

# £12m Welsh Government investment is catalyst for world's first compound semiconductor cluster

The state of the art facility is the first project to be supported by the £1.2bn City Deal and is the latest development in the Welsh Government's plans to make Wales the global centre of expertise for compound semiconductors.

The creation of the compound semiconductor industry facility will put Wales at the forefront of technological advancements in this area and is expected to attract up to £365m of private sector investment over the next 5 years.

Compound semiconductors are the key technology driving advances in a host of areas ranging from wireless technology and smart phones, to solar energy and power stations, from healthcare for new imaging devices and diagnostics, to transport.

Describing the project as a major coup for South East Wales, First Minister Carwyn Jones said:

"I am delighted our initial £12m investment has kick-started the creation of the world's first compound semiconductor industry cluster in Newport.

"Our support for the Institute for Compound Semiconductor Technology has been widely recognised as the catalyst for developing this world-leading cluster, which is expected to create more than 2,000 well paid jobs and be the cornerstone of a truly transformative project for the area.

"Today's major investment puts Wales at the cutting edge of this exciting technology, which has the ability to change the way we live. This is great news for Wales – and the first of many new exciting projects set to make a real difference to the economy of South East Wales."

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## US manufacturing decline and the rise

# of new production innovation paradigms

Between 2000 and 2010, US manufacturing experienced a nightmare. The number of manufacturing jobs in the United States, which had been relatively stable at 17 million since 1965, declined by one third in that decade, falling by 5.8 million to below 12 million in 2010 (returning to just 12.3 million in 2016). Certainly, the 2007–08 recession accelerated the disruption, but the causes were also structural, not simply financial. There was trouble with capital investment, output, productivity, and trade deficits. Contrary to what many believed, productivity gains due to robotics or automation have not been the cause of manufacturing employment's decline; the sector has been hollowing out.

This economic disruption has resulted in growing social disruption. While most people in the US assumed the nation was becoming one big middle class, instead a working class facing declining incomes came into clear, angry view during the 2016 US presidential election. The median income of men without a secondary school diploma fell by 20% between 1990 and 2013; for men with secondary school diplomas or some college, median income fell by 13%. The decline of US manufacturing—traditionally a route to the middle class—hit these groups particularly hard. There is now a major income inequality problem.

The question is: can the US manufacturing sector spring back? A core idea now being explored in the US is that new production paradigms could transform the sector. We have seen these new paradigms before: application of steam power in the UK, development of interchangeable machine-made parts, then mass production in the US, and the creation of quality manufacturing in Japan. The United States is now competing with low-wage, low-cost producers, particularly in Asia. Could the economy use its still strong innovation system to develop new production paradigms to drive up production efficiency and drive down costs so it can better compete?

Innovation also carries its own rewards; production innovation can enable more innovative—and competitive—products. Scientists and engineers are now telling us that there may be breakthroughs—new paradigms—available in a series of fields that could significantly change the way we produce complex, high-value technologies and goods, enabling dramatic production efficiencies. Advanced materials, digital production, photonics, lightweight composites, 3D printing, assistive robotics, revolutionary fibres, nano and biofabrication, all offer breakthrough production paradigms. These new technological advances must, in turn, be accompanied by new processes and business models to implement them. While new jobs may not necessarily be created at the production moment, job growth upstream and downstream of production is likely, given manufacturing's role as the major job multiplier in the connected value chains of firms.

Developing such new paradigms is the core idea behind advanced manufacturing in the US. Advanced manufacturing institutes as a means to nurture such paradigms are now being explored in depth across 14 new institutes, each

organised around a potential paradigm. Created through collaborations between industry, universities, and state and federal governments—and cost-shared by all—they are undertaking collaborative research on advanced technologies, shared test beds and demonstration facilities, and new approaches in workforce training. They are an attempt to apply Germany's Fraunhofer Institute model in a US setting, and borrow from the earlier US Sematech collaborative model that in the 1980s and 1990s applied advanced production processes to revive its semiconductor leadership.

This is a highly complex model: each institute typically joins over a hundred small and large firms, regional universities and community colleges, and state and regional agencies, with backing from federal R&D organisations. These R&D agencies are used for funding single scientist principal investigators, not a swarm of diverse collaborators. One federal official has compared creating a manufacturing institute to forming a new nation. The institutes must operate at a regional level because manufacturing firms are embedded in regional ecosystems, but must also bring their new production technologies into implementation at a national level, a complex regional-national balancing act.

The institutes have also become a new delivery mechanism for workforce education, a growing challenge for US manufacturers. If advanced manufacturing is to be implemented, it must have workforce and engineering communities trained for it. The United States has perhaps the most decentralised labour market of any developed economy, which makes such a major "up-skilling" project difficult. The institutes, with their ability to bring together manufacturers, community colleges, state programmes, university curricula, and online tools, with new technology development and testbed facilities, are now pursuing this task.

Perhaps the most interesting feature of the US advanced manufacturing effort is the wide range of diverse technologies aimed at by particular institutes. While some countries are working on single-shot efforts to bring the internet of things into a manufacturing setting, the United States has a shotgun approach, pursuing a wide range of technologies, from materials to digital, to bio, to nano. A big issue in this diverse approach will be pulling the individual institute strands together into a new system. The future factory will not be organised around single technologies; it will merge and connect a series. The institutes are starting to come together to form a network, called ManufacturingUSA. A critical task for this new network will be to turn the institutes' advanced technology strands into an entirely new production system. Hopefully, the potential of this new innovation model will continue to be tested.

## References

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## [Kirsty Williams wishes finalists of prestigious new teaching awards good luck](#)

Education Secretary Kirsty Williams has today sent a message of good luck to all those who have made it through to the finals of the prestigious new Professional Teaching Awards Cymru (Fri 5th May).

Thursday 04 May 2017

17 outstanding education professionals and schools have been shortlisted with the winners being announced at a special event in Cardiff City Hall on Sunday 7 May.

The awards have been established by the Welsh Government to recognise the best in schools across the country and to celebrate the commitment, dedication and inspiration of the teaching profession in Wales.

A panel of Wales-wide judges have selected the 17 entries for the seven categories, which include:

- Teacher of the year.
- Headteacher of the year.

- Award for promoting pupil wellbeing and or inclusion in school.
- Award for supporting teachers and learners.
- Whole school award for promoting relationships with parents and the community.

Kirsty Williams said:

“These prestigious new awards are an opportunity to say thank you to our teachers and educational professionals and formally recognise the best leadership and teaching from across Wales.

“I am looking forward to meeting all the finalists at the ceremony on Sunday and I wish all of them the best of luck and hope everyone has a great day.”

Winners will be presented with a ‘Griff’ in honour of Griffith Jones of Llanddowror, who turned the Welsh into one of the world’s most literate nations during the 1700s.

[May 2017](#)

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## [Temporary suspension of bird gatherings will be lifted from 15 May](#)

The temporary suspension was introduced in December 2016 after the declaration of the whole of Wales as an Avian Influenza Prevention Zone. This followed the confirmation of the H5N8 strain of Avian Influenza across European countries, the Middle East and North Africa.

Last week, the Cabinet Secretary confirmed the Avian Influenza Prevention Zone would not be replaced after its expiry on 30 April. The temporary suspension on gatherings of some species of birds in Wales, however, remained.

The lifting of the temporary suspension, from 15 May, follows an updated evidence-based risk assessment and is dependent on no further outbreaks of H5N8 in poultry or other captive birds or findings in wild birds.

The Cabinet Secretary said:

“I have taken this decision based upon the latest qualitative risk assessment, which considered the risk of incursion of H5N8 into poultry farms from contact primarily with resident wild waterfowl, but also with other possible pathways.

“The updated assessment concluded the overall risk should now be assessed as low, this is defined as being ‘rare, but may occur occasionally’. The overall risk is determined by the likelihood of the virus remaining in wild birds and the environment and the exposure to poultry.

“Expert opinion is that the risk to poultry is reduced as migratory wild birds leave Great Britain and as the resident wild waterfowl enters its breeding season. Environmental contamination will also reduce with warmer, drier weather and higher UV levels. Therefore, the risk of exposure to poultry is low as the resident wild waterfowl enters the breeding season they become less gregarious and the possibility of environmental contamination reduces.

“The overall risk presented by gatherings is also reduced, provided there are high levels of biosecurity at the gathering, ensuring species do not mix and cleansing and disinfection is carried out.

“Provided there are no further outbreaks or findings, the current general licence will be revoked and replaced on 15 May by a new general licence allowing all gatherings of birds.”

The Chief Veterinary Officer for Wales, Christianne Glossop added:

“While I am sure this news will be welcomed by poultry and other captive bird keepers I would remind them it is vital they remain vigilant for signs of disease and maintain excellent biosecurity practices.”

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## **Holyhead welcomes Wales' first Cruise call of the season**

The Astoria is a 580 passenger and 236 crew ship which is operated by Cruise and Maritime Voyages. After docking in Holyhead, passengers had a choice of excursions around north Wales, which included visits to Snowdonia, Anglesey

and the north Wales coast.

The cruise ship market is big business for Wales and Cruise Wales and partners are working hard to grow the market. In addition to Holyhead an increasing number of cruise visitors are coming to south west Wales through cruise ships docking at Swansea, Milford Haven Port, Pembroke and Fishguard. With the support of Welsh Government support under the Tourism Investment Support Scheme a floating pontoon at Fishguard has been installed to allow larger vessels to anchor, as a result Fishguard calls have increased from 5 in 2015 to 29 for 2017.

Fishguard will get its first call of the season when the National Geographic 'Explorer' vessel – will call for the first time on 6 May. The call is as a result of a National Geographic familiarisation visit last year to see what Wales had to offer as a cruise destination. Passengers will be offered excursions to see the highlights of the Pembrokeshire Coast National Park and to explore the local flora and fauna.

This season, Welsh ports are set to welcome 37,000 passengers and 15,000 crew – an increase in calls of 33% year on year.

Cabinet Secretary for the Economy and Infrastructure, Ken Skates, said:

“The cruise market has been highlighted in the tourism strategy for Wales as one way of growing the tourism industry in Wales by 10% by 2020 and Cruise is one of the fastest growing sectors year on year. We are working with many outside stakeholders and are looking at various infrastructure developments for the cruise market. I hope that both the cruise operators and passengers are impressed with what Wales has to offer and will return again in the future.”