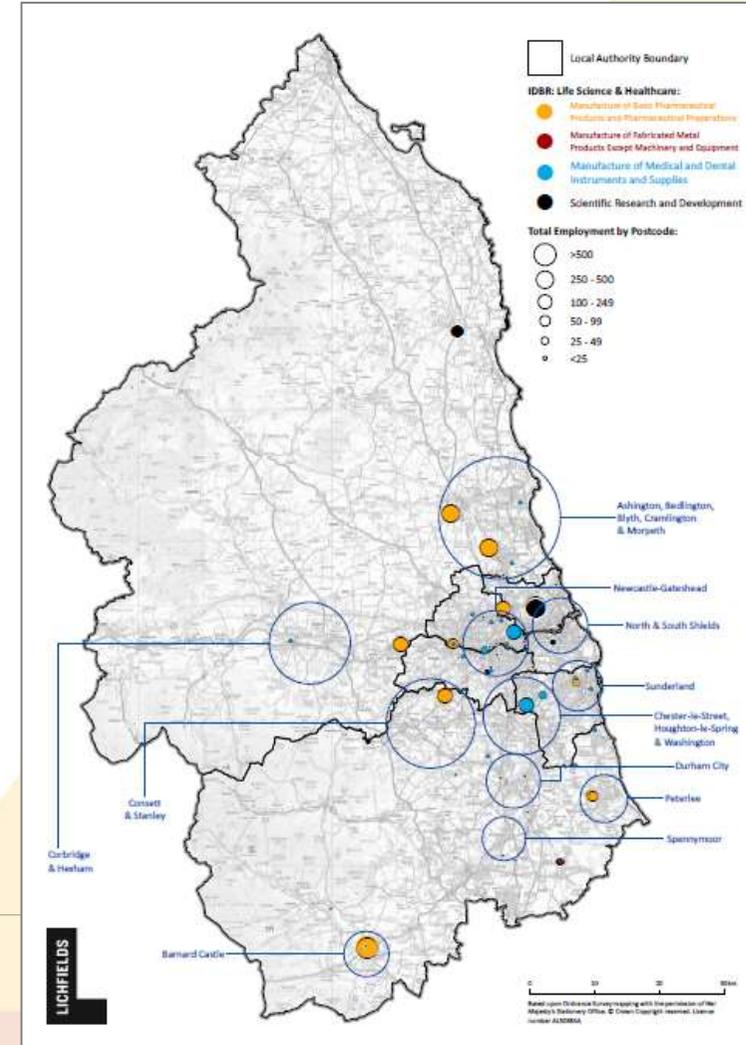


# Life sciences and healthcare

## Location of businesses and assets



## Sector employment by postcode



# Health Quest North East

## Key assets, opportunities and challenges



### Businesses

#### Specialisms include:

- Extensive pharmaceutical manufacturing footprint across API and drug manufacture, Formulation and Packaging
- SME base in medical technologies and devices
- Digital and data strengths
- Clinical trials

#### Opportunities and challenges

- Strong reputation for quality and compliance
- Strengthened co-ordination of sectors
- Personalised and smart delivery of medicines
- Process development
- Social innovation
- Regulatory concerns.

### Eco-system

#### Networks

- AHSN NENC
- First for Pharma
- Bionow
- NEPIC
- Innovation super-network
- Catapult engagement

#### Hubs and facilities

- International Centre for Life
- National Innovation Centre's for Ageing and Smart Data
- National Centre for Innovation in Formulation
- Biologics Centre (Tees V)
- National Centre for Health Care Photonics
- NHS research focus

#### Opportunities

- Strengthened visibility and networking
- Develop regional translation environment
- Growth in incubation and other facilities

### Research and Science

#### Universities with specialisms and business partnerships including:

- Ageing and health
- Cell Therapies
- Cancer
- Dementia
- Diagnostics
- Digital healthcare
- Formulations
- .....etc

#### Opportunities

- Commercialisation of knowledge base
- Growth of industry partnerships
- Strengthened co-ordination
- Demographics

### Skills



- 50,000 STEM students coming through our universities every year
- Strong pharmacy schools
- Strong industry led apprenticeships and schools programmes
- Northern Future UTC

#### Opportunities

- Immediate skills gaps
- Grow skills supply



## The key aims

- Provide a comprehensive support system for key high growth businesses and sub-sectors.
- Develop a cluster economy opportunity around world-leading companies selecting the North East for production plants by supplementing the pharmaceuticals supply chain
- Unlock the commercial potential of NE university world class research
- Supportive business and NHS infrastructure to translate discovery through development to adoption
- Be a/the leading region for NHS adoption of innovation

## Current activity

Appoint of Sector Lead from November 2017

Development of evidence

- Publication of new report on Medicines manufacturing
- <https://www.nelep.co.uk/news/growing-the-contribution-of-the-north-east-pharmaceuticals-sector/>

Active engagement with UK Medicines Manufacturing Strategy – projects

- Cell and gene therapies
- Small Molecule medicines

Examples of investment in key NE based innovation

- Key centres (approved): Ageing, formulation, health care photonics
- Key centres (in development): Smart packaging
- Social innovation programmes: Health Quest North East

Supporting SME growth – in addition to general approach

- Life sciences incubator

Skills agenda – in addition to general approach

- Northern Futures UTC



# North East Growth Deals: How are they supporting investment in innovation?

November 2017



## Growth Deals – funding to help deliver the ‘Strategic Economic Plan’

We manage £270m of Local Growth Funding provided through three ‘growth deals’ between the North East LEP and Central Government.

In return we invest to enable growth – **over 17,000 jobs forecast** from supported projects by 2025.

Funding period 2015-21 - all funds allocated, some ‘mini programmes’.

Relatively high proportion of capital funds supporting innovation, science parks and incubation facilities circa £42m ( >£23m on NETPark).



HM Government

# Science Central Newcastle : Laboratory and Life Sciences Incubation Hub



## Current Status:

Under construction.

Completion August 2018

Location	SEP theme	LGF budget
Newcastle	Innovation	£8.9m
<b>Project Description</b>	Creation of Newcastle's first life science lab with incubation and grow on space. Part of Science Central masterplan.	

## KPIs Forecasts by 2024/25: -

- 270 jobs
- 7510sqm new commercial space.
- 29 new business starts
- 15 existing businesses accommodated.



HM Government

# Hope Street Exchange (Centre for Innovation and Enterprise, University of Sunderland)



Location	SEP theme	LGF budget
Sunderland	Innovation	£4.9m
Project Description	Creation of business incubation and innovation centre with bespoke graduate programmes and also open research facilities including fab lab'.	

## Main KPIs and Forecasts by 2024/25:

- Circa 400 jobs
- 4,000 sqm new / refurbished commercial space
- 150 new businesses accommodated

**Current Status:** Project opened March 2017.

# National Centre for Innovative Formulation



Location	SEP theme	LGF budget
Sedgefield	Innovation	£8.9m

<b>Project Description</b>	New open research facility focused on the technological development and commercialisation of formulated products
----------------------------	--



## KPIs Forecasts by 2024/25:

- 37 jobs initially
- 2700sqm
- 10 business supported with new products
- £5.4m leverage
- Range of other KPIs agreed reflecting specialist activities.

**Current Status:** Nearing physical completion, full occupation Feb. 2018. Advance support to pipeline of users from other CPI buildings.

# Explorer – Grow on space for NETPark

## KPIs Forecasts by 2024/25: -

- 148 Jobs
- 24,200 sqm Commercial space
- 10 business supported with new products
- £5.4m leverage

**Current Status:** - Under construction, on programme for completion Feb 2018.

Location	SEP theme	LGF budget
Sedgefield	Innovation	£3.2m
<b>Project Description</b>	Two new buildings - laboratory, clean room and office space, units ranging from 3,550 to 5,000 sq. ft. for science and technology companies, either graduating from the NETPark Incubator or inward investment.	



# NETPark Phase 3 infrastructure



Location	SEP theme	LGF budget
Sedgefield	Innovation	£5.1m
Project Description	Construction of a 1.2km internal highway opening up access to phase 3 of NETPark	

**Current Status:** Physical completion  
January 2018.

# National Centre for Healthcare Photonics

Location	SEP theme	LGF budget
Sedgefield	Innovation	£8.0m

<b>Project Description</b>	New open research facility focused on the technological development and commercialisation of healthcare photonics products
----------------------------	--



## KPIs Forecasts by 2024/25:

- 15 jobs initially
- 2,000sqm
- £3.5m leverage
- Range of other KPIs agreed reflecting specialist activities.

**Current Status:** Construction work started Nov 2017.  
Recruitment of new team in progress.

# About the Facilities

- at the National Centre  
for Healthcare Photonics



- 2000m<sup>2</sup> floor space
  - Specialist optics, life sciences, electronics and x-ray laboratories
- Manufacturing area and lab space
- Prototyping facilities suitable for clinical investigation and clinical validation work
- Offices, meeting, and seminar rooms
- Available on an open-access basis
- Opening in Q4 2018

## What next ?

- Develop capacity and strong proposals to capture a greater share of Industrial Strategy Challenge Funding etc.
- Support investment in business incubation facilities particularly associated with the SEP smart specialisation areas.
- Two new 'open project calls' 17<sup>th</sup> November 2018
  - **Innovation project development fund** – up to 4- 5 projects over 2 yrs
  - **Incubator Development Fund** – existing incubators and feasibility studies into the development of new facilities.

If you have project ideas we would like to hear from you.

**Contact:** [James.davies@nelep.co.uk](mailto:James.davies@nelep.co.uk)



---

**North East LEP** 1 St James Gate, Newcastle upon Tyne, NE1 4AD  
Tel: 0191 338 7420 | Email: [info@nelep.co.uk](mailto:info@nelep.co.uk) | [www.northeastlep.co.uk](http://www.northeastlep.co.uk) | [@northeastlep](https://twitter.com/northeastlep)



# Example of regional photonics support in Scotland

Stephen Taylor, Technology Scotland



PHOTONICS<sup>21</sup>



This project has received funding from  
the European Union's Horizon 2020  
research and innovation programme  
under grant agreement No 732695

**Innovate UK**  
Knowledge Transfer Network





# Photonics Support in Scotland

**EPRISE**

**Improving Regional Support for Photonics in The UK**

**12<sup>th</sup> December 2017**

**Stephen Taylor, CEO**



# Technology Scotland



## Industry Association for Emerging & Enabling Technologies



**Representing** industry interests to government



**Promoting** Scottish technology capabilities within the UK and internationally



**Influencing** policy at both Scottish and UK government level



**Supporting** the community through events, workshops and forums, aimed at funding, networking, skills sharing, collaboration



**Interfacing** to key national and international stakeholders

# Emerging and Enabling Technologies



## Driving *Step Changes* in Product and Service Performance

### Enabling Technologies

- Photonics
- Micro and nano electronics
- Advanced Manufacturing
- Nano Technology
- Advanced Materials

*E&E technologies provide a basis for:-*

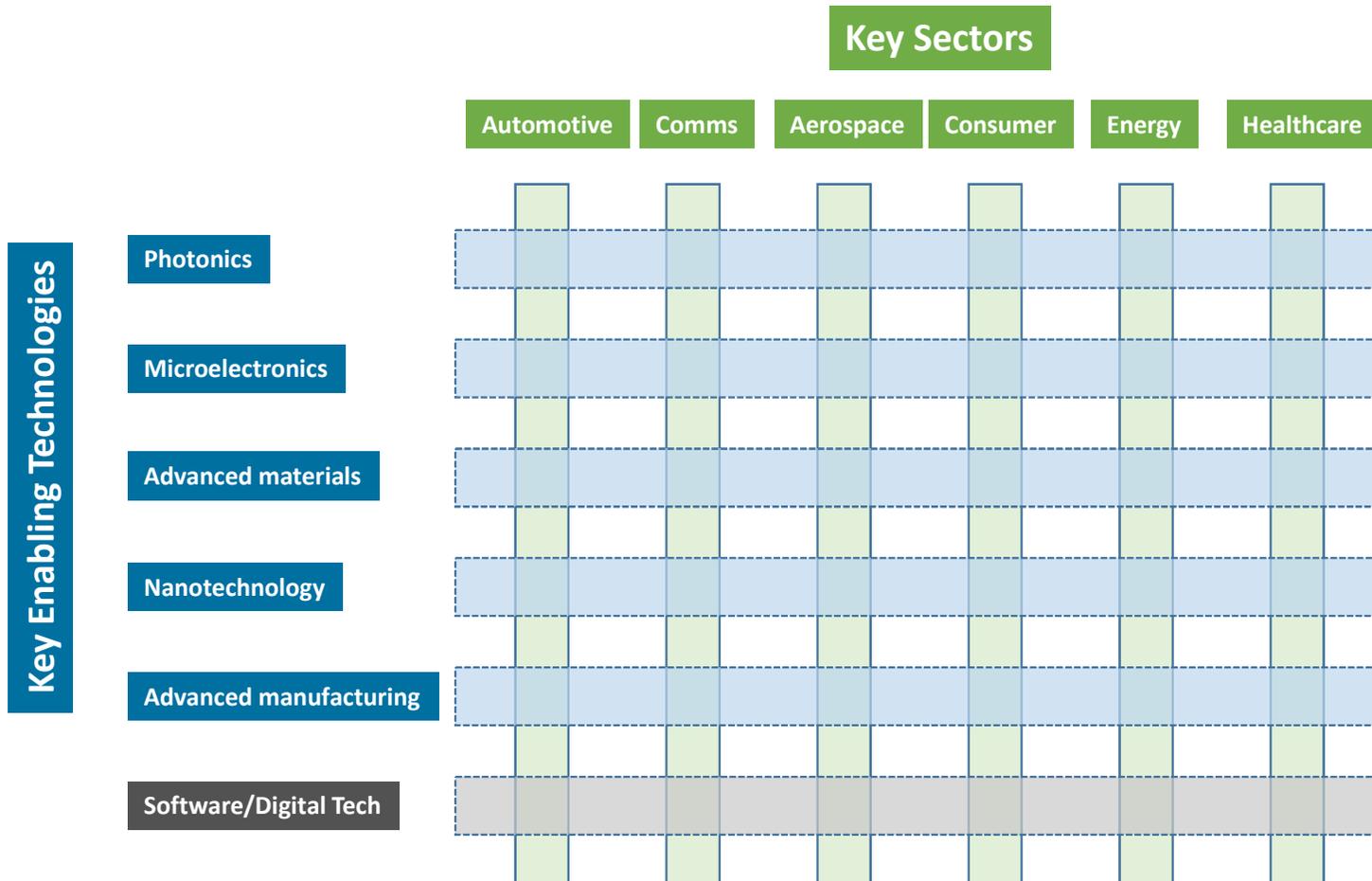
- *significant advancement of product and service performance and capabilities*
- *the modernisation of the global industrial base by unlocking innovation*
- *catalysing step changes in efficiency and productivity*

*Not intended as complete lists!*

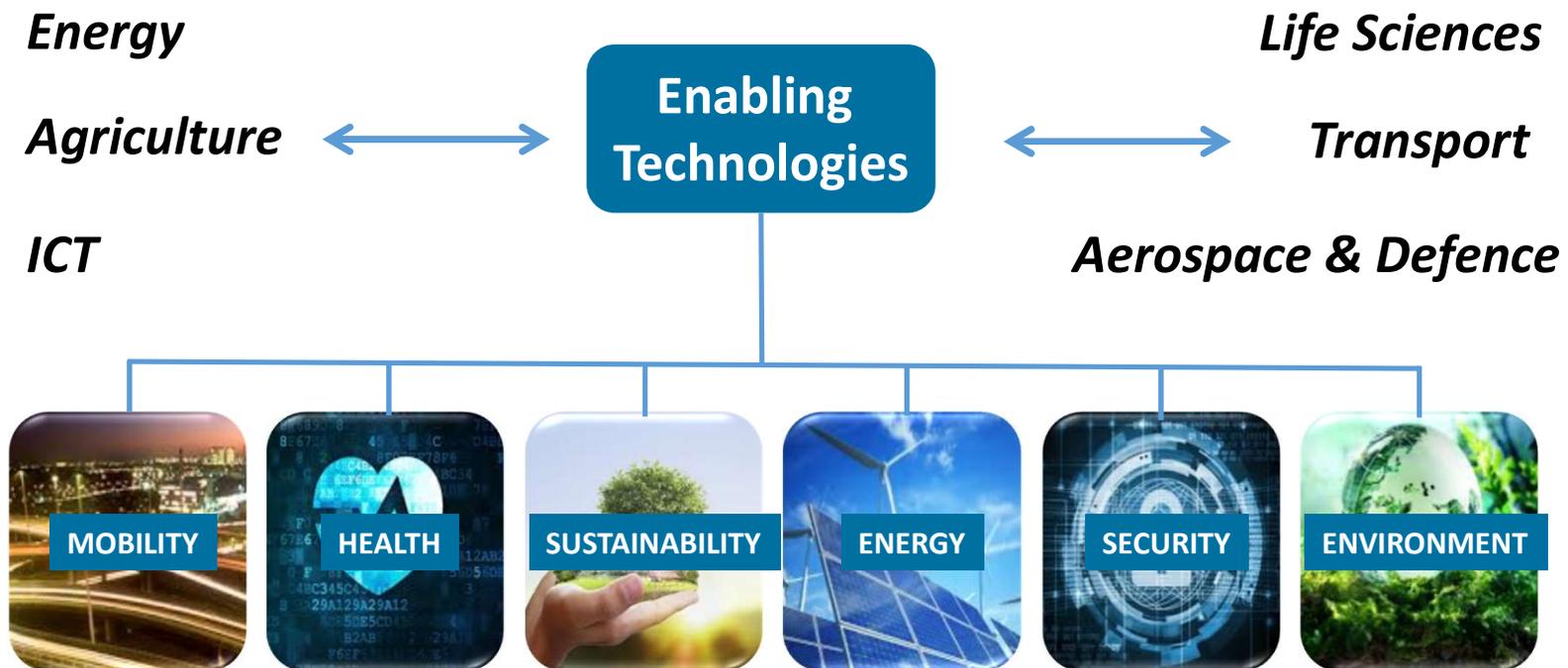
### Emerging Technologies

- Quantum Technologies
- Advanced sensors
- Cyber security
- FinTech
- Satellite earth observation
- Cloud Computing
- Internet of Things
- 5G Wireless & Mobile
- Artificial Intelligence
- Data Science
- Robotics / Autonomous Systems
- Location Specific Services

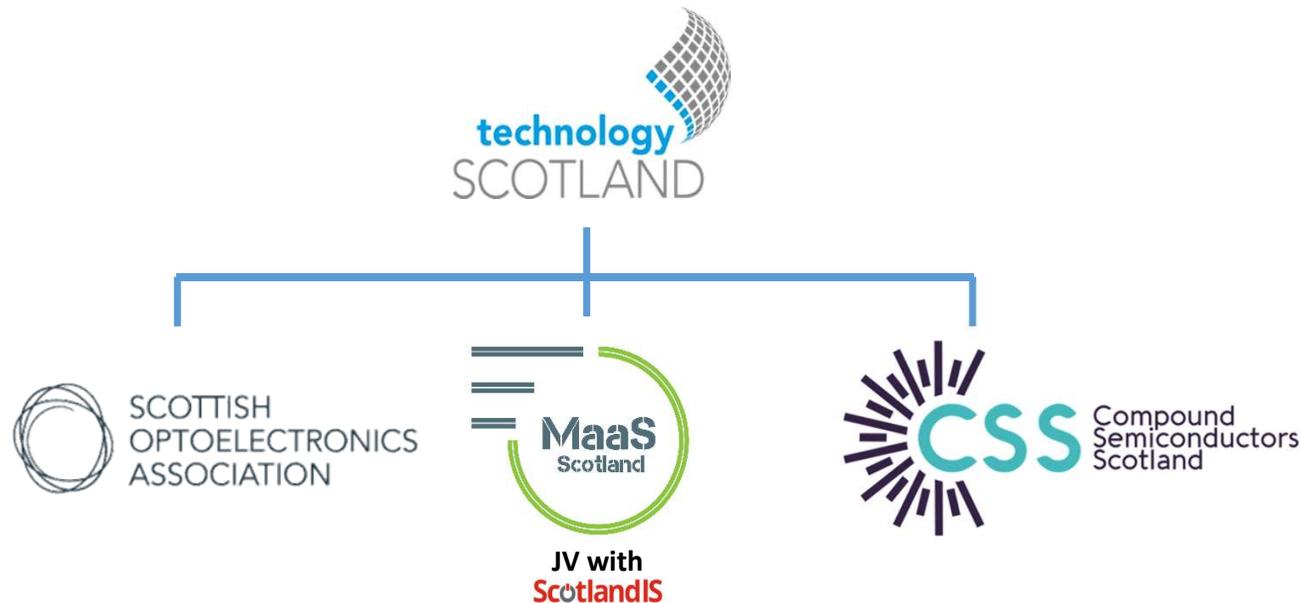
# Enabling Technology - Horizontal Sectors



# Addressing global challenges



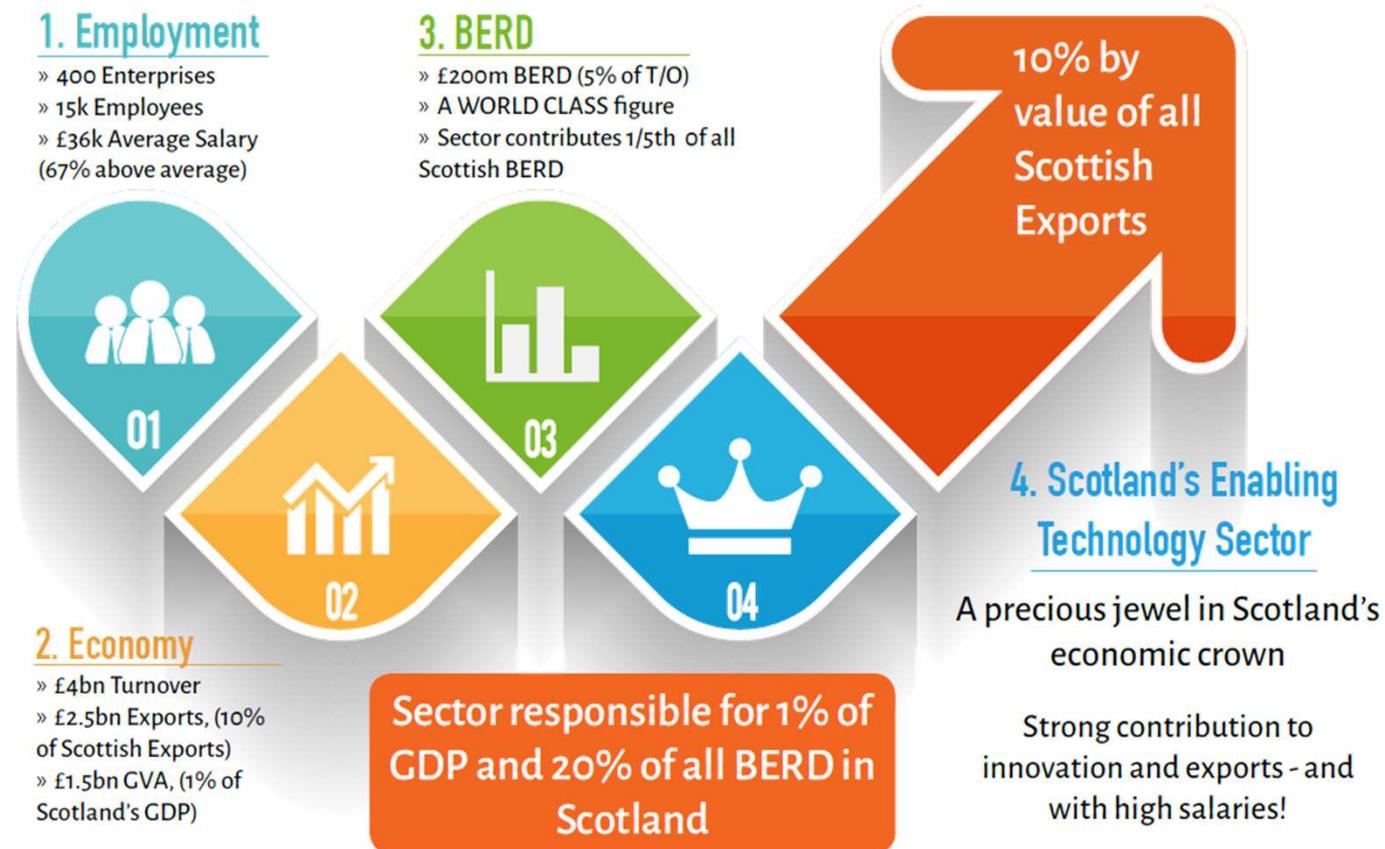
# Technology Scotland - Three Main Clusters



- 1400 in community
- Representing over 700 organisations
- Over 90 corporate members
- 40 events / workshops in 20 months – over 1500 participants

Currently evaluating clusters around Design, LiFi, and Smart Energy (eg Smart Grids/Offshore/Wind/Solar)

# Scotland's Enabling Technology Sector



Source: SE 2016

## Key activities 2017

### Holyrood Photonics Reception with Fraunhofer UK

- Over 120 attendees including three Scottish government ministers
- Challenge to double Scottish Photonics Sector within 5 years
- Resulted in follow up meeting with Paul Wheelhouse MSP, Minister for Business, Innovation and Energy
- Minister is keen to grow profile of Enabling Technology Sector and TS are currently working with his team to produce Growth Sector report

### Launched MaaS Scotland

- Group aims to support Scotland's future mobility Sector and position Scotland as leading location for future development
- Now approaching 60 members with 10 current and potential projects supported
- Full support from Transport Scotland and key meeting with Humza Yousaf MSP, Minister for Transport and the Islands has ensured visibility and support at Scottish Government

### Scottish National Economic Forum

- Facilitating the session "Innovation, creativity and digital drivers for industries of the future"

# Key activities 2017

## Represented Scottish Technology abroad

- EPIC, Photonics 21, ITS Europe, Laser Munich, PLG, Photonics West
- Organised Scottish Trade mission to German Photonics Event in Berlin
- Organising Scottish Trade mission to German MaaS event (SDI supported)

## Key delivery partner on:

- BEIS - Science and Innovation Audit (Enabling Technologies in Central Belt)
- Venturefest – High profile UK initiative focussing on Enabling Tech
- Visit Scotland's "Legends" Campaign

## Industry consultations

- Brexit Survey
- Skills and Recruitment Survey
- Response to recent report on Scottish Immigration Policy (with ScotlandIS)

## Innovate UK

- Partnered with Innovate UK to bring multiple Briefing Events to Scotland (E&E Technologies, Quantum, and Compound Semiconductors)

# Reports, surveys, and roadmaps

## Delivering Member Value



**TECHNOLOGY SCOTLAND BREXIT REPORT**

How confident do you feel following the announcement of the 12 point Brexit plan?

Confidence Level	Percentage
Very Confident	3%
Confident	25%
Not at all confident	58%
Little Confident	14%
No Confidence	0%

Do you trust the Scottish Government to secure Scotland's science & technology interests during Brexit?

Response	Percentage
YES	45%
NO	45%
UNSURE	10%

As a business, are you worried about the lack of access to the EU's free trade market?

Response	Percentage
YES	65%
NO	17%
UNSURE	18%

As a business, are you worried about reduced access to the EU's skilled labour?

Response	Percentage
YES	21%
NO	55%

**Short, Medium & Long Term Outlook**

Horizon	Color
Horizon 1	Blue
Horizon 2	Yellow
Horizon 3	Green

**ANNUAL REPORT 2016**

The Home of Emerging & Enabling Technologies in Scotland

**Technology Scotland Skills & Recruitment Survey 2017**

**Technology Scotland**

Championing Emerging and Enabling Technologies in Scotland

**Enabling Technologies in Scotland's Central Belt**

A Science and Innovation Audit Report sponsored by the Department for Business, Energy & Industrial Strategy

Sponsored by: HG Intellectual Property Scotland

www.technologyscotland.scot

Department for Business, Energy & Industrial Strategy; Glasgow Economic Leadership; Scottish Enterprise; NPL; Fraunhofer; CENSIS

# Scotland >125 Years of Optical Engineering!



- Scotland has a unique history and strengths in photonics
- Barr and Stroud (now Thales) was a true pioneer in “optical engineering”
- Barr and Stroud influenced Scottish Universities to produce generations of photonics engineers and scientists
- This led to a new generation of photonics businesses, and one of the world’s first photonics clusters (SOA)
- Glasgow – Laser City!



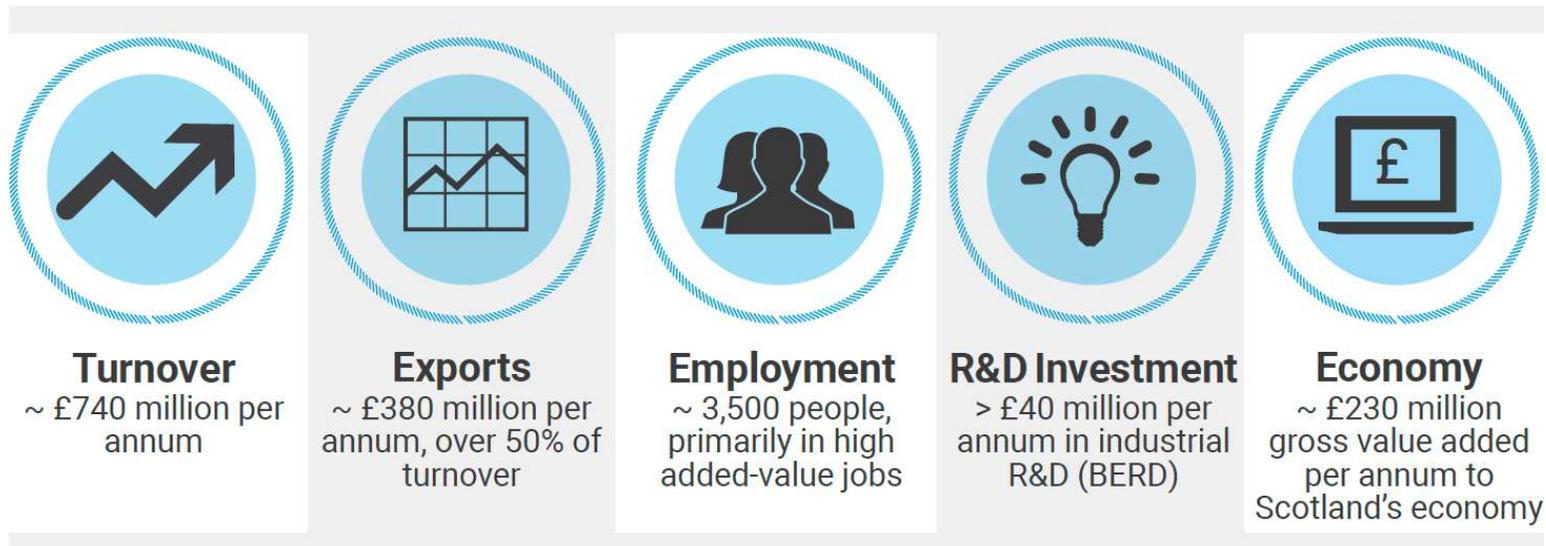


## One of the world's oldest Photonics Associations

- Founded in 1994, the Scottish Optoelectronics Association (SOA) is the 3rd oldest national photonics association in the world and one of the largest technology communities in Scotland
- As a founding member of the International Optoelectronics Association (IOA) the SOA has links to similar photonics bodies locally, nationally and internationally, making its reach and influence truly global
- The SOA is now under the umbrella of Technology Scotland, as a community for all photonics enabled organisations in Scotland
- The SOA has SMEs, OEMs, academic organisations, and individuals as members
- **2019 is our 25th Anniversary – we plan a big event in Glasgow!**

# Scottish Photonics Revenues

There are over 50 companies at the heart of the Scottish photonics cluster - their economic impact is substantial *being some 15%-20%* of the Enabling Technology Sector



Approximately half of the output of the Scottish photonics cluster is exported with the rest supporting important domestic sectors including defence, oil and gas, renewable energy, manufacturing and communications.

# Some Photonics Companies in Scotland



## Strong Academic and Research Base



### Access to skills

Scotland has the highest concentration of universities in Europe, all recognised as producing 'world-leading' research

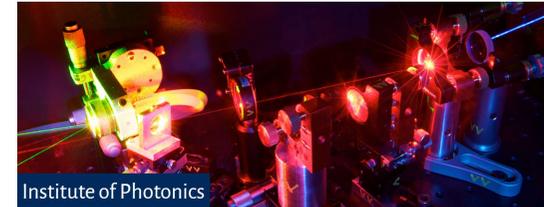
*Universities Scotland*

### A country of innovation

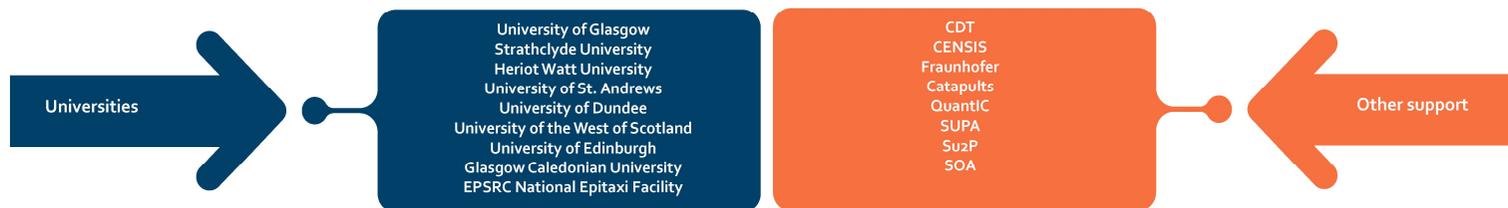
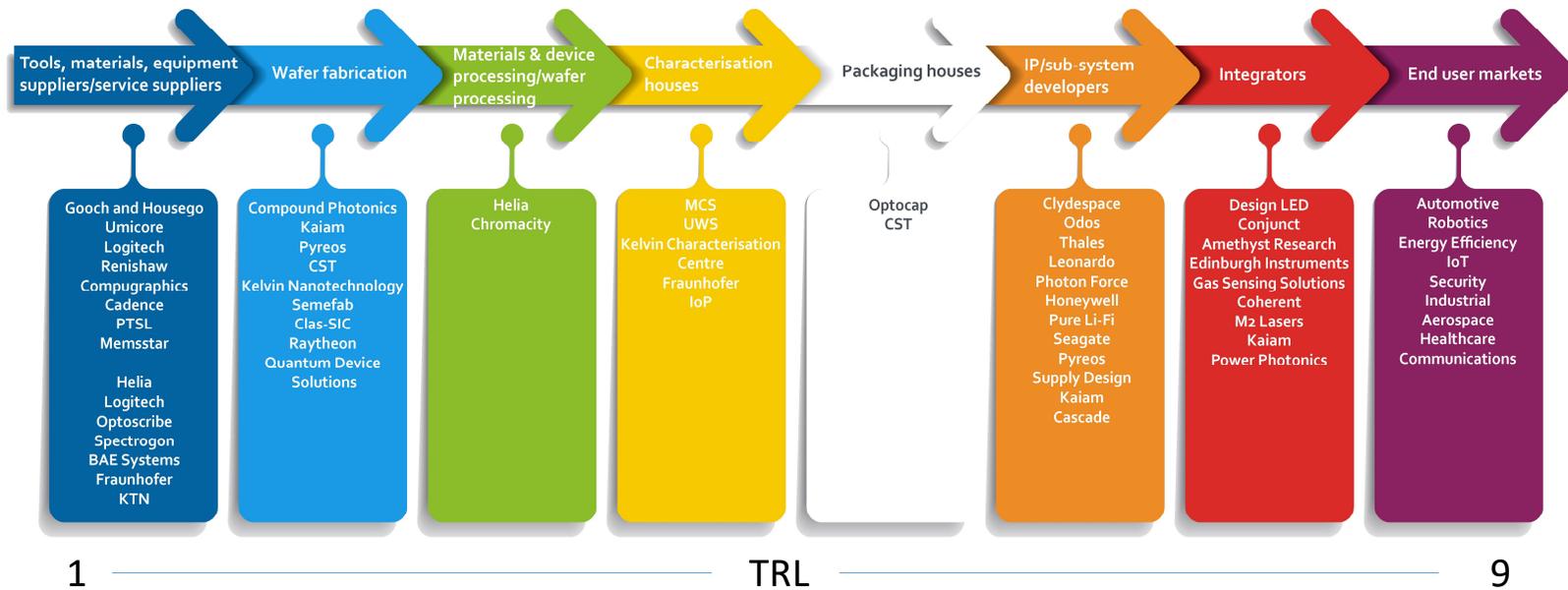
Scotland ranks higher than any of the G8 nations for numbers of academic citations relative to expenditure on R&D

*Universities Scotland*

# Strong Translational Assets and RTOs



# Scottish CS Value Chain



# Scottish Innovation and Investment Hubs



The Scottish Government is establishing five “Innovation and Investment Hubs” in London, Dublin, Brussels, Berlin, and Paris

Primarily, they provide a platform for collaborative activity to increase exports and attract investment to Scotland.

Work across government, partners and businesses to support trade, investment, innovation and inter-governmental relations with Europe.

As well as promoting trade and inward investment, the Hubs also cover broader economic opportunities, including:

- promoting Scotland's research, innovation, industrial, social and cultural strengths
- building diplomatic government-to-government relations
- pursuing cultural collaborations
- exploring collaborative research and innovation opportunities

# Photonics Days Berlin Brandenburg

## Scottish Photonics Trade Mission, October 2017



## Scottish Photonics – After BREXIT!





**Head Office**  
Suite 47, Geddes House  
Kirkton North  
Livingston  
West Lothian  
EH54 6GU  
Tel: +44 (0) 1506 401210  
Fax: +44 (0) 1506 420609

[www.technologyscotland.scot](http://www.technologyscotland.scot)

<https://www.linkedin.com/company/10387387>

[info@technologyscotland.scot](mailto:info@technologyscotland.scot)





# Welsh Optoelectronics Forum and regional support for photonics in Wales

Lyndon Jones, WOF Committee and  
former Chair



PHOTONICS PUBLIC PRIVATE PARTNERSHIP



This project has received funding from  
the European Union's Horizon 2020  
research and innovation programme  
under grant agreement No 732695

**Innovate UK**  
Knowledge Transfer Network



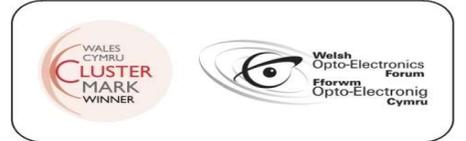
**WELSH OPTO-ELECTRONICS FORUM**

FFORUM OPTO-ELECTRONEG CYMRU

***Experiences of Regional Support for Photonics  
The North Wales Cluster***



**“Improving regional support for photonics in the UK”; Cardiff,  
December 2017**

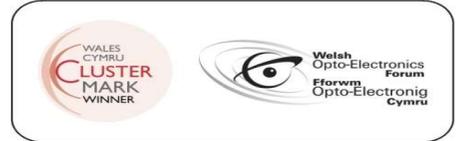


## **Welsh Opto-electronics Forum (WOF) Cluster and Cluster Organisation**

- **Who we are**
- **Formation/Origins of the North Wales Cluster**
- **Key Strengths**
- **Aims and Objectives**
- **Cluster Achievements**
- **Future Aspirations**



**“Improving regional support for photonics in the UK”; Cardiff,  
December 2017**



## WOF – who we are

WOF was founded more than 20 years ago and is an ***independent*** organisation with strong representation from industry, academia and the public sector.

- At various times we have secured the support of regional development agencies, Welsh Government, KTN, Innovate UK and other organisations.
- We have delivered significant support for the sector through events and networking activities.



**“Improving regional support for photonics in the UK”; Cardiff,  
December 2017**

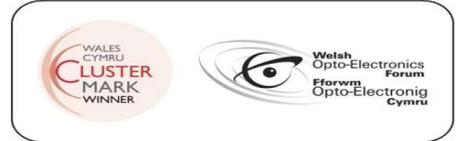


## WOF – who we are

- We have a strong industrial base with excellent university links and a history of knowledge transfer. ***Applications are diverse across all key sectors for Wales.***
- We have a ***track record of delivering successful initiatives*** and would want to see and create opportunities for this to continue.
- We seek to promote a “joined-up” approach to photonics in Wales and see collaboration as key, particularly with OpTIC Technology Centre and Welsh Government.



“Improving regional support for photonics in the UK”; Cardiff,  
December 2017



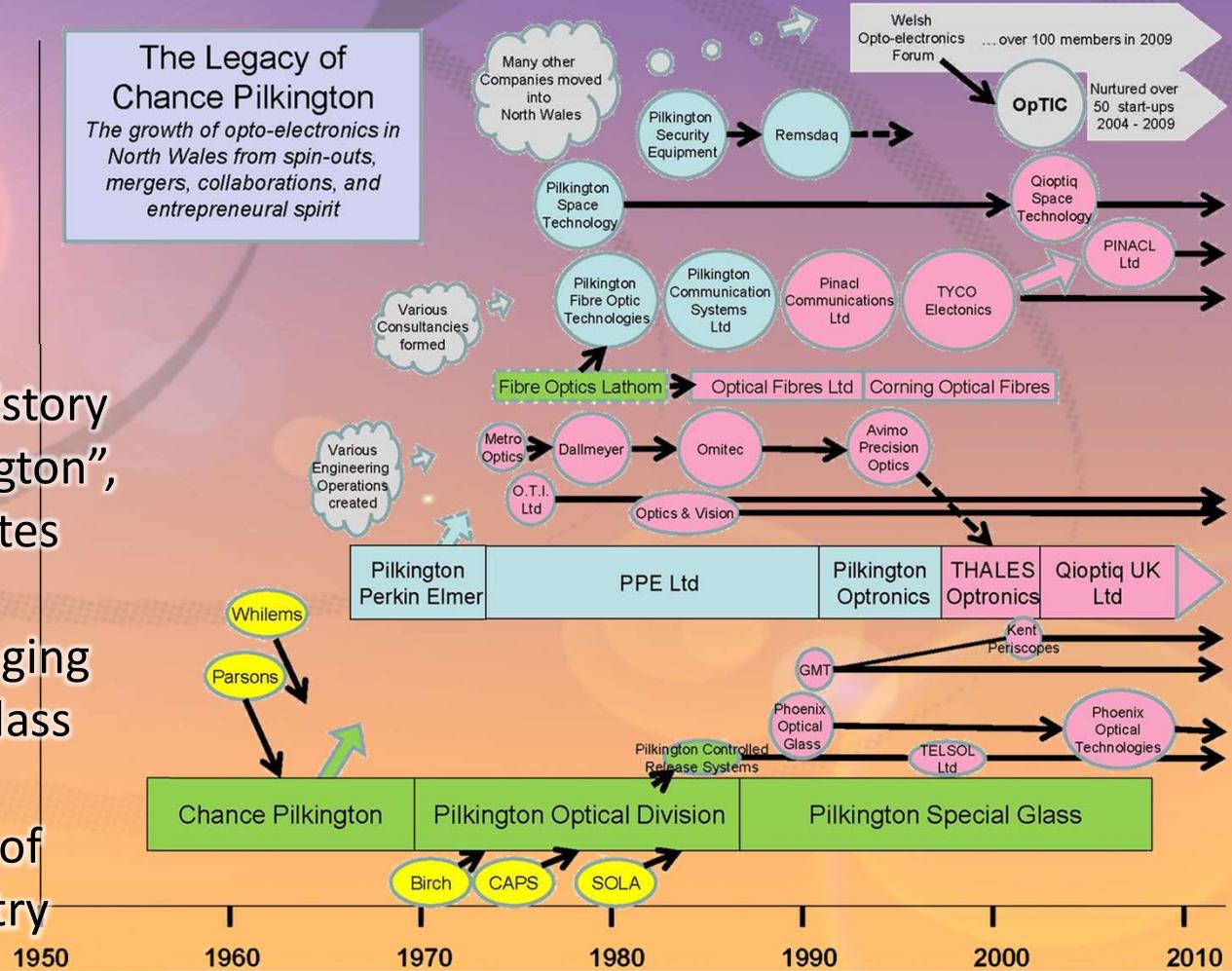
# WELSH OPTO-ELECTRONICS FORUM

FFORUM OPTO-ELECTRONEG CYMRU

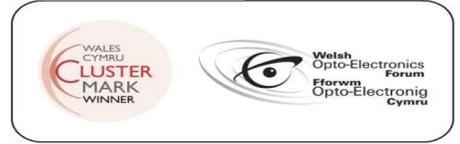
## Origins - The North Wales Cluster

Taken from "A history of Chance Pilkington", this slide illustrates the diversity of companies springing up around the glass maker and the dynamic nature of photonics industry

**The Legacy of  
Chance Pilkington**  
*The growth of opto-electronics in  
North Wales from spin-outs,  
mergers, collaborations, and  
entrepreneurial spirit*



"Improving regional support for photonics in the UK"; Cardiff,  
December 2017



## Origins - The Welsh Opto-electronics Forum

- In Pre-devolution Wales, the Welsh Development Agency win European funding to develop a Regional Technology Plan for Wales
- WDA researchers conclude that “Clustering” is a way to improve the success of fledgling innovative industries
- The formation of clusters becomes a key element of the technology plan
- The pre-existing opto-electronics cluster surrounding Chance Pilkington in St. Asaph is recognised and encouraged through the formation of WOF



**“Improving regional support for photonics in the UK”; Cardiff,  
December 2017**



## Photonics in Wales -Key Strengths

- **Breadth of Opto-electronics Technology capability**
- **Significant strengths in a number of areas through both University and Commercial capability, (specialist optics, opto-electronic materials, fibre optics and optical telecomms, semiconductors for photonics, microsystems, photonics applications)**



**“Improving regional support for photonics in the UK”; Cardiff,  
December 2017**



## Photonics in Wales -Key Strengths

- Strengths across the **supply chain**  
materials → components → systems → equipment
- **Solid growth** in Total Annual Revenues: estimated at around £1.2 B of which 60% comes from exports
- A mix of organisation size with **many SME's and "micro" organisations**



“Improving regional support for photonics in the UK”; Cardiff,  
December 2017



## **Overall AIMS and OBJECTIVES**

**Stimulate the use** of opto-electronics

Provide **networking opportunities** in opto-electronics

**Encourage and facilitate** the interaction of industry/academia

**Develop the skill base**

Offer support for **business development**

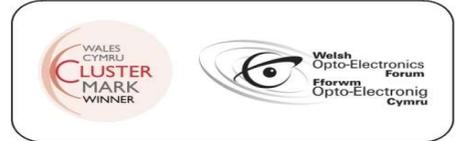
Be the **independent voice** for the sector in Wales

**Promote the sector**

**Support developments** in the Welsh infrastructure



**“Improving regional support for photonics in the UK”; Cardiff,  
December 2017**



# WELSH OPTO-ELECTRONICS FORUM

FFORUM OPTO-ELECTRONEG CYMRU

Achievements

WDA offices used as base  
WDA provide admin &  
stage WOF events

Objective one funded Sector  
Champion, employed by  
WDA to develop photonics  
Sector via WOF

Post devolution no WOF  
budget.

WAG funding won  
in competition, project by  
project.

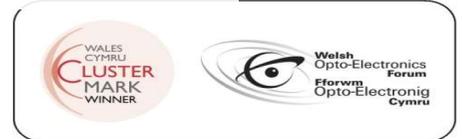
Joint meetings with KTN.  
Funded to deliver project  
by Innovate UK.

?????

- Regional Technology Plan – flagship project
- Creation of a formal industry based structure
- Chair of Optoelectronics Materials Chemistry
- Sector Champion
- Objective One funding
- OpTIC Project
- Regiostars Award
- Regional Cluster Award
- Celebration of Photonics Event
- Sector Sustainability and Growth Grant
- Photonics Innovation Strategy for Wales
- CAMPUS – Photonics Capability Map
- Influencing Welsh Priorities for RIS3
- Welsh Photonics Capability Brochure
- Launchpad – Innovate Sector Funding
- UK ~Solar PV Road Map



“Improving regional support for photonics in the UK”; Cardiff,  
December 2017



## Achievements

The most dynamic and fruitful periods in WOF's history so far have been:

- When industry, academia and the public sector have been equally committed to its steering group
- When the Forum's aims align with Government objectives and allow a low level of funding, over and above membership charges, to be dependably available, without tying up scarce resources to secure it



**“Improving regional support for photonics in the UK”; Cardiff,  
December 2017**



## Achievements

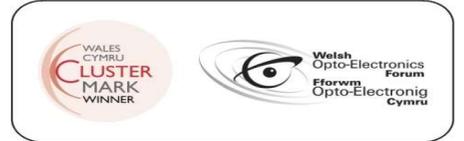
**The North Wales cluster continues to deliver innovation in many areas including:**

- Telecoms
- Holography
- Space
- Hyper-spectral imaging
- PV
- Astronomy
- Metrology
- Displays

**While the strength of Bio-photonics and Compound Semiconductor activity in the south continues to grow rapidly**



**“Improving regional support for photonics in the UK”; Cardiff,  
December 2017**



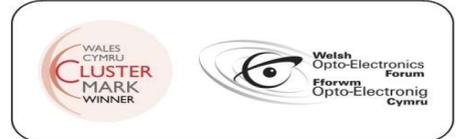
## Ambitions

WOF's aspiration is to continue to facilitate the **collaborative thinking** and working that will build an **agile innovation network** in photonics, positioning Wales in several global supply chains, bringing sustainable prosperity from new markets.

Participating in the development of the **Centre for Photonics Expertise** will be a major opportunity for WOF to further this aspiration in the near future.



**“Improving regional support for photonics in the UK”; Cardiff,  
December 2017**

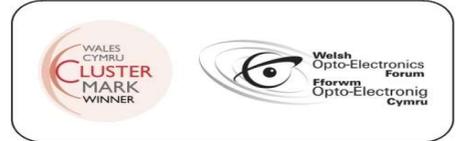


## Ambitions

- ***Improving the performance of Welsh science and technology.***
- ***Demonstrating the capability for leverage provided by photonics.***
- ***Establishing photonics as one of the core enabling technologies delivering sustainably increased prosperity for Wales.***



**“Improving regional support for photonics in the UK”; Cardiff,  
December 2017**



## Contact

[admin@wof.org.uk](mailto:admin@wof.org.uk) Administrator

*Dr. Sarah Rugen-Hankey*

[chair@wof.org.uk](mailto:chair@wof.org.uk) Chair

*John Blomfield*

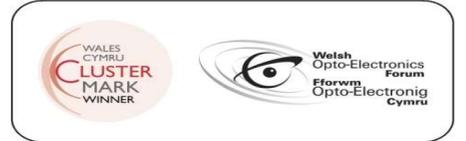
[wof.org.uk](http://wof.org.uk)

*Website (currently being rebuilt)*

[@WelshOptoForum](https://twitter.com/WelshOptoForum)



**“Improving regional support for photonics in the UK”; Cardiff,  
December 2017**





# OpTIC Technology Centre at St Asaph

Caroline Gray, Wrexham Glyndwr  
University



PHOTONICS<sup>21</sup>



This project has received funding from  
the European Union's Horizon 2020  
research and innovation programme  
under grant agreement No 732695

**Innovate UK**  
Knowledge Transfer Network



The OpTIC Technology Centre  
Glyndwr Innovations Ltd.

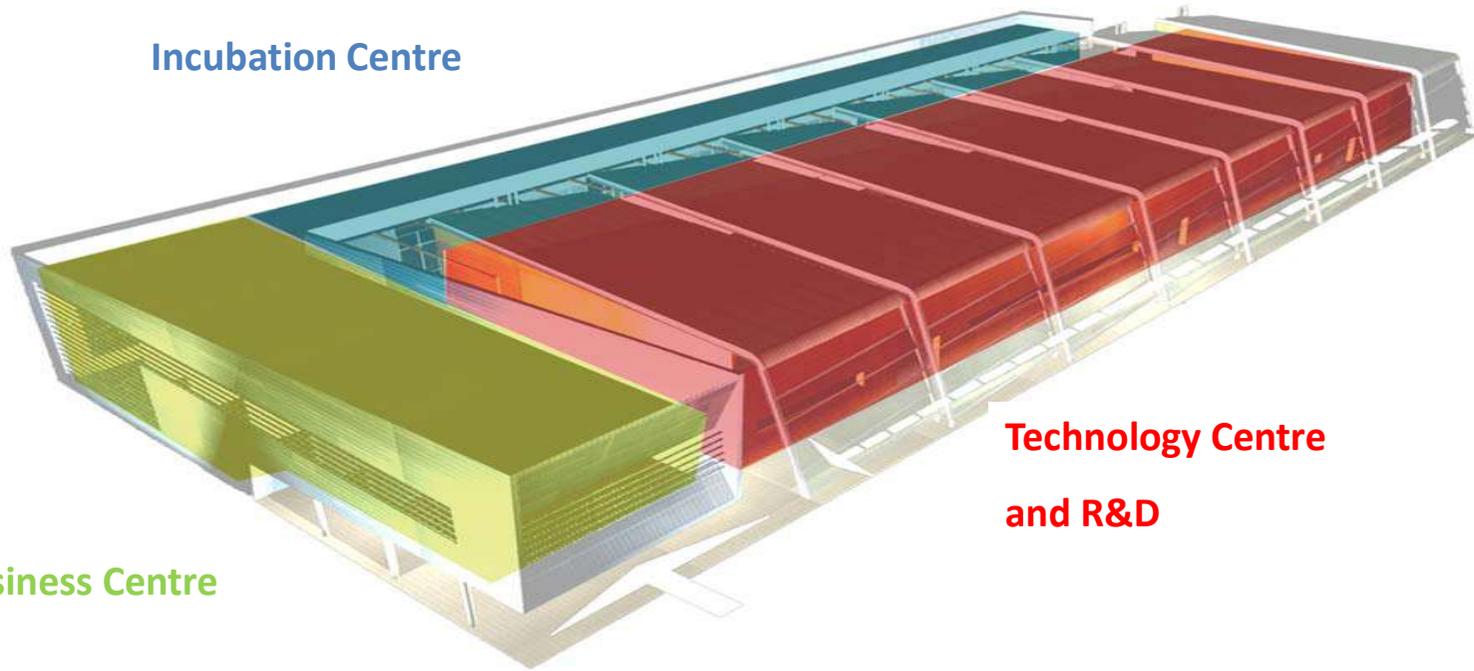
*The leading Technology and Incubation Centre  
in North Wales*

Science and Engineering at work...



# The OpTIC Technology Centre

Incubation Centre



Technology Centre  
and R&D

Business Centre

Approx 120 employees

glyndŵr  
INNOVATIONS



## 3 Business Groups commercially operated independent facility

- University owned commercial entity Glyndwr Innovations Ltd.
  - Business and Conference Centre
  - Incubation Centre
  - Own in house, commercially focussed technical support team
    - Engineering Design, Optical component fabrication, Metrology and assembly facilities



## Business Centre

**28,000+ Visitors / Year**

- Conference Room
- Boardroom
- Meeting Rooms
- 'The Street'

A business focused venue for up to 120 delegates. Suitable for seminars, exhibitions, training courses, international conferences etc.

Our on-site restaurant can provide a full catering service



# Incubation Centre

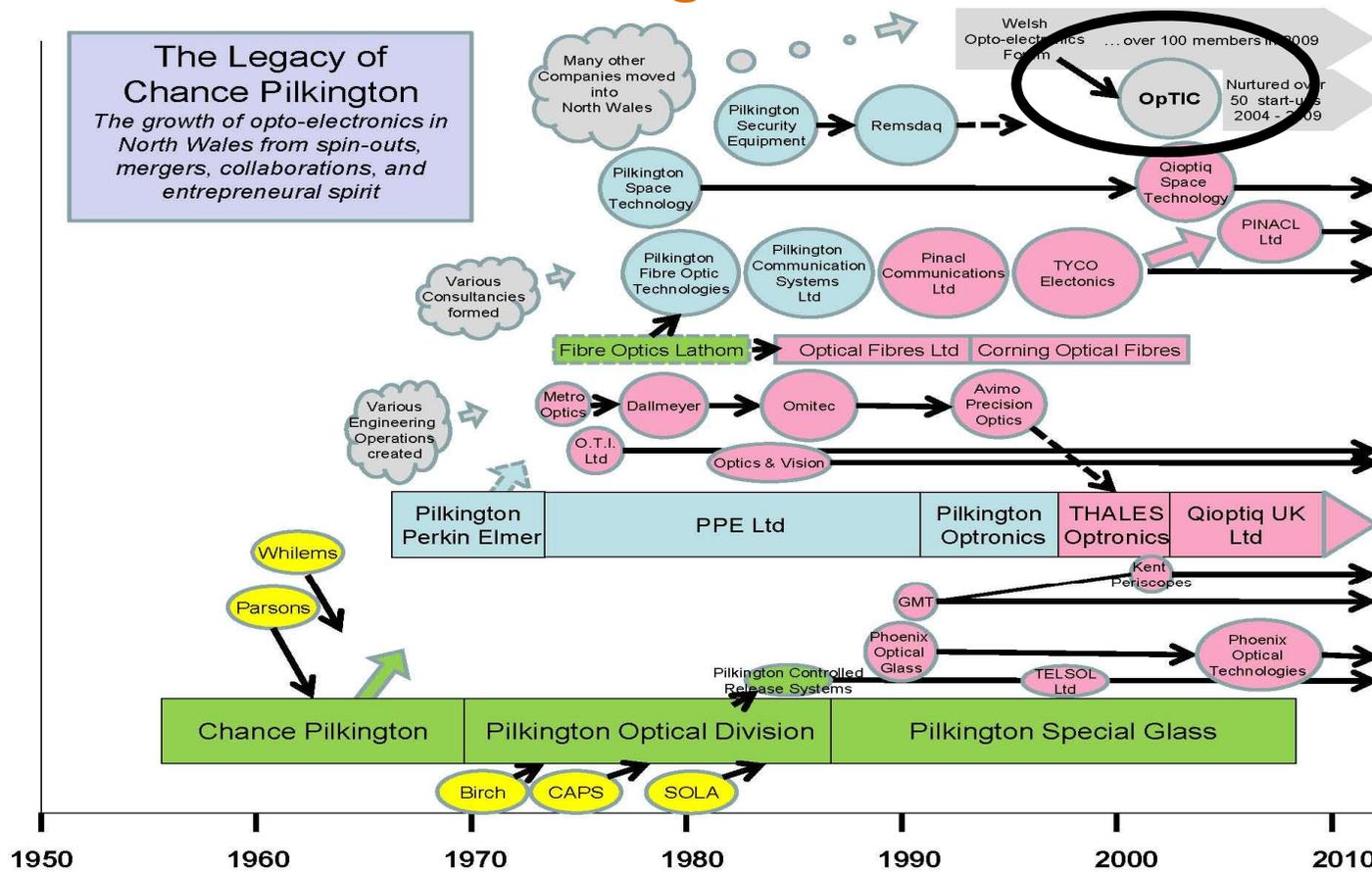


24 Units – Office / Laboratory  
Shared Office Desks  
Virtual Offices  
Focused on technology/innovation

Business Support & Funding  
Finance Wales Regional Office  
18 companies  
Low risk/all inclusive



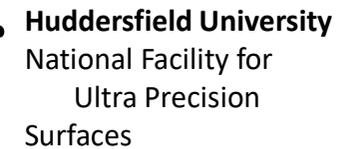
# How it all began.....



Source: **glyndŵr**  
 INNOVATIONS



# Current St Asaph Business Park Opto Electronics & Photonics Cluster.... Still going strong



# OpTIC Centre Clients



Wales Centre for Pharmacy Professional Education  
Canolfan Addysg Fferylliaeth Broffesiynol Cymru



Huddersfield University  
National Facility for  
Ultra Precision Surfaces



## Some Statistics....

- The OpTIC centre is the place of work for 142 people
- 41 of 50 past companies incubated within OpTIC are still in business (82%)
- 5 successful companies spun out into immediate local area (~70 tech jobs)
- Research groups of 4 Universities on site –
  - Swansea University
  - Huddersfield University
  - Cardiff University
  - Glyndwr University
- Fully commercially self funded as an SME



# Testimonials

"OpTIC is an excellent incubation facility and provides a thriving environment for young technology companies to grow according to their needs. One of the main advantages of OpTIC is that a wide range of support facilities are easily available in one location, allowing companies the chance to use them when required and reducing the difficulties which face all small businesses in meeting rapidly-changing demands. The working atmosphere at OpTIC is collegiate and relaxed which fosters good inter-company contacts between the resident companies. LML certainly benefited from being in OpTIC in the first few years of our operation."

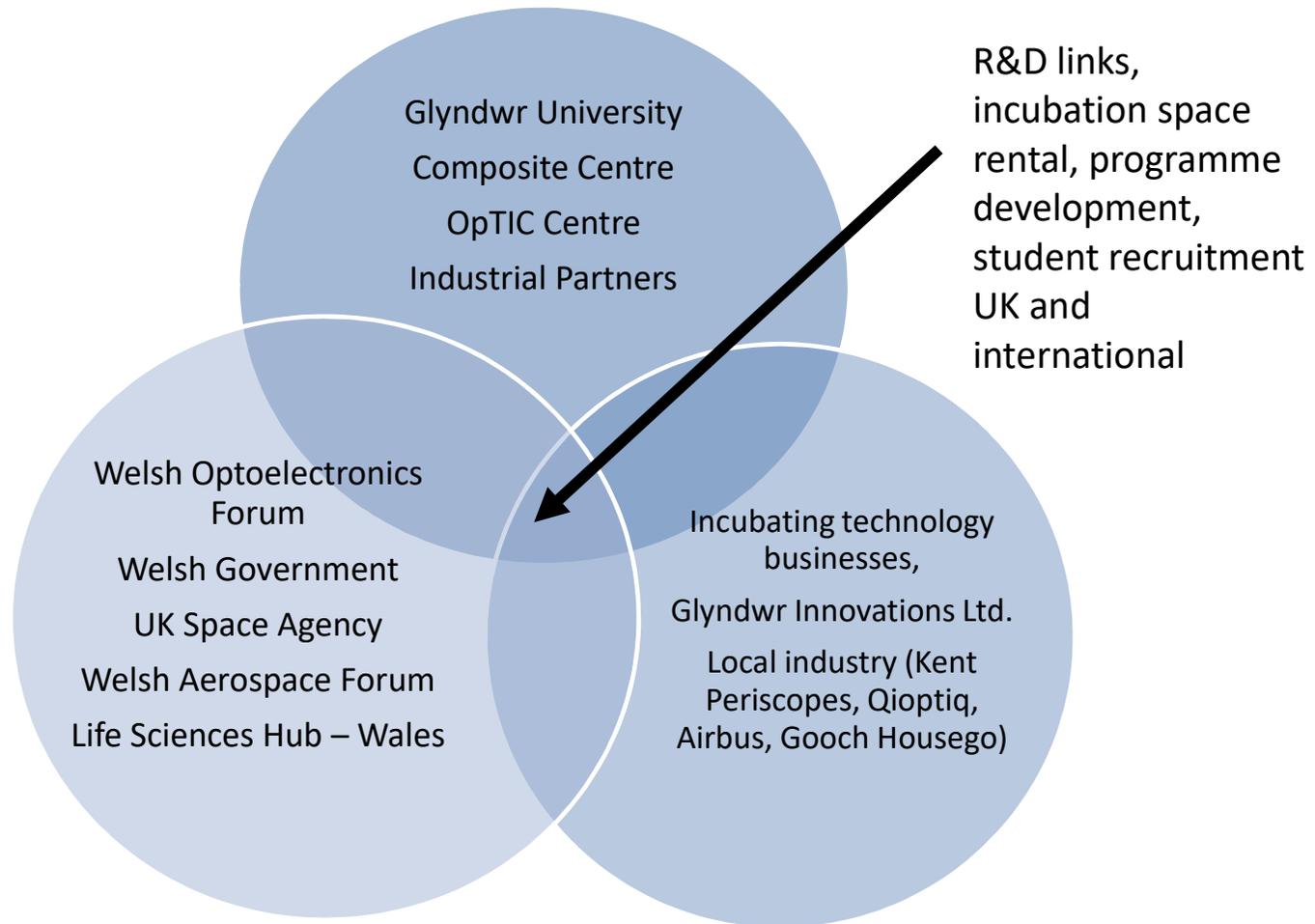
**Dr. Nadeem Rizvi, Managing Director, Laser Micromachining Limited**

I would highly recommend start-up companies to locate their business at OpTIC. I did consider renting space elsewhere but when all associated costs are taken into account OpTIC is good value for money, there is only one monthly bill and I can concentrate on my business. Another advantage is that you only pay for the space you need and our footprint has expanded in line with business needs. Furthermore, the fact that there is no lengthy lease to sign up to made all the difference to me as an SME.

The premier location and facilities are superb, restaurant, reception, goods in/out and you can never underestimate the benefits of interacting with like minded people. Basically it's a great place for new and growing businesses!

**Peter Maguire, Managing Director, MC Diagnostics**

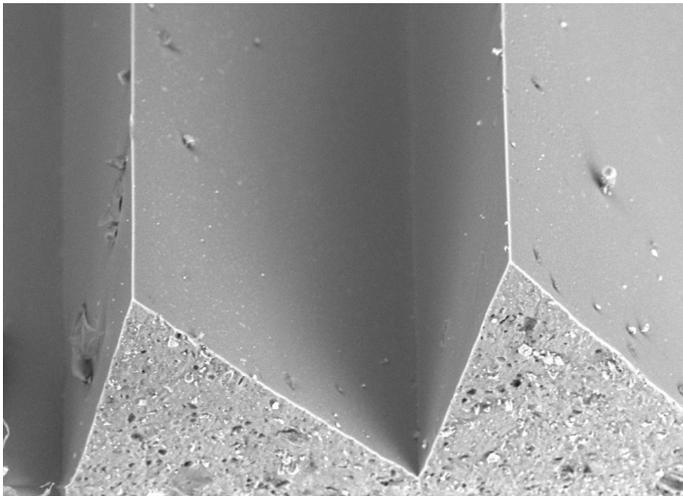
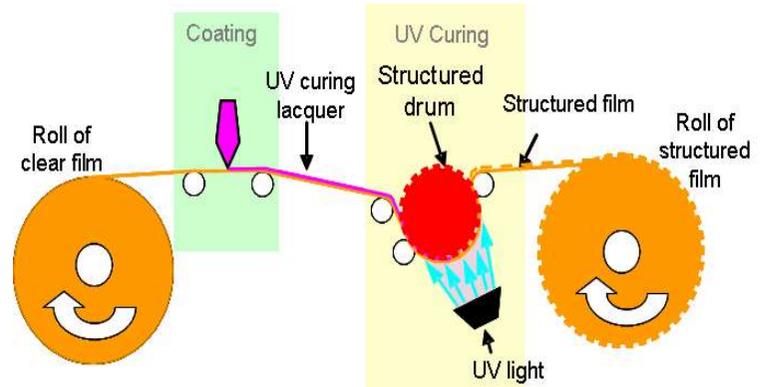
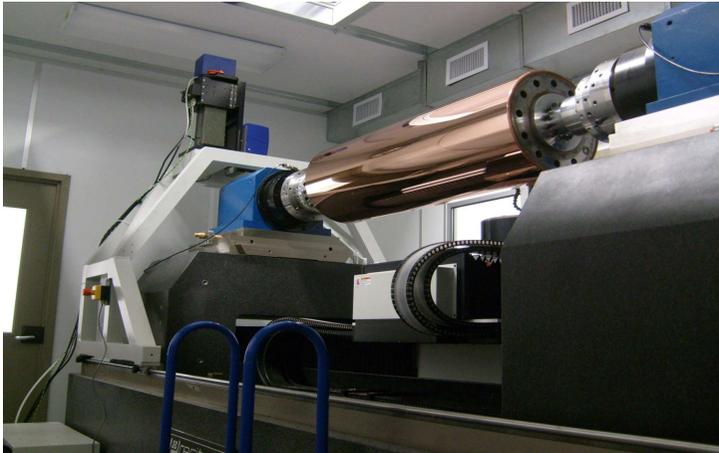




**How it works....**

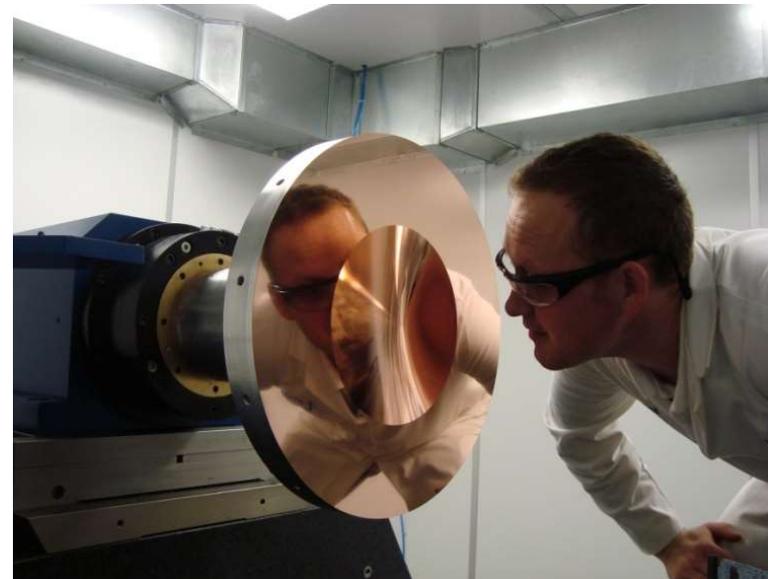


# UPS2 Drum Diamond Turning (IKC to SME)



LML2607

L x400 200 um



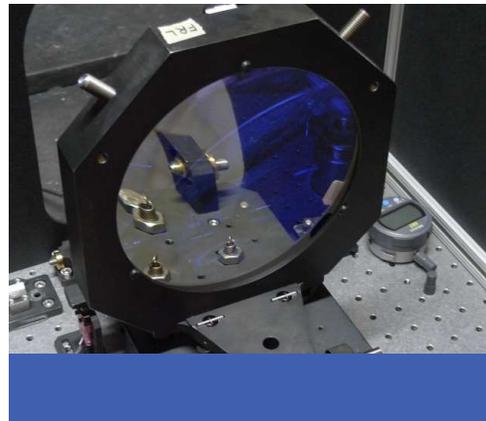
# Precision Optical Systems

- Three core capabilities offered commercially both externally and to incubator clients

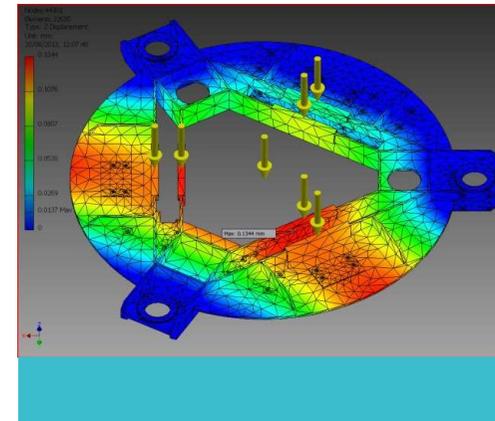
precision polishing



surface metrology



engineering design

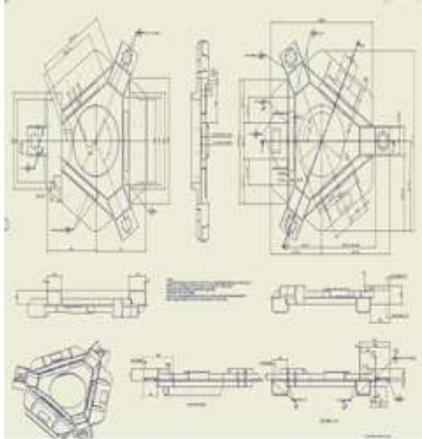


# Introduction

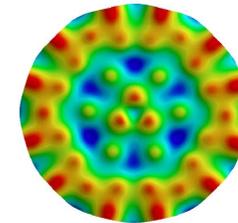
- Glyndŵr Innovations is a wholly owned subsidiary of Wrexham Glyndwr University
- The **Precision Optical Systems Group** at GIL formed following the successful delivery of ESO-ELT prototype segments
- The group offers optical system design, fabrication of large precision optics and associated opto-mechanical design services.



# Engineering Design Support services

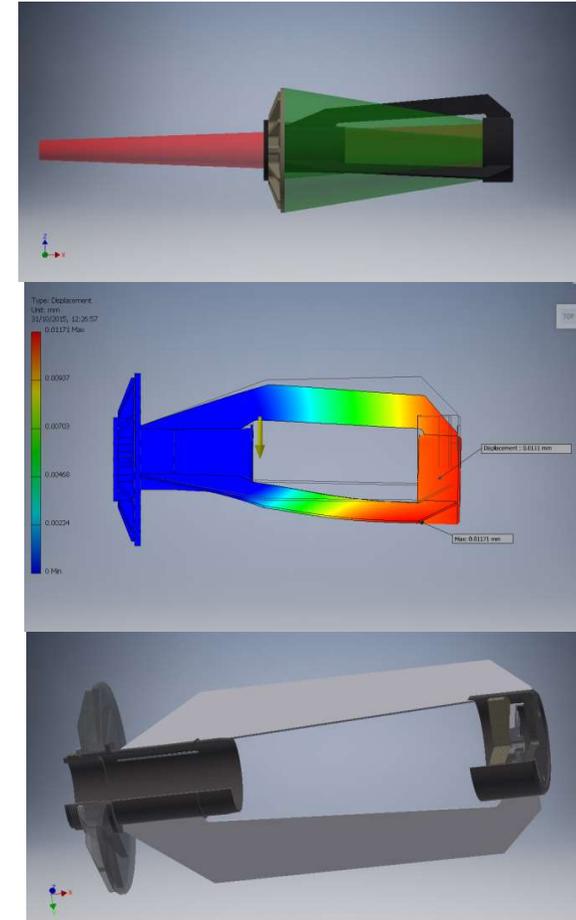
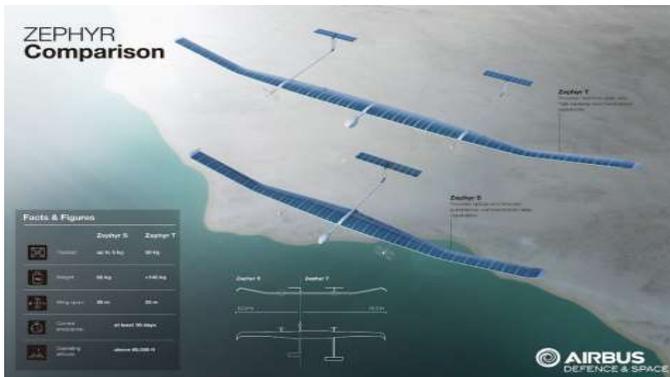


- Specialist Engineering Team –
- Offering Support Services in -
  - Mechanical Design
  - Opto-Mechanical Design
  - FE analysis
  - Optical and mechanical systems integration



# Optical Systems – Design to manufacture example

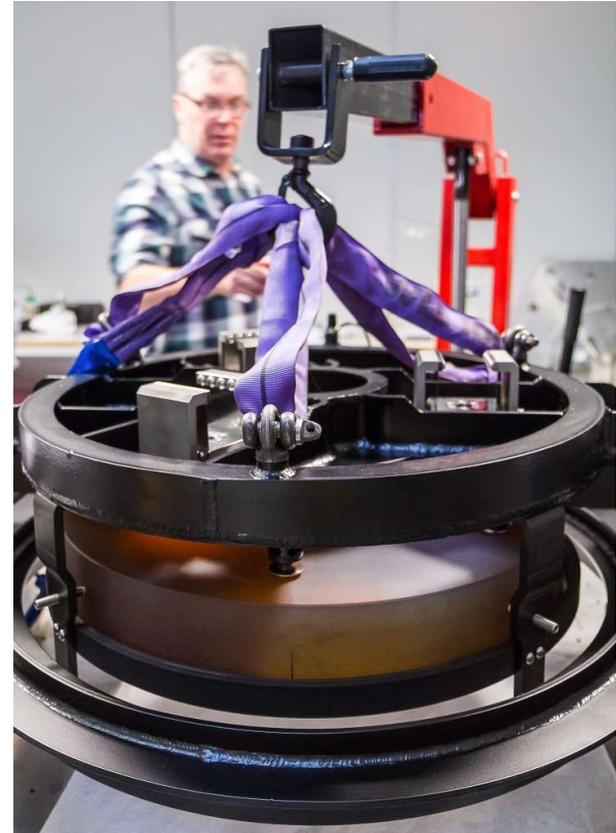
- Design of complete systems from concept to finish
  - Concept
  - Optical Design
  - Structure and mounts
  - FE and Thermal analysis
  - Actuation
  - Build
  - Test
- Application



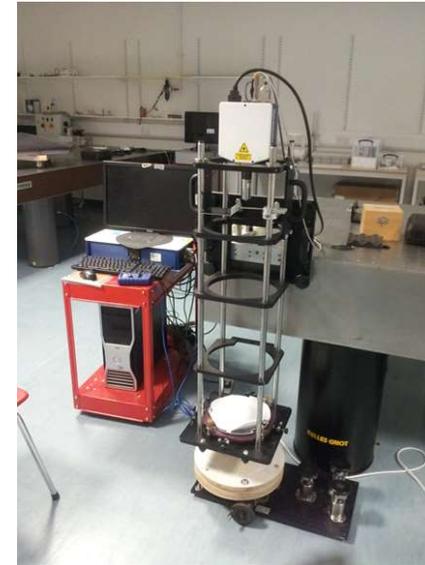
# System build and Integration

On site team to support clients engineering design, build and integration requirements

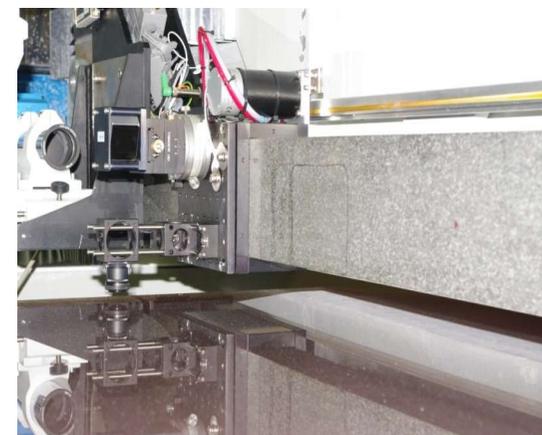
- Offer a system design and build service to incubating companies and industry
- Experience in handling and mounting of optics and integration of optics into assemblies
- Knowledge of build and commissioning of systems



# Metrology

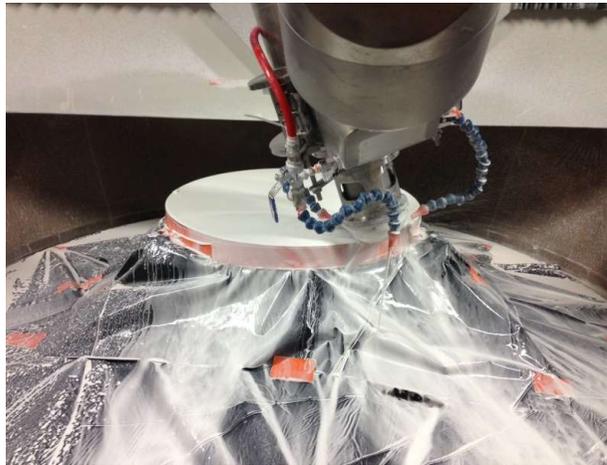
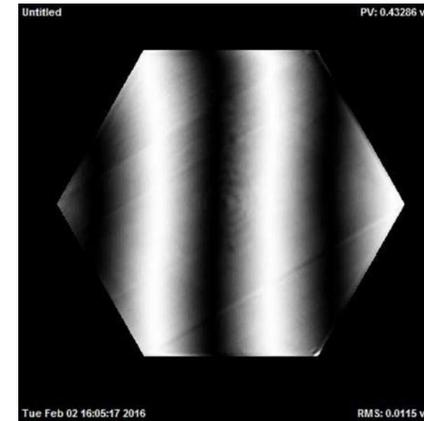


- Team with > 60 years of cumulative experience in system design and optical metrology
- Fully equipped metrology lab
- Bespoke instruments for large optics
- Bespoke software for stitching interferometry and non-contact profilometry



# Precision Polishing : Recent Large Optics

- E-ELT – M1prototype segments 9nm RMS
- 1.5 m hexagonal Reference test sphere 15nm RMS
- Convex Test Retrosphere – 680mm 4nm
- Window for JPAS-Telescope– polishing and integration



# Specialised Environment facilities

- Access to clean room facilities on demand
- Experience in clean integration of large optics for cryogenic application



# Examples of industrial Projects



## JPAS Camera Plano-Convex window

680mm plano-convex entrance window for the JPCAM, the large 1,200 Mega-pixel cryogenic camera, for the J-PAS Telescope.

In addition to the high precision polishing and wide-spectrum coating, the window was required to be integrated into its cryogenic frame in a cleanroom environment and verification of its compliance to the challenging vacuum and leak testing criteria.

## Ultra-Lightweight Ground Imaging telescope

The team has designed and built a complete ultra-lightweight special purpose telescope for an airborne ground observation system used on a HAPS UAV.

The project required the opto-mechanical design of a lightweight structure including the use of composites and other lightweight materials. It also required the design and fabrication of lightweight optics.

The instrument is designed to withstand a wide temperature variation.

Prototyping included assembly, alignment and both performance and survival testing of the instrument over its specified environmental envelope.



# Why Incubator Facilities Work?

- Business support for Technical personnel
  - A great idea doesn't run a business
- Large company feel/environment
- Expensive technical facilities on hand
- Grant funding streams and investment partner contacts
- Multi Sector interaction and peer support



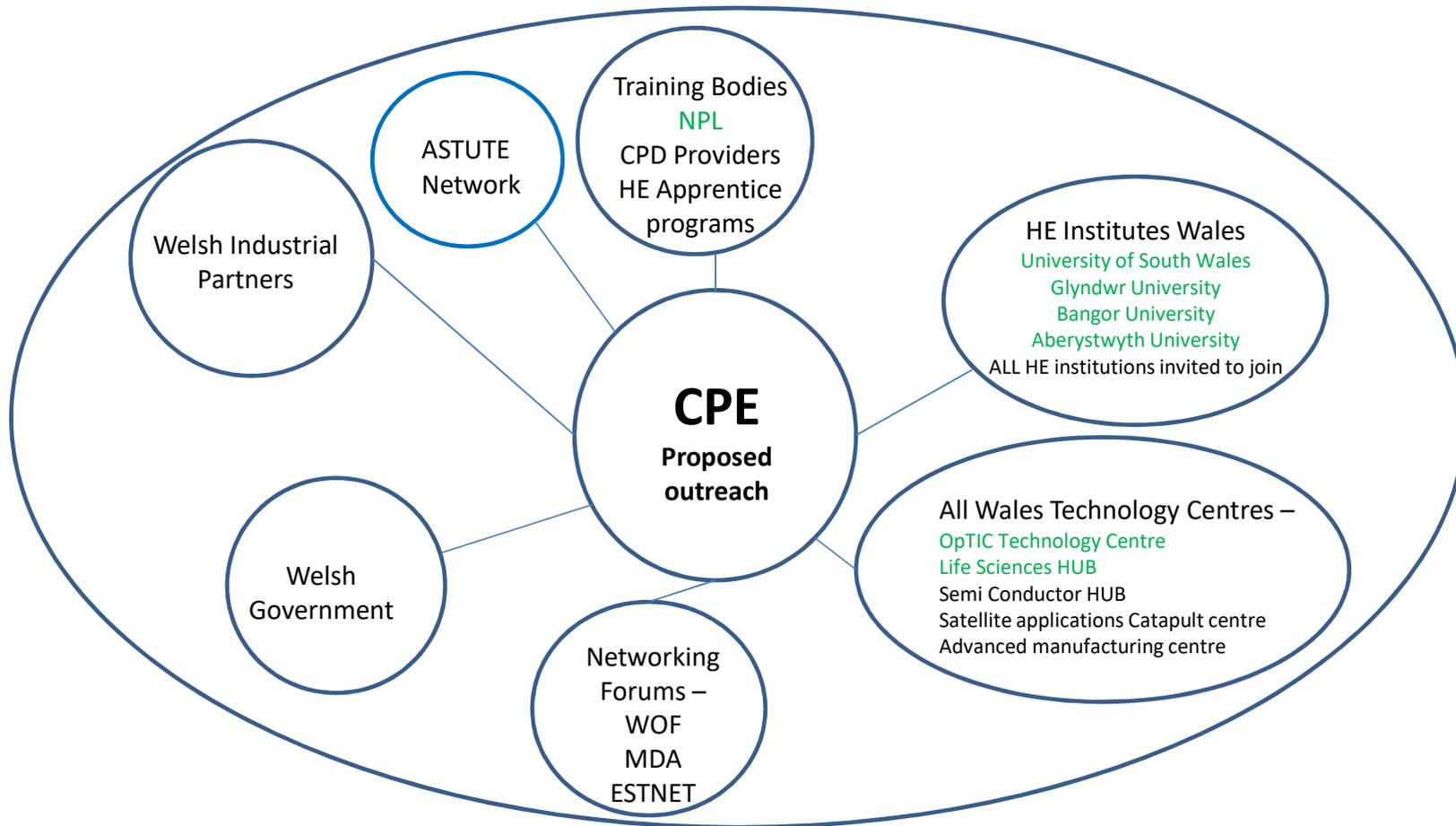
# Future Plans

- Center for Photonics Expertise (CPE)
  - Potential WEFO funded project currently in BP stage
- UKSA Incubator program –
  - Looking to increase this area of activity in phase 2 of this round
- “Gwiliwr” – HAPS platform telescope system
  - Marketing, Product launch and manufacture



# *Centre for Photonics Expertise (CPE)*





# Why do we need CPE?

- Photonics and Opto-electronics are areas WG has invested in heavily to date
  - Photonics is not an industry... It is an enabling technology
  - Photonics reaches across multiple sectors
  - Wales has world leading expertise in many areas of Photonics and optoelectronic technologies
- CPE aims to
  - Provide a united cross sector access point and support network to Photonics based expertise in Wales
  - Provide a supportive and reactive network for Welsh industrial partners irrespective of their sector activity
  - Provide Photonics expertise and resource to existing Welsh Catapult, Technical Hubs and advanced manufacturing facilities



# What would CPE offer?

- Development of a multi- academic partner steering body to provide consolidated photonics expertise as an enabling technology
- Identify, link and support core areas of existing photonics expertise & resource
- Create a single body providing Photonics expertise pan Wales
- Access to dedicated and co-ordinated Photonics based solutions for industrial partners across all sectors
- Dedicated academic resource to support industrial partners, academic research and all sector initiatives with Photonics technology support



## **The 4 named Partners – Glyndwr, South Wales, Bangor and Aberystwyth Universities**

- The 4 main HE partners are all leaders in different areas of Photonics based research and have a wide range of dedicated equipment and extensive facilities to offer
- The partners will work together to support the CPE network across Wales feeding and supporting existing sector groups and activities to ensure efficient and effective communications of CPE capability and function
- The CPE Executive committee will provide a discussion and decision making platform to ensure effective use of resource and individual project lead



# Project Value and Staffing

- Total project value £5.7M
- WEFO funded value £3.8M (66%)
- 14 x FTE Roles including
  - Business Development Officers
  - Administration
  - Financial management
  - 9 dedicated Research Personnel across 4 institutions
- Committed senior academic support from 4 HE institutes



# Sectors supported

- Sectors and groups targeted are broad as the applications for photonics technologies have potential to reach across all major sectors of industry.
- Businesses in the Convergence region with innovation potential who are seeking photonics related solutions to facilitate growth and improved productivity
- Larger organisations & SMEs with varying technology needs
- Companies outside Wales with potential to invest inwardly
- Companies looking for high value technical resources which can be serviced by existing WG investments (metrology equipment, test resources)
- Across all sectors but focussing on the following “Grand Challenge” sectors in Wales:
  - Energy & Environment
  - Life Sciences & Health
  - Advanced Engineering and Materials



# Deliverables /Outputs

- Key Output Indicators
- Number of Enterprises supported to introduce new to market products: ~40
- Number of Enterprises supported to introduce new to firm products
- Employment increase in supported enterprises:
- Other Output Indicators
- Number of enterprises cooperating with supported research institutions: ~60
- Private investment matching public support in
- innovation or R&D projects: 50% of project cost
- Number of patents registered:
- Established body and operating board
- CPE web space linking member HE institutions, industrial partners and WG support networks to present the “shop window” for Wales Photonics Expertise.



Thank you for listening..  
Any Questions?





# Enterprise Europe Network

Lyndon Jones, Enterprise Europe  
Network



PHOTONICS<sup>21</sup>  
PHOTONICS PUBLIC PRIVATE PARTNERSHIP



This project has received funding from  
the European Union's Horizon 2020  
research and innovation programme  
under grant agreement No 732695

**Innovate UK**  
Knowledge Transfer Network



# enterprise europe network

## Improving regional support for Photonics in the UK

*Enterprise Europe Network support  
including accessing EU funding*

*12<sup>th</sup> December 2017*

**Lyndon Jones**  
**BIC Innovation Project Director for EEN**



# The world's largest support network for SMEs with international ambitions

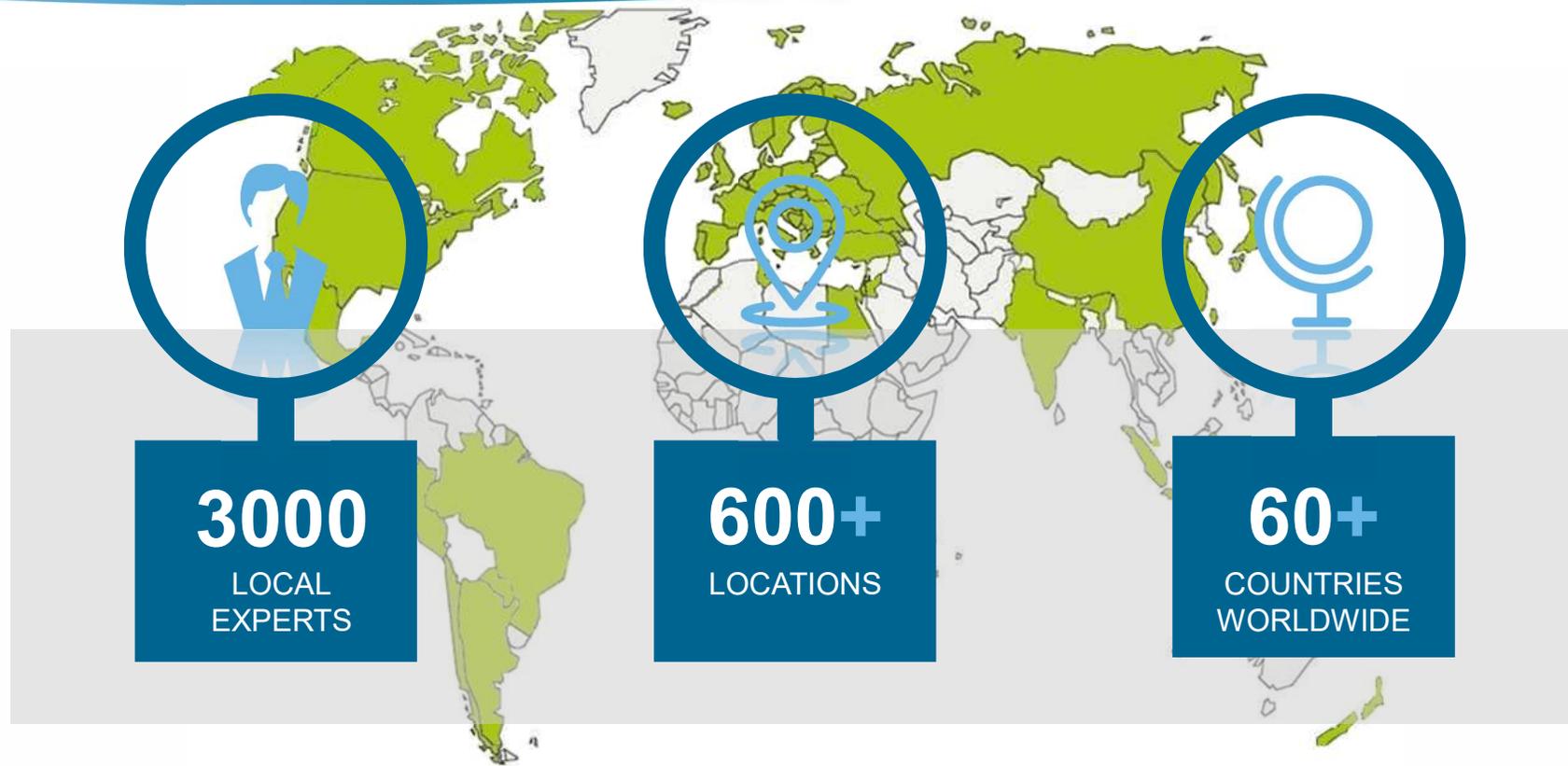


Our purpose...

Helping ambitious SMEs innovate and grow internationally.

---

# Global network – not just EU



# Helping growth-oriented SMEs with...



# Support for commercial and business development

Identifying clients' commercial needs/offers, then finding suitable partners for:

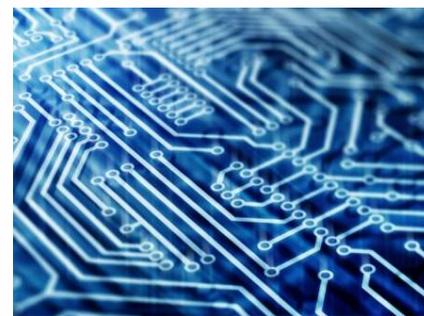
- product distribution or sales agency
- supply chain development
- sub-contract R&D project work
- JV, merger or franchise agreement
- company sale or acquisition
- transport/logistics
- subcontracted or reciprocal production



# Support for innovation and technology transfer

Identifying clients' technology needs/offers, then finding suitable partners for:

- IP licensing agreement
- technical cooperation to adapt/develop
- joint ventures based on technology
- commercial agreement with tech support
- manufacturing agreement inc. expertise

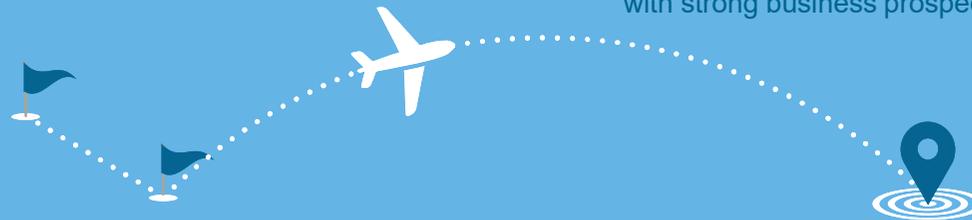


# How it works: international partnerships via the Network's tailored advice

The Network's business database contains thousands of company profiles to find the perfect match. In addition we organise:

**Matchmaking events** across Europe where SMEs can meet potential business partners in person.

**Company missions** where we set up and prepare you for targeted international meetings with strong business prospects



# EEN profiles – browse for partner profiles

enterprise europe network

Helping ambitious businesses grow internationally

Sign in

HOW CAN WE HELP? PARTNERING OPPORTUNITIES

We help ambitious businesses grow internationally

Move into new markets

Innovate to grow

“EEN provided invaluable support”

Search by keyword e.g. battery, engineering, biofuels

Photonic\* OR opto\* OR Optic\* OR Laser

199 opportunities found

Filter your results

I'm looking for a partner...

- to buy from 244
- to sell to 23
- that needs my tech/expertise 14
- with tech/expertise that I need 184
- to collaborate with/co-develop with 7

Country of origin

- Anywhere in the world
- Europe

62 countries selected Show

Search

Get updates to this list  Email

**Bose-Einstein-light (BEL) - cold laser**

Lasers as sources for coherent and intense light are used in many high-tech applications and medical devices. Generally, the generation of laser light is characterized by a significant level of more

Germany

**Hand piece for laser induced-suture of the cornea**

applications. Concerning the biomedical applications the Research Centre has a dedicated optoelectronics laboratory. The laser-induced corneal suturing technique has been... more

Italy

**Innovative solid-state laser with a copolymer as active compound**

most well-known laser organic systems: (i) a robust all-carbon skeleton is available here in a homologous series made of the repeating unit, which gives them high emission quantum yield close to unity over... more

Spain

**Method for laser ablation threshold determination of solid state materials.**

interaction – microelectronics, development of novel micro- and nanomaterials, nanophysics, optical coatings fabrication, etc. Good knowledge of the laser ablation threshold... more

Bulgaria



# EEN request profiles – relevant examples

## INTERREG V A programme- Rocket project: Seeking industrial partner for applying functional micro 3D printing technique to the fabrication of electronic, micromechanical, photonic or biomedical product

devices. They are looking for an end user of this technology and the collaborator in this project is expected to be a company fabricating/developing devices in the field of electronics, optics ... [more](#)

 Netherlands

## EURONANOMED: seeking SME in the field of cardiology, working on biomedicine and biosensing

hormones are limited to hospitalized patients and not available in the peripheral areas or in the general practice outpatient place. In this project they aim to realize a non-invasive optoelectronic label... [more](#)

 Spain

## Seeking optimum pitting solution for zero stone fruit

company is seeking excellence. All kind of quality control equipment ( laser , Xray ... or other) are also looking for. All kind of such solutions from manufacturers... [more](#)

 France

## High performance filtering technology that collects fine dust, microorganism, viruses smaller than 0.5µm

optical manipulation, semiconductor production. The company would like to have partners with a technical expertise in developing filtering technology that: - collects fine dust, viruses smaller than 0.5µm -... [more](#)

 South Korea

# EEN offer profiles – relevant examples

**Established Slovak university has developed a technology for preparation of optical fibres from polydimethylsiloxane and is looking for partners to commercialize this technology**

, microfluidic components, **optofluid** waveguides and in other types of micromanufacturing for electrical, optical, biological, biomedical and other applications. The main purpose of using PDMS for the... [more](#)



Slovakia

**Hand piece for laser induced-suture of the cornea**

applications. Concerning the biomedical applications the Research Centre has a dedicated **optoelectronics** laboratory. The laser-induced corneal suturing technique has been proposed in ophthalmic surgery. The... [more](#)



Italy

**Fully automated poultry monitoring – chicken, duck, turkey**

traceability of **food** products. A small German company specialised in machine vision and **optical** quality control has developed a poultry checking system. This is a visual... [more](#)



Germany

**Research Grant - Looking for chemical and pharmaceutical producers of in vivo imaging equipment and contrast agents.**

enabling technologies are DNA nanotechnology and nano-**optics**, and in particular plasmonics. The project exploits the potential of DNA nano-architectures to tailor the plasmonic response of a nanostructure to... [more](#)



Italy

# International brokerage events .....

## EEN Matchmaking or Brokerage Events – what do they offer participants?

- Brokerage Events (BE) set up meetings between prospective partners (who might otherwise have walked past each other in the aisles) and are organised to run alongside/within major trade shows, etc.
- Before the event, each registered participant can cross-match their objectives with all other participants and book targeted meetings. A meetings schedule is then prepared for each participant; usually for multiple meetings through the day.
- Sitting down face to face with a potential partner accelerates the prospective collaboration qualification process.
- Participants have a slick, efficient experience as EEN team members administer all aspects of the brokerage event configuration and delivery to maximise client benefit.



# National & International brokerage events

## Digital technologies - transforming how healthcare is delivered to citizens

Brokerage Event : United Kingdom

13 Feb 2018 - 13 Feb 2018

Advances in artificial intelligence, virtual reality, sensors, wearables and other innovative technologies, are redefining the way healthcare is being... ?

**Technology keywords:** Creative products, Health information management , Information Processing & Systems, Workflow , Sensors & Wireless... ?

Updated last week

## International HORECA B2B meeting at SIRHA EXPO

Brokerage Event : Hungary

08 Feb 2018 - 08 Feb 2018

Enterprise Europe Network will organize a brokerage event at SIRHA Expo, which will take place from 7 to 9 February in Budapest, Hungary. An... ?

**Technology keywords:** Agriculture Machinery / Technology, Food Additives/Ingredients/Functional Food , Food Processing

**Market keywords:** General food products, Health food , Hotels and resorts , Other consumer products , Other food and beverages , Other... ?

Updated last week

## Plant and crop productions B2B meetings at VIBE, Vegepolys International Business Event - SIVAL

Brokerage Event : France

16 Jan 2018 - 16 Jan 2018

Enterprise Europe Network, VEGEPOLYS, the leading European cluster for plants and the SIVAL, the European key professional showcase in the plant... ?

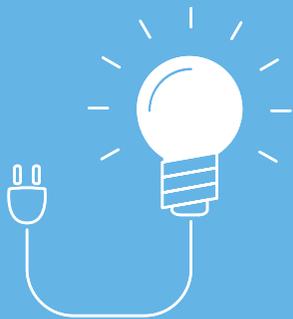
**Technology keywords:** Agriculture, Agriculture Machinery / Technology , Biocontrol , Crop Production , Horticulture , Micro- and... ?

**Market keywords:** Agriculture, Forestry, Fishing, Animal Husbandry & Related Products

Updated last quarter

# How it works: innovation support & access to finance

Tailored long-term support to steer you onto the fast track to success.



- | Advice and help for innovative SMEs to access R&I grant funding (H2020, SME Instrument, Innovate UK ...)
- | KAM services for SME Instrument beneficiaries
- | Personalised support to help shape innovation potential into international commercial success
- | Help in finding the right technology to improve your innovation
- | Help in finding the finance it needs to grow.

# I2S - Innovate 2 Succeed



- Offered to selected EEN clients (In Wales, SMEs that are not on WG's AGP)
- Relevant to directors of commercially-viable businesses seeking to benefit from tailored support to identify & address a barrier to innovation
- Typically 5-7 days consultancy support inc. utilisation of GrowthMapper tool to underpin support requirements
- Pace of delivery is flexible within a 3 month window
- A 100% funded programme under Horizon 2020

# Scale-Up Support

## Grow further and scale up

### Rapidly expand your business to become world-beating

Some ambitious businesses aim for sustained high growth, scaling up quickly to seize international opportunities and become global success stories.

Is yours one of them?

We work with high-growth-potential SMEs to accelerate their journey.

Our Scale Up experts – successful business leaders in their own right – work together as part of our Scale Up Board while also giving you dedicated one-to-one support. This is tailored to help you achieve your global ambitions.

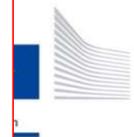
EEN works in partnership with the Scale-Up Institute, Local Enterprise Partnerships and initiatives such as the Goldman Sachs 10,000 Small Businesses programme, connecting you to the best support for scale ups regionally, nationally and internationally.

#### Support includes:

- Connections to next-stage growth funding
- Strategic partnerships
- Mergers and acquisitions
- Structuring for global growth
- Implementing international markets strategy
- Market insights

EU-funded 18-month client-centred pilot programme for 30 UK SMEs with exceptional growth potential via a scalable / replicable business model and processes – further candidates sought by 31<sup>st</sup> December

- SMEs with realistic, high-growth oriented ambition & verified business plan and a commitment to implement it
- Established companies with stable core teams, cash flow and foothold in their key markets and that are looking to scale-up and expand to new markets (geographic or sectoral)
- Companies with a potential for market creation & disruptive innovation in any sector
- Driven by innovation (technological or otherwise)
- Preferably more or less ready to receive equity investment



# Horizon 2020: SME Instrument Support



Ideally contact EEN at initial planning

Honest broker to identify best options / calls

EEN offer to pre-screen draft proposals & engage NCP for expert critique

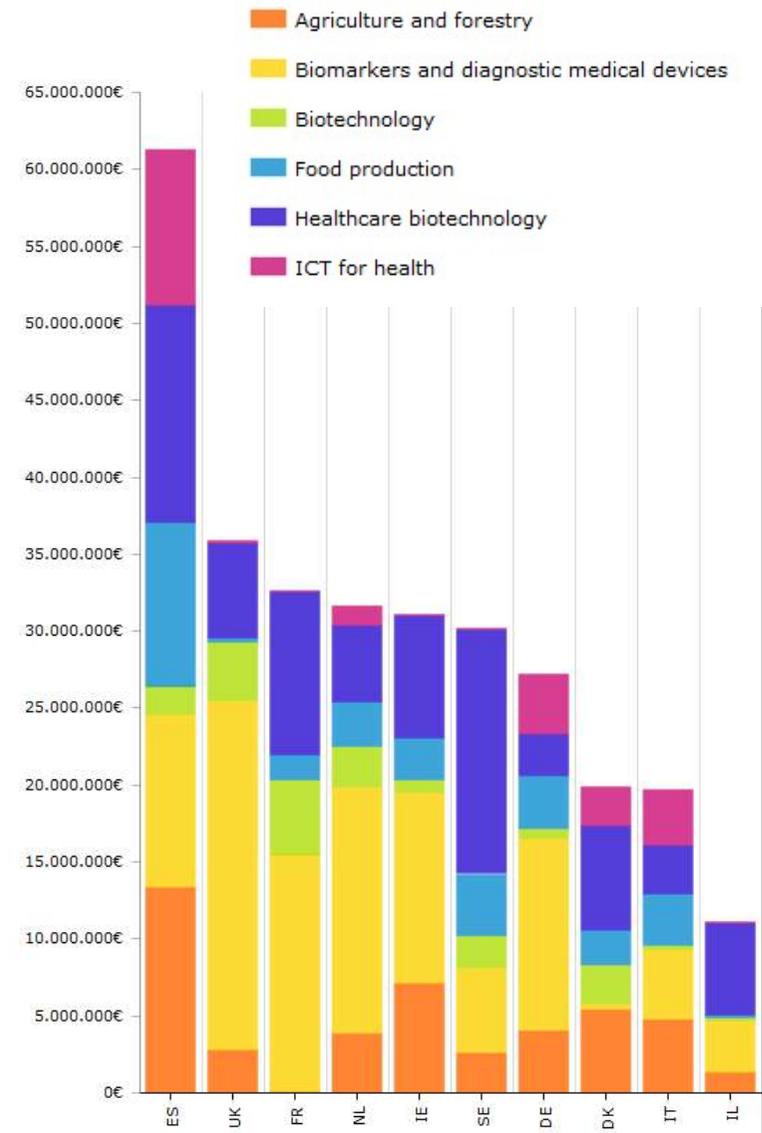
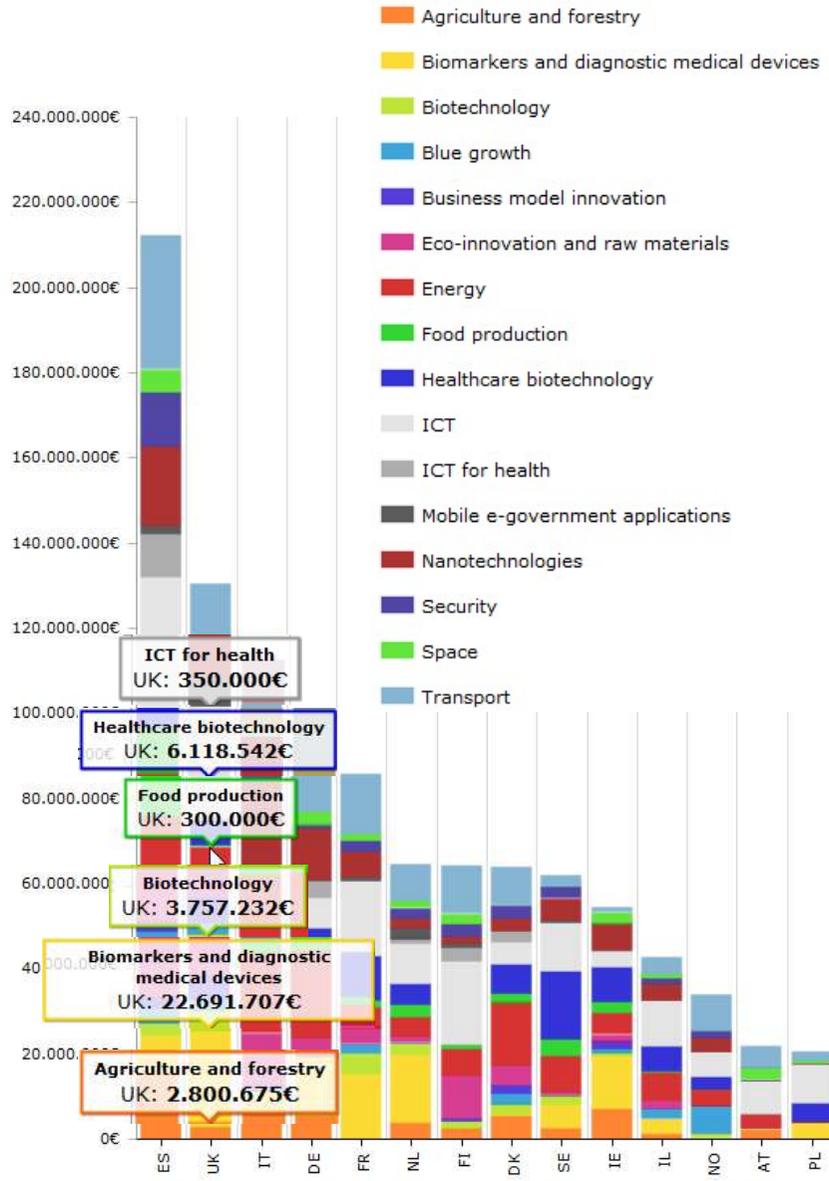
SME Inst awardees must take bundled coaching – EEN KAM administers

EEN triage Seal of Excellence holders (for high-scoring, but unfunded projects)

# Eligibility UK Partners since UK EU Referendum vote

(slide courtesy Jerome de Barros, NCP Health)

- UK partners are fully eligible to all Horizon 2020 instruments at least while the UK is still a member of the EU and encourage to continue to apply to the programme in the usual way:
- UK Treasury guaranteed that all Horizon 2020 projects **applied to** while the UK is still a member of the EU, will have certainty over future funding with the Treasury underwriting the payments of such awards, even when specific projects continue beyond the UK's departure from the EU
- The European Commission added similar clarifications in its latest version of the H2020 Expert briefing:  
[http://ec.europa.eu/research/participants/data/support/expert/h2020\\_expert-briefing\\_en.pdf](http://ec.europa.eu/research/participants/data/support/expert/h2020_expert-briefing_en.pdf)



## UK SME Instrument Beneficiaries (EPRISE)

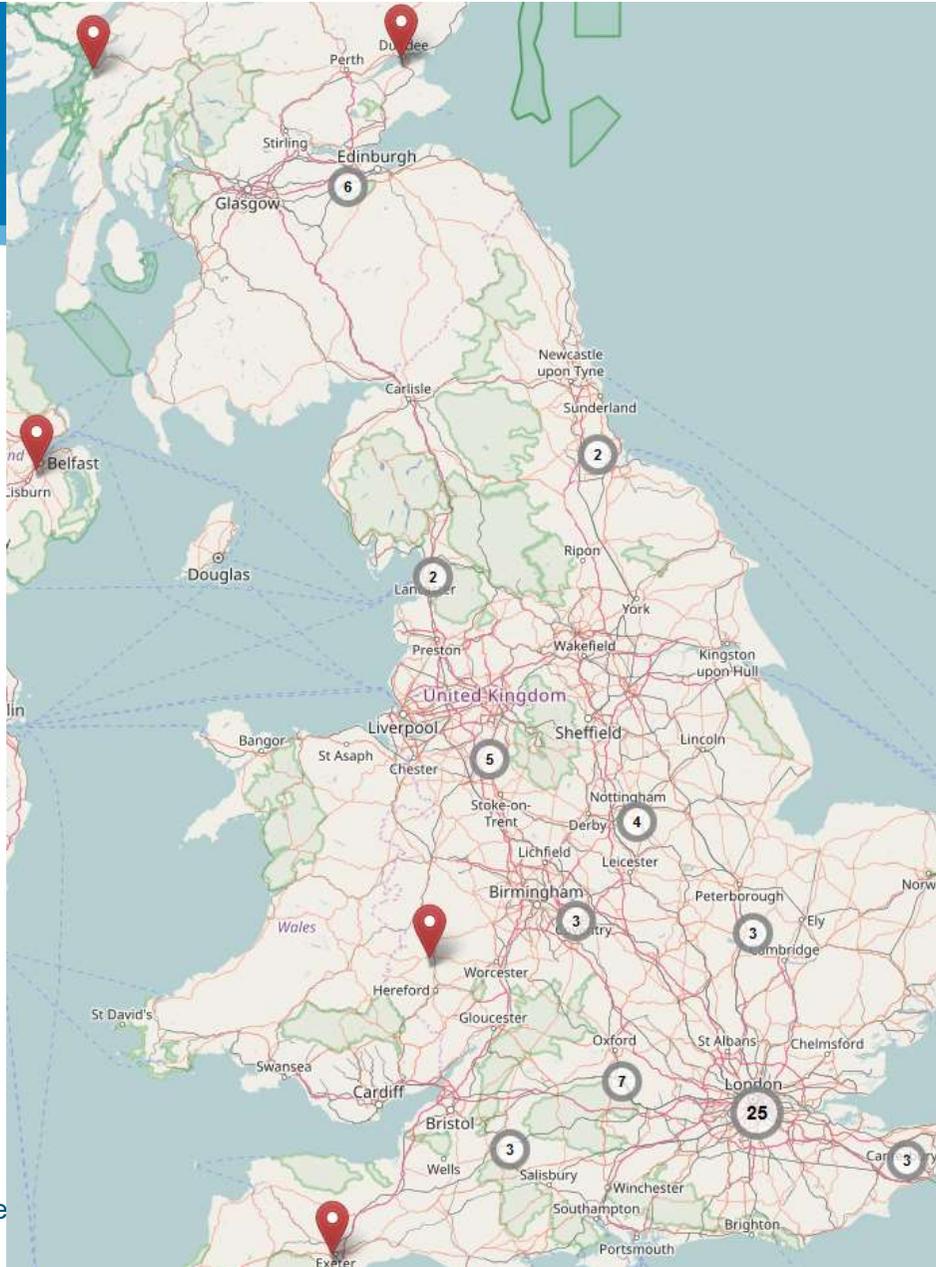
**69 projects have awards to date in the sectors overlapping EPRISE:**

- 56x Phase 1 ~€2.9m total
- 13x Phase 2 ~€33m total

70% intervention rate generally

Anecdotally, Phase 2 applicants are ~3x more likely to be successful if their path was via a Phase 1 application & award previously

Wales currently has 4 SMEI awardees, but none of these in the EPRISE sectors



RESEARCH & INNOVATION  
Participant Portal

European Commission > Research & Innovation > Participant Portal > Calls

HOME FUNDING OPPORTUNITIES HOW TO PARTICIPATE PROJECTS & RESULTS EXPERTS SUPPORT LOGIN REGISTER

EU Programmes 2014-2020

Search Topics

Updates

Calls

H2020

3rd Health Programme

Asylum, Migration and Integration Fund

Consumer Programme

COSME

European Statistics Programme

Hercule III Programme

Internal Security Fund - Borders

Internal Security Fund - Police

Justice Programme

Pilot Projects & Preparatory Actions

Horizon 2020

Advanced search for topics  
Calls for tenders on TED

Excellent Science

- European Research Council (ERC)
- Future and Emerging Technologies (FET)
- Marie-Sklodowska-Curie Actions
- Research Infrastructures

Industrial Leadership

- Leadership in enabling and industrial technologies (LEIT)
- Information and Communication Technologies

Status  Calls with forthcoming topics  Calls with open topics  Calls with only closed topics

Sort by  Call title  Call identifier  Publication date

Industrial Leadership  
SME Instrument  
H2020-EIC-SMEInst-2018-2020  
Publication date: 27 October 2017

**Budget of the SME Instrument**

**Overall indicative budget (€ millions)**

**2018:** 479.74

**2019:** 552.26

**2020:** 600.99

Having recently been moved under the European Innovation Council pilot, SME Instrument competitions are now open competitions (no sector/ theme) through to 2020 with 4 cut-offs / year in each of Phase 1 and Phase 2

Topic: **EIC-SMEInst-2018-2020: SME instrument**

Publication date: 27 October 2017

Types of action: SME-1 SME instrument phase 1

DeadlineModel: multiple cut-off

Opening date: 07 November 2017

Cut-off dates: 08 February 2018 17:00:00  
03 May 2018 17:00:00  
05 September 2018 17:00:00  
07 November 2018 17:00:00  
13 February 2019 17:00:00  
07 May 2019 17:00:00  
05 September 2019 17:00:00  
06 November 2019 17:00:00  
12 February 2020 17:00:00  
06 May 2020 17:00:00  
02 September 2020 17:00:00  
04 November 2020 17:00:00

Time Zone : (Brussels time)

---

Topic: **EIC-SMEInst-2018-2020: SME instrument**

Publication date: 27 October 2017

Types of action: SME-2 SME instrument phase 2

DeadlineModel: multiple cut-off

Opening date: 07 November 2017

Cut-off dates: 10 January 2018 17:00:00  
14 March 2018 17:00:00  
23 May 2018 17:00:00  
10 October 2018 17:00:00  
09 January 2019 17:00:00  
03 April 2019 17:00:00  
05 June 2019 17:00:00  
09 October 2019 17:00:00  
08 January 2020 17:00:00  
18 March 2020 17:00:00  
19 May 2020 17:00:00  
07 October 2020 17:00:00

Time Zone : (Brussels time)



# SME Instrument - notes & tips

## SME Instrument Target



- SMEs
  - Single company ok
  - Established in EU or associated countries
- Innovative idea – disruptive - demonstration stage
- Clear ambition to grow at EU/global level
- Knowledge of the market and of competitors
- Convincing commercialisation plan



# SME Instrument - notes & tips

## Evaluation: **IMPACT**



Convince evaluators that your project will make money and create jobs

- **Market (will to pay) - targeted users**
- **Market conditions – competition – Market share**
- **Commercialisation plan**
- **EU/global dimension**
- **Knowledge protection**
- **Jobs created in Europe**

## Evaluation: **EXCELLENCE**



Convince evaluators that your innovation is excellent

- **Innovative product/process/service**
- **Viable & Disruptive technology**
- **Added value**
- **Better than existing solutions**
- **Commercial potential**
- **Understanding of risks and opportunities**

## Evaluation: **IMPLEMENTATION**



Convince evaluators that you will make it

- **Credibility of the work plan**
- **Right Resources internally**
- **Right Partners and stakeholders**
- **Team organisation**
- **Realistic time frame**

# SME Instrument - notes & tips

## Hints and tips



- *Before taking a strategic decision to apply*
  - **Look carefully at the programme target**
  - **Assess if your project is mature in all aspects of evaluation criteria**
  - **Take advise on other funding programmes from NCP, EEN or others, notably incubators if you are a starter company**
  - **Try a 3 minute pitch**
  - **If you work with a consultant choose a success fee rather than a fixed price**

## Hints and tips

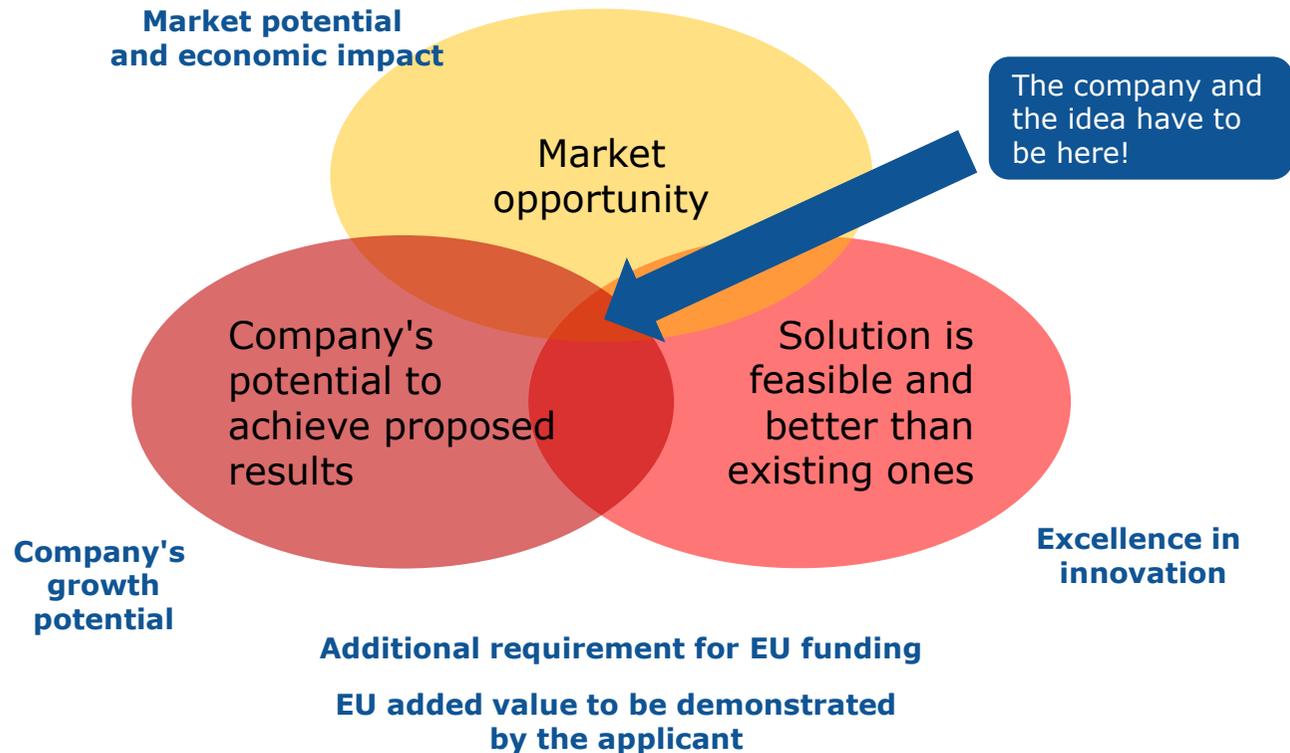


- *When applying:*
  - **Make sure your proposal is balanced and covers all aspects of each evaluation criteria**
  - **Write to convince evaluators to invest**
  - **Put concrete realistic figures**
    - Show market size, market share, sales price,*
    - Show 3 years projections of sales volumes, turnover, jobs created*
  - **Invest in a catching title and a good abstract**
  - **Use the full 10 pages – delete the hints in the template**
  - **Form matters, test your proposal, review the language,**
  - **Do not wait the cut-off date**

## SME Instrument : Selecting candidates



- This programme is targeted at innovation excellence – addressed at very good companies and entrepreneurs - it is not an easy source of revenue!
- Propose only companies which have a good potential for this scheme



# Relevant opportunities within Horizon 2020 e.g. Societal Challenges ....

The screenshot displays the 'RESEARCH & INNOVATION Participant Portal' interface. On the left, a sidebar lists 'EU Programmes 2014-2020' with 'H2020' selected. The main area shows 'Calls for Proposals' with filters for 'Societal Challenges' and 'Secure, clean and efficient energy'. Two call details are highlighted in red boxes:

- Call 1:**
  - Topic: **LC-SC3-RES-7-2019: Solar Energy in Industrial Processes** (Forthcoming)
  - Publication date: 27 October 2017
  - Focus area: Building a low-carbon, climate resilient future (LC)
  - Types of action: RIA Research and Innovation action
  - DeadlineModel: single-stage
  - Opening date: 07 May 2019
  - Deadline: 27 August 2019 17:00:00
  - Time Zone: (Brussels time)
- Call 2:**
  - Topic: **LC-SC3-RES-6-2018: Demonstrate significant cost reduction for Building Integrated PV (BIPV) solutions** (Open)
  - Publication date: 27 October 2017
  - Focus area: Building a low-carbon, climate resilient future (LC)
  - Types of action: IA Innovation action
  - DeadlineModel: single-stage
  - Opening date: 31 October 2017
  - Deadline: 13 February 2018 17:00:00
  - Time Zone: (Brussels time)

At the bottom, three call cards are visible, with the middle one highlighted in red:

- Card 1:** Societal Challenges, Building a low-carbon, climate resilient future: Green Vehicles, H2020-LC-GV-2018-2019-2020, Publication date: 27 October 2017
- Card 2 (highlighted):** Societal Challenges, BUILDING A LOW-CARBON, CLIMATE RESILIENT FUTURE: SECURE, CLEAN AN ..., H2020-LC-SC3-2018-2019-2020, Publication date: 27 October 2017
- Card 3:** Societal Challenges, Horizon Prize - Low Carbon Energy Inducement Prizes 2016 - Low Carbon Hospital, H2020-LCE-Prizes-2016-01, Publication date: 05 July 2016

# EEN supports EU-funded research consortium building



ENTERPRISE EUROPE NETWORK

European Commission

European Commission > Enterprise Europe Network > Part...

Network Forums

Partnering Home Events Profiles

**Profile Advanced Search**

Profile details Profile types Partners Key

Business Offer  
 Business Request  
 Research & Development Request  
 Technology Offer  
 Technology Request

Title of Profile	Country	Type	Publish Date
LC-GV-04-2019: A French SME looking for trucks and passenger cars manufacturers to develop a combustion engine based on...	France	R&D Request	11 Oct 2017
H2020-SFS-06-2018 Digital integrator and primary food producing SMEs sought to join a data driven integrated pest...	United Kingdom	R&D Request	06 Dec 2017
Clinical research institute sought for Eurostars project.	Germany	R&D Request	26 Sep 2017
Eurostars2 Project: Development of cloud based English negotiation learning platform	South Korea	R&D Request	02 Oct 2017
H2020 MSCA-ITN-ETN-2018: Seeking an industrial partner working in the field of virology and vector-borne diseases	Germany	R&D Request	22 Nov 2017
H2020-MSCA-ITN: Looking for a company providing online training modules on transferable skills	Spain	R&D Request	25 Oct 2017
IBEROEKA – Partners search for testing activities and validation of internet of things (IoT) system for epilepsy...	Spain	R&D Request	14 Nov 2017
EUROSTARS. Companies for the development of highly efficiency systems for energy storage based on graphene technologies	Spain	R&D Request	24 Aug 2017
EUROSTARS - Looking for pharmaceutical SMEs specialized in the development of innovative pain treatments	Belgium	R&D Request	11 Oct 2017
Eurostars2: Development of a damper and flexible coupling for a torsional vibration system in diesel engines	South Korea	R&D Request	16 Aug 2017
Erasmus Mundus proposal : A consortium of 4 universities is looking for partners (companies, NGO's, etc) in the field of..	France	R&D Request	29 Nov 2017
EUREKA/Eurostars: agriculture company that provides post-harvest services or post-harvest treatments	Spain	R&D Request	06 Oct 2017
[Eurostars2] Stem cells, research materials and cellular therapeutics	South Korea	R&D Request	05 Dec 2017
[EUREKA] Artificial neural network based software development for new technology business suggestion	South Korea	R&D Request	04 Sep 2017
H2020-LC-SC3-RES-5-2018: Opti-Hotel – Holistic optimization of energy efficiency and renewables integration for local...	Germany	R&D Request	05 Dec 2017
Research partners sought for the project EUREKA 2017: Smart house technology integrator for speech-to-speech natural...	Romania	R&D Request	23 Jun 2017
H2020 (SC6-co-creation-2016-2): German IT company is looking for public administrations and IT service companies for...	Germany	R&D Request	23 May 2017
H2020 project for virtual entrepreneurship center with various innovative activities that support the development of the...	Bosnia and Herzegovina	R&D Request	07 Nov 2017
EUROSTARS. Technological partners for the design and development of an hydro-generator with an innovative efficient...	Spain	R&D Request	24 Aug 2017
Eurostars: SME coordinator with expertise in electronic toys development and SMEs with expertise in inertial motion unit...	Switzerland	R&D Request	16 Nov 2017
EUREKA/Eurostars2: Development of a solar tracker controller	South Korea	R&D Request	07 Dec 2017

## EEN achievements 2015-2016 (England, Northern Ireland & Wales)



**5,000+ SMEs**  
advised and supported



**830 companies**  
given intensive innovation coaching and mentoring



**8,000+ participants**  
in EEN events



**£40m finance**  
raised through direct EEN support



**1500 SMEs**  
connected to overseas collaborators

# Contact us

[www.enterprise-europe.co.uk](http://www.enterprise-europe.co.uk)

Based in your region  
and connected to the world

Partner	contacts	Email
 <p><b>bicinnovation</b> believeinchange</p>	Lyndon Jones Jamie Sheridan John Clark	<a href="mailto:lyndon.jones@bic-innovation.com">lyndon.jones@bic-innovation.com</a> <a href="mailto:james.sheridan@bic-innovation.com">james.sheridan@bic-innovation.com</a> <a href="mailto:john.clark@bic-innovation.com">john.clark@bic-innovation.com</a>
 <p>Swansea University Prifysgol Abertawe</p>	Lawson Coombes Philip Harfield David Guite	<a href="mailto:l.j.coombes@swansea.ac.uk">l.j.coombes@swansea.ac.uk</a> <a href="mailto:p.d.harfield@swansea.ac.uk">p.d.harfield@swansea.ac.uk</a> <a href="mailto:d.r.guite@swansea.ac.uk">d.r.guite@swansea.ac.uk</a>

[enterprise-europe.co.uk](http://enterprise-europe.co.uk)

**Innovate UK**





# Stephanie Project – Space technology with photonics for market and societal challenges

Elaine Scott, Business Durham



PHOTONICS<sup>21</sup>



This project has received funding from  
the European Union's Horizon 2020  
research and innovation programme  
under grant agreement No 732695

**Innovate UK**  
Knowledge Transfer Network





# STEPHANIE

## Project's Overview

*Elaine Scott*  
*Business Durham*

*Regional Support for Photonics,  
Cardiff, 12 December 2017*



**Interreg  
Europe**



European Union | European Regional Development Fund





**NETPark Incubator**



**NETPark – current site**



## NETPark Explorer – January 2018



## **CPI – National Printable Electronics Centre**

# The Space Market

## North East Satellite Applications Centre of Excellence

**UK share of the global space market from 6.5% to 10% by 2030.**

2010	2030
Global satellite market £250bn	Global satellite market £400bn
UK market share £9bn	UK market share £40bn

# Space photonics

## European Space Agency – ESA

Wave technologies either in optic fibers or waveguides

Impact in future spacecraft engineering by replacing or enhancing conventional electrical approaches in the fields of digital and rf telecom payloads, sensors, micro lidars and spectrometers by reducing the:

- Weight
  - Size
  - Power
  - Performance of the systems they replace.
-

# Space photonics

Some areas of applications:

- Flexible RF payloads
  - Optical interconnects for digital payloads
  - Photonic integrated circuits
  - Intra-satellite digital communications
  - Fibre optic sensing for satellite platforms
  - Photonics for launchers
-

# FOCUS & PARTNERS



# STEPHANIE

## *Space T<sub>E</sub>chnology with P<sub>H</sub>otonics for market and societal challenges*

EPICAH ▪ EV4CityN ▪ HOPE ▪ FoodChains 4  
EU ▪ GPP4Growth ▪ Green Screen ▪

Research and Innovation  
SME competitiveness  
Low-carbon economy  
Environment and resource efficiency

projects  
OptiTrans  
PERFECT ▪ P-IRIS ▪ REUS ▪ RaiSE ▪ RCIA ▪  
REBORN ▪ REFORM ▪ RELOS3 ▪ REMIX ▪ Road-CSR ▪  
RUMORE ▪ Rural SMEs ▪ School Chance ▪ SHARE ▪  
SOCENT SPAs ▪ STEPHANIE ▪ STOB regions ▪ STRING  
SUPPORT ▪ TANIA ▪ Urban M ▪ VIOLET ▪

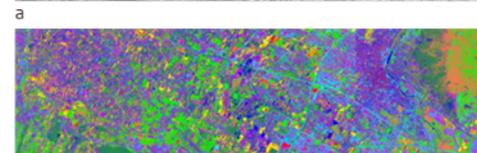
# Overall objective

To support a move towards **public policy** capable of promoting **effective use of R&I in space technology based on photonics** to develop products with strong **market potential** and capacity to address **socio-environmental** problems.

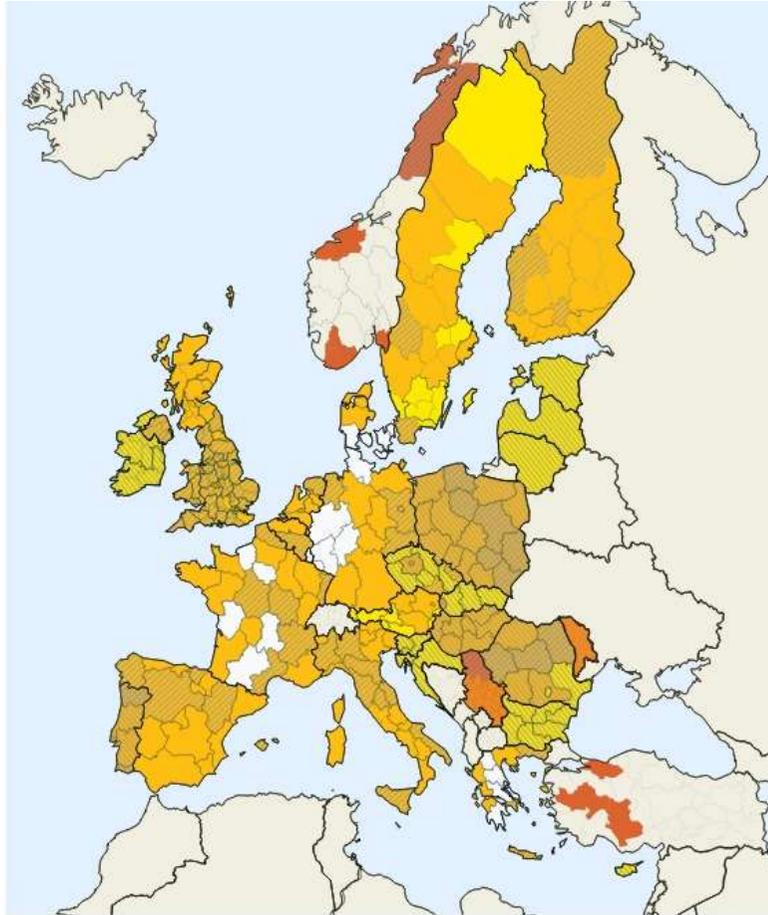


# Aerospace and photonics

**Photonics** is a **Key Enabling Technology (KET)** that plays a crucial role in aerospace, deeply entangled in many related R&D activities, from the construction of cutting-edge optoelectronic payloads on satellites to the development of high level products able to address a wide range of global issues and societal needs.



d



*Tuscany is traditionally a location of value chain in the field of **Photonics**: it offers a rich texture of **Aerospace LE**, **SMEs** and a unique concentration of related scientific know-how in **Research Organisations**.*

## EU regions and S3 cooperation



**STEPHANIE** brings together **8 partners** from **7 European regions**.

They exchange knowledge on **policy** to **guarantee real benefits** from **space technology** based on **photonics**.

### **SMART SPECIALISATIONS:**

- **Aerospace**
- **ICT & Photonics**

# The Partnership

 IT	'Nello Carrara' Institute of Applied Physics - National Research Council of Italy (IT) – <b>Lead Partner</b>
 IT	Regional Government of Tuscany (IT)
 CZ	City of Prague (CZ)
 FR	Photonics Bretagne (FR)
 DE	NanoMicroMaterialsPhotonics.NRW Cluster c/o NMWP Management GmbH (DE)
 ES	Andalusian Foundation for Aerospace Development Center for Advanced Aerospace Technologies (ES)
 UK	Durham County Council (UK)
 BE	University of Liège - Liège Space Centre (BE)

# APPROACH



The project addressed 2 main **policy challenges**, using a 2 pillar approach:

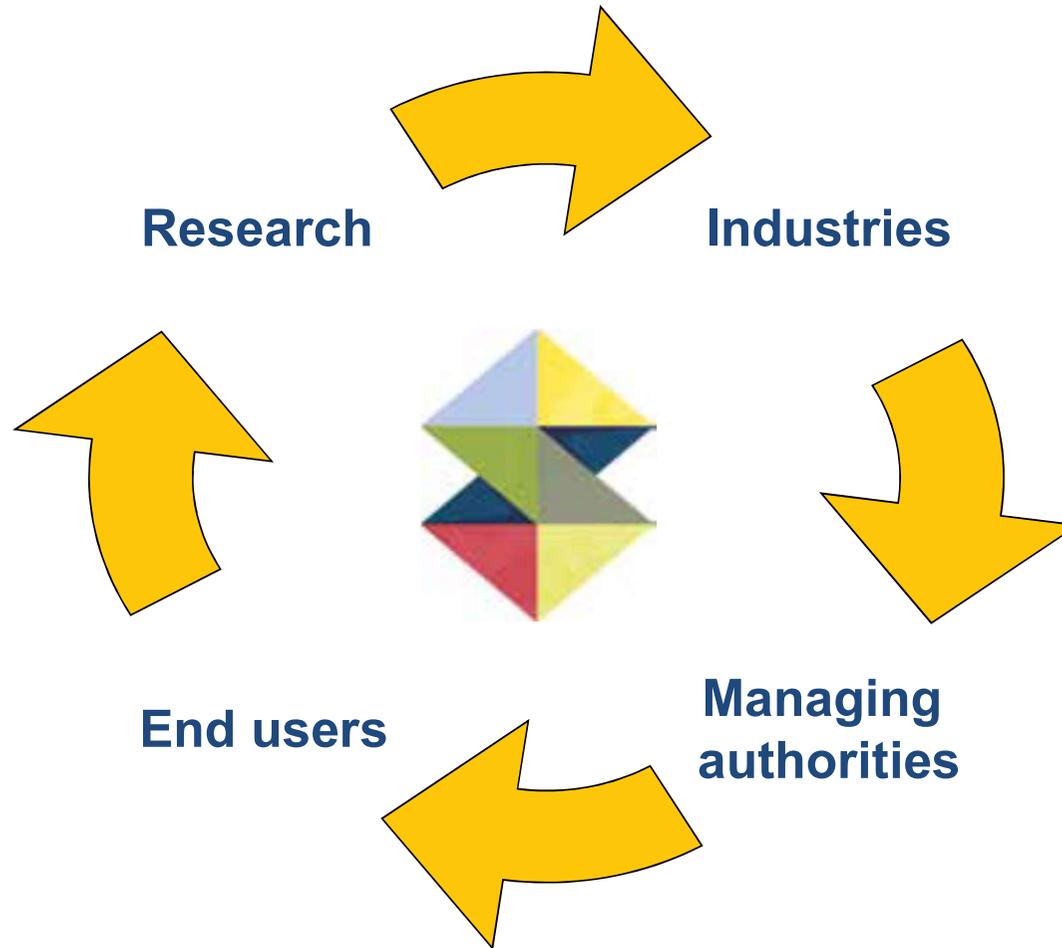
1

- ***quadruple helix cooperation*** along the technological value chain at regional and interregional level;

2

- ***funding for space technology***, including more targeted and simplified regional and interregional funding schemes.

# Quadruple Helix Cooperation



# ACTIVITIES & OUTPUTS

---

## Main activities

Partners use interregional exchange & concerted regional actions to:

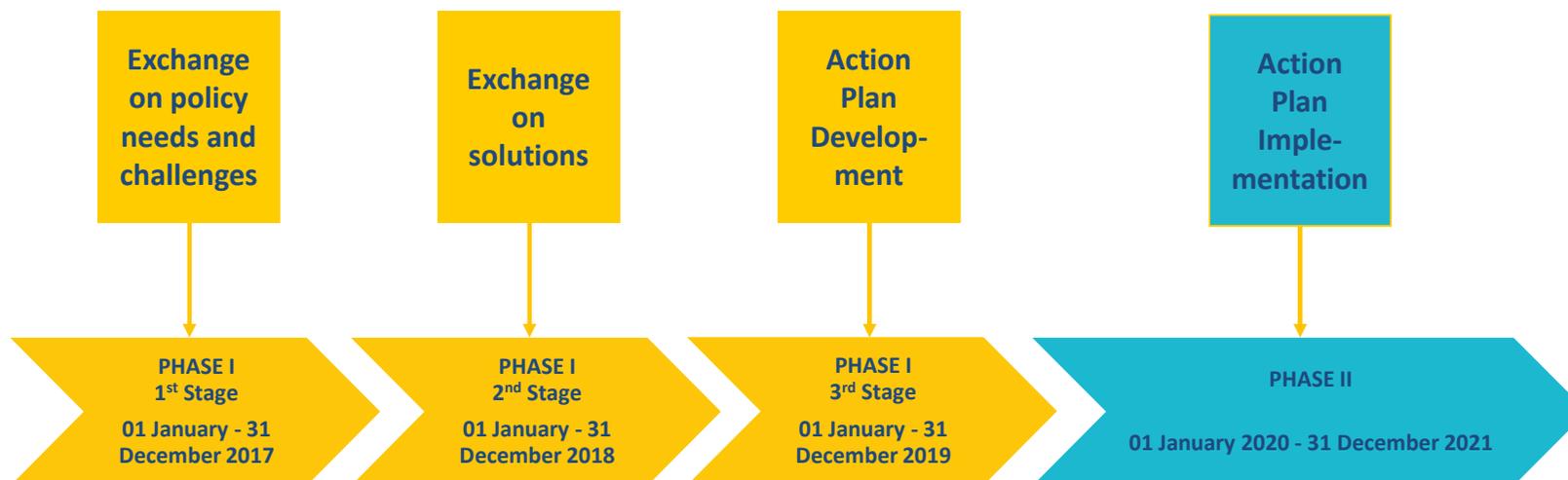
- ***promote involvement of stakeholders*** through 7 local stakeholder groups (representatives of the quadruple helix) actively involved in exchange (workshops, staff exchanges);
  - develop ***7 regional visions*** for a better understanding of R&I policies challenges and opportunities applied to photonics based space technology;
  - identify and share ***14 Good Practices*** (GPs) related to policy supporting products and services with potential in terms of market and addressing socio-environmental challenges;
  - prepare, apply and monitor ***7 Action Plans*** for integrating and deploying GPs in the space technology industry within regional policies.
-

# Activities timeline

Official phases of STEPHANIE project activity:

Phase 1 (3 years): 01 January 2017 – 31 December 2019

Phase 2 (2 years): 01 January 2020 – 31 December 2021



## Expected Policy Improvements

STEPHANIE will lead to policy improvements in partners' ERDF ROP:

- ***Implementation of new projects***: managing authorities, clusters/research centres and stakeholders from the quadruple helix can propose high-quality projects, including funding for technological innovation / application involving the whole value chain;
  - ***Change in the management of the policy instrument***: lessons learnt from exchange between partners can lead to improvements to the way the ROPs are managed by importing new approaches from other regions.
-

# Expected Policy IMPACT

Policy changes will :

- deliver long term impact to regional competitiveness and socio-environmental wellbeing
  - open new markets for enterprises
  - improve capacity of regions to direct European space policies and strategies.
-



**STEPHANIE**  
Interreg Europe

 European Union  
European Regional  
Development Fund

# Thank you for listening

**Elaine Scott**

Business Durham – 07786 026916

[Elaine.scott@durham.gov.uk](mailto:Elaine.scott@durham.gov.uk)

---



# Thank you for attending



PHOTONICS PUBLIC PRIVATE PARTNERSHIP



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 732695

**Innovate UK**  
Knowledge Transfer Network

