

A PHOTONICS ENABLED INNOVATION STRATEGY FOR WALES

“A different approach is needed to innovation. A new model. And a new entity that is independent, innovation driven, and focussed on developing the capability model at the national level. It is increasingly appreciated globally that Photonics is having a deep and far-reaching impact on a wide range of end markets & societal challenges. This strategy leverages all relevant Welsh academic, public and private sector resources to harvest the value of those impacts for Wales”.

The Welsh Opto-electronics Forum (WOF) is an independent networking organisation dedicated to the growth and profitability of the Opto-electronics sector in Wales. A vigorous consortium of industrial companies and university groups we have a long history of working with government and a proven track record of delivering successful initiatives. We are committed to seeking out new challenges.

Opto-electronics, also known as Photonics, is a technology that has, for decades, supported and enabled many key sectors of importance to Wales. With an ongoing global growth of 10% it currently employs in Wales

about 6,000 and generates over £1bn in sales. At the end of 2011 WOF held a “Celebration of Photonics” event in Cardiff to highlight this achievement of photonics and promote its role as an enabler of new business.

Based on input from organisations attending this event and subsequent research, WOF believes that there is significant potential for accelerating the impact of photonics on the economy by enabling innovation in many new disciplines. The resulting “Photonics Enabled Innovation Strategy” captures these ideas and articulates a way forward.

This strategy sets out a vision for Wales of an open innovation community which collaborates to create and freely share ideas thus enabling faster wealth creation from new science and technology. This exceptional interaction between industry and academia happens through the movement of researchers unhindered by conventional career structures. The education system is built around the stimulating principles of opportunities and enquiry, leading to an enviable supply of talent to enable growth within Wales.

Companies will benefit from new product Development based upon grant channelling and unlocking IP invested in Universities, faster access to skills, solving challenges, coordinating facilities and encouraging cooperation between partners.

Academic partners will benefit from improved performance of Welsh Science and Technology and demonstrable economic impact of their endeavours.

Wales will benefit from sustainably increased prosperity & new jobs creation.



Celebration of Photonics participants

The vision is of a region positioned in several global supply chains because collaborative thinking and working will allow us to build on our capabilities, thus creating a Wales that will sustainably prosper from new markets because of our new-found agile innovation network.

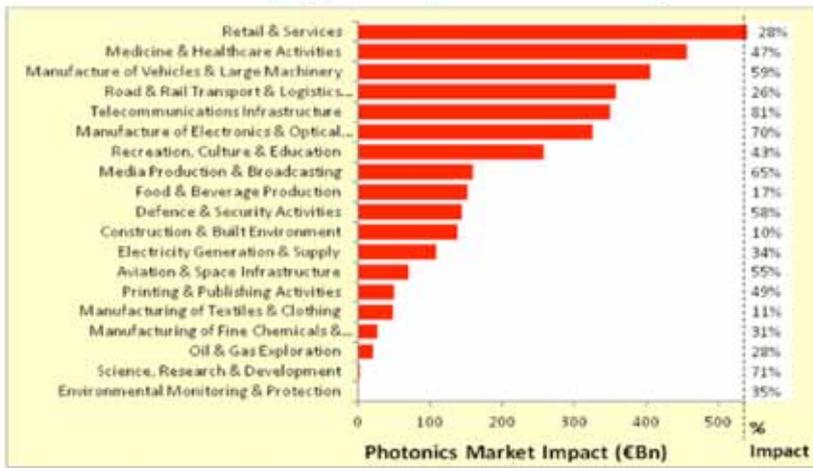
The essential details are summarised here...but we need YOUR help to deliver it.

There is a wealth of capability and commercial opportunity not being exploited in Wales. Our objective is to build Welsh economic performance by using photonics capability & the development of an accessible collaborative IP portfolio to address commercial opportunity via Welsh Industry.

Photonics is a key enabling technology throughout modern industry and is well placed to act as the catalyst for economic improvement.

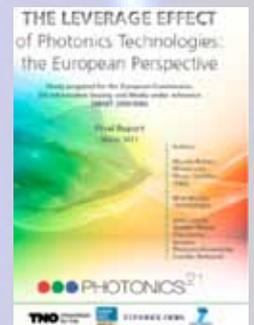
Market Impact

- Combining size of impacted markets with level of impact
 - Photonics market impact = ~€3trillion
 - Photonics employment impact = ~30 million jobs

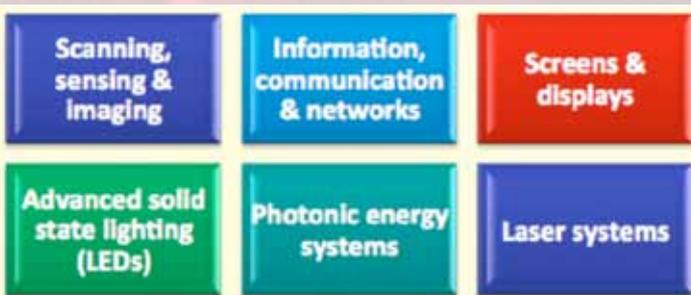


A recent study, commissioned by the European Commission, entitled "The Leverage Effect of Photonics Technologies: the European Perspective" identifies photonics as a Key Enabling Technology for the future. That this report is available on the FP7 web site shows the significance accorded to photonics by the European Commission. It gives well-researched evidence and models for forecasting with various scenarios. It reports that the European photonics market is worth €58.5billion (21% of the world market) and

that the European photonics industry employs 290,000 people. However a key finding is that because of the underpinning involvement of photonics on 20 major industries it has an overall leverage of 10% of the total EU economy. This amounts to a stunning €3 trillion of sales and some 30million jobs.

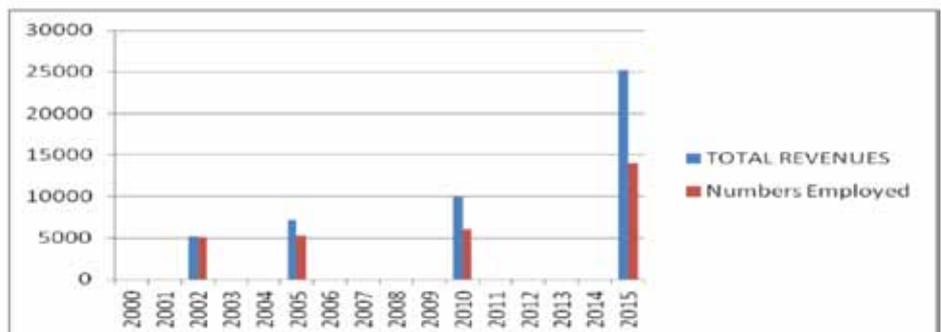


Available on: http://cordis.europa.eu/fp7/ict/photonics/Docs/reports/photonicsleveragestudy_en.pdf



The leverage report summarises the photonics technologies that deliver this impact into just six key headings. A review of the photonics technologies in Wales shows that we have a presence, albeit at a low level in all of these six areas

If we can realise the potential of our solid base across these technologies by the innovative application of them in markets new to us, such as Life Sciences, we have the potential not just to track global growth, but to significantly improve our growth in terms of both revenues and jobs.



Total revenues are £ x 100,000

Focus on large sectors where photonics impact currently small, not just sectors where photonics impact established.

Establish a specific policy to support full SME participation at all stages of supply chains

Support the vertical connection between research and industry

As government, actively participate in photonics

*“The UK has the potential to be a world leader in innovation.....
....but the challenges we face in innovation are as big as those elsewhere.”*

Innovation and Research Strategy for Growth; DBIS Dec 2011

The recommendations from the Photonics21 Leverage report are clear. But whilst these may be Critical Success Factors, they raise significant challenges and we fear they may also be Barriers!

We need an effective **innovation eco-system** for Wales! The current environment comprises many parties with different capabilities developed to meet their own organisational objectives: Government (Welsh Government); Industry (many different sectors; many different businesses); Academia (many universities, many departments, many experts); Support Organisations; Programmes. All effective in many ways, but each of these has evolved its own models of operation to suit its own objectives and has developed competencies to achieve these. Collaboration to the benefit of the entire eco-system is unlikely to be amongst these!

We believe that past models for innovation in the UK have not been as successful as desired. **We need a new approach to managing innovation.**

But we are convinced that Wales has as much, if not more potential than the rest of the UK. Our underlying capabilities and more manageable size should work to our advantage in looking at alternative strategies – a “David” rather than a “Goliath” approach. And Photonics, as a technology, can enable a wide range of innovations across many industrial sectors.

Dr Robert G. Cooper, a leading international authority in product innovation introduces the concept of to “Bold Innovation” and the “five innovation vectors” that drive it. From this we see that Governments tend to concentrate efforts at Vectors 1 and 5 where they are most effective in introducing initiatives. TSB and RCUK activities support Vector 4. Vectors 2 and 3 are largely ignored – or expected to “just happen”.

Maximum Sales, Profits & Innovation Productivity in Mature Markets

1. An Innovation Strategy that identifies and provides focus on attractive strategic arenas – growth engines.

2. A climate & culture, organisation and leadership that fosters true innovation.

3. Game-changing ideas generation to create ‘big ideas’ – the breakthroughs – to feed your innovation funnel.

4. An idea-to-launch system for driving these large-scope, complex, higher risk projects to market.

5. Building strong business cases & picking winners – making the right investment decisions.

Robert Cooper's five Innovation Vectors

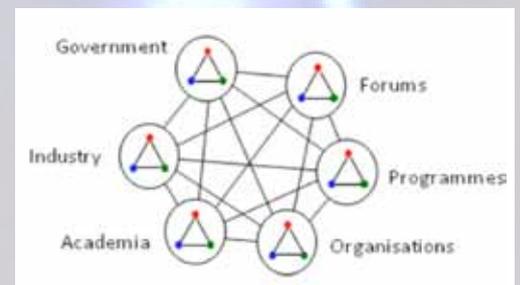
A different approach is needed. A new model. And a new entity that is independent, innovation driven, and focussed on developing the capability model at the national level.

We propose that

- A business-oriented delivery team is appointed to lead an innovation programme for Wales.
- It shall be independent of any existing organisation, and thus impartial and even-handed.
- It shall be innovation-driven, responsible for the five innovation vectors, and have extensive knowledge about capabilities and opportunities in the sectors of value within Wales, and able to exploit the photonics capability in Wales.
- It shall identify opportunities that draw on capabilities in Wales, and enhance those capabilities as well as contribute to the economic development of Wales.

Such an organisation will need to work with all elements of the innovation eco-system to ensure:-

- Attractive growth engines are identified that are relevant to the capabilities and ambitions of Wales and organisations within Wales;
- Provision of innovation leadership which is experienced, impartial, and energetic;
- Accountability for developing and feeding the innovation funnel for Wales;
- Responsibility for projects from idea through to launch to avoid the "Valley of Death" problem; that projects are rooted in commercially viable ventures.



Leadership and a shared vision are the keys to the success of this strategy. The vision will be developed through a Supervisory Committee that represents key stake-holders across Wales, and should also include international figures.

While this Committee will focus on the vision for the strategy, the implementation will be the responsibility of an operational body. The leadership, and management, of this operational body will require experience of working in industry (hence understanding commercial pressures and the profit motive), working with government and academia (and the priorities of each), and how to work with all such stakeholders in a fast-moving, competitive and innovative world.

Such an operational body needs to be seen, by the community, as being trusted, capable, accountable, inclusive, pro-active and permanent.

The strategy aims to increase prosperity in Wales over a 10-year time-frame, and set in place a sustainable model of operation for the benefit of Wales.

11th July 2012 in OpTIC St Asaph 10.30am

19th July 2012 in the Millennium Centre, Cardiff Bay 10.30am

Workshops will be held on this Strategy document and on the dissemination of the HE STEM Bangor led 'CAMPUS' project (CAbility Matrix in Photonics UpSkilling) for industry contact susan.sheridan@wof.org.uk.

OUR PLANS are to establish pilot initiative activities in the Life Sciences, Energy, ICT and other sectors to demonstrate and fine tune the approach. Ultimately we would hope to constitute a commercial organisation for the ongoing sustainability of the innovation eco-system. Meanwhile we will continue to provide focussed workshops, flag-up promotion opportunities, and consult with key stakeholders.

WE WANT your support to help us succeed. We need your commitment to help us deliver. This could be anything from confirming to Welsh Government that this is the right way forward, to participating in our initiatives, to committing your time to steer the new organisation forward.

To add your view and find out what role you can play, please contact Susan Sheridan at WOF:
susan.sheridan@wof.org.uk

Compiled by The Welsh Opto-electronics Forum

With acknowledgement and thanks to:

GroundedInnovation PHOTONICS²¹

