



# Innovation in Action

## Press release

### European public-private partnerships delivering first socio-economic impacts

Brussels, Belgium, 8 December 2015 – Innovative European public-private partnerships (PPPs) are now starting to deliver socio-economic impacts in key industrial sectors, including aviation, electronic components & systems, health, and fuel cells and hydrogen for transport & energy solutions. The PPPs, all partnerships between the European Union, industries and (in some cases) Member States, are presenting their activities and successes in the European Parliament during the European Innovation Summit. The results demonstrate the added value of the PPP model and explain why two new PPPs have been set up more recently in the fields of bio-based products and rail.

A number of PPPs (also known as Joint Undertakings or JUs), were set up in 2007-2008 to drive innovation in key industrial sectors, namely aviation (Clean Sky and SESAR), electronic components & systems (ENIAC and ARTEMIS, which subsequently merged to create ECSEL), health (IMI), and fuel cells and hydrogen for transport & energy solutions (FCH).

Since their launch, these pioneering partnerships have more than demonstrated their ability to deliver results that are both scientifically excellent and have practical applications in areas that are vital to Europe's competitiveness. Now, the PPPs are starting to demonstrate clear socio-economic benefits.

In the **aviation** world, **Clean Sky** is delivering the large demonstrators resulting in significant pollution and noise level reductions. In some cases, these technologies – for instance, new engines, structures, aerodynamics, on-board energy systems and avionics – are already being integrated into products.

For its part, **SESAR** is delivering a catalogue of solutions to modernise European air traffic management, ensuring the sustainability of European air travel and aviation. A first set of solutions is already in the pipeline for Europe-wide deployment. In the longer term, deployment of SESAR solutions is expected to result in a system capable of handling up to 100% more traffic with increased safety, while reducing departure delays by 30% and CO2 emissions by 10%.

When it comes to **electronic components and systems**, **ECSEL's** forerunners, ARTEMIS and ENIAC, are delivering results with a significant impact. For example, one award-winning project developed a best-in-class leadership technology to reduce energy losses by up to 40% in energy generation, distribution and utilisation by manufacturing power electronics devices on silicon wafers thinner than paper. This technology leveraged a private investment of €250 million in Dresden.

According to industry data, the **FCH JU** has sparked investments across the **fuel cells and hydrogen** industry, resulting in significant leverage: almost 60% out of 150 organisations sampled have increased their research and development expenditures/budgets thanks to the FCH JU.

In the **health** sector, **IMI** projects are delivering tools to speed up drug development, particularly in challenging areas such as brain disorders, diabetes, and antimicrobial resistance. They are also helping to reduce the use of animals in medical research and establishing new research resources, networks and infrastructures. IMI is catalysing unprecedented levels of collaboration between the private and public sectors.

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By definition, all PPPs are leveraging significant levels of research funding from industry and, in some cases, Member States. They have also proven to be an asset for small and medium-sized enterprises (SMEs), which account for a large number of JU project participants.

Building on the successes of these older initiatives are two new PPPs set up in 2014. **BBI JU** (which is also involved in the European Innovation Summit) is working in the **bio-based industries and materials** sector. Its expected socio-economic impacts include reductions in greenhouse gas emissions, the creation of jobs (primarily in rural areas) and new, profitable uses for waste and industrial streams. In the rail sector, **Shift2Rail** brings together key stakeholders in the **rail** sector with the goal of doubling the capacity of the European rail system and increasing its reliability and service quality by 50%, whilst halving lifecycle costs.

Some challenges facing Europe and the world today are simply too great for any single company, organisation or country to succeed alone. Europe's PPPs excel at bringing together partners from universities, large industry, SMEs, and other stakeholder groups to create innovation-driven research communities focused on addressing these challenges. The results presented at the European Innovation Summit show that the PPP model is successful and can deliver significant socio-economic impacts.

# ENDS #

## Notes to Editors

**Clean Sky, SESAR, IMI, FCH, ECSEL and BBI** are taking part in a number of sessions plus an exhibition at the [European Innovation Summit 2015](#) in the European Parliament and surroundings. The key events are all on **Tuesday 8 December** at the following times and places (all rooms are in the **European Parliament**).

Date & time	Event	Location
<b>8:30-9:30</b>	<b>Press breakfast with the Joint Undertakings</b> All six JUs will present their activities and successes. Journalists will have plenty of time for Q & As	MEP Salon
<b>9:30-11:00</b>	<b>Policies and instruments for innovation</b> Speaking on behalf of all JUs, Bert de Colvenaer of FCH JU will give a speech on how the JUs represent a strong instrument for promoting innovation in key industrial areas.	PHS 4B001
<b>12:45-14:30</b>	<b>Opening of the European Innovation Summit Exhibition</b> All six JUs have stands at the exhibition, which runs for the duration of the summit.	ASP, first floor
<b>17:00-19:00</b>	<b>What is the socio-economic impact of pan-European Joint Undertakings?</b> Event featuring presentations by and debates with all JUs.	PHS 5B001

In addition, individual speakers from the JUs feature in a number of **other conference sessions**. For details, or to **arrange interviews** with PPP representatives, contact any of the JUs' press officers.

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## Press contacts, websites & social media

### Bio-Based Industries (BBI)

- Claudia Pecoraro, Policy Officer, European Commission  
E-mail: [claudia.pecoraro@ec.europa.eu](mailto:claudia.pecoraro@ec.europa.eu) | Tel: +32 2 296 1650
- [www.bbi-europe.eu](http://www.bbi-europe.eu) | Twitter: @BBI2020

### Clean Sky

- Maria-Fernanda Fau, Advocacy & Communications Manager  
E-mail: [maria-fernanda.fau@cleansky.eu](mailto:maria-fernanda.fau@cleansky.eu) | Tel: +32 2 221 8159
- [www.cleansky.eu](http://www.cleansky.eu) | @cleansky\_ju

### Electronic Components and Systems for European Leadership (ECSEL)

- Alun Foster, Head of Plans and Dissemination  
E-mail: [alun.foster@ecsel.europa.eu](mailto:alun.foster@ecsel.europa.eu) | Tel: +32 2 221 8122
- [www.ecsel.eu](http://www.ecsel.eu) | @ECSEL\_JU

### Fuel Cells and Hydrogen (FCH) JU

- Luciano Gaudio, Stakeholders Relationships Manager  
E-mail: [Luciano.Gaudio@fch.europa.eu](mailto:Luciano.Gaudio@fch.europa.eu) | Tel: +32 2 221 81 30 | Mobile: +32 478 77 71 16
- Zeynep Musoglu, Communication Officer  
E-mail: [zeynep.musoglu@fch.europa.eu](mailto:zeynep.musoglu@fch.europa.eu) | Tel: +32 2 221 81 28
- [www.fch.europa.eu](http://www.fch.europa.eu) | [www.linkedin.com/company/fch-ju](http://www.linkedin.com/company/fch-ju)

### Innovative Medicines Initiative (IMI)

- Catherine Brett, External Relations Manager  
E-mail: [catherine.brett@imi.europa.eu](mailto:catherine.brett@imi.europa.eu) | Tel: +32 2 541 8214 | Mobile: +32 484 896 227
- [www.imi.europa.eu](http://www.imi.europa.eu) | @IMI\_JU

### SESAR JU

- Triona Keaveney, Senior Communications and Media Relations Officer  
E-mail: [triona.keaveney@sesarju.eu](mailto:triona.keaveney@sesarju.eu) | Tel: +32 2 507 8012
- [www.sesarju.eu](http://www.sesarju.eu) | @SESAR\_JU

### Shift2Rail

- Maria Kelly, Communications Officer, European Commission  
E-mail: [maria.kelly@ec.europa.eu](mailto:maria.kelly@ec.europa.eu) | Tel: +32 2 298 8530
- [www.shift2rail.org](http://www.shift2rail.org)

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## Bio-Based Industries (BBI) – creating a competitive bioeconomy in Europe

Launched in 2014, the Bio-Based Industries Joint Undertaking (BBI JU) is a public private partnership between the European Commission and BIC (Bio-based Industries Consortium) supporting research and innovation for bio-based industries. The BBI JU budget stands at €3.705 billion (about 75% from industry).

- Independent body since 26 October 2015
- Horizon 2020 rules for participation
- Principles of openness, transparency and excellence

BBI JU's objective is to develop sustainable and competitive bio-based industries in Europe, based on advanced biorefineries that source their biomass sustainably by:

1. demonstrating new technologies using European biomasses: new chemical building blocks, new materials, and new consumer products from European biomass;
2. developing business models integrating economic actors along the value chain;
3. setting up flagship biorefinery plants deploying technologies & business models for bio-based materials, chemicals & fuels, demonstrating cost & performance.

The expected impacts of BBI JU for Europe by 2030 are as follows:

- develop the potential of agriculture waste and forestry residues;
- replace 30% oil-based chemicals & materials;
- diversify & grow farmers' income;
- create 1 million jobs – 80% in rural areas;
- reduce dependency on import of fossil raw materials;
- shift to bio-based → average 50% greenhouse gas emission reduction.

Find out more: [www.bbi-europe.eu](http://www.bbi-europe.eu)

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## Clean Sky - powering a stronger Europe

Aerospace is one of the top-ranking sectors of excellence in Europe. The European aeronautical industry leads, or co-leads, worldwide. This industry shows a steady growth and in 2013, contributed to 4% of the EU's gross domestic product (GDP).

That growth translates to jobs in aeronautics amounting to 534 000 in Europe. With a global demand increasing by more than 4% per annum and an estimated need for 40 000 new aircraft in the next 20 years, according to all predictions the sector will continue growing enormously. This is a huge opportunity for the European economy, but it creates obligations for the manufacturers and airlines related to the environmental footprint. It also triggers the appearance of new entrants from emerging countries, and makes it all the more necessary for European industry to keep its competitive edge through innovation.

The EU answer to this challenge is Clean Sky - the EU Joint Technology Initiative for aeronautics, fostering and coordinating research and innovation in substantially greening aeronautics and fostering competitiveness. The mainstream objective of this programme is to integrate ambitious technologies into full-scale demonstrators, in order to reach a high readiness level - ready for future implementation into new products and markets.

Clean Sky 1 started in 2008. It has grown into a wide research and technology ecosystem from all over Europe, with more than 600 participating entities in 24 countries. Industrial leaders, universities, research centres and European SMEs work together to keep innovation at the heart of the European leadership for aeronautics. Clean Sky is SME-friendly - they account for up to 35% of all the Calls for Proposals' participants.

With still one year to go, Clean Sky is already delivering the large demonstrators resulting in significant carbon dioxide (CO<sub>2</sub>), gas emissions and noise level reductions. In some cases, these technologies – for instance, new engines, structures, aerodynamics, on-board energy systems and avionics – are already being integrated into products.

The results of Clean Sky 1 to date show clearly that the formula is successful. Its follow-up, Clean Sky 2, has already started and has gone through 4 Calls for Proposals and recruited about 200 participating entities as a first step.

Find out more: [www.cleansky.eu](http://www.cleansky.eu)

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## Electronic Components and Systems for European Leadership (ECSEL) - keeping Europe at the forefront of technology development in electronic components and systems

With a unique, tri-partite funding model, ECSEL JU leverages on EU, national/regional, and private investments in research, development and innovation (RD&I) to ensure unconstrained access to electronic components and systems technologies for key markets and for addressing societal challenges. The €1.17 billion funding made available by the EU is expected to attract a commensurate amount of funding from the ECSEL Participating States. Adding to the €2.34 billion contribution from the research and development actors, this leverages a total investment approaching €5 billion for the whole programme.

The Joint Undertakings ARTEMIS and ENIAC, that came before ECSEL JU, selected altogether 119 projects for funding, engaging €630 million in EU contributions, leveraging €912 million national contributions, and incentivising research and innovation with total eligible costs approaching €4 billion. Each euro contributed by the EU resulted in €6.40 research and innovation activity in Europe.

ECSEL also draws benefit from being a public-private partnership. The private members are excellently positioned to assure the direct industrial and research relevance of the programme's activities, and to federate the RD&I actors into coherent projects clustered around key topics and amplifying their impact. At the same time this assures alignment with European, national and regional strategic priorities.

Through this construction, ENIAC and ARTEMIS (and now ECSEL JU), have been able to construct major, impactful projects. Two examples:

- 'Critical sYStem engineering Acceleration' (CRYSTAL) will reconfirm the European leadership in safety-critical electronics systems (for automotive and other transport domains, and of course healthcare), establishing an Interoperability Specification (IOS) and a Reference Technology Platform (RTP) as a European standard, providing ready-to-use, integrated tool chains. It engages a budget of €82 million to support 71 partners from 10 countries, keeping European companies at the forefront of these markets.
- 'Enabling Power technologies on 300mm wafers' (EPT300) developed a best-in-class, leadership technology to reduce energy losses by up to 40% in energy generation, distribution and utilisation, by building power devices on 300mm wafers thinner than paper. It has been selected by the European Commission as a 'multiKET Pilot Line' demonstrator, and received the Austrian Ministry of Economy, Family and Youth's State Prize for Innovation in 2013. The sequence of pilot line projects EPT300 >> EPPL >> eRAMP created the technology that leveraged a private investment of €250 million in Dresden.

Find out more: [www.ecsel.eu](http://www.ecsel.eu)

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## Fuel Cells and Hydrogen (FCH) – sparking investments, building communities

Hydrogen is a versatile energy carrier that can be produced from various feedstocks including renewable sources such as solar and wind. Fuel cells directly convert the chemical energy in hydrogen to electricity, with pure water and potentially useful heat as the only by-products. Hydrogen-powered fuel cells are not only pollution free, but they also have more than double the energy efficiency of traditional combustion technologies.

Since 2008, the FCH JU has been supporting **155 projects** and has contributed to build a strong FCH community in Europe: **1 266 participants and 545 beneficiaries**. In particular among the beneficiaries, 169 (31%) are research centres and universities and 348 (63%) are private companies. The FCH JU has also been successful in attracting **SMEs**, which account for **27%** participation compared to 18% across the Seventh Framework Programme (FP7).

The FCH sector represents a very significant economic potential. It is estimated that the total number of jobs in the sector in Europe has been increasing by about 6% yearly since 2007, to around 4 000 full time employees in 2012 and turnover is expected to rise by on average 35% year on year towards 2020, according to a 2013 report commissioned by FCH JU. It is also estimated that the manufacturing of fuel cells worldwide will experience exponential growth in jobs this decade, with almost 700 000 cumulative jobs created by 2020 (over a million total new jobs could be created when fuel cell installation, servicing and maintenance is considered). To ensure that as many of these jobs as possible are created in Europe, incentives for the technology roll-out need to be put in place.

On average, annual turnover has increased by 10% (on a 2012 total of €0.5 billion), research and development expenditures by 8% (on a 2012 total of €1.8 billion) and market deployment expenditures by 6% (on a 2012 total of €0.6 billion).

According to industry data, the FCH JU has sparked investments across the FCH industry, resulting in significant leverage: almost 60% out of 150 organisations sampled have increased their research and development expenditures/budgets thanks to the FCH JU.

In addition, the FCH sector also outpaced the rest of the industry concerning the number of patents granted. It saw a 16% annual increase in the number of patents granted in the EU to European companies, while the average annual growth for all EU industries was 1.5%.

Building a resilient Energy Union in Europe, with a forward-looking climate change policy, will not be possible without concrete technologies. Fuel cells and hydrogen constitute a triple 'win' for Europe because they simultaneously **enhance energy security, improve environmental sustainability, and boost economic competitiveness**. Capable of producing heat and electricity for buildings, and as an electrical power source for vehicles or energy storage enabler, fuel cells and hydrogen can help address the most pressing European challenges and priorities.

Find out more: [www.fch.europa.eu](http://www.fch.europa.eu)

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## Innovative Medicines Initiative (IMI) – Europe’s partnership for health

The Innovative Medicines Initiative (IMI) is a partnership between the EU and the European pharmaceutical industry (represented by EFPIA, the European Federation of Pharmaceutical Industries and Associations). IMI was created because medicines development is a lengthy, inefficient and costly process, and turning scientific discoveries into benefits for patients is incredibly challenging. In addition, Europe’s drug development sector faces increasingly stiff competition from the US and Asia.

The good news is that IMI is delivering innovative solutions to the many bottlenecks in drug development and creating a thriving research community that is well placed to carry research findings from laboratory bench to patient bedside.

IMI has a total budget of over €5 billion for the period 2008-2024. Half of this comes from the EU’s research programmes; the other half comes from large companies and organisations, mostly EFPIA companies. EFPIA companies do not receive any EU funding, but contribute to the projects ‘in kind’, for example by investing their researchers’ time or providing access to research facilities or resources. This means that for every euro of taxpayers’ money invested in medical research and innovation through IMI, an additional euro is invested by the industry.

The results of this investment are impressive. On the jobs front, there are now 2 272 full-time, highly-skilled jobs directly associated with IMI projects. SMEs are key partners in IMI; there are currently 169 SMEs involved in IMI projects, and they receive 15.8% of IMI funding. Through IMI, they have been able to validate and commercialise new tools and technologies for drug development, and hire new staff. IMI projects have also established new spin-off organisations to ensure project activities will continue when the IMI funding ends.

The tools, methods and technologies developed by IMI projects have other important impacts. By saving time and reducing inefficiency, they are helping to lower drug development costs. Many project results also contribute to efforts to reduce the use of animals in medical research.

Research networks and infrastructures created by the projects are also making their mark on medicines development. For example, the COMBACTE project has created a pan-European network of clinical trial sites for antibiotics designed to treat drug-resistant infections; the first clinical trial is already ongoing and more are in the pipeline. Meanwhile IMI’s Ebola projects are running clinical trials of Ebola vaccines in Africa and elsewhere. Just setting up the trials is delivering benefits for local communities; in one trial in Sierra Leone, new facilities had to be built to run the study, including an emergency room and vaccine storage facility at a local hospital.

In addition to its research projects, IMI boasts a number of education projects; by training new and existing medicines development professionals, these are helping to increase skills in the sector, including among patients keen to play a stronger role in medical research.

IMI’s first projects began in 2009-2010 and are drawing to a close now. IMI is currently carrying out an in-depth study of the socio-economic impacts of these projects; the results are expected in early 2016.

In the longer term, it is expected that IMI’s socio-economic impacts will be significant, as many IMI projects are working in disease areas like Alzheimer’s disease, diabetes and antimicrobial resistance where there is an urgent need for safe, effective treatments.

Find out more: [www.imi.europa.eu](http://www.imi.europa.eu)

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## SESAR Joint Undertaking

Aviation is a key driver of EU economic growth, jobs and trade, and essential for the life and mobility of its citizens. The EU air transport and airports directly employ around 1.4 million people and support 4.7 million (direct or indirect) jobs. The direct contribution of air transport and airports to the EU's gross domestic product (GDP) is estimated at €110 billion, while the overall total impact, including the indirect effects, is as large as €300 billion. Air traffic management (ATM) is a critical element of this aviation value chain, however, the system is currently highly fragmented and reliant on ageing technology, leading to inefficiencies amounting to €4 billion annually.

As the technological pillar of the Single European Sky (SES), the SESAR project is recognised as an essential enabler for modernising European ATM and ensuring that European air travel stays attractive, while the European aviation industry remains competitive. Since its establishment in 2007, the SESAR Joint Undertaking (SJU) has conducted more than 350 validations, mobilising the equivalent of more than 1 800 full-time jobs from the aviation domain and developing a network of skilled experts across the Member States' ATM industry. Together, this workforce has succeeded in defining, researching and developing solutions to overcome fragmentation and deliver a better performing ATM system. This collaboration has led to the delivery of close to 95 industry prototypes, thereby setting a new standard for the future evolution of systems both on the ground as well as in the air. The SJU has also carried out more than 30 000 individual flight trials demonstrating the readiness of SESAR Solutions for wider scale deployment.

In 2013, a first mature set of these solutions was selected by the European Commission for Europe-wide deployment within the framework of by the Pilot Common Project, a process which is coordinated by the SESAR Deployment Manager. These solutions (grouped into six 'ATM Functionalities') are expected to be deployed between 2015 and 2024 across Europe, and are expected to deliver a total of approximately €12.1 billion worth of performance gains for some €3.8 billion of investments. Looking beyond to 2035, and subject to a timely and coordinated the deployment of solutions, the SESAR project could potentially generate for aviation annual recurring benefits ranging from €8 billion to €15 billion per year. This translates into the following gains:

- efficiency and predictability: up to 6% reduction in flight times and up to 30% reduction in departure delays;
- environment: up to 10% reduction in fuel burn and CO<sub>2</sub> emissions;
- capacity: a system capable of handling up to 100% more traffic, and up to 10% additional flights landing at congested airports;
- cost-effectiveness: up to 40% reduction in air navigation services costs per flight;
- safety: improved by a factor of 3-4 times coping with the expected traffic increase.

Or, for an average trip in Europe:

- 20 minutes shorter door-to-door travel time;
- 10 kg in fuel savings per passenger;
- €15 in ticket savings.

Find out more: [www.sesarju.eu](http://www.sesarju.eu)

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