

Press release: £21 million investment for MAST Upgrade

The UK's new fusion experiment MAST Upgrade at Culham, Oxfordshire is to receive funding to tackle one of the hottest issues in fusion energy research – plasma exhaust.

The UK Atomic Energy Authority is assembling MAST Upgrade at Culham Science Centre and the device is within months of its first operations. The £21 million of plasma exhaust enhancements will be phased between now and 2022. Funding will come jointly from the European fusion research consortium EUROfusion and the UK's Engineering and Physical Sciences Research Council.

The controlled exhaust of power and particles from a hot fusion plasma, through the 'divertor' area of the reactor, is arguably the biggest challenge facing a future fusion power plant using the tokamak design. The extreme power loadings (>10 megawatts per square metre – higher than that on a spacecraft re-entering Earth's atmosphere) in a conventional divertor would require regular replacement of reactor components and adversely affect the economics and cost of electricity. Divertor and exhaust physics is therefore a major part of EUROfusion's reactor design work as part of its EU Roadmap to the Realisation of Fusion Energy.

MAST Upgrade's flexible divertor design is already focussed on studying a range of configurations which could solve this problem. These include the new 'Super X' divertor, designed to cool particles down by steering them on a longer exhaust path out of the plasma.

The plasma exhaust funding will give MAST Upgrade an unrivalled capability over the coming years by: increasing the tokamak's plasma heating power; installing a cryoplant for the divertor; improving plasma fuelling systems; upgrading plasma control hardware and software; and adding extra diagnostic equipment for measuring plasma exhaust data.

These upgrades will allow fusion scientists to improve their understanding of plasma exhaust physics and enable better predictive modelling of this issue for the prototype fusion powerplant DEMO.

Head of MAST Upgrade Operations, Andrew Kirk, was responsible for putting together the funding bid, said:

MAST Upgrade provides a uniquely flexible test bed for plasma exhaust physics in all divertor configurations. This extra funding will enhance our capabilities even further, enabling MAST Upgrade to assess alternative divertors for use in the first fusion power plants.

Martin Cox, MAST Upgrade project sponsor, also recognised a wider benefit:

I am delighted that we have received such strong EUROfusion support for MAST Upgrade despite the perturbation caused by Brexit. This shows tremendous confidence in our facilities and people, and demonstrates that we have a very important role to play in the future European fusion programme.

Ends

For an animation showing [MAST Upgrade's Super X divertor](#)

For more information please contact Nick Holloway, UKAEA Media Manager, on 01235 466232 or email nick.holloway@ukaea.uk

Notes to Editors

Fusion energy Fusion research aims to copy the process which powers the Sun for a new large-scale source of clean energy here on Earth. When light atomic nuclei fuse together to form heavier ones, a large amount of energy is released. To do this, fuel is heated to extreme temperatures, ten times hotter than the centre of the Sun, forming a plasma in which fusion reactions take place. A commercial power station will use the energy produced by fusion reactions to generate electricity.

Nuclear fusion has huge potential as a long-term energy source that is environmentally responsible (with no carbon emissions) and inherently safe, with abundant and widespread fuel resources (the raw materials are found in seawater and the Earth's crust).

Researchers at Culham are developing a type of fusion reactor known as a 'tokamak' – a magnetic chamber in which plasma is heated and controlled. The research is focused on preparing for the international tokamak experiment ITER, now being built in southern France. ITER – due to start up in 2025 – is designed to show that fusion can work at the scale of a powerplant, and if successful should lead to electricity from fusion being on the grid by 2050.

Fusion research at Culham is funded by the [Engineering and Physical Sciences Research Council](#) and by the European Union under the EURATOM treaty.

United Kingdom Atomic Energy Authority The UK Atomic Energy Authority (UKAEA) carries out fusion energy research on behalf of the UK Government at Culham Science Centre.

UKAEA's fusion lab Culham Centre for Fusion Energy oversees Britain's fusion programme, soon to be headed by the new MAST Upgrade experiment. It also hosts the world's largest fusion research facility, JET (Joint European Torus), which it operates for European scientists under a contract with the European Commission.

Further information: [MAST Upgrade project](#)

EUROfusion The EUROfusion consortium is made up of thirty members, representing 26 European Union member states plus Switzerland and Ukraine. In

addition about 100 third parties contribute to the research activities through the consortium members. EUROfusion collaborates on ITER activities with Fusion for Energy (Spain) and intensively supports the ITER International Organization (France).

EUROfusion funds fusion research activities in accordance with its roadmap to the realisation of fusion energy. The roadmap outlines the most efficient way to realise fusion electricity by 2050.

Further information: [Eurofusion](#)

Speech: SMMT Connected 2017 conference

Thank you. It is a real privilege to be here to be able to open this event.

We stand on the cusp of a radical shift in the automotive sector. The government should do what it can to facilitate of what is going to be a transformational set of possibilities.

Predicting the future, we know, is notoriously tough.

It was in 1894 'The Times' published a leader column, at a time when London transport was dominated by horse and carts. They predicted that "In 50 years, every street in London will be buried under nine feet of manure."

Now London in 1944 faced many challenges, but that wasn't one of them.

The automobile changed everything for the future.

It is clear already that it doesn't take much of a gaze into the crystal ball to know that the technology that is already being applied is going to make changes that are even more profound than those we have experienced in previous decades.

More than a million vehicles on UK roads are already connected to the internet. And the pace of development of self-driving vehicle technology is simply astonishing as everyone here knows and as we will be seeing more today.

How we respond to these opportunities and this shift is of huge importance.

I am very conscious, speaking on behalf of the government, that the only way we can do this and the best way we can do it, is to work together to solve the policy challenges, the research investment challenges, with you, in partnership.

This has been the way that the success of the automotive sector has been built over recent years and the years ahead provide an opportunity to deepen

that and to invite colleagues in relevant and adjacent sectors to join what has been an enormously successful collaboration.

It is worth just pointing out and reinforcing just why the level of interest and excitement in this subject matter is as it is. The video that Mike (Hawes) produced captures a lot of that.

There is the commercial opportunity and anyone in business will have a keen eye to that and I'll come on to that.

As that video shows, the potential for improving and in some cases, transforming people's lives is astonishing. One thing to emphasise is the role of these technologies in saving lives.

Nearly 90% of road crashes on our network of roads in this country involve human error. That said, we have some of the safest roads in the world in the UK, but even so, 1,700 people still die on our roads every year, and many more are injured and traumatised by that.

Over the decades, everyone in this room in the automotive sector has made huge and deliberate strides in improving safety. The government has supported that through a regulatory environment with advanced safety standards.

So we should, as a nation, be proud of the progress we've made.

In 1975, 6,400 people died on our roads. By 1995 that was down to 3,600. As I said, today, the toll stands at 1,700. Yet that is still 30 bereaved families each and every week in this country.

Greater automation, greater autonomy, and the help that we see through these technologies offers the possibility to transform that figure.

It will also mean new freedoms for elderly people and those with mobility impairments, opening up aspects of living their lives that seemed to be off limits in the past. Opening up the opportunities that many of us have taken for granted.

Even for those of us who drive now, the freedom not to have to, while still being able to get about where and when we want to, will be liberating.

Then there's the tremendous potential for improvements in productivity, new investment and faster growth right across these technologies.

The SMMT and the Automotive Council has a clear view that Mike Hawes expressed earlier, that the UK can be a world leader in this transformational field with our strengths, not only in automotive, but in research and development.

We can be agile and fleet of foot in having the right regulatory conditions in place, we can put in place the right conditions to ensure Britain is successful.

Companies around the world are making major investments already in this

technology.

There is obviously a long-term value for the UK, as a whole, if we can make sure we punch above our weight in the development and the commercialisation of these technologies.

It is very evident that if the UK doesn't take this opportunity, there will be many other countries that will be very keen to do so.

As part of the industrial strategy that we are working together with the industries in this room on, we have been very clear of the importance of innovations in mobility as a driving force of many of the changes that we think are available and that we can play this position of leadership.

We need to invest as a government, together with the industry, in the research, the skills of the workforce, the infrastructure we need to be competitive now and into the future.

We have strength in depth in many of the relevant areas of research for example robotics, artificial intelligence and telecommunications.

We have a wonderful history of innovation in the automotive sector, with UK designers and engineers sought after all over the world including many of you here in this room today.

And I'm determined that the government will be completely supportive in seeking to enable, to encourage, to work closely together, that where barriers are thrown up by discoveries then we can act quickly and decisively to remove them and address what might otherwise hold development back.

We need to do this in partnership, we need to do this in partnership not just with the industry but with our research institutions and our universities and our insurers for example.

Some of the most exciting self-driving and connected vehicle demonstration programmes anywhere in the world are already happening in the UK, backed up by over £200 million plus of investment from industry and from government.

I think is especially interesting about the UK's programme is who is involved in taking projects forward, and what they are trying to achieve.

For example, if anyone has time to go down to Greenwich over the next few months you may come across a number of fully automated, fully electric shuttles that will be taking people around the peninsula.

It won't just be the technology that is being demonstrated, but the breadth of partnership required to make it work in everyday situations.

Yes, of course, there are software companies like Oxbotica involved, developing the control system software.

Yes, there are vehicle manufacturers such as Westfield involved, who built the shuttle based on an existing design already in operation at Heathrow

airport

There are research labs like TRL involved, who have been engaged in automated vehicle research in the UK since the 1950s.

But other partners may be less obvious but equally crucial.

Greenwich Council, for example, who know this is an opportunity to solve problems of urban congestion and to further reinforce the many attractions of Greenwich.

The Royal College of Art who are keen to explore the implications for future vehicle design. I think back to that great flourishing in South Kensington of the 'Albertopolis' where you had institutions like the Royal College of Art set up with Imperial College and with the research and the artistic and scientific institutions working side-by-side on the shared problems of the day. You have just that possibility today.

Going back to Greenwich, the insurance company Royal Sun Alliance, who are working closely to assess the implications for the insurance industry.

It is part of a programme that is, and in my view, has to be collaborative by design, with the brightest minds from our universities working in partnership with different industries and those parts of the public sector that are needed to anticipate challenges and seize opportunities.

I'm very conscious that central government has a vital role too – not least by ensuring that we have the right regulatory framework to enable the development of this technology.

The UK, as many of you in the room know, was one of the first countries in the world to set out a framework for the testing of automated vehicles on public roads. Those of us that have had some experience of that are excited by it.

Safety is of course our primary concern, and our Code of Practice sets out how we think developers should act to ensure this.

But we have got to be careful and have taken care to design a framework that is supportive of a technology that has the potential to save lives.

As I was saying, most of the advanced here are positively contributing to a safer world and we should approach regulation with that in mind. An excessively cautious approach would risk stifling this potential and ultimately cost lives.

On the subject of risk, Mike has referred to the [Vehicle Technology and Aviation Bill](#) currently going through parliament, which addresses the issue of insurance for the developing market.

The Bill ensures that those affected by collisions – whether caused by a human driver or their automated vehicle – are financially protected.

The vital point is that, for affected individuals, the insurance process should feel more or less the same. Motorists and victims of collisions won't be forced to go to court to obtain compensation.

They will have the benefit of fast and fair insurance compensation – just as they do today. And that will be vital, it seems to me, to advance the commercial sales of self-driving cars.

Over the coming years we will take forward a programme of regulatory reform to ensure we stay up to date as the technology evolves.

Of course, more will need to be done; which is why we will engage closely and continuously with all stakeholders to ensure we always strike the right balance.

One of the other big thing that central government can do is provide direct support for the development and testing of connected and autonomous vehicle (CAV) technology in the UK.

That is why a few months ago, at the Autumn Statement, the government made a commitment to £100 million of new investment, to be match-funded by industry.

Today, I am delighted to announce that the first £55 million phase of competition funding will begin early next month.

Last Summer some of you responded to the invitation when we asked stakeholders for their views about the UK testing infrastructure for connected autonomous vehicles.

You told us that the UK could do something genuinely unique – and in the process create the world's most effective CAV testing cluster.

And this how you told us it could be done:

First, by coordinating our existing, and in many cases world class, assets into a coherent national ecosystem. So one asset complementing and reinforcing another.

Secondly, capitalising on our ability to test anywhere, enabling end-to-end testing across virtual, controlled and public environments.

Thirdly, by removing barriers to entry for SMEs and start-ups with fairly priced access to this comprehensive testing environment, and to support them in making best use of it. I'm conscious that as well the major players, we have new insurgents who may not have access to the same degree of infrastructure. If we can make it available to them, then this offers manifold opportunities for them, for the country and for the bigger audience.

And, finally, by concentrating investment where it will make the most difference: building up facilities and capacities that can serve as a one-stop shop for UK innovators and international partners.

Following the advice we've been given in recent months, we have decided to

focus on the broad cluster of excellence between London and Birmingham.

This will make sure we can capitalise on the strengths of test tracks at Millbrook and Mira, at the science parks at Case New Holland and Cranfield, and places like Coventry and Milton Keynes. They can work together, all of the institutions, all of the test tracks, all of the research facilities, can come together to create a place where everything is available.

Ultimately, the only way to benefit the country as a whole is to use this stage of investment to establish Britain unambiguously as the best place in the world to work on CAV technology.

In doing so our ambition is not solely to demonstrate excellence in this field, but, in doing so, to provide an exemplar, and I think the sector couldn't be a better exemplar, of what a modern industrial strategy can achieve.

This is both a hugely important opportunity in itself, but it is also in a sense, a test bed for other approaches to the Industrial Strategy in other sectors. I'm determined we will make a huge success of this so that we can apply it elsewhere.

Of course, many challenges remain on this journey, there will be ups and downs, and it is important we have a relationship that we can work together and work hard collaboratively to overcome obstacles and barriers, many of which may not be obvious.

However, what is clear to me, as someone who has come into this role and got to know the automotive sector pretty well, that the opportunity to change lives of citizens is huge.

We are I think in this country a nation with a justified reputation for innovation, entrepreneurship and for being makers as well as traders. We always have been and always will be. It is a history that unites us, and it should guide our future too.

So if we cannot predict the future in terms of mobility, we can certainly work together and we can be the ones who, if we do this, I think can create it here and others can follow our example.

[News story: Changes to UK anti-money laundering measures](#)

On 26 June 2017 changes will be made to UK anti-money laundering measures to help prevent money laundering and terrorist financing. It'll increase the transparency of who owns and controls companies in the UK. This legislation

will make changes to current requirements about people with significant control (PSC) information.

Impact on companies

From 26 June PSC won't be updated on the confirmation statement (CS01). Instead, you'll need to tell us on forms PSC01 to PSC09 whenever there's a change. You'll have 14 days to update your register and another 14 days to send the information to us.

Changes to exemptions

DTR5 companies are exempt from requirements to hold information about their PSC. From 26 June these exemptions will change, and you may need to provide PSC information. If your company's traded on an EEA or Schedule 1 specified market, it's still exempt. If your company isn't exempt, you'll need to send PSC information to us when changes take place.

Impact on different types of corporate bodies

Scottish Limited Partnerships (SLP)

From 24 July, active SLPs must register PSC information with us. You must tell us about the changes within 14 days. Every year, you must confirm the details are correct. From 24 July, you need to give PSC information when registering a new SLP.

General Scottish Partnerships (SP)

From 24 July, any SPs where all the partners are corporate bodies, need to register PSC information with us. You must tell us of changes within 14 days and confirm this information every year on a confirmation statement.

Protection regime

There will be changes to the [protection regime](#). When SPs and SLPs provide us with PSC information, the protection regime becomes available to them. You can apply for a restriction so your information isn't disclosed on the public register. Only specified public authorities can access this information at the moment for company types in scope of PSC requirements. The new anti-money laundering legislation extends this to credit and financial institutions, as these carry out customer due diligence. Where appropriate, we'll make protected PSC information available to them.

Press release: UK Space Agency and CNES join forces to curb climate change

The Agency's Director of Growth, Catherine Mealing-Jones, and CNES President, Jean-Yves Le Gall, signed the MicroCarb cooperation agreement this morning (19th April) at the French Ambassador's Residence in London, witnessed by Jo Johnson, the Minister of State for Universities, Science, Research and Innovation, and France's Ambassador to the UK, Sylvie Bermann.

MicroCarb is a satellite mission which will measure sources and sinks of carbon, the principal greenhouse gas driving global warming. It is the first European mission intended to characterise greenhouse gas fluxes on Earth's surface and gauge how much carbon is being absorbed by oceans and forests, the main sinks on the planet.

Credit: French Embassy Press Office.

The mission, scheduled to launch in 2020, will also contribute to international efforts to measure how much carbon gas is being emitted by natural processes and human activities. MicroCarb will enable the UK Space Agency and CNES to pave the way for a longer term operational system in response to the Paris Agreement.

The UK space sector is already thriving, employing more than 38,000 people all over the country and supporting over £250 billion of output across the wider economy. With its £10 million investment, the UK will provide key components and services for the MicroCarb satellite, securing and growing vital capability in understanding climate change. The University of Leicester and University of Edinburgh will also represent the UK on the joint science team.

Universities and Science Minister, Jo Johnson, said:

"UK collaboration with France on MicroCarb provides an excellent platform to demonstrate cutting-edge British science, our commitment to climate policy, and a productive relationship with a key European partner.

"The UK space sector is alive with talent and opportunity and through our modern Industrial Strategy we are ensuring the UK remains a vital contributor to international space research."

CNES President, Jean-Yves Le Gall, added:

"CNES is working with the UK Space Agency to curb climate change, and MicroCarb is a fine example of spacefaring Europe's commitment to this global effort and a further illustration of our ability to 'invent the future of space'."

News story: £1.4 billion deal for Royal Navy's new attack submarine

The submarine, named Agamemnon, is part of the Astute Class, the largest, most advanced and most powerful attack submarines ever to enter service with the Royal Navy. The submarines are being built by BAE Systems in Barrow-in-Furness, Cumbria, which employs around 8,000 people in its Submarines business, with thousands more working in the UK submarine supply chain.

The new contract guarantees a better deal for the UK taxpayer and for the Armed Forces, with an incentivised contract arrangement that will help to save money and demands the best possible work from industry.

Defence Secretary Sir Michael Fallon said:

This latest investment means we are well on our way to completing our fleet of Astute submarines. These are the most advanced submarines ever operated by the Royal Navy and are already providing unprecedented levels of stealth and attack capability across the world.

Backed by a rising defence budget and a £178 billion equipment plan, Barrow will remain the hub of our submarine build programmes providing high skilled jobs for years to come.

Defence Secretary Sir Michael Fallon with BAE Systems apprentices inside Devonshire Dock Hall where HMS Agamemnon is under construction. Picture: Michael Vallance, BAE Systems.

Construction of the 7,400 tonne, 97-metre long Agamemnon began in 2012, and is well underway in the Devonshire Dock Hall at Barrow, alongside Boat 5 – Anson – and the yet-to-be-named Boat 7. Their sister submarines, HMS Astute, Ambush and Artful are already in service with the Royal Navy, contributing to operations around the globe.

Rear Admiral Paul Methven, Director Submarines Acquisition for the Submarine Delivery Agency, said:

The signature of this contract secures another world-class nuclear submarine for the Royal Navy. These are the most technologically advanced submarines we have ever operated, offering much greater firepower, better communications and more advanced stealth technology than their predecessors.

Today marks another significant milestone for the Astute programme, that demonstrates the UK's ability to deliver complex engineering projects, providing a fleet of submarines which will protect the UK's interests around the globe.

Featuring the latest nuclear-powered technology, the Astute Class submarines can circumnavigate the world submerged, manufacturing the crew's oxygen from seawater as they go. They also have the ability to operate covertly and remain undetected in almost all circumstances despite being 50 per cent bigger than the Royal Navy's current Trafalgar Class submarines which are being replaced by the Astute Class.

Will Blamey, Managing Director of BAE Systems Submarines, said:

Securing the contract for the sixth Astute class submarine is a significant milestone for BAE Systems and the result of many years of hard work by our highly skilled workforce. The Astute class submarines are amongst the most highly capable and technologically advanced in the world and we're immensely proud to build them for the Royal Navy.

Alongside work on the Astute Class, BAE Systems is also the industrial lead for the Dreadnought programme, the Royal Navy's next generation of nuclear deterrent submarines.